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# Australian Outdoor Timber and Infrastructure Market

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# **Australian Outdoor Timber and Infrastructure Market**

Prepared for

**Forest & Wood Products Australia**

by

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*Knowledge for a sustainable Australia*

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## Executive Summary

In order to understand whether Forest and Wood Products Australia's Research and Development program could provide any value or benefit to the outdoor timber and infrastructure market, an overview of the current National market size and priorities (including lost opportunities) for this industry sector has been conducted.

The outdoor timber and infrastructure markets represent approximately 37 to 52 per cent (dependent of calculation method) of the apparent consumption of sawn and round wood. The market volume has doubled over the last 10 years with sawn treated plantation timber seeing the largest growth, particularly landscaping sleepers.

The round wood market on the other hand has declined to half its size when last measured in 2007. Sawn hardwood has remained steady with hardwood round used as transmission poles seeing some decline.

As with other sectors of the Australian timber industry there are threats or lost opportunities. Some of these could be resolved with focussed research or development and others that are beyond the FWPA's ambit, e.g. resource access. It is recommended that this sector be considered as significant within the timber industry.

PRODUCT	ESTIMATED VOLUME m <sup>3</sup>					
	Softwood			Hardwood & Cypress		
	2000	2007	2010	2000	2007	2010
Roundwood agricultural & landscape	303,164	485,000	249,000	-	-	-
Sawn fencing and landscaping	249,839	235,000	614,000 - 1,187,589	57,509	33,950	53,000
Sawn structural	60,054	190,000	640,000 - 719,389	1,617	-	50,000 - 100,000
Sawn other construction	104,000	82,000	68,000	30,863	-	113,500
Infrastructure / heavy industrial	14,960	10,000	15,000	136,850	90,000	92,275
<b>TOTAL VOLUMES</b>	<b>732,017</b>	<b>1,002,000</b>	<b>1,586,000 - 2,273,978</b>	<b>226,839</b>	<b>123,950</b>	<b>308,775 - 358,775</b>

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## Background

Forest and Wood Product Australia (FWPA) has been investigating its priorities in investments and it was suggested that outdoor and infrastructure timber applications were under-represented. That is, timber and wood products such as agricultural rounds, outdoor structural and landscaping timber products and poles, bridge and wharf timbers.

In order to understand if FWPA's R&D program could provide any value or benefit to this part of the industry an overview of the current national market size, priorities (including lost opportunities) for this industry sector has been conducted.

The following summary report describes:

- The structure of this market sector - describing key participants in the supply chain (growers, processors, merchants and specifiers), and
- Major species and annual volumes entering the market, and
- Historical trends over previous 10 years with industry forecasts for volume demands for the next 10 years, and
- A very initial high level screening of R&D (product) challenges facing this sector has also been conducted.

### ***Acknowledgements***

The Timber Development Association wishes to thank the numerous companies and individuals involved in the development of this report. The report would not have been possible without the cooperation given by the timber industry in freely allowing access to their data and knowledge. In some cases to understand the breakup of segments and categories commercial-in-confidence information was made available.

Special thanks are given to A3P and the New Zealand Timber industry that were freely willing to make their data available and assist in interpreting the results.

## Estimated volumes of new outdoor & infrastructure timbers (2000-2010)

PRODUCT	ESTIMATED VOLUME m <sup>3</sup>					
	Softwood			Hardwood & Cypress		
	2000	2007	2010	2000	2007	2010
<b>ROUNDWOOD AGRICULTURAL &amp; LANDSCAPE</b>						
Grape Sticks / Horticultural posts	125,803	270,000	249,000	nd	nd	nd
Landscape and fencing rounds	177,361	215,000		nd	nd	nd
	<b>303,164</b>	<b>485,000</b>	<b>249,000</b>	-	-	-
<b>SAWNWOOD</b>						
<b>Sawn Fencing and Landscaping</b>						
Palings and Pickets	126,353	80,000	250,000 - 625,437 <sup>1</sup>	57,509	33,950	53,000
Fence Posts and General Landscape	102,554	140,000		na	na	na
Lattice	20,932	nd		na	na	na
Landscape Sleepers	-	15,000	364,000 - 562,152 <sup>2</sup>	na	na	na
	<b>249,839</b>	<b>235,000</b>	<b>614,000 - 1,187,589<sup>5</sup></b>	<b>57,509</b>	<b>33,950</b>	<b>53,000</b>
<b>Sawn Structural</b>						
F, MGP, GL & LVL grades	60,054	190,000	340,000 - 454,389	1,617	nd	50,000 - 100,000
H3 LOSP	nd	nd	300,000	na	na	na
	<b>60,054</b>	<b>190,000</b>	<b>640,000 - 719,389<sup>3</sup></b>	<b>1,617</b>	-	<b>50,000 - 100,000</b>
<b>Sawn Other Construction</b>						
Residential decking boards	43,000	50,000	50,000	5,673	nd	100,000
External joinery	36,000	14,000	9,000 <sup>3</sup>	23,000	nd	nd
Cladding	25,000	18,000	9,000 <sup>4</sup>	2,190	nd	13,500
	<b>104,000</b>	<b>82,000</b>	<b>68,000</b>	<b>30,863</b>	-	<b>113,500</b>
<b>ALL SAWNWOOD</b>	<b>413,893</b>	<b>507,000</b>	<b>1,222,000 - 2,009,978<sup>5</sup></b>	<b>89,989</b>	<b>33,950</b>	<b>216,500 - 266,500</b>
<b>INFRASTRUCTURE / HEAVY INDUSTRIAL</b>						
Sleepers (railway)	-	-	-	25,000	20,000	12,275
Commercial Boardwalk, Bridge, Wharf, Cross-arms etc	2,250	nd	1,000	3,860	nd	15,000
Round Poles and Piles	12,710	10,000	14,000	107,990	70,000	65,000
	<b>14,960</b>	<b>10,000</b>	<b>15,000</b>	<b>136,850</b>	<b>90,000</b>	<b>92,275</b>
<b>TOTAL VOLUMES</b>	<b>732,017</b>	<b>1,002,000</b>	<b>1,586,000 - 2,273,978<sup>5</sup></b>	<b>226,839</b>	<b>123,950</b>	<b>308,775 - 358,775</b>

Table 1: Estimated volumes of outdoor and infrastructure timber and wood products 2000-2010. Sources: 2000 & 2007 – Unpublished surveys and published reports. 2010 – Industry Sources.

<sup>1</sup> Upper values based on estimate of preservatives sold and typical retention rates

<sup>2</sup> Upper values based on estimate of preservatives sold and typical retention rates

<sup>3</sup> Plus sawn timber and EWPs included in H3LOSP

<sup>4</sup> Plus sawn timber and EWPs included in H3LOSP

<sup>5</sup> Range of volume are given due to conflict in outcomes when comparing the various sources of data collection

nd – no data available

na – not applicable

## Proportion of total timber consumption

Data gathered for Table 1 gives total outdoor timber consumption for 2010 of between 1 894 775 to 2 632 753 cubic metres. ABARE statistics are not currently available for apparent consumption of timber in Australia for 2009-2010 so a comparison using apparent consumption of timber for 2008-2009 has been done. Total Australian sawn timber consumption in 2008-2009 was 4 995 000 cubic metres. Therefore between 38 - 53% of the timber market in Australia is outdoor timber products. Note that this excludes industrial packaging (softwood and hardwood) which is a significant market sector (~435,000 – 500,000 m<sup>3</sup> per annum) which could also be considered outside timber.

## Key participants in the supply chain

The most dominant product in the outdoor and infrastructure timber market by volume is treated plantation pine, which represents between 84 to 86 per cent of the entire market. The key component of treated plantation pine is sawn treated pine, representing between 70 to 76 percent by volume of the entire market. Fencing, landscaping, and structural products are the main uses of sawn treated pine.

In this product segment, the key participants in the supply chain are the softwood plantation owners, processors, contract treaters (see definition below), and timber wholesalers/distributors and merchants. Some significant volumes in this segment are imported into Australia from New Zealand and Chile and therefore importers are another participant in this sector.

Of the three remaining categories softwood roundwood is the next largest segment. Key participants in this segment are plantation growers and contract treaters. There is also some involvement by wholesalers/distributors and merchants.

Sawn hardwood and infrastructure applications segment represent the rest of the outdoor market and they are similar in size. Sawn hardwood key participants are the native forest owners, processors, wholesalers and merchants. The infrastructure market segment has plantation and native forest owners, processors and government and private infrastructure owners (power poles, rail and road bridges etc) as key participants.

### *Contract Treaters*

These are specialist companies that treat timber products but may not necessarily process or remanufacture them further.

In some instances processors may sell untreated sawn products to these specialist companies and then purchase back the treated product.



## **Major species and indicative major volumes**

Preservative treated plantation pine such as radiata, slash and hoop pine, completely dominate this market accounting for around 90 percent by volume. Plantation pines are sourced locally and radiata pine is also imported in finished and untreated form from New Zealand and Chile.

The remainder of the market is split up with hardwoods, being either Australian native or imported species, the main imported hardwood species by far is merbau. Small volumes of locally sourced cypress are used in fencing markets. A small amount of imported softwood such as Western Red Cedar comes in for use as cladding and external joinery.

### ***Australian native hardwoods***

Of the Australian hardwood timber species used it is hardwoods that have an in-ground natural durability class 2 or better that are used in the outdoor and infrastructure markets. Australian species such as spotted gum and blackbutt dominate but there are many other species available in lesser volumes. River red gum dominates the hardwood railway sleeper market.

### ***Imported hardwoods***

This segment is heavily represented by merbau. Ten years ago this species was relatively unknown however with this timber meeting the bushfire resistance requirement for BAL 29 level, and the low cost compared to Australian hardwoods, the demand for merbau has grown strongly. Today it is the dominate hardwood decking species and is also beginning to be available as post and structural sizes.

Other imported hardwoods species such as yellow balau are available for outside applications but are not as nearly as prevalent as merbau.

## Trends over previous 10 years

### ***Roundwood***

The softwood roundwood market has seen a collapse in volumes occurring in recent years. The reason for this collapse is attributed to the reduction in demand for agricultural and horticultural poles due to a decade of drought, particularly in key markets of Victoria and South Australia. Adding to the collapse is the glut in wine grape production with few new vineyards being established in recent years. Also during the last decade the latter has also seen the market place learn to damage fewer poles, recycle and repair poles as well as, to a lesser extent, use non-wood products.

### ***Sawn fencing & landscaping timber***

This market segment has been the fastest growing market segment in the outdoor timber and infrastructure markets. Of this segment, production of treated landscape sleepers appears to have exploded in volume.

The reason for this is not known, but some of the basis for this growth can be attributed to previous under reporting and underestimating in the reviewed reports. However, there is no doubt that market sales data trends indicate growth in this segment as there is a noticeable trend away from use of roundwood in urban landscaping to sawn landscaping timbers. There is also greater customer access to the product and expansion of uses generated by TV renovation shows and their focus on outdoor rooms.

Production of treated pine fence palings and fence rails has also increased. Again, the reasons for this are unclear but a portion may be attributed to previous reports underestimating this category. Sales of fencing are closely correlated to increase new home construction and growth and demand in Victoria and Queensland has been strong. There are also increased fence renewals due to degradation of old hardwood fences. Hardwood resource accessibility has also seen the availability of hardwood palings fall, the market being taken up by treated pine, but the decline in volume in hardwood is not enough to explain the large volume increases in treated pine fencing. Other reasons given are the increased use of lapped fencing as well as the reported use of palings to both sides of the fence.

### ***Sawn structural & other timber***

The volume of sawn structural pine has also increased, but not to the same degree as treated landscape material. The small growth may be attributed to the fact that suppliers of structural timber are more likely to be captured by previous and current volume data surveys and estimates, and more reliable estimates of preservative uptake.

H3 LOSP product market segment figures vary in their coverage and detail provided so an accurate indication of growth is not possible. However, there is strong to suggest there has been significant growth in this market segment with a continuing steady growth and this is likely to continue.

Reasons for this steady growth can be attributed to the use of finger jointed primed H3 LOSP product. This product has superior attributes to rougher headed treated pine which results in it being preferred in featured outdoor application such as pergolas, balustrades, handrails, picket fencing and outdoor rooms. In addition timber companies have been marketing this product which has assisted the increase sales. This growth is likely to continue as the product is becoming a preferred option in many of these applications, particularly if the product will be painted. Strong growth is particularly noted in NSW and Victoria.

One observation noted was the use of this outdoor product in internal applications. The reason for this can only be attributed to the finger jointed primed finish that has superior finish qualities and requires less painting.

Another reason for the growth in LOSP is the APVMA restrictions on certain applications of CCA treated timber, Government's procurement policies has seen a trend away from CCA to that of LOSP, ACQ and copper azole. Added to this is the fact that the LOSP treatment process is friendlier to finger-jointing adhesives, does not need to be redried after treatment, and that it remains stable in transporting and storing in merchants racks, there was a noticeable trend towards H3 LOSP.

The use of sawn structural hardwoods in outdoor applications such as deck framing has not changed significantly. Increased bushfire restrictions have favoured the hardwood species that are naturally bushfire resisting (i.e. blackbutt, spotted gum) but a range of unseasoned hardwoods predominate. Growth from this has been counterbalanced by wider use of treated softwoods as well as non-wood products such as steel.

### **Western red cedar**

Over five years ago Canadian suppliers had been shipping around 50,000 m<sup>3</sup> of Western Red Cedar (WRC) into Australia per year. In the main around half of the WRC ended up in the outdoor market. Recently the volume has fallen dramatically by 25 - 30% in total annual volumes and even more in dollar value.

The trend in volumes (and dollar value) of WRC is decreasing. Reasons given for this are, restrictive bushfire requirements for both cladding and window joinery, substitution by fibre-cement (in bushfire and non-bushfire areas) and increased take up of hardboard, primed pine and plywood cladding products. There are also strong indications that demand for some finished manufactured products (e.g. plantation shutters and window frames) has not changed but has seen manufacturing occur outside Australia, to countries such as China or Vietnam, from imported WRC and shipped to Australia.

### **Cladding**

There appears to have been some growth in cladding volumes as new homes increasingly utilise a variety of external walling materials – particularly on the first floor. There also appears to be a trend towards lighter weight housing in some markets (e.g. knock down/rebuilds of holiday homes) growth in first floor additions which is adding to demand.

### ***Infrastructure & heavy industrial***

There has been significant reduction in volumes of timber railway sleepers. Demand was quite high in and around the year 2000 due to large renewal projects and timber availability but has steeply declined since then.

Significant losses in markets in larger transmission poles to alternative materials and losses in country NSW in particular to concrete and steel were caused by supply problems of suitable hardwood poles. Extended spacing distance between large poles also meant that hardwood cannot compete. Losses in larger poles have been counterbalanced by increases in electricity distribution networks and replacement of ageing smaller transmission poles means this market is fairly steady.

## **Forecast for next 10 years**

### ***Roundwood agricultural & landscaping***

The last 10 years saw a doubling in planting in the Australian wine grape sector. This saw considerable demand for small round timber for vineyard sticks. In recent times wine grape prices have remained steady or fallen; consequently the demand for new planting has reduced with the consequence vineyard sticks demand has not fallen.

The forecast for treated round vineyard sticks is they will not return to the early to mid 2000's demand as the wine grape industry will either stay static or reduce. This combined with reduced damage and increased reuse and repair of sticks means that it is likely that the demand for vineyard sticks will continue to be low.

Small round timber is utilised as stock fencing and other use in the agriculture sector. The trend has been falling over the last 10 years with the severe and extended drought and general decline in this sector. With returning more favorable weather in key Victorian and South Australian markets the outlook for this sector could improve, but it is early days yet to see if this is actually the case. Use of roundwood for landscaping needs is expected to decrease as masonry continues to take the end market and sawn landscape and sleepers take up the low end of the market.

### ***Sawn fencing and landscaping***

New house starts and the ease and flexibility of construction, availability and price will continue to mean that timber fencing and landscape market should remain steady or even grow. Growth in prime pine pickets is also expected.

### ***Sawn structural & other timber***

The market for structural timber such as rougher headed is expected to remain steady or even fall as house starts and economic activity remains steady. The trend towards outdoor rooms is strong yet is mitigated by increased bushfire restrictions as well as a trend towards new housing incorporating outdoor areas as part of the house structure (and roofline) – creating less demand for attached timber structures. However, population growth will compensate to some degree and markets grow slightly.

The market for primed pine has seen steady growth and this is likely to continue. With the combined attributes of finger jointed defect free timber and a true factory applied primer has seen demand of this product increased. In addition as some timber companies are doing excellent marketing of these products. Wide spread availability, ease and flexibility of construction and competitive pricing means continuing steady growth is predicted.

### ***Infrastructure and heavy industrial***

Growth in investments in infrastructure renewal (particularly in flood/cyclone affected areas) is expected to continue over the next 10 years. However replacement with alternative non-wood materials is likely in most segments so the market is expected to stay steady.

## Challenges requiring R&D work

The diversity of products found in the outdoor timber market is too great to adequately describe all of the challenges facing this sector. Therefore a few of the key challenges are described below.

### *Bushfire design requirements*

The restrictions placed on using timber products in and around buildings in bushfire prone areas have increased dramatically over the last 10 years. These requirements have shifted demand seen by the introduction of merbau in the early 2000's to its current near domination of the hardwood decking market today. Use of Western red cedar has declined considerably as bushfire solutions utilising this species are not available as well as competition from other cladding products, both wood and non-wood.

The year 2009 saw the restrictions expanded to include greater parts of Australia considered bushfire prone, particularly Victoria where the whole state is declared bushfire prone. Many parts of metropolitan areas are now considered bushfire prone where previously they were not. Other states such as Queensland and Western Australia previously avoided capture altogether but this has now changed.

2011 will see the re-introduction of grassland which will again dramatically increase the number of buildings captured by bushfire building requirements. Softwood products, particularly treated pine will be dramatically affected as building solutions for treated pine will again be adversely restricted in affected areas.

There are Standards and building regulations that allow the use of fire retardants for bushfire resistance but to date no manufacturer has successfully commercially developed a product.

### *Disposal / end-of-life*

International trends show that there may be a time in the future where wood, particularly treated wood products, may be prevented from disposal in landfill. If landfill bans ever eventuate it would affect the preference for treated timber products to be used as the increase cost of available disposal mechanisms will be factored into the project's life costs.

A micro example of this continues to be seen in South Australia where over the past five years end-of-life CCA treated grape sticks were unable to be disposed in landfills in that state. This stimulated repair and reuse options of existing grape sticks over purchase of new product.

The two examples above provide an insight on how end-of-life restrictions on treated wood can adversely affect markets for new wood products.

A particular Australian trend is increasing state government levies that drive increased diversion from landfill and recovery of wastes, including timber into recycling and energy applications. A federal carbon pollution tax or emissions trading scheme (ETS) would also drive increase use of end-of-life wood for energy purposes. Actual or perceived additional non-carbon air pollution (e.g. particulates, dioxins etc) and contaminates in ash from combustion of outdoor treated timber creates a barrier to the use of the diverse range of treated timbers for energy purposes.

While the traditional preservative CCA is relatively well-researched, the non-CCA preservatives are not. Some problems are occurring in the disposal and energy recovery of some of the end-of-life wood products treated with these non-CCA preservatives. Research is needed to look into the recyclability and/or combustion issues associated with these non-CCA treated timbers

### ***Expectation of appearance of timber in outdoor environments***

The attributes that favour timber selection in the interior environment, its aesthetic qualities, let it down in exterior applications. It is clear that the look and feel of timber in its interior applications is desired to be repeated in the exterior environment.

Exterior timber applications are not preferred due to the increased maintenance needs in the first instance or, when considering the whole life cycle costs, the maintenance requirements make timber a more expensive material.

Improving timber's performance in the exterior applications and finishes are a key component for success or failure. Finishes of all types, that is stains, coatings and paints have let down users of timber products in this application.

Advice from finish manufacturers can be confusing and contradictory. Objective advice from the timber industry is demanded yet advice is out of date or doesn't meet specifiers' expectations.

### ***Transmission poles***

It was suggested by one processor that investment into extending the capacity of transmission poles to accept large spacing distance was necessary. This may involve the development of composite transmission poles that can cope with larger pole spacing and can compete with non-wood alternatives.

### ***Rail sleepers***

With new rail infrastructure favoring the selection of concrete sleepers the demand for new hardwood rail sleepers is falling. However much of the existing rail network is on timber sleepers and is expected to be so for many years to come.

The traditional resource available to supply rail sleepers is reducing, seen recently with a large section of the red gum industry closed. With a large network of timber sleepers remaining and the inability to mix sleeper types, it is expected that there will be replacement demand for this sector for some time to come. In addition, there is some anecdotal evidence that concrete sleepers are failing earlier than expected as they cannot cope with less than perfect beds or the heavy weights carried on some freight trains. Therefore there may be a future need to introduce other timber species into the rails sleeper mix to supplement the diminished traditional resource. This may involve research to establish suitable alternative species.

## Appendix 1 - Key and assumptions for estimates

The following describes the types of timber included in the categories in Table 1. These categories and products have been used as the sources for 2000 and 2007 figures by different product categories. The information accessed for the 2010 estimates also used different product descriptions. The categories for the various sources therefore have been aggregated. Note that the main sources relied on to provide the 2000 and 2007 estimates provided data for treated products.

### *Roundwood – agricultural & landscape*

Product	Description	
	Softwood	Hardwood
Grape Sticks / Horticultural posts	CCA and creosote treated posts	na
Landscape and Fencing rounds	CCA and creosote treated rounds	na

### *Sawn fencing and landscaping*

Product	Description	
	Softwood	Hardwood
Palings and Pickets	Treated green and wet after treatment with CCA, ACQ	2010 ~ 5-10% of sawn hardwood production
Fence Posts and General Landscape	Wet after treatment	
Lattice		Not regarded as significant
Landscape Sleepers	Wet after treatment	New hardwood not regarded as significant

### *Sawn structural and sawn other*

Product	Description	
	Softwood	Hardwood
<b>Sawn Structural</b>		
F, MGP, GL & LVL grades	F and MGP grades – RH dry and wet, H3 LVL Australian production, H3 and H4 treated sawn timber, GL and imports from NZ, Chile and Fiji. CCA, ACQ and Cu Az treated.	Hardwood used in outside construction (decks, pergolas etc not estimated)
H3 LOSP	Beams, rafters, joists, fascia, cladding, external joinery, decking, door jambs, handrails, balustrades, fencing and screens - solid timber glulam and FJ. Includes structural and non-structural products such as , fascia, cladding, external joinery, decking, door jambs, handrails, balustrades, fencing and screens	na
<b>Sawn Other Construction</b>		
Residential decking boards	Includes all ACQ, Cu Az and LOSP treated. Australian production and	Includes all Australian production and imports

	imports.	
External joinery	Includes pre-primed FJ and solid LOSP and CCA and western red cedar. To avoid double counting all H3 LOSP is included in H3 LOSP category above.	
Cladding	Pre-primed FJ and solid H3 LOSP and CCA, plywood H3 LOSP and western red cedar. To avoid double counting all H3 LOSP is included in H3 LOSP category above.	Hardboard and sawn hardwood

### ***Infrastructure / heavy industrial***

Product	Description	
	Softwood	Hardwood
Sleepers (railway)	No known production	Railway sleepers
Commercial Boardwalk, Bridge, Wharf, Cross-arms etc	Small production of EWPs for road barriers and bridges	Heavy duty or industrial hardwoods
Round Poles and Piles	Power poles (WA)	Power poles, building piles, wharf timbers

Note that this category excludes industrial packaging (softwood and hardwood) which are significant market sectors (435,000 - 500,000 m<sup>3</sup> per annum) which could be argued to be outside timber.