New England / North West Regional Development Board

Northern Inland Forestry Investment Group

Feasibility Study for Utilisation of Residual Wood in the Walcha Region

June 2005

ESD CONSULTING

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Table of Contents

1 Study scope

The Northern Inland Forestry Investment Group of the New England / North West Regional Development Board (the Board) has contracted ESD Consulting Pty Ltd (ESD) to examine options for the commercial utilisation of residual wood in the Walcha region.

ESD has analysed potential residual wood utilisation options for the softwood resource in the Walcha region to be established as part of the Walcha Softwood Plantation Development Strategy (the Strategy). ESD has also examined options for utilisation of residual wood from the planned expanded hardwood plantation estate in the region.

The Strategy aims to establish a further 40,000 hectares of softwood plantation resources in the region with a silvicultural regime designed to produce veneer and high grade sawlog, and to minimise production of other log products from the plantations. These assumptions have been used in this study to derive potential utilisation options for analysis.

The terms of reference of the study were to

- Analyse 'traditional' options for low quality wood and wood residues utilisation;
- Also analyse 'non-traditional' options, as it is likely that even if the target of 50,000 hectares of plantation is achieved, this may be below the scale required for 'traditional' operations;
- Take into account the infrastructure and other circumstances in the Walcha area in undertaking the analysis;
- Identify and target potential investors for these processing options;
- Make recommendations on the best options to pursue; and
- Provide links into key networks which will assist in pursuing the opportunities.

This study examines the opportunity to utilise wood residues in commercial processing operations to add maximum economic value to any future plantations developed in the Walcha region. In doing so, the study makes recommendations on a range of options that may be appropriate for the region, and highlights the issues the Board will need to consider in attracting residual wood processing to the region.

2 Executive summary

Residual wood for further processing will flow directly from harvesting operations in both existing and future plantations in the region, and from residues derived from higher value wood processing such as sawn wood production. Based on the analysis conducted by ESD, the following table highlights the potentially available residual wood from both in-forest and processing residues in the region. This has been separated into four time periods corresponding to expansion in residual wood availability for ease of analysis.

Table 2-1: Total residues potentially available for industry development in the Walcha region 2005 – 2035

Residue type	Available volume (m^3/a) 2005 to 2021	Available volume (m^3/a) 2022 to 2027	Available volume (m^3/a) 2028 to 2033	Available volume (m^3/a) 2034 onwards
SOFTWOOD				
In-forest residues (existing public)	60,000	60,000	60,000	60,000
In-forest residues (existing private)*	14,600	-	-	-
In-forest residues** (future private)	-	75,000	100,000	115,000
Processing residues (existing)	60,320	60,320	60,320	60,320
Processing residues** (future)	-	-	-	220,000
HARDWOOD#				
In-forest residues** (existing and future private)	66,000##	118,000	125,000	125,000
TOTAL	*200,920*	*313,320*	*345,320*	*580,320*

**Assumes no replanting of the existing private forest estate takes place post-harvest*

 # Plantations only

*** Note future resource volumes are based on achieving planting targets as set out in the Strategy document for softwood, and in Section 3.2 of this report for hardwood*

Note these hardwood plantation volumes would only be available from 2012

Traditionally, many market commentators highlight that new wood processing capacity must be 'world scale' in terms of processing capacity in order to be cost competitive. The key assumption is that wood products compete in an undifferentiated market and cannot therefore demand a price premium. As a result, one of the principle tools of competition is to ensure a competitive advantage through positioning low on the international cost curve for production of that commodity. Many 'world scale' processing investments in the Walcha region would not be realised until 2034, assuming Strategy planting targets are met.

'Non-traditional' residual wood processing options have been examined in the context of the potential feasibility of project development, and timing of commencement. Options evaluated included

- Reconstituted panels production (particleboard, medium density fibreboard, oriented strand board);
- Landscape industries;
- Export woodchip;
- Export log;
- Renewable energy generation; and
- Ethanol from cellulosic biomass.

Residual wood processing options will deliver the most value in terms of regional economic growth where they focus on further value-adding, and hence employment, in the Walcha region. Taking this into account, ESD recommends the Board examine the following residual wood processing options (note these are not ranked)

- Small log sawn wood processing (Hew Saw), with sale of co-products (sawdust, bark, woodchips) for renewable energy generation at the existing Liddell Power Station owned by Macquarie Generation;
- Wood preservation, with the capacity to treat both hardwood and softwood residual wood products;
- Small scale particleboard production, with appropriate market access and vertical integration to assist in cost competitiveness of small scale processing; and
- Export logs, in the case where market conditions are favourable.

In attracting residual wood processing investment to the Walcha region, potential investors will inevitably prepare a detailed feasibility study. This document forms the business case for a new processing investment, and is the critical document from which to raise finance for new project development. The feasibility study provides investors and project financiers (either internal or external) with a referenced document supporting the project assumptions and addressing each of the key areas of risk.

This process can be 'streamlined' by having ready answers to a series of project-critical questions that potential investors will have. The Board can play a role in this by preparing up-to-date information that addresses typical issues project developers analyse in the context of evaluating a potential investment. These issues are highlighted in Section 5 of the report.

To encourage development of residual wood processing in the region, the Board should identify the desired Walcha region residual wood processing options in terms of the

- Potential residual wood processing opportunities, as outlined in this report; and
- Desired end result for the Walcha region in terms of maximum economic value added (regional investment and employment).

This should involve a decision on the optimum opportunity to pursue. The Board can then develop specific investment attraction documentation, and discuss this with the relevant contact from the list of potential investment groups provided by ESD. Investment attraction documentation should include a summary of the key benefits and opportunities the Walcha region can offer in terms of supporting a processing investment, and form the basis of a full feasibility study by potential investors.

Potentially feasible residual wood processing options presented in this report are based on the plantation development assumptions in the Strategy. If expanding the plantation estate in the region does not match the timing and silviculture as presented in the Strategy, this will have impacts on the choice of residual wood processing options by the Board.

3 Residual wood resource analysis – Walcha region

Residual wood for further processing will flow directly from harvesting operations in both existing and future plantations in the region, and from residues derived from higher value wood processing such as sawn wood production. This section analyses existing and predicted future flows of residual wood, and presents a summary of when potential processing opportunities may become available.

3.1 Softwood

3.1.1 Resource from public plantations

Forests NSW manage a total of 9,872 hectares of softwood plantation in the Walcha region (source: Walcha Softwood Development Strategy 2002). This area is currently being harvested at an approximate rate of 400 hectares per annum (Ken Fussell pers. comm.). The current committed log volumes from the existing Walcha softwood resource are presented in the following table.

Table 3-1: Log allocation from existing Walcha softwood resource

Customer	Location	Log volume allocated (m^3/a)	Log type
Big River Woods	Kyogle	6,000	Veneer
McVicar	Quirindi	120,000	High quality sawlog
A A Summer	Nundle	30,000	Medium quality sawlog
Smaller mills	Various	4,000	Medium quality sawlog

Source: Forests NSW Ken Fussell pers. comm.

In addition to this resource, uncommitted log volumes, or those volumes which do not currently have a market, are as follows:

Table 3-2: Uncommitted log volumes potentially available from existing Walcha softwood resource

Log type	Available from	Log volume m^3/a (estimate)
Pulp quality log	2005 annually	60,000

Source: Forests NSW Ken Fussell pers. comm.

It is estimated that the available pulp (or lower) quality logs available will be less than 25 cm centre diameter, and not meet the higher grade sawlog specifications applying to other customers of Forests NSW.

3.1.2 Resource from private plantations

In addition to the publicly managed resource, some 2,762 hectares of privately owned plantation has been established in the region (source: MacDonald and Brandis 2002, in Walcha Softwood Development Strategy 2002).

It is noted in the Strategy that these plantations were established on an opportunistic basis, and consistent with trends on private land elsewhere in NSW, may not be replanted to softwood plantation post-harvest.

Assuming a growth rate of 18 m^3 per hectare per annum and a growing period of 25 years, the total standing volume on private land in the region is estimated at 1,242,900 m^3. If harvested over a 17 year period from 2005, and assuming 20% of the crop is pulp or lower quality log, it is estimated this estate could yield around 14,600 m^3 per annum of residual wood for industry development for the 17 years harvesting period. This would approximately align with the timing of new residual log resources available from the thinning of new softwood plantings in the region.

3.1.3 Processing residues

In addition to log resources, the Strategy document estimates each processing operation will generate up to 38% wood residues that may be utilised by industry. As a result, the following table highlights potentially available residual log volumes from wood processing.

Table 3-3: Processing residues potentially available from existing allocated softwood resource

Customer	Location	Log volume allocated (m^3/a)	Log type	Residues as % of log intake*	Available processing residues (m^3/a)
Big River Woods	Kyogle	6,000	Veneer	30	1,800
McVicar	Quirindi	120,000	High quality sawlog	38	45,600
A A Summer	Nundle	30,000	Medium quality sawlog	38	11,400
Smaller mills	Various	4,000	Medium quality sawlog	38	1,520

**Source: Walcha Softwood Plantations Development Strategy 2002, p 86*

Replanting of the estate is taking place to replace areas harvested, however Forests NSW are not establishing any new areas of softwood plantation to add to the total plantation estate size.

The estate managed by Forests NSW is critical in the utilisation of low value wood / residues from the region, as this estate provides the base volume for any processor until plantations established under the Strategy approach harvest age (thinning and clearfall).

3.1.4 Resource from future plantations under the Strategy

The Strategy plans for the development of a further 40,000 hectares of softwood plantation in the Walcha region. According to the silvicultural and growth assumptions in the Strategy, the anticipated future wood flows from plantation development are as follows:

Table 3-4: Total softwood residues available for industry development in the Walcha region from future plantations

Residue type	Available volume (m^3/a)	Available from
In-forest residues (future private)	75,000	2022
	100,000	2028
	115,000	2034
Processing residues	220,000	2034
TOTAL	*435,000**	

** Assumes from 2034 onwards*

Importantly, the Strategy sets out a range of assumptions in relation to planting and silvicultural management of future plantations. Any variation from these planting assumptions will have a direct impact on the predicted future wood flows from softwood plantations in the region.

3.1.5 Summary – softwood

Based on this analysis, the following table highlights the potentially available residual wood from softwood plantation in-forest and processing residues in the region. This has been separated into four time periods corresponding to expansion in residual wood availability for ease of analysis.

Table 3-5: Total softwood residues available for industry development in the Walcha region from existing plantations

Residue type	Available volume (m^3/a) 2005 to 2021	Available volume (m^3/a) 2022 to 2027	Available volume (m^3/a) 2028 to 2033	Available volume (m^3/a) 2034 onwards
In-forest residues (existing public)	60,000	60,000	60,000	60,000
In-forest residues (existing private)*	14,600	-	-	-
In-forest residues (future private)	-	75,000	100,000	115,000
Processing residues (existing)	60,320	60,320	60,320	60,320
Processing residues (future)	-	-	-	220,000
TOTAL	*134,920*	*195,320*	*220,320*	*455,320*

**Assumes no replanting of the existing private forest estate takes place post-harvest*

This table shows:

- In-forest residues from existing plantations in the region are capable of producing up to 74,600 m^3 per annum of logs suitable for further processing. These residues are available from 2005 to 2022, at which point the availability drops to 60,000 m^3 per annum due to the assumption of final harvest of the private plantation resource in the region;

- Existing processing in the region is capable of producing up to 60,320 m^3 per annum of residual material suitable for further processing. These residues are available from 2005 on an ongoing basis, contingent on the supply of wood to mills under agreement with Forests NSW;

- In-forest residues from future plantations are anticipated to contribute to total residual wood availability in the region from 2022; and

- Processing residues from future processing on the region is anticipated to contribute to total residual wood availability from 2034.

3.2 Hardwood

3.2.1 Resource from existing hardwood plantations

There are currently no publicly owned hardwood plantations in the Walcha region, and around 2,000 hectares of privately owned plantations. These are all managed by Forest Enterprises Australia (FEA), and have been established on high quality sites in the higher rainfall areas of the region. There are no current harvesting operations taking place in privately owned hardwood plantations in the region. It is estimated harvesting would commence in existing plantations around 2012.

3.2.2 Resource from future hardwood plantations

It is difficult to predict future regional hardwood plantation establishment rates. The Strategy sets out clear targets for the establishment of softwood plantations; however no commensurate analysis has been conducted on the potential for expansion of hardwood plantations in the region.

Anecdotal evidence suggests there is demand for hardwood plantations in the area, and that the hardwood industry can co-exist with the softwood industry in terms of competition for land due to only slightly overlapping land quality requirements. As a result, it has been assumed that the hardwood plantation establishment rate in the region will be around 300 hectares per annum for the next 10 years, commencing from 2005. At the end of this 10-year period, the total hardwood estate in the region is anticipated to be around 5,000 hectares on a sustainable basis.

3.2.3 Summary – hardwood

Based on the assumptions above, and assuming hardwood plantations are managed for woodchip production only, potential wood flows from the total hardwood plantation estate might be 125,000 m^3 per annum on a sustainable basis (that is, areas are replanted post-harvest and the next rotation continues).

These harvest volumes could commence as early as 2012, with harvest of around 66,000 m^3 per annum, rising to an estimated total sustainable harvest figure of around 125,000 m^3 per annum by 2025. Note if hardwood plantations are managed for solid wood production, these figures will be lower than as estimated.

3.2.4 Summary – all residues

The following table summarises all of the current and potential residues available for industry development in the Walcha region over time.

Table 3-6: Total residues potentially available for industry development in the Walcha region 2005 – 2035

Residue type	Available volume (m^3/a) 2005 to 2021	Available volume (m^3/a) 2022 to 2027	Available volume (m^3/a) 2028 to 2033	Available volume (m^3/a) 2034 onwards
SOFTWOOD				
In-forest residues (existing public)	60,000	60,000	60,000	60,000
In-forest residues (existing private)*	14,600	-	-	-
In-forest residues** (future private)	-	75,000	100,000	115,000
Processing residues (existing)	60,320	60,320	60,320	60,320
Processing residues** (future)	-	-	-	220,000
HARDWOOD#				
In-forest residues** (existing and future private)	66,000##	118,000	125,000	125,000
TOTAL	*200,920*	*313,320*	*345,320*	*580,320*

**Assumes no replanting of the existing private forest estate takes place post-harvest*

 # Plantations only

*** Note future resource volumes are based on achieving planting targets as set out in the Strategy document for softwood, and in Section 3.2 of this report for hardwood*

Note these hardwood plantation volumes would only be available from 2012

3.3 Resource costs

The cost of resource is a critical element in determining the potential viability of residual wood processing options. The resource analysis conducted above highlighted two main sources of residual wood for potential processing:

- In-forest residues; and
- Processing residues.

These have different cost structures to industry as a raw material for further processing. This is discussed further below.

3.3.1 In-forest residues

In-forest residues are traditionally more costly to industry, as they are in a form that requires bulk handling, and are a primary product of a harvesting operation.

Forests NSW advise that softwood plantation harvesting and haulage costs in the Walcha region are commercial in confidence and not publicly available. Forests NSW do advise, however, that operations are competitive with other, more mature plantation regions in NSW. As a result, the anticipated costs for harvesting and haulage have been taken from ESD Consulting's own database, and are estimated below.

Table 3-7: Estimated harvesting and haulage costs, Walcha region

Operation type	Unit	Lower limit	Upper limit
Softwood plantation thinning	$/tonne	$12.00	$20.00
Softwood plantation clearfall	$/tonne	$9.00	$18.00
Hardwood plantation clearfall	$/tonne	$9.00	$14.00
In-field debarking, chipping and screening (hardwood woodchip – includes chipping losses during screening)	$/tonne	$20.00	$35.00
Haulage	$/tonne/km	$0.08	$0.14

Source: ESD Consulting Pty Ltd database

Taking the figures from the table above, if a softwood plantation were being clearfelled 120km from the market, the costs to a processor per tonne of residual wood are estimated as follows.

- Harvesting cost for residual wood $12.00
- Loading cost included in harvesting cost
- Transport cost $14.40
- Log royalty to grower $12.00
- TOTAL DELIVERED COST/TONNE $38.40

These costs will vary depending on the difficulty of harvesting, the desired royalty the grower requires for the wood, and the distance to the processing facility. However, these may be used as a base figure for resource cost from in-forest residues in the region.

3.3.2 Processing residues

Processing residues are traditionally less costly to industry utilising these as a raw material for further production. This is due to the fact that they are a secondary product. That is, higher value logs have been sold to a wood processor (eg sawlog, veneer), who processes these into high value products. The residues are a co-product, and can be sold to recover costs and a profit, as opposed to being one of the primary products of harvesting as is the case with in-forest residues.

As a result, when considering inputs to a process such as the manufacture of reconstituted panel products, an optimal raw material mix has a high proportion of suitable material as processing residues to assist in lowering the total (or weighted average) cost of processing.

Anecdotal evidence suggests that where a fully integrated market exists for high value and low value products in a plantation region, processing residues command a delivered price ranging from $\$25/m^3$ to $\$35/m^3$, depending on residues quality and distance to the processing facility. This represents the cost to a processor considering an investment in residual wood processing in the Walcha region.

4 Potential options for residual wood processing in the Walcha region

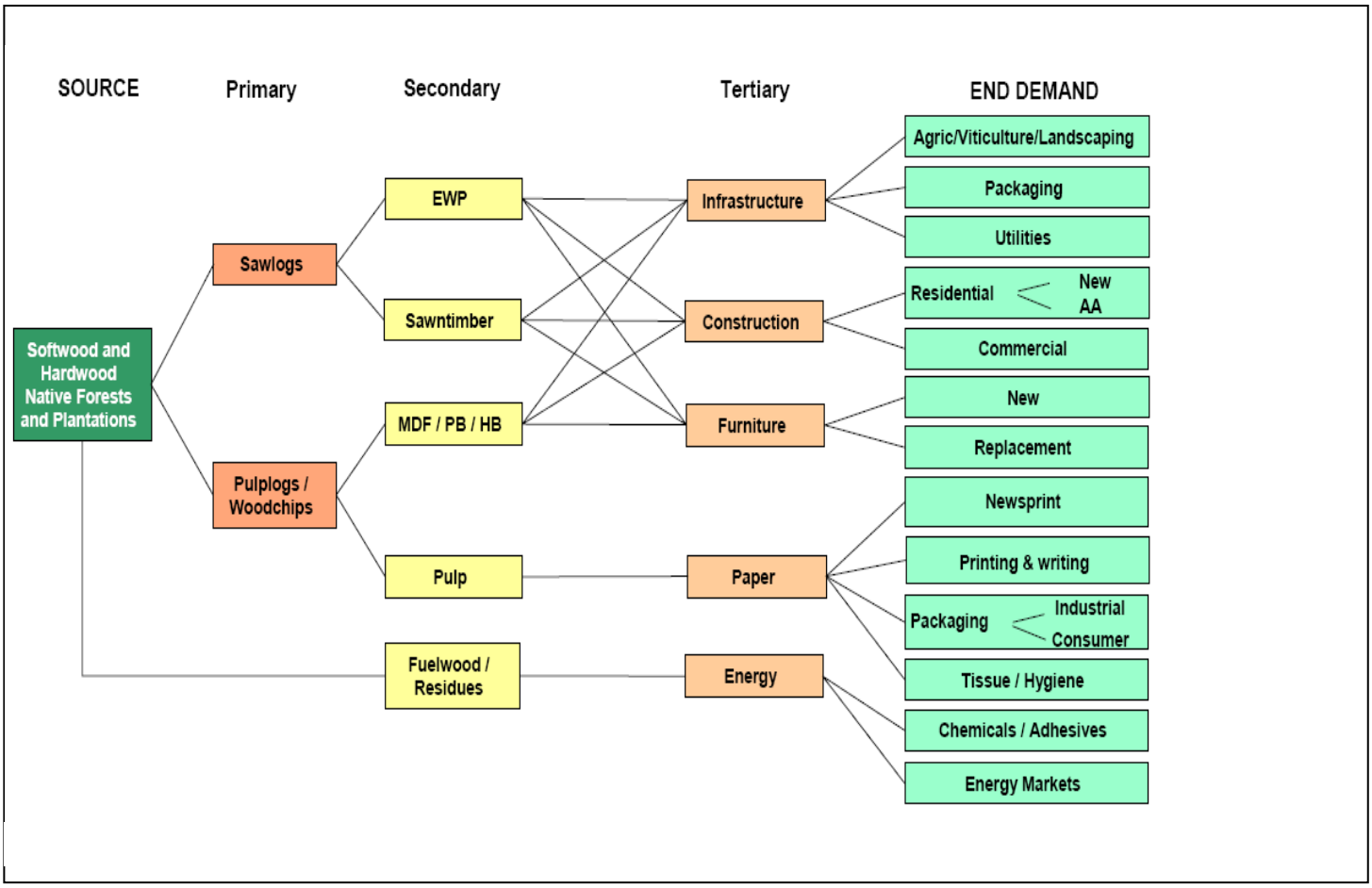
This section provides comment on the resource requirements for 'world scale' residual wood processing operations, and on the drivers for this scale of production. This section also examines a range of potential options for utilisation of residual wood in the Walcha region.

Importantly, ESD has not prepared a feasibility study on each potential opportunity. We have drawn on our experience in terms of the critical issues on which project developers and their financiers focus to provide informed comment on the opportunities that may represent potential residual wood processing investment in the Walcha region.

4.1 'Traditional' utilisation options

The following table highlights the range of potential utilisation options from the Australian forest products industry.

Figure 4-1: Products produced by the Australian Forest Industry



Source: FWPRDC. Note EWP = engineered wood products, PB = particleboard, HB = hardboard, AA = additions and alterations

Many market commentators highlight that new wood processing capacity must be 'world scale' in size in order to compete in terms of cost to market. The key assumption is that wood products compete in an undifferentiated market and cannot therefore demand a price premium. As a result, one of the principle tools of competition is to ensure a competitive advantage through positioning low on the international cost curve for production of that commodity.

The following table highlights relative 'world scale' production capacity as a function of total resource requirements to support each manufacturing facility.

Table 4-1: Potentially feasible residual world scale wood processing options

Industry type	World scale log input requirements (m^3/a)	Output	Capital expenditure (AUD million)	Required plantation area (ha)
Bleached Kraft Pulp mill	3,000,000	600,000 adt	1,100	125-250,000
Kraft Linerboard	1,200,000	300,000 adt	550	80-150,000
Integrated TMP*/Newsprint mill	1,100,000	450,000 adt	600	65-130,000
Softwood sawmill	400-500,000	150,000 m^3	85	35-40,000
Orientated Strand Board	400-650,000	200,000 m^3	130	25-80,000
Export sawlog	250-500,000	250,000 m^3	Low	25-50,000
Medium Density Fibreboard	250-400,000	165,000 m^3	150	20-35,000
Particleboard	250-400,000	200,000 m^3	115	20-35,000
Export woodchip operation	250-500,000	250-500,000 t	Low	15-25,000
Softwood ply mill	120-200,000	100,000 m^3	50	14-20,000
Laminated Veneer Lumber	120-150,000	80,000 m^3	50	12-20,000
Post and Poles	20,000	17,000 m^3	1	1,500

Source: adapted from http://www.plantationsnortheast.com.au/markets.htm

**TMP = thermo-mechanical pulp, eg Norske Skög mill in Albury, NSW*

adt = air dry tonnes

m^3 = cubic metres

t = tonnes

Taking into account the information prepared in the resource analysis in Section 3, based purely on availability of resource, the following 'world scale' residual wood processing opportunities are potentially feasible in the Walcha region. Note this excludes sawn wood, laminated veneer lumber and plywood processing, which are a source of residues for further processing.

Table 4-2: Potentially feasible residual 'world scale' wood processing options

Residue type	2005 to 2021	2022 to 2027	2028 to 2033	2034 onwards
Post and poles processing	✓	✓	✓	✓
Export woodchip (softwood)				✓
Particleboard*		✓	✓	✓
Medium Density Fibreboard*		✓	✓	✓
Oriented Strand Board				✓

** Note these options would only be feasible if both hardwood and softwood is considered as feedstock for board production*

The above table clearly demonstrates that the additional 40,000 hectares of softwood plantation planned for the region is essential to reach 'world scale' processing capacity for a range of products.

4.2 'Non-traditional' utilisation options

This section examines a range of 'non-traditional' potential utilisation options for the Walcha residual wood resource. The approach taken is to examine which processing options may be established in the medium term (ie within 5-7 years) in order to provide market 'pull through' for the development of future wood plantations in the Walcha region under the Strategy.

4.2.1 Small log sawn wood processing

The lower quality log resource from the existing softwood plantation estate does not meet current small sawlog specifications for log sales in the region. If small log sawn wood processing is to be a viable option in the region, chosen sawing technology must be capable of processing small logs efficiently in order to generate sufficient recovery of marketable sawn wood.

In addition, if a sawn wood processing facility were to be established in the Walcha region to process the existing residual softwood resource, it should also be capable of processing sawlog quality plantation grown hardwood wood in the region.

These factors point to specific technology for the processing of small logs – the Hew Saw. The Hew Saw was originally designed to process small pine logs; however the technology is readily adaptable to producing sawn wood from hardwood plantation wood.

Currently, the only company in Australia using Hew Saw technology on a commercial scale is the Australian Stock Exchange-listed group Forest Enterprises Australia Limited (FEA). FEA operate a Hew Saw at their Bell Bay, Tasmania, site to process both plantation grown hardwood and softwood logs. FEA's end markets are the kiln dried structural framing wood market for both hardwood and softwood sawn products.

Note ESD discussed the potential for pine sawlog processing with senior executives and the Walcha mill manager from Boral Limited, the new owners of the Fennings sawmill. Boral did not indicate any interest in processing pine sawlog as the owners and operators of the mill.

The current log intake in FEA's Tasmanian Hew Saw operations is around 100,000 m^3 per annum. This indicates the scale at which an operation can be viable in the Walcha region. Over time, a Hew Saw sawn wood processing operation could expand log intake capacity in order to process the higher volumes of wood from expanded plantation development under the Strategy.

The Hew Saw technology

The Hew Saw is based on having logs debarked and sorted into diameter classes (logs of the same diameter) to maximise recovery of sawn product on processing. Logs are passed through a debarker, and then electronically scanned for log length and small end diameter. Logs of the same length and small end diameter are stored in defined 'bunkers', prior to being transferred to the log infeed deck of the Hew Saw for processing.

Figure 4-2: Debarked and diameter scanned hardwood plantation logs

To maximise recovery of sawn wood, at the start of each shift the Hew Saw cutting pattern is set to process logs of a defined length and diameter class into a set of defined products.

That is, by reducing the variability of the logs going through the mill, the Hew Saw can process these logs more efficiently to generate a higher sawn wood recovery. FEA predict their recovery of sawn wood from their Bell Bay operation to be as high as 45% (Tony Cannon pers. comm.). This compares favourably with softwood sawmills as identified in the Strategy document at a recovery of 38%. Other products include sawdust (est 10%), bark (est 10%) and woodchips (est 35%) (Tony Cannon pers. comm.).

Figure 4-3: Log entering Hew Saw

The Hew Saw has a chipper canter, which removes the sides and the top of the log to square the log prior to going through the Hew Saw. The chipper canter produces woodchips which may be exported (as is the case with FEA), or utilised for reconstituted panels or renewable energy production.

Immediately following the chipper canter are sets of circular saws which cut the log simultaneously by multiple blades in both the horizontal and vertical planes. These saws are set manually at the start of a shift to suit the log size and desired sawn wood product to be cut.

The Hew Saw can process logs from a small end diameter of 8 centimetres through to 35 centimetres, allowing significant flexibility in resource conversion. However, the larger the logs, the larger the Hew Saw machinery required for conversion (ie higher capital and operating cost). FEA's experience is that, based on one eight-hour shift per day, the Hew Saw can process up to 100,000 m^3 of logs per anum with a maximum small end diameter of 28 centimetres (Tony Cannon pers. comm.).

Figure 4-4: Log exiting Hew Saw as cut boards

Figure 4-5: Hardwood boards ex Hew Saw

Hew Saw processing – competitive advantage

The competitive advantage of the Hew Saw is that it is relatively inexpensive technology which can convert small logs into quality structural wood. The target resource, being smaller logs, is usually slightly lower cost than the higher prices paid for larger logs which yield higher recoveries under traditional sawing conversion technology. Logs can be either hardwood or softwood, allowing flexibility in processing and end product marketing.

Critical issues

The Hew Saw produces accurate sawing with a high quality finish (see above). Important processing issues to maintain the high efficiency of Hew Saw processing include

- Ensuring the log debarking and diameter scanning is efficient for log infeed and operation of the saw;
- Logs are straight; and
- Finished product handling is appropriately scaled and automated to handle the rapid movement of sawn wood.

Other important issues include the availability of markets for co-products, including sawdust, bark and woodchips. Firm residues offtake contracts (eg with Macquarie Generation – refer Section 4.2.6) are related to reducing the financing risk on a new project. If a proponent is able to demonstrate to a project financier that all co-products are sold, it significantly adds to the business case and reduces financing risk. This is particularly relevant for greenfields projects in relatively new industries.

Assuming a maximum small end diameter of 30cm and an annual processing volume of around 100,000 m^3, the estimated capital cost for establishing a Hew Saw operation in the region is around $20 million. This includes all associated infrastructure and utilities associated with log handling, debarking, scanning, log conversion, sawn wood kiln drying and by-product handling facilities.

4.2.2 Reconstituted panels

Reconstituted panels include particleboard, medium density fibreboard (MDF) and oriented strand board (OSB). The raw materials for these products are manufactured by reducing wood to its fibrous or wood flake components, then reorganising the fibre or flakes into a defined structure and recombining the wood fibre under heat and pressure with resin or adhesives.

4.2.2.1 Particleboard

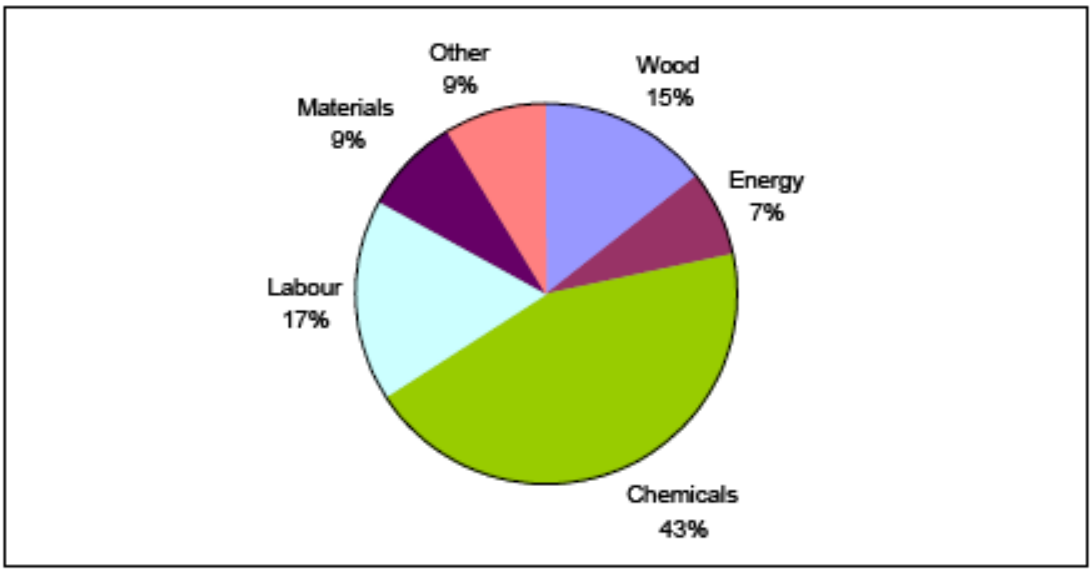
Particleboard (also known as chipboard) is produced from wood flakes and particles of varying size which are laid out in a ‘mat’ and bound together with resin under heat and pressure. Particleboard can be overlain with materials such as paper, melamine and veneers for appearance grade application.

The main end uses for particleboard are in the furniture industry, and particleboard is increasingly being used with 'tongue and groove' floors, with the addition of a water resistant adhesive.

Australia's largest producer of particleboard is Carter Holt Harvey Limited (CHH). CHH, listed on both the New Zealand and Australian Stock Exchanges, owns and operates significant processing assets, as well as wood marketing and sales divisions.

CHH are responsible for a significant proportion of the Australian particleboard market, and produce particleboard at four Australian facilities: Gympie in south east Queensland, Tumut and Oberon (flooring manufacture) in NSW, and Mount Gambier in South Australia. The primary market for particleboard products is the furniture market, where CHH commands a 61% market share in Australia.

Figure 4-6: Key particleboard costs of production in the Asia-Pacific region



Source: 'Investment Opportunities in the Australian Forest Products Industry', Jaakko Pöyry Consulting October 2001

Particleboard is an undifferentiated product. Once the product arrives in a wholesaler or re-seller's facility, it cannot be told apart from one manufacturer to the next. This is due in part to minimum Australian Standards for the product, and also due to the consistency in raw material and manufacturing technology utilised for production.

As a result, to be competitive, a new producer must be able to compete on price. To compete on price, the new producer must have a low cost of production. Traditionally, new producers achieve this by establishing large scale processing facilities that have a low cost of production on a per unit basis. That is, with a large annual throughput, a new processor can generate a sufficient investment 'hurdle rate' (the rate of return above which an investor deems a return acceptable) due to production economies of scale.

This is based on a number of assumptions, one of which is the cost of capital for new processing facilities.

One option to reduce this cost is to acquire processing assets that are older or have been fully depreciated. In the case of the Walcha region, this would involve a project proponent assessing existing particleboard processors to determine whether this type of infrastructure exists. For example, CHH's Tumut particleboard plant has a production line that is currently not operating due to poor market conditions.

The smallest particleboard manufacturing plant in Australia is Tasmanian Wood Panels (TWP), located at Wesley Vale near Devonport in north west Tasmania. TWP has an annual intake of around 100,000 m^3 of woodchips and sawmill residues, producing around 40,000 m^3 per annum of particleboard for the furniture market in Victoria. Importantly, TWP competes in the same market as CHH, which is extremely price sensitive. Cost of production is critical, and TWP's competitive advantage is in a lower cost of production due to fully depreciated capital equipment used in the production process.

Looking at the Walcha region, due to resource constraints, particleboard may be considered a processing option if a small plant could be established to produce particleboard cost-effectively into the Sydney or export markets.

Critical issues

Taking all of these factors into account, critical issues in the potential establishment of a particleboard manufacturing plant in the Walcha region include

- The availability of sufficient resource to ensure cost competitive processing;
- If insufficient resource is available to justify new capital investment, the identification of low capital cost particleboard manufacturing assets potentially available (ie second hand equipment that could be moved to the Walcha region);
- The cost of inputs, particularly resins and chemicals;
- The markets for particleboard products. A smaller production facility will require market access in the form of direct sales agreements / vertical integration with customers such as furniture manufacturers (refer Table 4-3) to compete in an undifferentiated marketplace. This may also include creation of a specific particleboard 'brand'.
    - There is an opportunity to discuss the issue of vertical integration with the Furniture Industry Association of Australia. Establishment of such facilities in association with reconstituted panels manufacture is Recommendation 8 of their Wood Policy 2004;

- Given the availability of both softwood and hardwood residues, technical issues with producing particleboard from eucalypts (noting that in South Africa, Argentina and Brazil, eucalypts are used in the manufacture of particleboard); and

- Identification of a potential project proponent willing to look at small scale particleboard production.

Particleboard production may not be considered until around 2022, from when, assuming planting targets are met under the Strategy, significant additional resource will become available. Alternatively, smaller scale particleboard production may be considered earlier if appropriate vertical integration to ensure market access is available.

Table 4-3: The furniture industry as a market for Australian wood

	1999	2000	2001	2002	2003	2004p
Furniture Industry			*thousand cubic meters*			
Hardwood	106	123	102	101	100	95
Softwood	263	301	263	308	305	299
Total Timber	369	425	365	409	405	394
Particleboard	128	150	153	152	154	151
MDF	106	123	112	127	130	137
Plywood	37	36	29	35	38	39
All Sectors			*thousands cubic meters*			
Hardwood	1,470	1,466	1,277	1,245	1,173	1,135
Softwood	3,045	3,519	3,113	3,642	3,795	4,006
Total Timber	4,515	4,985	4,390	4,886	4,968	5,141
Particleboard	850	940	850	950	960	945
MDF	408	490	432	520	576	622
Plywood	270	294	233	277	275	256
Furniture Industry			*% of total consumption*			
Hardwood	7.2	8.4	8.0	8.1	8.5	8.3
Softwood	8.6	8.6	8.4	8.5	8.0	7.5
Total Timber	8.2	8.5	8.3	8.4	8.1	7.7
Particleboard	15	16	18	16	16	16
MDF	26	25	26	24	23	22
Plywood	14	12	12	13	14	15

Source: Furnishing Industry Association of Australia Wood Policy, 2004

4.2.2.2 Medium Density Fibreboard (MDF)

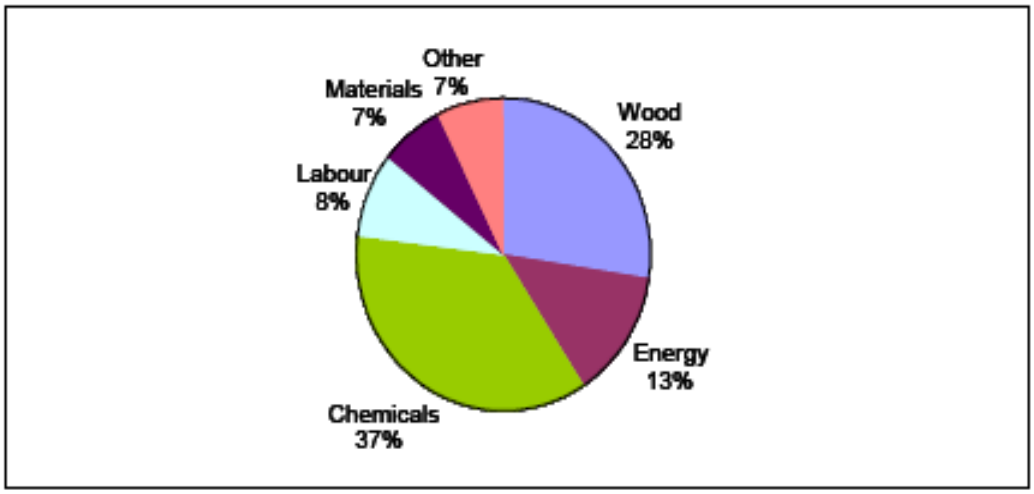
MDF is a wood-based panel product made from de-fibrated wood or other fibrous materials such as bagasse. MDF is a higher quality finished product than particleboard, and can be readily moulded, finished and laminated. MDF's main market is in the furniture and joinery industries.

MDF is also used as a raw material for mouldings (eg wood skirting boards and window frames). MDF is an interior product, not suitable for use in exposed conditions.

The largest producer of MDF in Australia is also Carter Holt Harvey. CHH own and operate Australia's largest MDF manufacturing plants in Oberon, NSW, and Bell Bay, Tasmania.

ESD discussed MDF production with CHH in Bell Bay, Tasmania, as this plant produces MDF from both hardwood and softwood feedstock. Importantly, the feedstock is not mixed to produce MDF, but each raw material is batch processed to produce either a hardwood or a softwood MDF product. CHH advise this is not a technical issue with gluing, but is due to significant costs associated with 'front end' handling and raw material reclaim requirements to ensure a consistent hardwood / softwood blend in mixed MDF boards. Hardwood MDF is produced for specific clients and not sold in the general commodity market.

Figure 4-7: Key MDF costs of production in the Asia-Pacific region



Source: 'Investment Opportunities in the Australian Forest Products Industry', Jaakko Pöyry Consulting October 2001

The Bell Bay plant produces approximately 180,000 m^3 per annum of MDF from an intake of around 300,000 m^3 per annum. Of the annual intake of 300,000 m^3, only 5% is hardwood, and CHH would like to increase this requirement in future. The majority (over 70%) of the finished product is exported, with 30% of these exports to Japan.

CHH advise that, even at this production volume, the company would like to expand significantly to reduce their unit cost of production. CHH advised that new MDF plants are starting up internationally at a processing capacity linked to a 450,000 m^3 per annum intake. This is instructive for Walcha, as in reality, there is insufficient resource in the region for internationally cost competitive MDF production until 2034. The critical issues in the development of MDF processing capacity in the region are as for particleboard production.

4.2.2.3 Oriented Strand Board (OSB)

Oriented Strand Board (OSB) is a wood-based panel product made from strands or flakes of wood. OSB is a product developed in North America and has been produced and marketed as an alternative to softwood plywood, as the product has technical and structural properties similar to softwood plywood.

OSB production has been investigated in the Walcha region previously, with the result that it appears infeasible to produce OSB in the region. The major reasons include a lack of sufficient resource, and a lack of market acceptance of the end product.

4.2.3 Landscape industries

Landscape industries are those which process plantation wood into products for use in the garden products and agricultural industries. Generally, plantation wood is treated with chemicals to make the wood more durable for its desired end use, which may include vineyards, orchards, paddock fences, farm buildings and yards. Like the demand for reconstituted panels, demand for products from landscape industries is closely aligned to the housing and construction market.

The majority of wood treatment facilities in Australia use copper-chrome-arsenate (CCA) as the wood preservation chemical. Approximately 800,000 m^3 of CCA-treated pine is produced in Australia each year, making Australia the world's third highest per capita user after New Zealand and the United States.

Currently, Tamworth Treated Woods operates a small wood treatment plant in Tamworth. The plant produces around 1,500 m^3 per annum of treated poles and posts for the rural fencing market.

Further south, Australian Stock Exchange-listed group Willmott Forests Limited operates a wood treatment plant in Sandy Lane, Bombala. The plant was acquired from the previous owners, Prime Pine, for $8.3 million in 2003. The plant has an annual log intake of approximately 50,000 m^3 per annum, and produces a range of products including landscape sleepers, posts and rails for the landscape market in the ACT and Sydney.

Koppers Wood Products specialises in the processing and marketing of treated wood for the Australian and Asian region. The company is Australia's largest supplier of treated wood poles, railway sleepers, engineering and piling wood and landscaping and viticulture products. Koppers have a range of wood treatment facilities in most states of Australia, and products include

- Utility poles (telecommunication & electricity transmission);
- Engineered piling (marine piles, bridges, railway sleepers);
- Koppers logs (retaining walls, landscaping, rural fencing, vineyards);
- Building poles; and
- Treated framing.

Figure 4-8: Willmott Forests Limited – wood treatment plant, Sandy Lane Bombala

Major cost items in treatment facilities include wood supply (encompassing grower royalties, harvesting and transport), inventory / stock on hand, treatment chemicals, power costs, employment costs, transport and distribution costs and environmental compliance costs.

4.2.3.1 CCA treated wood

In developing wood treatment processing opportunities, it is important to note the recent review of CCA-treated wood conducted by the Australian Pesticides and Veterinary Medicines Authority (APVMA). The APVMA is the Australian Government statutory authority responsible for the regulation of pesticides and veterinary medicines up to the point of retail sale. All pesticides and veterinary medicines must be registered by the APVMA prior to being supplied, sold or used throughout Australia.

Arsenic wood treatment products were reviewed by the APVMA in 2003 following new information, both from Australia and overseas, that highlighted public health concerns for human exposure to arsenic from treated wood structures. A key issue was whether or not arsenic leaches from treated woods, and whether this might be likely to have an adverse impact on people and the environment.

From its assessment of the information available, the APVMA concluded that it had insufficient information to be satisfied that the continuing use of CCA is safe for wood used in structures with which the general community (and particularly children) are likely to come into frequent and intimate contact. The review also found that product label instructions for wood treatment operations, waste management and disposal and protection of the environment were inadequate.

The APVMA has recommended the use of CCA for treatment of woods for some end uses be phased-out. For remaining uses, the APVMA is satisfied that, by placing greater control on the use of CCA products, they can continue to be used safely. To achieve this, it is proposed that CCA product labels will be varied to highlight the key risks with the use of CCA treated wood.

4.2.3.2 Alternatives to CCA treatment

The NSW Department of Environment and Conservation (DEC) advises the following groups of preservatives are currently registered for wood preservation use in NSW

- Copper chrome arsenate (CCA);
- Copper-based alternatives to CCA (ammoniacal copper quaternary (ACQ) and copper azole or Tanalith E;
- Boron;
- Creosote; and
- Pyrethroid and metal-based light organic solvent preservatives (LOSP).

Source: http://www.environment.nsw.gov.au/licensing/qaswood.htm

A number of these chemicals combine copper and organic preservative, and are considered more environmentally friendly than CCA as they do not contain chromium or arsenic.

Critical issues

Taking all of these factors into account, critical issues in the potential establishment of a wood treatment plant in the Walcha region include

- Resource availability within required log specifications (matched to end product markets);
- End product markets, which may include landscape sleepers, treated posts, decking and vineyard poles. For example, if the end market chosen were large treated sleepers for the Sydney market, larger logs would be required;
- The cost of inputs, particularly chemicals;
- Use of appropriate wood treatment, matched to end product markets and environmental compliance issues; and
- Identification of a potential project proponent.

Wood treatment processing is a viable option for consideration by the Board in the short to medium term, as resource volumes from both hardwood and softwood plantations may be appropriate to industry development.

4.2.4 Export woodchip

Exporting of softwood and hardwood woodchips has developed in several regions of Australia to take advantage of demand for quality hardwood fibre for paper manufacture, and to optimise silvicultural management of softwood plantations. In particular, thinning of softwood plantations to produce sawlogs generates wood which can be sold as woodchips. Significant examples of this include thinning privately owned plantations (Auspine) in South Australia and Victoria, and exporting woodchips through the port of Portland in Victoria.

Currently, Boral Limited operate a chipper near Tea Gardens, and export facilities from the Port of Newcastle. Boral hold a licence to export up to 500,000 tonnes per annum of hardwood woodchips from the Port of Newcastle. Hardwood logs are trucked to Tea Gardens for chipping, and the chips are transported to the wharf for loading out. Woodchips generated from offcuts in Boral's northern NSW sawmills are trucked direct to the wharf for export.

To remain viable, the Strategy document advises a woodchip export operation as a 'stand alone' operation requires a minimum volume of 250,000 – 500,000 tonnes per annum. At present, the combined hardwood and softwood plantations in the region would not support this volume until 2034.

However, given the chipper at Tea Gardens and the existing export infrastructure operated by Boral at the Port of Newcastle, there may be an opportunity to bring forward operations to take advantage of favourable market conditions.

This would require separate handling facilities for plantation hardwood and / or softwood woodchips at the Port. This would likely consist of a concrete hardstand storage area, a new (dedicated) conveying system and plantation woodchip reclaim. It is assumed the weighbridge, administration, woodchip testing, chipper, woodchip screening and ship loader could use existing facilities.

Based on ESD's experience, the estimated cost of undertaking an upgrade to enable the export of plantation woodchips from the Walcha region would be in the order of $7 – 8 million.

Anecdotal evidence suggests that with the current high exchange rate and international shipping costs, the export of softwood woodchips is marginal. The capacity to pay for softwood woodchips can be as low as $25 per tonne of woodchips delivered to the wharf, making any movement in the Australian dollar important to viability.

Critical issues

Critical issues with the establishment of export woodchip operations in the Walcha region's plantations include

- Woodchips can be generated either ex forest or as wood processing residues. As identified in Section 3.3, processing residues are generally lower cost;

- Provided the estate size is large enough to generate commercial volumes on an ongoing basis, softwood plantations managed for sawlog production can generate sufficient woodchips to maintain a viable export woodchip operation. These volumes can be supplemented with processing residues;

- Woodchip export operations have a low capital cost compared to residual wood processing options. Woodchip export operations also have a low level of direct employment;

- The markets for export woodchips are predominantly in Asia (Japan, Indonesia, China and Korea), and exposed to exchange rate fluctuation. While currency hedging can minimise trading risk, there is a requirement for expert financial as well as operational knowledge;

- There is also a requirement for strong balance sheet capacity to support operations, particularly in the early stages (first 3-4 shipments), as 'credits' are common until the supplier / customer relationship is well established; and

- With minimal capital costs, there is the opportunity to utilise existing chipper and woodchip export facilities at Tea Gardens and Newcastle. This would need to be discussed with Boral Limited.

Given the desire to add maximum value to the region in terms of employment, an export woodchip strategy is not considered a viable option in the short to medium term. If, however, the Strategy planting targets are being met and there is a need to establish a market for silvicultural thinnings as part of the focus on production of veneer logs, then an export woodchip market may be a viable option.

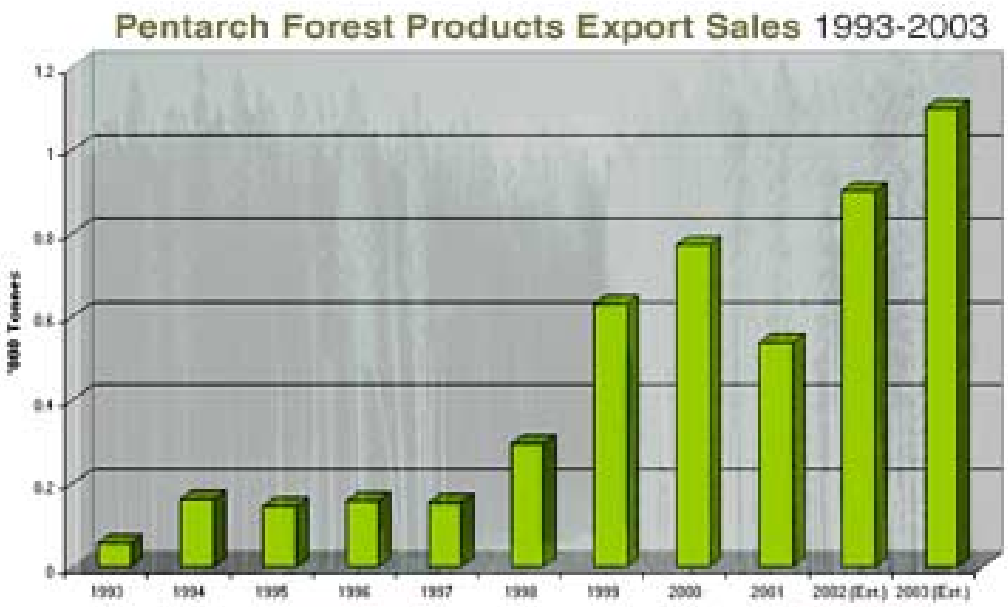
4.2.5 Export log

As for the export of woodchips, exporting logs is a potential option for the utilisation of residual wood. The most significant difference is the potential for log exports from a smaller resource base.

Export sales of sawlogs from Australia are small by international standards, due to the high level of domestic utilisation for sawn structural wood. If sawlog supply exceeds demand, the drivers for sawlog exports may change, although this is unlikely under the Strategy which aims to produce higher quality logs. Export sales of pulp logs from Australia are very small by international standards, with prices significantly lower than achieved for export sawlogs.

ESD discussed the issue of exporting logs with Pentarch Forest Products Pty Ltd, Australia's largest exporter of radiata pine and Caribbean pine logs. Pentarch operate log exports from a range of Australian ports to supply customers in Japan, China, Indonesia, Thailand, Philippines, Vietnam, India and the United Arab Emirates. The volume exported has underpinned forestry and harvesting activities during periods of low domestic consumption for the Australian forestry industry.

Figure 4-9: Pentarch Forest Products Pty Ltd – Australian log exports



Source: http://www.pentarch.biz/pentarch-forest-pro.htm

Pentarch advise that to ensure a sustainable log export operation, the resource must be capable of supplying 13,000 – 14,000 tonnes every 8 weeks. Eight weeks is the standard time to complete a cargo from the time of ordering shipping. According to this timeframe, the minimum viable export log operation would be in the order of 90,000 tonnes per annum.

In order to guarantee the supply of shipping capacity, the operation would need to ensure there is sufficient volume of export logs for 3 to 4 shipments, or around 60,000 tonnes per annum. Each shipment is required to pay a fee of USD50,000 to cover the costs of shipping and demurrage (port holding time), so the larger the volume shipped, the better the net cost per unit shipped.

Pentarch also advise that prices for export grade logs are currently low due to the high Australian dollar. Export sawlogs are currently attracting AUD55/tonne, and export pulp logs AUD32/tonne delivered to wharf. To derive a net return to the grower, harvesting and haulage costs need to be deducted, as do other costs such as road tolls and other charges associated with delivery. In addition, claims by customers for out of specification logs are around 2 – 5% of the total volume. These costs are also borne by the forest owner.

Critical issues

Critical issues with the establishment of export log operations from the Walcha region's plantations include

- Logs can be sold in varying qualities for export, from sawlog quality through to pulp log quality. The resource analysis in Section 3 highlights that only pulp log quality is available from existing forests in the region. Pulp log prices are considerably lower than for sawlog;
- Log export operations have a low capital cost compared to residual wood processing options, in addition to a low level of direct employment;
- The markets for export logs are also predominantly in Asia, with major markets in Korea. As for the woodchip market, these markets are exposed to exchange rate fluctuation, requiring expert financial as well as operational knowledge;
- Also as for export woodchips, there is a requirement for strong balance sheet capacity to support operations; and
- The Port of Newcastle is the primary port for export of logs. Discussions would need to take place with the Port Authority, and with companies who export logs to determine the key issues and operational logistics required.

An export log strategy is a potentially viable option in the short to medium term, depending on current exchange rate and exporting costs, and provided sufficient volume of quality logs can be guaranteed. The option requires detailed financial analysis in association with an experienced group such as Pentarch.

However, given the low employment multiplier effect of log exports, the Board may not wish to pursue this approach. As for export woodchips, if Strategy planting targets are being met and there is a need to establish a market, then an export log market may be a viable option.

4.2.6 Renewable energy generation

The Strategy highlights renewable energy generation as a potential manufacturing option for the region (page 118). As part of this analysis, the Strategy identifies a minimum dry fibre requirement of 100,000 tonnes per annum to operate a 12 megawatt generator on a continuous basis. This equates to approximately 240,000 tonnes per annum of green (or fresh cut) radiata pine residues. Assuming plantation hardwoods in the region have a similar basic density, new renewable energy generation capacity may be potentially feasible in the region from 2022.

There are a number of important issues in considering the establishment of new renewable energy generation capacity. These include energy efficiency, economies of scale, and sovereign or regulatory risk applying to the renewable energy sector.

Energy efficiency

Efficiency of energy production is a factor of

- Basic density of the wood utilised;
- Gross calorific value;
- Moisture content; and
- Ash content.

The efficiency issue is critical, as for a low value product such as electricity, feedstock costs can make up as much as 60% of the total operating cost of the plant. As such, there is a 'trade-off' between up-front capital costs and efficiency from economies of scale vs operating costs in the longer term.

Economies of scale

Economies of scale are critical for efficient conversion of raw material to electricity, regardless of raw material type. The typical size of coal-fired power stations is substantial (in the order of 2,000MW capacity), driving capital costs per unit of electricity produced lower.

The average capital cost to install a large wood-waste electricity plant is around $2 million per MW of capacity, taking into account a relatively large plant size to achieve economies of scale. As plant size falls below 25MW, capital costs per MW of output rise sharply.

Unless targeted at specific markets, for example replacing remote diesel generation with biomass, residual wood plants must strive to emulate this efficiency through achieving economies of scale. In general, once plant size decreases below 25MW, efficiency decreases. Within the constraints of long-term viability of resource supply, wood waste plants should strive for capacity in the order of 30MW.

Sovereign or regulatory risk

The Mandatory Renewable Energy Target (MRET) is Australia's target for renewable energy production. The aim of the MRET is for Australia to produce 9,500 GWh, or 2% of the total electricity production per annum, of electricity from accredited renewable sources by 2010. The MRET is implemented through the Renewable Energy (Electricity) Act 2000, and introduces a legal liability on wholesale purchasers of electricity to purchase additional amounts of energy from renewable sources over time. MRET applies to all wholesale purchasers of electricity on major grids, and a small number of isolated grids.

Renewable Energy Certificates (RECs) are the means by which the MRET targets are monitored. RECs are created by generating power from an accredited, renewable source. RECs can then be traded or used to reduce or avoid a charge for failing to meet the MRET targets.

The charge for not meeting the MRET target is $40/MWh. RECs are bankable, and may be registered with the Office of the Renewable Energy Regulator any time after they are created.

Currently, hydroelectricity and solar water heaters are the greatest source of RECs, followed by bagasse and wind power. In 2002, wood waste contributed 4%, and black liquor, a by-product of the paper making process, a further 4%.

Wood waste or residues, subject to certain conditions, may be used to create RECs under MRET. These conditions are set out in detail in the Renewable Energy (Electricity) Regulations 2001, specifically Regulation 7. Key issues in the use of wood waste to create RECs include

- Compliance with all Commonwealth, State and Local Government requirements with regard to sustainable forest management and harvesting operations
    - This includes areas covered by a Regional Forest Agreement (RFA), where the social, economic and environmental implications of the use of forested land have been assessed in detail;
- Where wood waste is sourced from native forests, power generation must not be the primary purpose of a harvesting operation;
- Wood waste from native forests is subject to a 'high value' test, where the total financial value of the high-value process if higher than the financial value of other products of harvesting;
- Wood waste from plantations may only be used for power generation if
    - The harvesting operation is approved under relevant planning and approvals processes, and
    - No product of a higher financial value than biomass for energy production could be produced at the time of harvesting.

Renewable energy as an option in the region

Due to resource constraints, in the period to 2022, existing generation capacity appears the best option for renewable energy production. Macquarie Generation is currently generating renewable energy from biomass at their Liddell Power Station in the Hunter Valley. Liddell became the first coal-fired power station in Australia licensed to co-fire plant biomass and coal to produce electricity in 1999. Co-firing significantly reduces greenhouse gas production by substituting coal with greenhouse gas-neutral fuel. Macquarie's Power Stations are licensed to replace up to 5% of normal coal fuel requirements with waste wood (biomass).

The biomass supplied for co-firing is currently sawdust and shavings from licensed sawmills. Sawmills currently supplying Macquarie Generation with residual material must operate under sustainable harvesting regimes accredited and audited by the Australian and New South Wales Governments, as highlighted above.

Macquarie Generation advises it currently receives approximately 7,000 – 10,000 tonnes per month of biomass material, some from as far away as 300 kilometres. This includes sawdust, woodchips, shavings and chipper fines, and includes supply from the Boral hardwood sawmill in Walcha. Supply is currently on an ad-hoc basis, depending on the capabilities of transport companies to generate efficient backloads to the power station.

Delivered prices are in the area of $32/tonne, depending on moisture content and wood quality. Contracts are often on a spot-sale basis, with delivery to take place between fixed dates. Biomass is dumped on the coal stack, and mixed in with coal at the point of loading from the coal stack to the boiler.

This offers a significant opportunity for the development of a market for residual wood in the region. The resource cost analysis in Section 3.3 indicates that sale of in-forest residues to Macquarie Generation would not be feasible at the current price, unless at a very low return (royalty) to the grower. However, processing residues would offer the opportunity for a return on co-products to residual wood processing in the region.

In addition, if renewable energy capacity were to establish closer than the Liddell Power Station (eg at the new McVicars sawmill), this would offer significant transport cost savings, in turn providing better returns for growers and residual wood processors.

Critical issues

Critical issues with the use of residual wood for renewable energy generation include

- The high capital cost, resource requirements, sovereign risk and knowledge and expertise require for new renewable energy facilities, effectively limiting markets to the existing Liddell Power Station. This would only change if renewable energy capacity were to establish in the region;

- The capacity to pay for raw material and the need for efficient transport to maximise returns on residual wood products;

- The need for strict chain of custody on wood supply to demonstrate compliance with the acts and regulations relating to renewable energy generation; and

- The need for consistency in products to facilitate ease of mixture with the coal burning infrastructure in the power station.

Renewable energy generation is a viable option for the region, either directly from existing and future plantations under the Strategy, or as part of generating returns from co-products for new residual wood processing capacity in the region.

4.2.7 Ethanol production from cellulosic biomass

Ethanol is a clear, colourless liquid produced by fermentation as a product of sugar metabolism in certain species of yeast in the absence of oxygen. Yeasts can grow in the presence of up to only about 14% alcohol, but the concentration of alcohol in the final product can be increased by distillation. Ethanol can be used as an industrial solvent, as an alcoholic beverage, or in blends with oil-based fuels as an automotive fuel. Ethanol for industrial and fuel use is normally made unfit for human consumption (denatured) by the inclusion of small amounts of substances that are either toxic or unpleasant.

Ethanol is typically produced from high-starch grains such as wheat corn and barley, from sugar products such as low grade molasses, and from hydrocarbon sources such as ethylene. Ethanol production from sugar and grains is a well established (and rapidly growing) industry internationally.

'Cellulosic biomass' refers to agricultural, woody, and fibrous materials, such as agricultural and forestry residues, industrial wastes (eg paper sludge), and major portions of municipal waste (eg waste paper).

The technology for the commercial scale viability of cellulosic biomass to ethanol plants has yet to be proven internationally. In 2004, Canada's Iogen Corporation announced it produced the world's first cellulose ethanol fuel for commercial use. The plant is located in Ottawa, and uses wheat straw and other agricultural residues as the feedstock. The plant is a demonstration plant only, and at the time of the announcement, Iogen claimed to be in the process of finalizing locations for a full-scale commercial plant.

The lack of commercial demonstration of the potential for ethanol from cellulosic biomass is a significant impediment to the commercial scale deployment of the technology. Iogen appear committed to this path, as do other companies such as BC International Corporation (http://www.bcintlcorp.com), who are in the process of developing a number of ethanol from cellulosic biomass projects.

In the Australian context, the ethanol industry is immature and dominated by a small producer base of three companies. Importantly, even after a range of Australian Government assistance programs aimed at developing the domestic ethanol industry, no new ethanol production capacity has been installed in Australia from some years. This is significant when considering the Australian industry expansion is proposed using a known product and known technology (ethanol from grains and sugar).

ESD believe the production of ethanol from cellulosic biomass in Australia is still some time off, and will take place only when the production technology is commercialised by a participant in the Australian ethanol industry. In turn, ESD believe this will take place only once the Australian ethanol industry diversifies from its small producer base.

As a result, ESD does not recommend ethanol from cellulosic biomass is a viable option for utilisation of residual wood in the region in the medium term.

5 Critical issues in attracting processing investment

5.1 The need for a feasibility study

In attracting residual wood processing investment to the Walcha region, potential investors will inevitably prepare a detailed project feasibility study. This is an important document, as it forms the basis of the business case for a new processing investment. The feasibility study is also the critical document from which to raise finance, either externally through debt and equity markets, or internally from retained earnings. The feasibility study provides investors and project financiers (either internal or external) with a referenced document supporting the project assumptions and addressing each of the key areas of risk.

Note due to individual financing requirements, each organisation assessing potential residual wood processing investment in the Walcha region will require their own analysis, and hence their own feasibility study.

Evaluation of the potential for developing new or expanded projects is a detailed process. This is particularly the case for projects that are capital intensive such as forestry. Critical areas in the assessment of potential project feasibility include

- Resource availability, including quality, quantity, resource security and price;
- Suitable markets for the processed product;
- Suitable conversion technology at a scale appropriate to the planned market;
- Availability of infrastructure, including physical and community infrastructure, to facilitate cost-effective project development;
- Government policy (political certainty), including project development and environmental approvals policy;
- Assessment of key risks, including business, political and environmental risk; and
- The likelihood of sound commercial returns.

In preparing a feasibility study, potential investors will follow a similar project feasibility evaluation process. This process can be 'streamlined' by having ready answers to a series of project-critical questions that potential investors will have. The following sections highlight these critical issues, and some typical issues project developers will require addressed in the context of evaluating a potential investment in the Walcha region. Having accurate answers to these questions, supported by reputable and up-to-date supplier documentation and information wherever possible, is critical to address specific areas of risk for project financiers and project developers investors in the context of funding new project development.

5.2 Feasibility study contents

5.2.1 Availability of resource

This is discussed in detail in Section 3. Importantly, potential investors require information on the timing of wood availability, wood quantity, quality, wood properties, variability and delivered cost. This section of a feasibility study also includes a discussion on resource supply risk, which complements the section on risk management.

5.2.2 Markets

Markets for the range of utilisation options are discussed in detail in a number of other publications, including the Strategy document. ESD has not elaborated on the markets discussion further.

A feasibility study market section is usually specific to the proponent and project. This highlights the desired end product markets, why these markets are a viable end use for the raw materials in question, and how markets are matched to processing capacity and technology. This includes a discussion on market drivers and market pricing, market access (including sale or off-take contracts in place, if any), and product storage, handling and distribution infrastructure to meet market demand.

This also includes a discussion on markets for co-products, which may include sawdust, bark, woodchips or processing offcuts from the production process.

5.2.3 Production process and technology

This section of a feasibility study is specific to the desired end markets above, and highlights the chosen production technology and process for this target market. This section addresses production risk in terms of the engineering design and machinery and equipment used to consistently manufacture products to the required market specifications from residual wood.

Where the production process is slightly unusual (eg a panel production plant that uses both hardwood and softwood residues), the production risk will need to be addressed by demonstrated commercial examples.

5.2.4 Utilities and infrastructure

This section of the feasibility study deals with the critical infrastructure to support project development. In the context of the Walcha region, this is discussed in some detail in the Strategy document, and will include

- Current roading infrastructure, and upgrades required to 'problem spots' (eg bridge load limits) to handle additional wood haulage;
- Potable water availability, and whether the current water supply system could handle an influx of population;

- Sewage treatment capacity, and whether the current sewage system could handle an influx of population;
- Electrical supply and distribution infrastructure, including current capacity and potential additional loads that could be drawn down to support new industrial development;
- Gas supply to the region, if any, and costs to link the region to a gas pipeline;
- Availability of skilled labour in the region;
- Housing capacity for new workers during both project development and implementation phases; and
- Hotel accommodation (number of beds).

5.2.5 Project implementation and operations

This section of a feasibility study deals with the structure of the proposed investment, for example if it is direct ownership, a joint venture or other structure. This section also deals with contractual arrangements with engineering service providers for construction and project management through to post-commissioning phase, and sets out detailed plans for the recruitment and training of operational and managerial staff, including ongoing project operations.

5.2.6 Government policy and regulatory environment

Analysis of policy impacting on the development of a wood processing opportunity needs to focus on the policy and regulatory environment at local, State and Commonwealth level

- Impacting on raw material supply; and
- Impacting on project development.

Raw material supply

The three levels of Government in Australia; Australian, State/Territory and Local, have specific interests in, and responsibilities for, forest management, including the management and regulation of plantation development. Responsibility for forest management and land allocation rests with the States and Territories, however in many cases Local Government plays a significant role in the planning of plantation development.

In NSW, the Plantations and Reafforestation Act and Code provide a streamlined approval process and a guaranteed right to harvest for authorised plantations. The legislation ensures that, where authorisation is granted, no other consent is required. Assistance and guidance for plantation proponents is available through the Department of Infrastructure, Planning and Natural Resources' (DIPNR's) regional plantation officers.

Project development

Depending on the capital investment and level of employment the project will create, there are a range of policy and regulatory issues associated with project development in NSW.

The Environmental Planning and Assessment Act 1979 (EP&A Act) and Environmental Planning and Assessment Regulation 2000 (EP&A Regulation) provide the framework for the use and development of land in NSW. The EP&A Act establishes the hierarchy of planning instruments which apply to the proposed development, and sets the capital investment and employment 'hurdles' over which more stringent planning approval applies.

For example, if a proposed residual wood processing development will process >50,000 m^3 per annum, the development will be classified designated development under the Environmental Planning and Assessment Regulation 2000, requiring an Environmental Impact Statement to accompany the Development Application for the proposed development Under Part 4 of the NSW EP&A Act 1979.

In addition, if the planned capital cost is in excess of $30 million, a proposed development will be classified State Significant under State Environmental Planning Policy 34 (SEPP 34).

If development approval is required from a number of planning authorities (eg the Roads and Traffic Authority, the Department of Environment and Conservation), a proposed development may be classified as integrated development under Section 91 of the EP&A Act 1979.

Other policy and regulatory instruments that impact on project development in NSW include

- Protection of the Environment Operations Act 1997 (PoEO Act)
    - The Act provides for an integrated system of licensing whereby a single schedule of activities requiring an environment protection licence will regulate all forms of pollution. Schedule 1 of the PoEO Act identifies developments that require an environment protection licence under the Act, including

      "Wood or wood milling is a premises-based scheduled activity and is defined as an activity that process wood or wood products by way of sawing, machinery, milling, chipping, pulping or compressing wood or wood and that:

      Has an intended processing capacity of more than 6,000 cubic metres of wood (or wood products) per year and burns waste (other than as a source of fuel); or

      Have an intended processing capacity of more than 50,000 cubic metres of wood (or wood products) per year".

- Roads Act 1993;
- Threatened Species Conservation Act 1995;
- State Environmental Planning Policies (SEPPs); and
- Local Environmental Plans.

At the Commonwealth level, the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) may also apply to a proposed development. The EPBC Act requires approval of the Commonwealth Minister for the Environment for actions that may have a significant impact on matters of national environmental significance.

The EPBC Act also requires Commonwealth approval for certain actions on Commonwealth land. Matters of national environmental significance under the Act include the following

- World Heritage properties;
- Ramsar wetlands of international importance;
- Threatened species or ecological communities listed in the EPBC Act;
- Migratory species listed in the EPBC Act;
- Commonwealth marine environment; and
- Nuclear actions.

These issues highlight the complexity in achieving planning approval for new developments in NSW, and illustrate the need to adequately addressing planning and regulatory risk associated with new project development. Ideally, as part of a feasibility study, a proposed project will have development approval before seeking project finance.

5.2.7 Health, safety, environmental and social issues

This section of a feasibility study provides information on the approvals status of a project. If development has been approved by the relevant consent authority, this is a significant positive for financing a new project.

This section also examines the regional community and economic benefits of new project development. This will include the direct employment effects, and the linkages with existing industry to add value in terms of indirect employment. This section will present the results of the environmental impact analysis of project development: usually undertaken as part of development approval.

In terms of project operations, this section will also present the operating environment for the new project, and highlight the organisation's approach to ensuring the health and safety of its workforce during construction and operations phases.

5.2.8 Project ownership, contractual and legal issues

This section of a feasibility study will examine issues such as land tenure, local regulations and federal and state legislation specifically relating to project operations (eg fuel excise and levies, payroll tax, occupational health and safety). This section will directly address the issue of sovereign risk and aim to ensure that all relevant legislation potentially impacting on project construction and operations is understood, and compliance planned for.

5.2.9 Risk assessment

Risk assessment is a key part of a feasibility study. Depending on the requirements of the project financier, the risks analysed can include

- Resource risk (security of supply within assumptions on quality),
- Project completion risk;
- Operational risk;
- Management risk;
- Environmental risk;
- Force majeure risk;
- Product and co-product off-take (market) risk; and
- Sovereign risk.

The analysis presents the potential likelihood of each risk taking place, the consequence of each risk on project returns, and the proposed management measures (including insurance) to effectively manage risk.

5.2.10 Financial analysis

The financial analysis is the most significant section of a feasibility study, as it presents the results of the project development assumptions. A comprehensive financial analysis will include

- A detailed financial model;
- A proposed project financing plan (including debt : equity assumptions);
- Financing costs and interest rates;
- Detailed analysis of capital and operating costs, derived from the engineering design and operating assumptions;
- Cashflow generation and project profitability; and
- Opportunities for project enhancement.

Financial model

In 2004, ESD completed a financial model for a substantial new regional processing investment in southern Australia. The model assessed the financial viability of a greenfields project, and contained the following information

- Corporate finance
  - Risk free rate
  - Debt/equity ratios (gearing)
  - Corporate tax and inflation rates
  - Aged creditors/debtors assumptions
- Input (plant feedstock)
  - Raw material type, volume and price
  - Storage, handling and management costs
- Capital
  - Total capital expenditure
  - Depreciation and amortisation
  - Construction start and finish dates
- Production
  - Processing plant design capacity (initial)
  - Processing plant capacity (capacity increases over time)
  - Anticipated sales volume
  - Plant operating days per annum
- Cost of production
  - Power, gas and water input volume and price
  - Chemical input volume and price (if any)
  - Associated costs of production
- Operating costs
  - Plant maintenance
  - Raw material costs

- Staff costs, including superannuation, insurance and leave costs
- Environmental and regulatory compliance costs
- Insurance, admin, marketing, training and R&D costs

- Sales/revenue
  - Sales volume by customer
  - Sales price by customer
  - Price for co-products
  - Volume of co-product production
- Financial performance
  - Profit and loss (including project and investor rates of return)
  - Cashflow
  - Balance sheet

5.3 Summary

As highlighted by this section, there are a significant number of issues a potential investor or project developer must address in the context of a feasibility study for new processing investment. The differing requirements of project financiers and potential investors themselves mean that there is no 'one size fits all' approach to a feasibility study analysis.

There are, however, a number of consistent issues which many potential investors will examine. These are outlined as headings in this Section, and include resource, utilities and infrastructure, government policy and regulatory environment and environmental, health and safety issues. The Board can play an important role in enhancing the potential for residual wood processing investment in the region by providing well-researched and documented answers to some of the fundamental investment questions to address project development risk.

6 Potential investment groups

ESD Consulting Pty Ltd has spoken with a range of potential investment groups, including existing wood processors, in the preparation of the report. A summary of groups that may be relevant to the Strategy and this study is as follows.

Figure 6-1: Potential investment groups

Organisation	Contact	Potential area of interest
WOOD INDUSTRY, PLANTATIONS AND PROCESSING		
Boral Limited (Wood Division) **Tel:** 02 6644 7280 (Koolkhan) **Fax:** 02 6644 7745 (Koolkhan)	Mr Steve Worley	Existing hardwood sawmiller Potential hardwood plantation developer
Carter Holt Harvey Limited The Zenith Centre Tower A Level 6 821 Pacific Highway Chatswood NSW 2067 **Tel:** 02 9468 5700 **Fax:** 02 9468 5793	Mr Ian Myers CEO CHH Pinepanels	Panels manufacture (particleboard, MDF)
Forest Enterprises Australia Limited PO Box 733 Launceston Tasmania 7250 **Tel:** (03) 6334 7811 **Fax:** (03) 6334 4660	Mr Tony Cannon Director David Lovell Area Forester	Existing hardwood plantation developer in the region seeking to expand Potential investor in Hew Saw processing technology
Furnishing Industry Association of Australia PO Box 2071 Hotham Hill VIC 3051 **Tel:** 02 9321 8999 **Fax:** 02 9321 8988	Mr Dennis Payton CEO	Vertical integration with wood based panel manufacturing plants (key recommendation of the FIAA's Wood Strategy 2004)
Hancock Natural Resource Group Australia The Zenith Centre, Tower B Suite 2, Level 12 821 Pacific Highway Chatswood NSW 2067 **Tel:** 61-2-9884-4801 **Fax:** 61-2-9884-4899	Dr David Brand Director New Forests Program	Potential plantation investor

Organisation	Contact	Potential area of interest
Invest Australia GPO Box 9839 Canberra City ACT 2600 **Tel:** 02 6213 7152 **Fax:** 02 6213 6451	Mr Garry Draffin CEO	Australia's inward investment attraction agency Invest Australia maintain links with international companies seeking to invest in Australia, and can assist with identifying potential international project proponents for a range of potential investment opportunities
Koppers Arch PO Box 2122, North Sydney NSW 2059 **Tel:** 02 9954 5433 **Fax:** 02 9954 5467	Mr Mark Boyle General Manager Koppers Wood Products	Potential investor in wood treatment facilities
NM Rothschild and Sons (Australia) Limited Level 16, 1 O'Connell Street Sydney NSW 2000 **Tel:** 02 9323 2220 **Fax:** 02 9323 2394	Steve Kirby Director	Potential plantation investor
Pentarch Forest Products Pty Ltd Level 1, Kings Garden Estate. 99 Coventry Street South Melbourne VIC 3205 **Tel:** 03 9682 8677 **Fax:** 03 9682 9533	Mr Simon Penfold Export Manager	Log and woodchip export
Willmott Forests Limited Locked Bag 4011, South Melbourne VIC 3205 **Tel:** 03 9696 1355 **Fax:** 03 9696 5567	Mr Marcus Derham CEO Mr David Smith Senior Executive Forestry Operations	Possible plantation developer in the region under the Strategy Possible investor in landscape wood processing capacity in the region.

7 Conclusions and recommendations

The Northern Inland Forestry Investment Group of the New England / North West Regional Development Board has contracted ESD Consulting Pty Ltd to examine options for the commercial utilisation of residual wood in the Walcha region. ESD has analysed potential residual wood utilisation options for the softwood resource in the Walcha region to be established as part of the Walcha Softwood Plantation Development Strategy. ESD has also examined options for utilisation of residual wood from planned expansion of hardwood plantations in the region.

The Strategy aims to establish a further 40,000 hectares of softwood plantation resources in the region with a silvicultural regime designed to produce veneer and high grade sawlog, and to minimise production of other log products from the plantations. These assumptions have been used in this study to derive potential utilisation options for analysis.

Resource availability

Residual wood for further processing will flow directly from harvesting operations in both existing and future plantations in the region, and from residues derived from higher value wood processing such as sawn wood production. Based on the analysis conducted by ESD, the following table highlights the potentially available residual wood from both in-forest and processing residues in the region. This has been separated into four time periods corresponding to expansion in residual wood availability for ease of analysis.

Table 7-1: Total residues potentially available for industry development in the Walcha region 2005 – 2035

Residue type	Available volume (m^3/a) 2005 to 2021	Available volume (m^3/a) 2022 to 2027	Available volume (m^3/a) 2028 to 2033	Available volume (m^3/a) 2034 onwards
SOFTWOOD				
In-forest residues (existing public)	60,000	60,000	60,000	60,000
In-forest residues (existing private)*	14,600	-	-	-
In-forest residues** (future private)	-	75,000	100,000	115,000
Processing residues (existing)	60,320	60,320	60,320	60,320
Processing residues** (future)	-	-	-	220,000
HARDWOOD#				
In-forest residues** (existing and future private)	66,000##	118,000	125,000	125,000
TOTAL	*200,920*	*313,320*	*345,320*	*580,320*

**Assumes no replanting of the existing private forest estate takes place post-harvest*

 # Plantations only

*** Note future resource volumes are based on achieving planting targets as set out in the Strategy document for softwood, and in Section 3.2 of this report for hardwood*

Note these hardwood plantation volumes would only be available from 2012

Traditional or 'world scale' residual wood processing investment

Traditionally, many market commentators highlight that new wood processing capacity must be 'world scale' in size in order to compete in terms of cost to market. The key assumption is that wood products compete in an undifferentiated market and cannot therefore demand a price premium. As a result, one of the principle tools of competition is to ensure a competitive advantage through positioning low on the international cost curve for production of that commodity.

Many 'world scale' investment opportunities would not be realised until 2034, assuming the Strategy planting targets are met.

Non-traditional residual wood processing investment

'Non-traditional' residual wood processing options have been examined in the context of the potential feasibility of project development, and timing of commencement. The approach taken by ESD was to examine which processing options may be established in the medium term (ie within 5-7 years) in order to provide market 'pull through' for the development of future wood plantations in the Walcha region under the Strategy.

Options evaluated included

- Reconstituted panels production (particleboard, medium density fibreboard, oriented strand board);
- Landscape industries;
- Export woodchip;
- Export log; and
- Renewable energy generation.

Recommendations and options to pursue

Residual wood processing options will deliver the most value in terms of regional economic growth where they focus on further value-adding, and hence employment, in the Walcha region. Taking this into account, ESD recommends the Board examine the following residual wood processing options (note these are not ranked).

Option 1 – Hew Saw processing

Establishing a Hew Saw processing investment in the Walcha region would add value to the existing residual wood resource in plantations managed by Forests NSW. The Hew Saw technology also has the potential to processing small hardwood logs, which will become available from the existing, and future, hardwood plantation resources in the region.

Forest Enterprises Australia Limited (FEA) has extensive experience in Hew Saw technology from their northern Tasmanian Hew Saw processing operations. FEA are also the largest private hardwood plantation developer in the Walcha region. FEA are an important stakeholder in terms of potential investment in the region from both the hardwood plantation and wood processing perspective. ESD recommends if this option is to be pursued, FEA are consulted directly on the opportunity for plantation and processing investment in the region.

There is a requirement for investment in Hew Saw processing to be supported by an off-take agreement(s) with Macquarie Generation for utilisation of the co-products from sawmilling, including bark, sawdust and woodchips. This arrangement has the potential to underpin project economics, and is an important component of investment viability.

Option 2 – Wood preservation plant

Given existing residual wood volumes, there is an opportunity to establish wood preservation treatment operations in the region to utilise the existing softwood residues, and potentially hardwood residues as these become available. This operation could form the basis for expanded processing in future as the planting targets under the Strategy are met.

ESD recommends if this option is to be pursued, companies such as Koppers and Willmott Forests Limited are consulted as potential project developers. ESD also recommends discussion with Tamworth Treated Woods as to potential expansion plans in the region.

Option 2 – Particleboard production

Particleboard is an undifferentiated product in the marketplace, requiring cost competitive production to ensure profitability. Due to resource constraints, particleboard may be considered a processing option if a small plant could be established to produce particleboard cost-effectively into the Sydney or export markets.

A smaller production facility will require market access in the form of direct sales agreements / vertical integration with customers such as furniture manufacturers to compete in an undifferentiated marketplace. This may also include creation of a specific particleboard 'brand'.

There is an opportunity to discuss the issue of vertical integration with the Furniture Industry Association of Australia. Establishment of such facilities in association with reconstituted panels manufacture is Recommendation 8 of their Wood Policy 2004. ESD recommends if this option is to be pursued, to discuss the issues with panels production with an experienced group such as Carter Holt Harvey Limited, and to discuss the potential for vertical integration with the Furniture Industry Association of Australia.

Option 4 – Export logs

An export log strategy is a potentially viable option in the short to medium term, depending on current exchange rate and exporting costs, and provided sufficient volume of quality logs can be guaranteed. The option requires detailed financial and risk analysis, which ESD recommends is conducted in association with an experienced group such as Pentarch Forest Products Pty Ltd.

The need to meet the Strategy planting targets

The potentially feasible residual wood processing options presented in this report are based on the plantation development assumptions in the Strategy. If expanding the plantation estate in the region does not match the timing and silviculture as presented in the Strategy, this will have impacts on the choice of residual wood processing options.

Attracting investment to the Walcha region

In attracting residual wood processing investment to the Walcha region, potential investors will inevitably prepare a detailed project feasibility study. This document forms the business case for a new processing investment, and is the critical document from which to raise finance for new project development. The feasibility study provides investors and project financiers (either internal or external) with a referenced document supporting the project assumptions and addressing each of the key areas of risk.

There are a significant number of issues a potential investor or project developer must address in the context of a feasibility study for new processing investment. The differing requirements of project financiers and potential investors themselves mean that there is no 'one size fits all' approach to a feasibility study analysis.

There are, however, a number of consistent issues which many potential investors will examine. These include the resource, utilities and infrastructure, government policy and regulatory environment and environmental, health and safety issues. The Board can play an important role in enhancing the potential for residual wood investment in the region by providing well-researched and documented answers to some of the fundamental investment questions to address project development risk.

Next steps

To investigate these options, the Board should identify the desired Walcha region residual wood processing options in terms of the

- Potential processing opportunities as identified in this report; and
- Desired end result for the Walcha region in terms of maximum economic value added (regional investment and employment).

This should involve a decision on the optimum opportunity to pursue. The Board can then develop specific investment attraction documentation (as highlighted in Section 5), and discuss this with the relevant contact from the list of potential investment groups provided by ESD. Investment attraction documentation should include a summary of the key benefits and opportunities the Walcha region can offer in terms of supporting a processing investment, and form the basis of a full feasibility study by potential investors.

Rod Bristow
Director
ESD Consulting Pty Ltd
June 2005

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