

# The potential for rotary peeling veneer in regional Tasmania

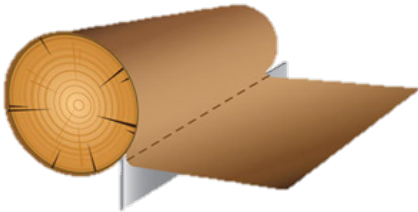
A feasibility study by Dr. David Blackburn and  
Associate Professor Gregory Nolan,  
University of Tasmania

## Reasons for the study

- The success of regional veneer peeling in Asia
- Availability of technology underpinning that success
- Large estates of potential resource in Tasmania
- Key findings from recent studies on that resource



Market opportunities



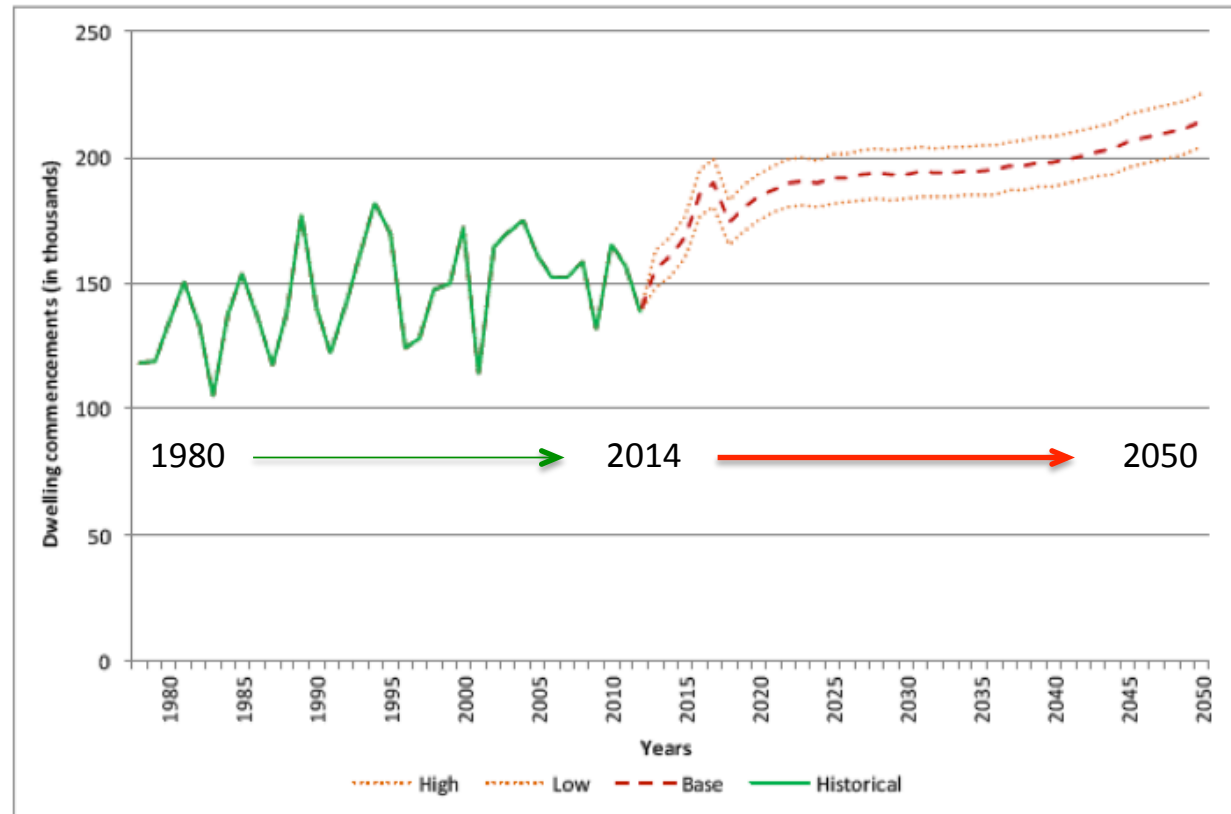
Technical feasibility



Economic feasibility

## Market opportunities

Total number of  
dwelling starts



Source: ABARES projections, Housing Industry Association datasets.

## Potential Products



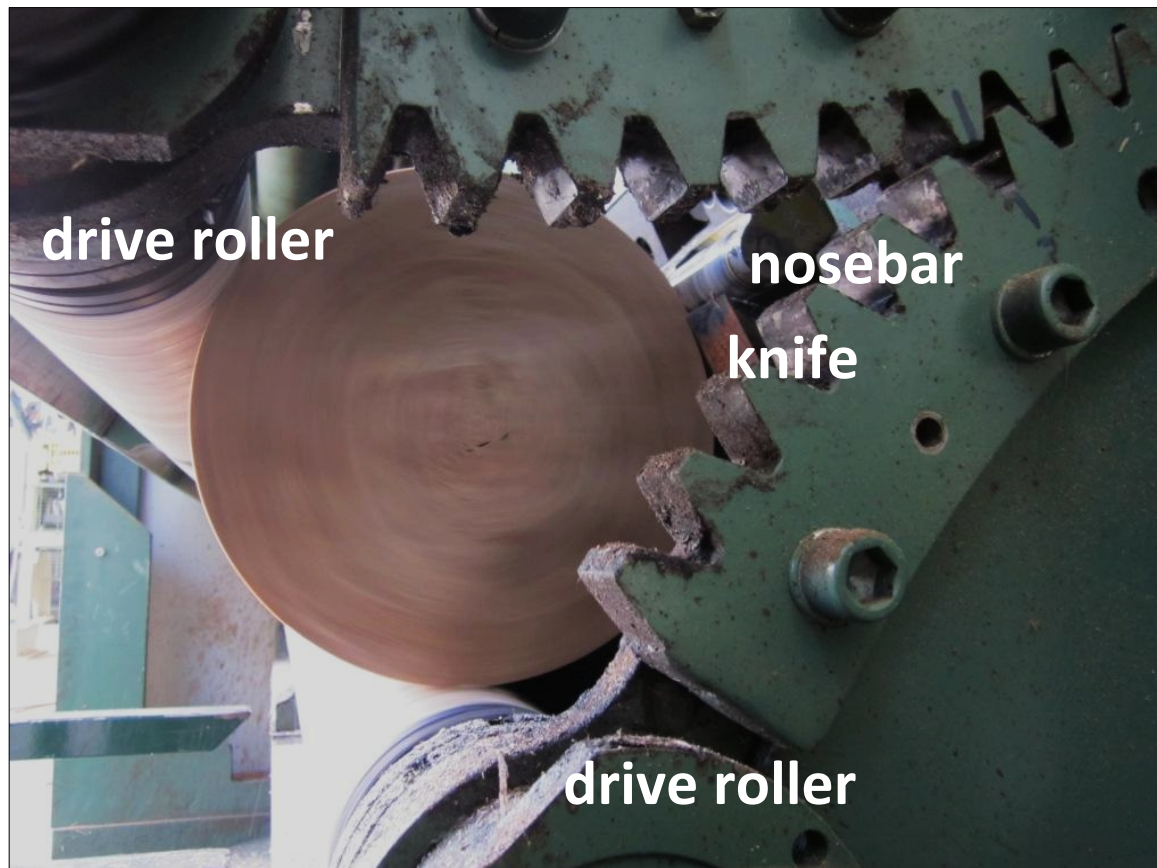


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## The spindleless lathe – peeling a log billet



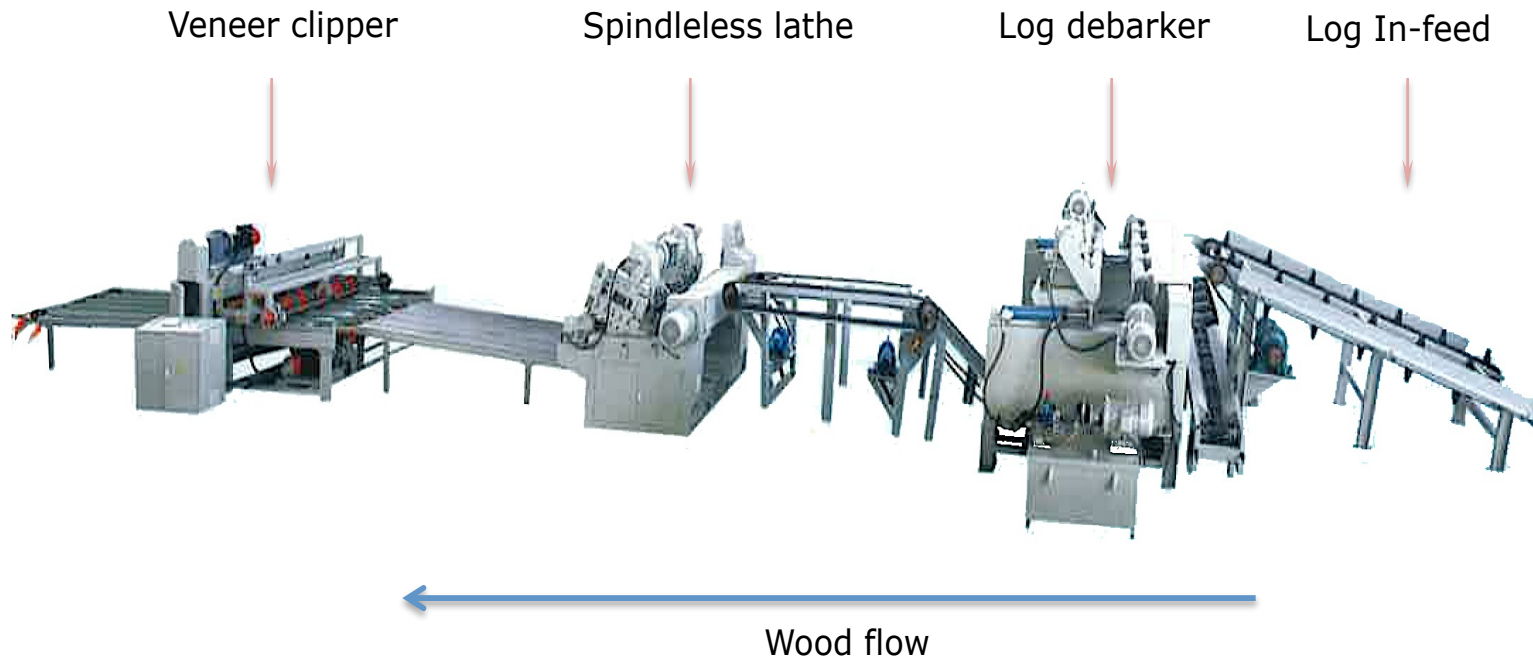
## The spindleless lathe – peeled veneer



## The spindleless lathe – billet core

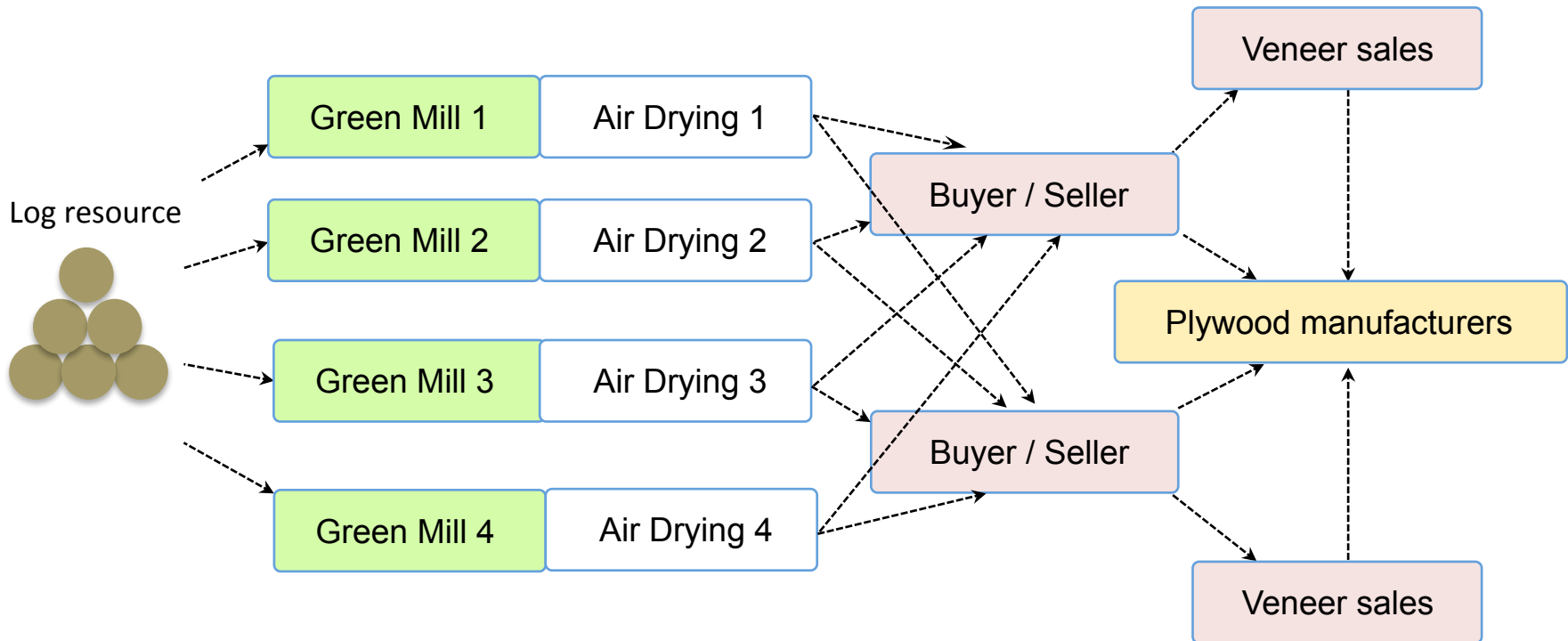


## Typical small scale spindleless lathe veneer peeling line





## Chinese regional veneer value chain



	<b>China</b>	<b>Tasmania</b>
<b>Strengths</b>	<ul style="list-style-type: none"> <li>• Cheap rural labour in regional areas</li> <li>• Availability and low cost of capital equipment</li> <li>• Large product demand</li> <li>• Favourable government policies</li> </ul>	<ul style="list-style-type: none"> <li>• Large volume of quality peeler logs are available</li> <li>• High quality strength and stiffness veneer</li> <li>• Peeler logs should produce some appearance veneer</li> <li>• Good transportation infrastructure</li> </ul>
<b>Weaknesses</b>	<ul style="list-style-type: none"> <li>• Most veneer produced is only suitable as core-ply</li> <li>• Limited availability of log resource in future</li> <li>• Increasing competition for logs from fibre-board mills</li> </ul>	<ul style="list-style-type: none"> <li>• No existing domestic market for eucalypt hardwood veneer</li> <li>• No locally available equipment and logistic support</li> <li>• High labour costs</li> <li>• Highly regulated operational requirements</li> </ul>
<b>Opportunities</b>	<ul style="list-style-type: none"> <li>• Investment available for larger-scale integrated operations</li> </ul>	<ul style="list-style-type: none"> <li>• Market research predicts steady long-term growth in housing and construction sector</li> <li>• Potential export markets for high strength and/or appearance quality veneer</li> </ul>
<b>Threats</b>	<ul style="list-style-type: none"> <li>• Slower predicted future growth in the housing and construction sector</li> <li>• Increased market competition from import</li> </ul>	<ul style="list-style-type: none"> <li>• A continuing strong Australian dollar will limit export markets and make imports attractive</li> <li>• Increased overseas market competition for exports</li> </ul>

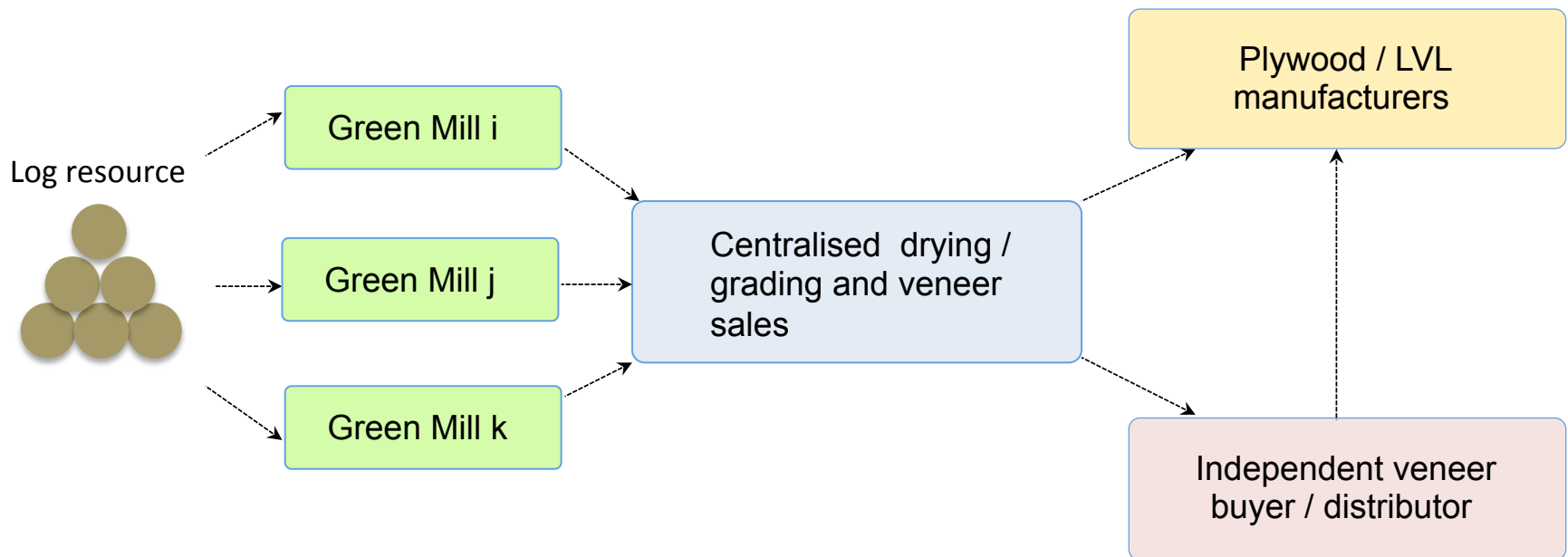


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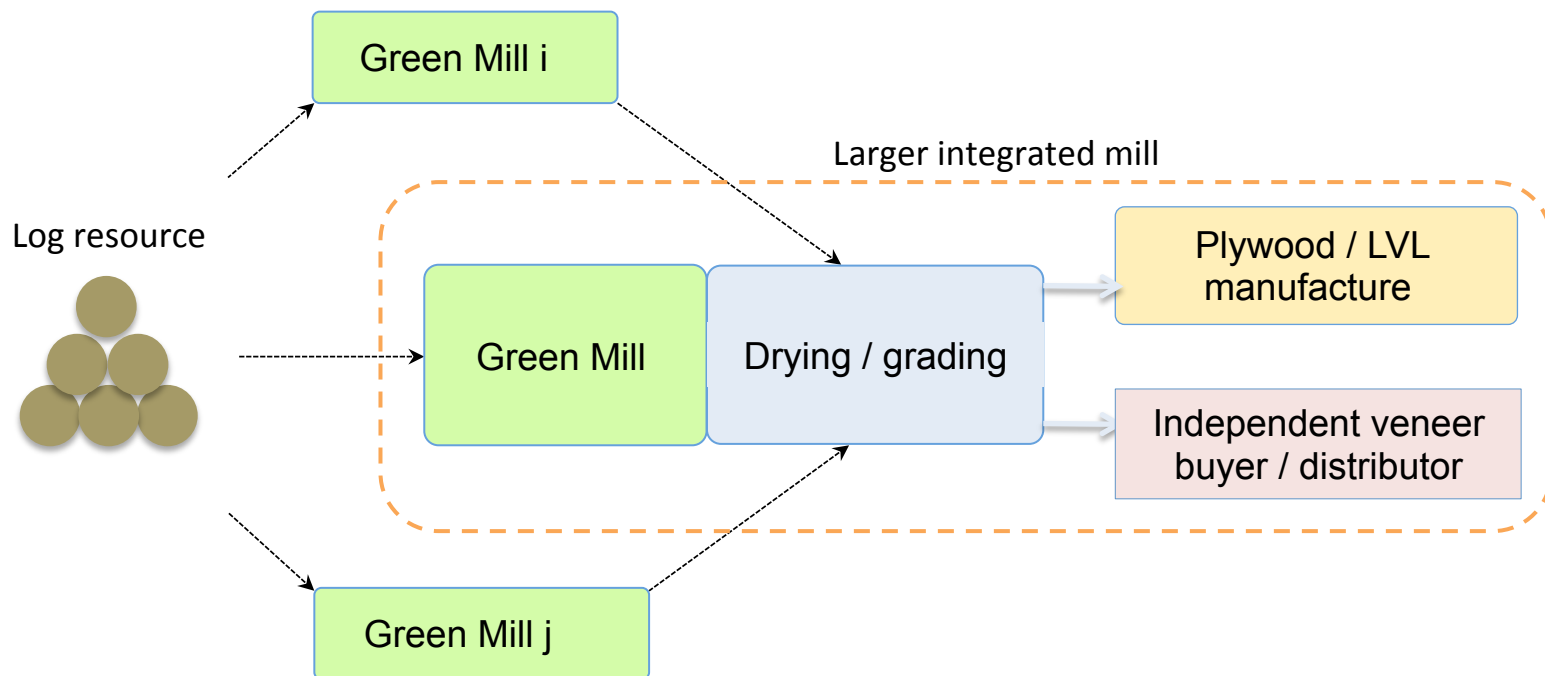
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Small-medium scale regional veneer peeling –  
Structure 1 - operators each peeling < 10,000 m<sup>3</sup> veneer p.a.



Medium-large scale regional veneer peeling –  
Structure 2 - operators peeling  $> 25,000$  m<sup>3</sup> veneer p.a.



Technical feasibility

*Resource...?*

*Operating regulations...?*

*Technical...?*

*Labour & regulations...?*

Economic feasibility

*Size...?*

*Costs...?*

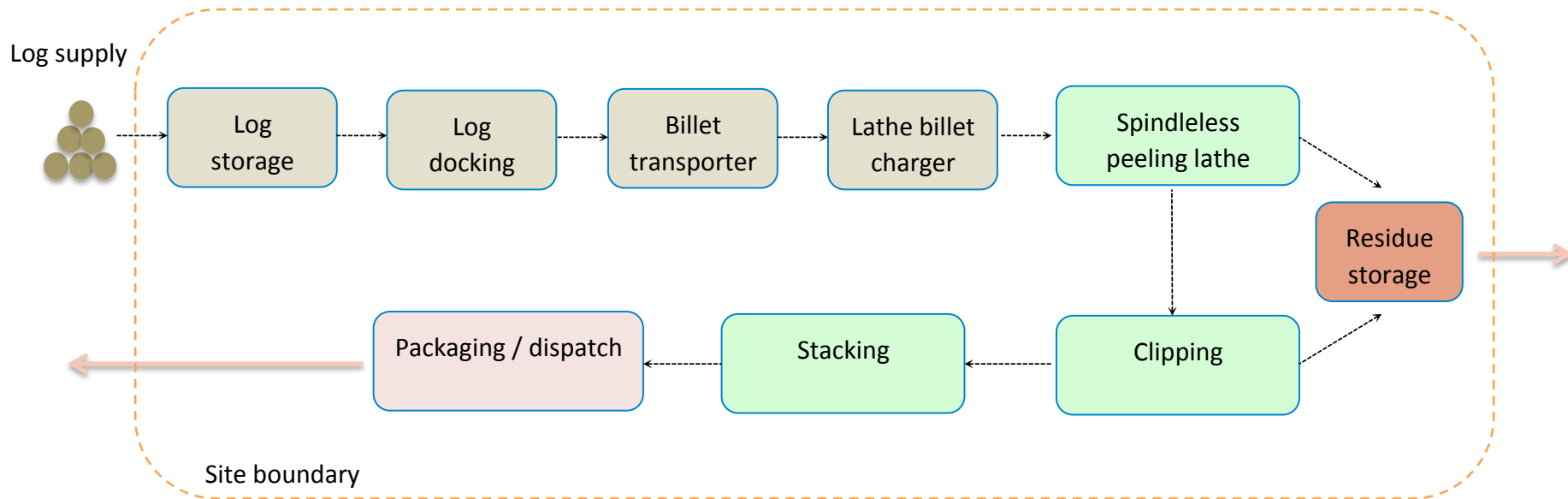
*Returns...?*

*Assumptions...?*

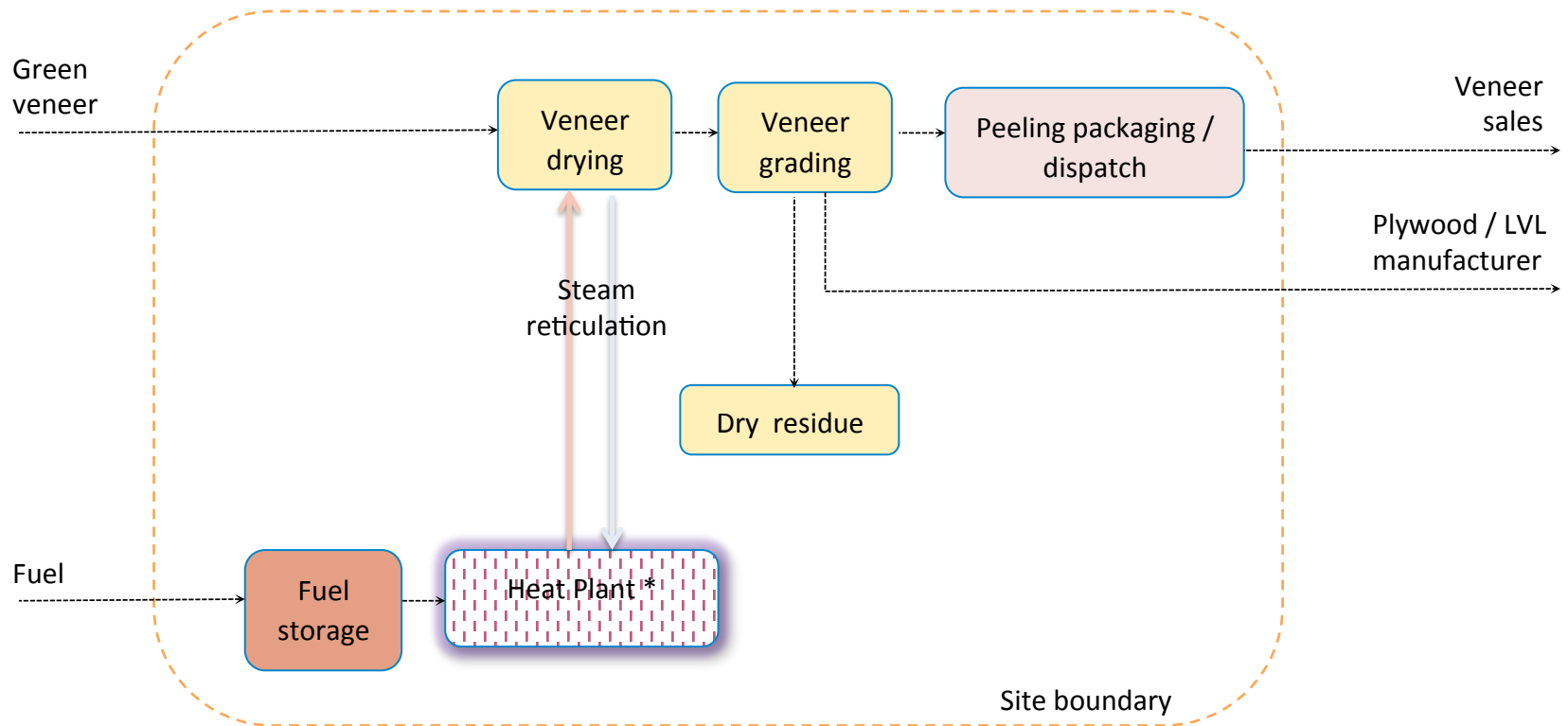
Enterprise Options	Production
<b>Option 1.</b> One low cost spindleless RPV line operating a single shift.	Peeling <b>7500 m<sup>3</sup></b> of logs to green veneer p.a.
<b>Option 2.</b> Two low cost spindleless RPV lines operating two shifts.	Peeling <b>30,000 m<sup>3</sup></b> of logs to green veneer p.a.
<b>Option 3.</b> Two high quality spindleless RPV line operating two shifts.	Peeling <b>50,000 m<sup>3</sup></b> of logs to green veneer p.a.
<b>Option 4.</b> Three high quality spindleless RPV lines operating three shifts.	Peeling <b>100,000 m<sup>3</sup></b> of logs to green veneer p.a.
<b>Option 5.</b> Independent veneer drying and grading facility with a refurbished heat plant operating three shifts.	Processing <b>75,000 m<sup>3</sup></b> of green veneer to dry veneer product p.a.
<b>Option 6.</b> Integrated Mill - Three high quality spindleless RPV lines, and one automated dryer with a scanner/grader, operating three shifts.	Processing <b>100,000 m<sup>3</sup></b> of peeler logs to dried veneer product p.a.



## Green veneer production processing flow

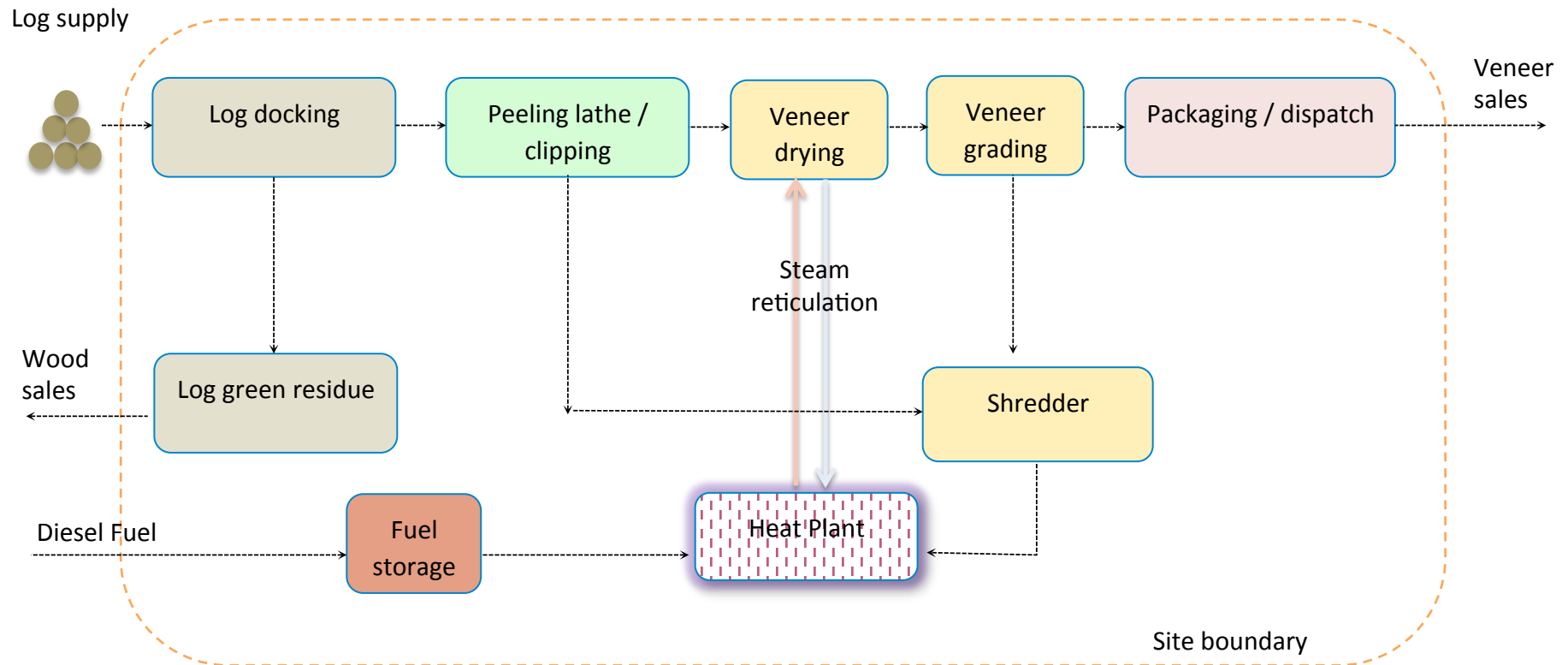


## Independent drying and grading operation



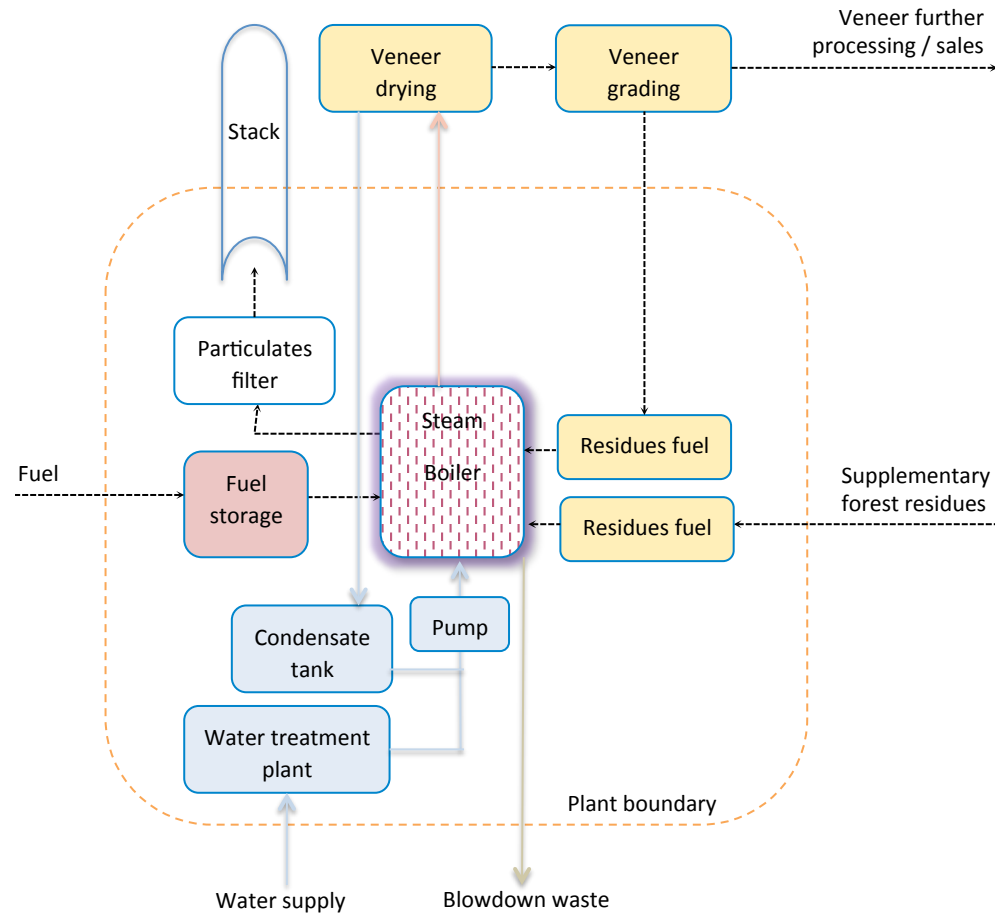


## Dry veneer processing flow





## Heat plant





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# Costs, prices and assumptions

1x LOW COST RPV line INSTALLED AT AN EXISTING SAWMILL OPERATION - x1 SHFT  
PRODUCTION TARGET 7500 m3 p.a. LOG SUPPLY FOR GREEN VENEER

CAPITAL COSTS	number	\$/unit	\$/unit	\$/unit
Log docking station	1	25000	25000	
Billie transporter	1	38000	38000	
Log deck / trailer charger	1	38000	38000	
RPV underrunner table	1	30000	30000	
Copper	1	20000	20000	
Veneer conveyors	2	22000	22000	
Stacker	2	12000	12000	
Waste conveyor	1	12000	12000	
Site preparation/building improvements	1	20000	20000	
Upgrade to Australian Codes	1	9000	9000	
Installation and establishment	1	20000	20000	
		\$Total capital cost	210000	
		Depreciation	10.00%	
		Dispersal rate	100%	
		\$Total annual cost	231000	
LEASES p.a.	number	\$/unit	\$/unit	\$/unit
Front and loader incs fuel/maint	0.3	3500	54600	
Fuel/till	1	250	13000	
Use	0.5	750	11700	
		\$Total annual cost	79300	

STAFFING p.a. (Single shift)	FTE	\$/hour	\$/unit	\$/unit
Leader operator L4	0.3	36830	42%	15600
Leader operator L3	1	36830	42%	15600
Log docking L4	2	36830	42%	15600
Peeling L4	2	36830	42%	15600
Copper/Locking line assistants L2	1	36830	42%	15600
Supervisor / Leading hand L4	1	36830	42%	15600
Maintenance Staff	0.3	36830	42%	15600
Sales, Admin & Accounting Staff	0.3	36830	42%	15600
General Manager Staff	0.3	36830	42%	15600
	6.5		\$Total annual cost	377200

OPERATING COSTS p.a.	\$/unit	\$/unit	\$/unit	\$/unit
Log resource m3	90	7500	675000	
Electricity kWh/hrs	150	180	27000	
Fuel/Easy / Fuel / hr	2	1875	3750	
Kiln Drying	150	24	3600	
Rates/Premises 50%	0.3	10000	3000	
Premises rental	0.3	20000	6000	
Consumables (m3)	1	5625	5625	
Fuel	3	3220	9660	
Freight to veneer dry (m3)	12.5	1875	23438	
Freight to veneer dry (m3)	25	5625	14063	
		\$Total annual operating costs	96460	

Log - Green Veneer Recovery	75%			
Green veneer sales m3 (cutting A - 1 m3 /hour/ha)	272	5625	1530000	
GENERAL EXPENSES p.a.				
Auditing and Legal 0.5%	3000			
Insurance	1500			
Water rates / Fees	1500			
Office Equipment	600			
Phone / Communications	1500			
Training start-up	5000			
Training ongoing	1500			
NPV discount rate	5%			
NPV discount rate	10%			

2x LOW COST RPV line INSTALLED AT AN EXISTING SAWMILL OPERATION - x2 SHFTS  
PRODUCTION TARGET 30000 m3 p.a. LOG SUPPLY FOR GREEN VENEER

CAPITAL COSTS	number	\$/unit	\$/capital cost
Log docking station	1	75000	75000
Billie transporter	2	18000	36000
Log deck / trailer charger	2	18000	36000
RPV underrunner table	2	30000	72000
Copper	2	20000	20000
Veneer conveyors	4	9000	36000
Stacker	2	12000	24000
Waste conveyor	1	12000	12000
Site preparation/building improve	1	20000	20000
Upgrade to Australian Codes	2	9000	18000
Installation and establishment	1	90000	90000
		\$Total capital cost	399000
		Depreciation	10.00%
		\$Dispersal rate	100%
		\$Total annual cost	399000
LEASES p.a.	number	\$/unit	\$/annual cost
Front and loader incs fuel/maint	1	3500	142000
Fuel/till	2	250	26000
Use	0.5	750	19500
		\$Total annual cost	227500

STAFFING p.a. (Double shift)	FTE	\$/hour	\$/unit	\$/unit
Leader operator L4	1	36830	42%	15200
Leader operator L3	1	36830	42%	15200
Log docking L4	2	36830	42%	15200
Peeling L4	2	36830	42%	15200
Copper/Locking line assistants L2	2	36830	42%	15200
Supervisor / Leading hand L4	2	36830	42%	15200
Maintenance Staff	0.3	36830	42%	15200
Sales, Admin & Accounting Staff	0.3	36830	42%	15200
General Manager Staff	0.3	36830	42%	15200
	25		\$Total annual cost	311380

OPERATING COSTS p.a.	\$/unit	\$/unit	\$/unit	\$/unit
Log resource m3	90	5000	450000	
Electricity kWh/hrs	150	800	120000	
Fuel/Easy / Fuel / hr	4	800	3200	
Kiln Drying	150	760	114000	
Rates/Premises 50%	0.3	10000	3000	
Premises rental	0.3	20000	6000	
Consumables (m3)	1	5625	5625	
Fuel	3	3220	9660	
Freight to veneer dry (m3)	12.5	1875	23438	
Freight to veneer dry (m3)	25	5625	14063	
		\$Total annual operating costs	209420	

Log - Green Veneer Recovery	75%			
Green veneer sales m3 (cutting A - 1 m3 /hour/ha)	272	3750	1027500	
GENERAL EXPENSES p.a.				
Auditing and Legal 0.5%	3000			
Insurance	1500			
Water rates / Fees	1500			
Office Equipment	600			
Phone / Communications	1500			
Training start-up	5000			
Training ongoing	1500			
NPV discount rate	5%			
NPV discount rate	10%			

HIGH QUALITY 1x6"-1x4" RPV LINES AT AN EXISTING SAWMILL OPERATION - x2 SHFTS  
PRODUCTION TARGET 50000 m3 p.a. LOG SUPPLY FOR GREEN VENEER

CAPITAL COSTS	number	\$/unit	\$/capital cost
Buildings & site infrastructure	1	50000	50000
Log docking station	1	120000	120000
Billie transporter	2	40000	80000
RPV underrunner table + RPV	1	85000	85000
Copper Pellet Round-up + RPV	1	61200	61200
vene	1	20000	0
conveyors	0	10000	24000
Stacker	0	6000	0
Waste conveyor	1	90000	90000
Site preparation	0	6000	0
Improvements and establishment	1	20000	20000
Upgrade to Australian Codes	1	30000	30000
Installation and establishment	1	120000	120000
		\$Total capital cost	1890000
		Depreciation	10.00%
		Dispersal rate	100%
		\$Total annual cost	2079000
LEASES p.a.	number	\$/unit	\$/annual cost
Front and loader incs fuel/maint	1	3500	36200
Fuel/till	2	250	26000
Use	1	750	11650
		\$Total annual cost	247000

STAFFING p.a. (Double shift)	FTE	\$/hour	\$/unit	\$/unit
Leader operator L4	1	36830	42%	15200
Leader operator L3	1	36830	42%	15200
Log docking L4	2	36830	42%	15200
Peeling L4	2	36830	42%	15200
Copper/Locking line assistants L2	2	36830	42%	15200
Supervisor / Leading hand L4	2	36830	42%	15200
Maintenance Staff	0.3	36830	42%	15200
Sales, Admin & Accounting Staff	0.3	36830	42%	15200
General Manager Staff	0.3	36830	42%	15200
	25		\$Total annual cost	311380

OPERATING COSTS p.a.	\$/unit	\$/unit	\$/unit	\$/unit
Log resource m3	90	5000	450000	
Electricity kWh/hrs	150	800	120000	
Fuel/Easy / Fuel / hr	4	800	3200	
Kiln Drying	150	760	114000	
Rates/Premises 50%	0.3	10000	3000	
Premises rental	0.3	20000	6000	
Consumables (m3)	1	5625	5625	
Fuel	3	3220	9660	
Freight to veneer dry (m3)	12.5	1875	23438	
Freight to veneer dry (m3)	25	5625	14063	
		\$Total annual operating costs	594060	

Log - Green Veneer Recovery	75%			
Green veneer sales m3 (cutting A - 1 m3 /hour/ha)	272	3750	1027500	
GENERAL EXPENSES p.a.				
Auditing and Legal 0.5%	3000			
Insurance	1500			
Water rates / Fees	1500			
Office Equipment	600			
Phone / Communications	1500			
Training start-up	5000			
Training ongoing	1500			
NPV discount rate	5%			
NPV discount rate	10%			

HIGH QUALITY 1x8"-3x4" RPV LINES - x3 SHFTS  
PRODUCTION TARGET 100000 m3 p.a. LOG SUPPLY FOR GREEN VENEER

CAPITAL COSTS	number	\$/unit	\$/capital cost
Buildings & site infrastructure	1	100000	100000
Log docking station	1	220000	220000
Billie transporter	4	18000	72000
Dragage Pellet Roll-up + RPV	1	85000	85000
Dragage Pellet Roll-up + RPV open?	3	61250	183750
Site conveyors	0	20000	0
Stacker	1	12000	12000
Waste conveyor	0	6000	0
Site preparation	1	90000	90000
Site preparation	1	25000	25000
Installation and establishment	1	120000	120000
		\$Total capital cost	3510000
		Depreciation	10.00%
		Dispersal rate	100.00%
		\$Total annual cost	3891000
LEASES p.a.	number	\$/unit	\$/unit
Front and loader incs fuel/maint	2	3500	36400
Fuel/till	3	250	38000
Use	2	750	11700
		\$Total annual cost	421000

STAFFING p.a. (Double shift)	FTE	\$/hour	\$/unit	\$/unit
Leader operator L4	2	36830	42%	15350
Leader operator L3	2	36830	42%	15350
Log docking L4	4	36830	42%	15350
Peeling L4	4	36830	42%	15350
Copper/Locking line assistants L2	4	36830	42%	15350
Supervisor / Leading hand L4	4	36830	42%	15350
Maintenance Staff	0.3	36830	42%	15350
Sales, Admin & Accounting Staff	0.3	36830	42%	15350
General Manager Staff	0.3	36830	42%	15350
	48		\$Total annual cost	3214300

OPERATING COSTS p.a.	\$/unit	\$/unit	\$/unit	\$/unit
Log resource m3	90	10000	900000	
Electricity kWh/hrs	150	1200	180000	
Fuel/Easy / Fuel / hr	6	5700	34200	
Kiln Drying	150	7500	112500	
Rates/Premises 50%	0.3	20000	6000	
Premises rental	0.3	40000	12000	
Consumables (m3)	1	7000	7000	
Fuel	3	18000	54000	
Freight to veneer dry (m3)	12.5	25000	312500	
Freight to veneer dry (m3)	25	75000	187500	
		\$Total annual operating costs	1275100	

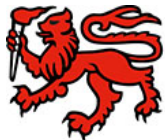
Log - Green Veneer Recovery	75%			
Green veneer sales m3 (cutting A - 1 m3 /hour/ha)	272	3750	1027500	
GENERAL EXPENSES p.a.				
Auditing and Legal 0.5%	3000			
Insurance	1500			
Water rates / Fees	1500			
Office Equipment	600			
Phone / Communications	1500			
Training start-up	5000			
Training ongoing	1500			
NPV discount rate	5%			
NPV discount rate	10%			

REFURBISHED HEAT PLANT AND DRYER/GRADING FACILITY AT AN EXISTING MILL - x3 SHFTS  
PRODUCTION TARGET 75000 m3 p.a. GREEN VENEER FOR DRY VENEER

CAPITAL COSTS	number	\$/unit/week	\$/capital cost
Buildings & site infrastructure improvements	1	100000	100000
Log shredder	1	120000	120000
Boiler/Heat Plant refurbishment	1	90000	90000
Raise Smart Drying System incs. Scanners/Graders	1	652000	652000
Delivered waste heat boiler/conveyor to chipper	1	10000	10000
Wood shredder conveyors	2	20000	20000
Installation and establishment	1	40000	40000
Wrapping unit	1	10000	10000
Control room	1	60000	60000
Racking/Storage	1	100000	100000
Sales and admin facility	1	30000	30000
		\$Total capital cost	856000
		Depreciation rate	10.00%
		\$Dispersal rate	856000/1
LEASES p.a.	number	\$/unit/week	\$/annual cost
Front and loader (small) incs fuel/maint	1	1800	9160
Fuel/till	4	250	5200
Use	2	750	11700
		\$Total annual cost	22060

STAFFING p.a. (3 shifts)	FTE	\$/hour	\$/unit	\$/unit
Leader/Fuel/Sort operator line assistants L3 day	3	35600	42%	13155
Leader/Fuel/Sort operator line assistants L3 a/night	6	40940	42%	14675
Shredder operator L3 day shift	1	48000	42%	16810
Shredder operator L3 a/night shift	2	48000	42%	16810
Dryer operator L3 day	4	35600	42%	13155
Dryer operator L3 a/night	8	40940	42%	14675
Wrapping/Storage/Dispatch L3 day	2	34200	42%	11784
Wrapping/Storage/Dispatch L3 a/night	4	39434	42%	12285
Control room operator/leading hand L3 day	1	40000	42%	15680
Control room operator/leading hand L3 a/night	2	40000	42%	15680
Maintenance Staff - shift day	2	55000	42%	18200
Sales, Admin & Accounting Staff	2	65000	42%	21840
General Manager Staff	1	100000	42%	34200
	38		\$Total annual cost	1263800

OPERATING COSTS p.a.	\$/unit	\$/unit	\$/unit	\$/unit
Green Veneer m3	225	75000	17625000	
Electricity kWh/hrs	150	1400	615000	
Boiler fuel - residual / none delivered	12.5	12500	156250	
Equip. maintenance / hr	10	5700	57000	
Rates/Premises	1	25000	25000	
Premises rental	1	110000	110000	
Consumables (m3)	2	56250	112500	
Spring/Packageing (m3)	5	56250	281250	
	7	8000	56000	
Light to wharf (m3)	25	56250	1406250	
		\$Total annual c	20453000	



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## Costs, prices and assumptions

1x LOW COST RPV LINE INSTALLED AT AN EXISTING SAWMILL OPERATION - x1 SHIFT  
PRODUCTION TARGET 7500 m3 p.a. LOG SUPPLY FOR GREEN VENEER

CAPITAL COSTS	number	\$/unit	\$/capital cost
Log docking station	1	20000	20000
Roller transporter	1	18000	18000
Log deck / roller charger	1	18000	18000
RPV syndrulus tube	1	30000	30000
Chopper	1	10000	10000
Veneer conveyors	2	12000	24000
Slacker	1	12000	12000
Waste conveyor	1	12000	12000
Site preparation/building improvements	1	20000	20000
Upgrade to Australian Codes	1	9000	9000
Installation and establishment	1	20000	20000
			150000

LEASES p.a.	number	\$/unit/week	\$/annual cost
Front end loader incs fuel/maint	0.3	3500	54000
Forklifts	1	250	13000
Ute	0.5	750	117000
			170000

STAFFING p.a. (single shift)	FTE	\$/hour	\$/annual cost
Loader operator L4	0.3	16000	4200
Roller operator L4	1	16000	4200
Log docking L4	0.3	16000	4200
Chopper	2	16000	36000
Clipping/grading line assistants L2	1	16000	4200
Superior / leading hand L4	0.3	40000	4200
Maintenance Staff	0.3	10000	4200
Sales, Admin & Accounting Staff	0.3	40000	4200
General Manager Staff	0.3	40000	4200
			77720

OPERATING COSTS p.a.	\$/unit	\$/unit p.a.
Log resource m3	90	7500
Electricity kWh/hrs	150	180
Gas/coal / fuel	2	180
Knife grinding	150	24
Raise Premises 50%	0.3	10000
Premises rental	0.3	10000
Fuel	1	2220
Freight to mill	1	2625
Freight to mill disposal / m3	12.5	1750
Freight to veneer dryer / m3	25	1625
		60450

Log - Green Veneer Recovery	75%
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REVENUE p.a.	272	5625	1530000
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GENERAL EXPENSES p.a.	\$/unit	\$/unit p.a.
Auditing and Legal 0.5%	1000	1000
Insurance	1000	1000
Water rates / fees	1000	1000
Office Equipment	1000	1000
Phone / Communications	1000	1000
		5000

Training start-up	1500
Training ongoing	1500
NPV discount rate	5%
NPV discount rate	10%

2x LOW COST RPV INSTALLED AT AN EXISTING SAWMILL OPERATION - x2 SHIFTS  
PRODUCTION TARGET 30000 m3 p.a. LOG SUPPLY FOR GREEN VENEER

CAPITAL COSTS	number	\$/unit	\$/capital cost
Log docking station	1	75000	75000
Roller transporter	2	18000	36000
Log deck / roller charger	2	18000	36000
RPV syndrulus tube	2	30000	60000
Chopper	2	10000	20000
Veneer conveyors	4	12000	48000
Slacker	2	12000	24000
Waste conveyor	2	12000	24000
Site preparation/building improvements	2	20000	40000
Upgrade to Australian Codes	2	9000	18000
Installation and establishment	2	20000	40000
			270000

LEASES p.a.	number	\$/unit/week	\$/annual cost
Front end loader incs fuel/maint	0.3	3500	54000
Forklifts	2	250	13000
Ute	0.5	750	117000
			170000

STAFFING p.a. (double shift)	FTE	\$/hour	\$/annual cost
Loader operator L4 day	0.3	16000	4200
Roller operator L4 night	0.3	16000	4200
Log docking L4 day	0.3	16000	4200
Chopper	4	16000	36000
Clipping/grading line assistants L2	2	16000	4200
Superior / leading hand L4 day	0.3	40000	4200
Maintenance Staff	0.3	10000	4200
Sales, Admin & Accounting Staff	0.3	40000	4200
General Manager Staff	0.3	40000	4200
			77720

OPERATING COSTS p.a.	\$/unit	\$/unit p.a.
Log resource m3	90	7500
Electricity kWh/hrs	150	180
Gas/coal / fuel	2	180
Knife grinding	150	24
Raise Premises 50%	0.3	10000
Premises rental	0.3	10000
Fuel	1	2220
Freight to mill	1	2625
Freight to mill disposal / m3	12.5	1750
Freight to veneer dryer / m3	25	1625
		60450

Log - Green Veneer Recovery	75%
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REVENUE p.a.	272	5625	1530000
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GENERAL EXPENSES p.a.	\$/unit	\$/unit p.a.
Auditing and Legal 0.5%	1000	1000
Insurance	1000	1000
Water rates / fees	1000	1000
Office Equipment	1000	1000
Phone / Communications	1000	1000
		5000

Training start-up	1500
Training ongoing	1500
NPV discount rate	5%
NPV discount rate	10%

HIGH QUALITY 1.4x1.4" RPV LINES AT AN EXISTING SAWMILL OPERATION - x2 SHIFTS  
PRODUCTION TARGET 100000 m3 p.a. LOG SUPPLY FOR GREEN VENEER

CAPITAL COSTS	number	\$/unit	\$/capital cost
Buildings & site infrastructure	1	50000	50000
Log docking station	1	120000	120000
Roller transporter	2	40000	80000
			250000

LEASES p.a.	number	\$/unit/week	\$/annual cost
Front end loader incs fuel/maint	0.3	3500	54000
Forklifts	2	250	13000
Ute	0.5	750	117000
			170000

STAFFING p.a. (double shift)	FTE	\$/hour	\$/annual cost
Loader operator L4 day	0.3	16000	4200
Roller operator L4 night	0.3	16000	4200
Log docking L4 day	0.3	16000	4200
Chopper	4	16000	36000
Clipping/grading line assistants L2	2	16000	4200
Superior / leading hand L4 day	0.3	40000	4200
Maintenance Staff	0.3	10000	4200
Sales, Admin & Accounting Staff	0.3	40000	4200
General Manager Staff	0.3	40000	4200
			77720

OPERATING COSTS p.a.	\$/unit	\$/unit p.a.
Log resource m3	90	7500
Electricity kWh/hrs	150	180
Gas/coal / fuel	2	180
Knife grinding	150	24
Raise Premises 50%	0.3	10000
Premises rental	0.3	10000
Fuel	1	2220
Freight to mill	1	2625
Freight to mill disposal / m3	12.5	1750
Freight to veneer dryer / m3	25	1625
		60450

Log - Green Veneer Recovery	75%
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REVENUE p.a.	272	5625	1530000
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GENERAL EXPENSES p.a.	\$/unit	\$/unit p.a.
Auditing and Legal 0.5%	1000	1000
Insurance	1000	1000
Water rates / fees	1000	1000
Office Equipment	1000	1000
Phone / Communications	1000	1000
		5000

Training start-up	1500
Training ongoing	1500
NPV discount rate	5%
NPV discount rate	10%

HIGH QUALITY 1.4x1.4" RPV LINES - x3 SHIFTS  
PRODUCTION TARGET 300000 m3 p.a. LOG SUPPLY FOR GREEN VENEER

CAPITAL COSTS	number	\$/unit	\$/capital cost
Buildings & site infrastructure	1	100000	100000
Log docking station	2	200000	400000
Roller transporter	4	40000	160000
			660000

LEASES p.a.	number	\$/unit/week	\$/annual cost
Front end loader incs fuel/maint	0.3	3500	54000
Forklifts	4	250	13000
Ute	0.5	750	117000
			170000

STAFFING p.a. (double shift)	FTE	\$/hour	\$/annual cost
Loader operator L4 day	0.3	16000	4200
Roller operator L4 night	0.3	16000	4200
Log docking L4 day	0.3	16000	4200
Chopper	4	16000	36000
Clipping/grading line assistants L2	2	16000	4200
Superior / leading hand L4 day	0.3	40000	4200
Maintenance Staff	0.3	10000	4200
Sales, Admin & Accounting Staff	0.3	40000	4200
General Manager Staff	0.3	40000	4200
			77720

OPERATING COSTS p.a.	\$/unit	\$/unit p.a.
Log resource m3	90	7500
Electricity kWh/hrs	150	180
Gas/coal / fuel	2	180
Knife grinding	150	24
Raise Premises 50%	0.3	10000
Premises rental	0.3	10000
Fuel	1	2220
Freight to mill	1	2625
Freight to mill disposal / m3	12.5	1750
Freight to veneer dryer / m3	25	1625
		60450

Log - Green Veneer Recovery	75%
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REVENUE p.a.	272	5625	1530000
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GENERAL EXPENSES p.a.	\$/unit	\$/unit p.a.
Auditing and Legal 0.5%	1000	1000
Insurance	1000	1000
Water rates / fees	1000	1000
Office Equipment	1000	1000
Phone / Communications	1000	1000
		5000

Training start-up	1500
Training ongoing	1500
NPV discount rate	5%
NPV discount rate	10%

REFURBISHED HEAT PLANT AND DRYER/GRADING FACILITY AT AN EXISTING MILL - x3 SHIFTS  
PRODUCTION TARGET 75000 m3 p.a. GREEN VENEER FOR DRY VENEER

CAPITAL COSTS	number	\$/unit	\$/capital cost
Buildings & site infrastructure improvements	1	100000	100000
Log docking station	1	200000	200000
Roller transporter	1	100000	100000
Boiler/Heat Plant refurbishment	1	100000	100000
Wood shredder	1	100000	100000
Waste conveyors	2	60000	120000
Slacker	1	10000	10000
Knife grinder	1	10000	10000
Roller/Heat Plant refurbishment	1	100000	100000
Raute Smart Drying System incs. Scanners/Graders	1	6525000	6525000
Installation and establishment	1	100000	100000
Wrapping unit	1	10000	10000
Control room	1	10000	10000
Racking/Storage	1	100000	100000
Sales and admin facility	1	30000	30000
			11698500

LEASES p.a.	number	\$/unit/week	\$/annual cost
Front end loader incs fuel/maint	0.3	3500	54000
Forklifts	2	250	13000
Ute	0.5	750	117000
			170000

STAFFING p.a. (3 shifts)	FTE	\$/hour	\$/annual cost
Loader operator L4 day	0.3	16000	4200
Roller operator L4 night	0.3	16000	4200
Log docking L4 night	0.3	16000	4200
Chopper	4	16000	36000
Clipping/grading line assistants L2	2	16000	4200
Superior / leading hand L4 day	0.3	40000	4200
Maintenance Staff	0.3	10000	4200
Sales, Admin & Accounting Staff	0.3	40000	4200
General Manager Staff	0.3	40000	4200
			77720

OPERATING COSTS p.a.	\$/unit	\$/unit p.a.
Log resource m3	90	7500
Electricity kWh/hrs	150	180
Gas/coal / fuel	2	180
Knife grinding	150	24
Raise Premises 50%	0.3	10000
Premises rental	0.3	10000
Fuel	1	2220
Freight to mill	1	2625
Freight to mill disposal / m3	12.5	1750
Freight to veneer dryer / m3	25	1625
		60450

Log - Green Veneer Recovery	75%
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REVENUE p.a.	272	5625	1530000
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GENERAL EXPENSES p.a.	\$/unit	\$/unit p.a.
Auditing and Legal 0.5%	1000	1000
Insurance	1000	1000
Water rates / fees	1000	1000
Office Equipment	1000	1000
Phone / Communications	1000	1000
		5000

Training start-up	1500
Training ongoing	1500
NPV discount rate	5%
NPV discount rate	10%

INTEGRATED & DRYING/GRADING MILL AT AN EXISTING HEAT PLANT, NEW PEELING PLANT- x3 SHIFTS  
PRODUCTION TARGET 100000 m3 p.a. LOG SUPPLY FOR DRY VENEER

CAPITAL COSTS	number	\$/unit	\$/capital cost
Buildings & site infrastructure	1	200000	200000
Log docking station	1	200000	200000
Roller transporter	1	100000	100000
Boiler/Heat Plant refurbishment	1	100000	100000
Wood shredder	1	100000	100000
Waste conveyors	2	60000	120000
Slacker	1	10000	10000
Knife grinder	1	10000	10000
Roller/Heat Plant refurbishment	1	100000	100000
Raute Smart Drying System incs. Scanners/Graders	1	6525000	6525000
Installation and establishment	1	100000	100000
Wrapping unit	1	10000	10000
Control room	1	10000	10000
Racking/Storage	1	100000	100000
Sales and admin facility	1	30000	30000
			11698500

LEASES p.a.	number	\$/unit/week	\$/annual cost
Front end loader incs fuel/maint	0.3	3500	54000
Forklifts	2	250	13000
Ute	0.5	750	117000
			170000

STAFFING p.a. (3 shifts)	FTE	\$/hour	\$/annual cost
Loader operator L4 day	0.3	16000	4200
Roller operator L4 night	0.3	16000	4200
Log docking L4 night	0.3	16000	4200
Chopper	4	16000	36000
Clipping/grading line assistants L2	2	16000	4200
Superior / leading hand L4 day	0.3	40000	4200
Maintenance Staff	0.3	10000	4200
Sales, Admin & Accounting Staff	0.3	40000	4200
General Manager Staff	0.3	40000	4200
			77720

OPERATING COSTS p.a.	\$/unit	\$/unit p.a.
Log resource m3	90	7500
Electricity kWh/hrs	150	180
Gas/coal / fuel	2	180
Knife grinding	150	24
Raise Premises 50%	0.3	10000
Premises rental	0.3	10000
Fuel	1	2220
Freight to mill	1	2625
Freight to mill disposal / m3	12.5	1750
Freight to veneer dryer / m3	25	1625
		60450

Log - Green Vene
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## Costs, prices and assumptions

1a LOW COST RPY INSTALLED AT AN EXISTING SAWMILL OPERATION - X1 SHIFTS PRODUCTION TARGET 7500 m3 p.a. - LOG SUPPLY FOR GREEN VENEER				2a LOW COST RPY INSTALLED AT AN EXISTING SAWMILL OPERATION - X2 SHIFTS PRODUCTION TARGET 15000 m3 p.a. - LOG SUPPLY FOR GREEN VENEER				HIGH QUALITY L&F+H&F RPY LINES AT AN EXISTING SAWMILL OPERATION - X2 SHIFTS PRODUCTION TARGET 10000 m3 p.a. LOG SUPPLY FOR GREEN VENEER				HIGH QUALITY L&F+H&F RPY LINES - X3 SHIFTS PRODUCTION TARGET 10000 m3 p.a. LOG SUPPLY FOR GREEN VENEER				REFURBISHED HEAT PLANT AND DRYER/GRADING FACILITY AT AN EXISTING MILL - X3 SHIFTS PRODUCTION TARGET 75000 m3 p.a. LOG SUPPLY FOR DRY VENEER				INTEGRATED & DRYING/GRADING MILL AT AN EXISTING HEAT PLANT, NEW PEELING PLANT - X3 SHIFTS PRODUCTION TARGET 300000 m3 p.a. LOG SUPPLY FOR DRY VENEER									
CAPITAL COSTS		number	\$/unit	\$total cost	CAPITAL COSTS		number	\$/unit	\$total cost	CAPITAL COSTS		number	\$/unit	\$total cost	CAPITAL COSTS		number	\$/unit	\$total cost	CAPITAL COSTS		number	\$/unit	\$total cost	CAPITAL COSTS		number	\$/unit	\$total cost
Log docking station	1	20000		20000	Log docking station	1	75000		75000	Buildings & site infrastructure	1	50000		50000	Buildings & site infrastructure	1	100000		100000	Buildings & site infrastructure	1	200000		200000	Buildings & site infrastructure	1	200000		200000
Blot transporter	1	18000		18000	Blot transporter	2	18000		36000	Blot transporter	2	18000		36000	Blot transporter	2	20000		40000	Blot transporter	2	20000		40000	Blot transporter	2	20000		40000
Log deck / power charger	1	18000		18000	Log deck / power charger	1	18000		18000	Log deck / power charger	1	18000		18000	Log deck / power charger	1	18000		18000	Log deck / power charger	1	18000		18000	Log deck / power charger	1	18000		18000
RPV quadrunner L&F	1	80000		80000	RPV quadrunner L&F	1	80000		80000	RPV quadrunner L&F	1	80000		80000	RPV quadrunner L&F	1	80000		80000	RPV quadrunner L&F	1	80000		80000	RPV quadrunner L&F	1	80000		80000
Chopper	1	20000		20000	Chopper	2	10000		20000	Chopper	2	10000		20000	Chopper	2	60000		120000	Chopper	2	60000		120000	Chopper	2	60000		120000
Veneer conveyors	4	20000		80000	Veneer conveyors	4	10000		40000	Veneer conveyors	4	10000		40000	Veneer conveyors	4	10000		40000	Veneer conveyors	4	10000		40000	Veneer conveyors	4	10000		40000
Stacker	1	12000		12000	Stacker	1	12000		12000	Stacker	1	12000		12000	Stacker	1	12000		12000	Stacker	1	12000		12000	Stacker	1	12000		12000
Water conveyor	1	20000		20000	Water conveyor	1	20000		20000	Water conveyor	1	20000		20000	Water conveyor	1	20000		20000	Water conveyor	1	20000		20000	Water conveyor	1	20000		20000
Site preparation/building improve	1	20000		20000	Site preparation/building improve	1	10000		10000	Site preparation/building improve	1	10000		10000	Site preparation/building improve	1	10000		10000	Site preparation/building improve	1	10000		10000	Site preparation/building improve	1	10000		10000
Upgrade to Australian Codes	1	10000		10000	Upgrade to Australian Codes	1	10000		10000	Upgrade to Australian Codes	1	10000		10000	Upgrade to Australian Codes	1	10000		10000	Upgrade to Australian Codes	1	10000		10000	Upgrade to Australian Codes	1	10000		10000
Isolation and establishment	1	20000		20000	Isolation and establishment	1	20000		20000	Isolation and establishment	1	20000		20000	Isolation and establishment	1	20000		20000	Isolation and establishment	1	20000		20000	Isolation and establishment	1	20000		20000
Storage	1	20000		20000	Storage	1	20000		20000	Storage	1	20000		20000	Storage	1	20000		20000	Storage	1	20000		20000	Storage	1	20000		20000
Depreciation	1	10000		10000	Depreciation	1	10000		10000	Depreciation	1	10000		10000	Depreciation	1	10000		10000	Depreciation	1	10000		10000	Depreciation	1	10000		10000
LEASES p.a.	number	\$/week	\$annual cost		LEASES p.a.	number	\$/week	\$annual cost		LEASES p.a.	number	\$/week	\$annual cost		LEASES p.a.	number	\$/week	\$annual cost		LEASES p.a.	number	\$/week	\$annual cost		LEASES p.a.	number	\$/week	\$annual cost	
Front and loader incs fuel/maint	1	3500		54600	Front and loader incs fuel/maint	1	3500		54600	Front and loader incs fuel/maint	1	3500		54600	Front and loader incs fuel/maint	1	3500		54600	Front and loader incs fuel/maint	1	3500		54600	Front and loader incs fuel/maint	1	3500		54600
Fuel	1	250		13000	Fuel	1	250		13000	Fuel	1	250		13000	Fuel	1	250		13000	Fuel	1	250		13000	Fuel	1	250		13000
Site	0.5	750		11700	Site	0.5	750		11700	Site	0.5	750		11700	Site	0.5	750		11700	Site	0.5	750		11700	Site	0.5	750		11700
Total annual cost				76200	Total annual cost				76200	Total annual cost				76200	Total annual cost				76200	Total annual cost				76200	Total annual cost				76200
STAFFING p.a. (Single shift)	FTE		\$hour salary On cost	\$Total Cost p.a.	STAFFING p.a. (Double shift)	FTE		\$hour salary On cost	\$Total Cost p.a.	STAFFING p.a. (Single shift)	FTE		\$hour salary On cost	\$Total Cost p.a.	STAFFING p.a. (Double shift)	FTE		\$hour salary On cost	\$Total Cost p.a.	STAFFING p.a. (Single shift)	FTE		\$hour salary On cost	\$Total Cost p.a.	STAFFING p.a. (Double shift)	FTE		\$hour salary On cost	\$Total Cost p.a.
Loader operator L4 day	1	36830	42%	15680	Loader operator L4 day	1	36830	42%	15680	Loader operator L4 day	1	36830	42%	15680	Loader operator L4 day	1	36830	42%	15680	Loader operator L4 day	1	36830	42%	15680	Loader operator L4 day	1	36830	42%	15680
Loader operator L4 night	1	36830	42%	15680	Loader operator L4 night	1	36830	42%	15680	Loader operator L4 night	1	36830	42%	15680	Loader operator L4 night	1	36830	42%	15680	Loader operator L4 night	1	36830	42%	15680	Loader operator L4 night	1	36830	42%	15680
Forklift operator L3 day	1	35600	42%	15166	Forklift operator L3 day	1	35600	42%	15166	Forklift operator L3 day	1	35600	42%	15166	Forklift operator L3 day	1	35600	42%	15166	Forklift operator L3 day	1	35600	42%	15166	Forklift operator L3 day	1	35600	42%	15166
Forklift operator L3 night	1	35600	42%	15166	Forklift operator L3 night	1	35600	42%	15166	Forklift operator L3 night	1	35600	42%	15166	Forklift operator L3 night	1	35600	42%	15166	Forklift operator L3 night	1	35600	42%	15166	Forklift operator L3 night	1	35600	42%	15166
Shredder operator L3 day shift	1	35600	42%	15166	Shredder operator L3 day shift	1	35600	42%	15166	Shredder operator L3 day shift	1	35600	42%	15166	Shredder operator L3 day shift	1	35600	42%	15166	Shredder operator L3 day shift	1	35600	42%	15166	Shredder operator L3 day shift	1	35600	42%	15166
Shredder operator L3 aft/night shift	1	35600	42%	15166	Shredder operator L3 aft/night shift	1	35600	42%	15166	Shredder operator L3 aft/night shift	1	35600	42%	15166	Shredder operator L3 aft/night shift	1	35600	42%	15166	Shredder operator L3 aft/night shift	1	35600	42%	15166	Shredder operator L3 aft/night shift	1	35600	42%	15166
Log docking L4 day	2	36830	42%	104597	Log docking L4 day	2	36830	42%	104597	Log docking L4 day	2	36830	42%	104597	Log docking L4 day	2	36830	42%	104597	Log docking L4 day	2	36830	42%	104597	Log docking L4 day	2	36830	42%	104597
Log docking L4 aft/night	4	42355	42%	240576	Log docking L4 aft/night	4	42355	42%	240576	Log docking L4 aft/night	4	42355	42%	240576	Log docking L4 aft/night	4	42355	42%	240576	Log docking L4 aft/night	4	42355	42%	240576	Log docking L4 aft/night	4	42355	42%	240576
Peeling L4 day	5	36830	42%	261493	Peeling L4 day	5	36830	42%	261493	Peeling L4 day	5	36830	42%	261493	Peeling L4 day	5	36830	42%	261493	Peeling L4 day	5	36830	42%	261493	Peeling L4 day	5	36830	42%	261493
Peeling L4 aft/night	9	42355	42%	541297	Peeling L4 aft/night	9	42355	42%	541297	Peeling L4 aft/night	9	42355	42%	541297	Peeling L4 aft/night	9	42355	42%	541297	Peeling L4 aft/night	9	42355	42%	541297	Peeling L4 aft/night	9	42355	42%	541297
Dryer operator L3 day	4	35600	42%	202208	Dryer operator L3 day	4	35600	42%	202208	Dryer operator L3 day	4	35600	42%	202208	Dryer operator L3 day	4	35600	42%	202208	Dryer operator L3 day	4	35600	42%	202208	Dryer operator L3 day	4	35600	42%	202208
Dryer operator L3 aft/nights	8	40940	42%	465078	Dryer operator L3 aft/nights	8	40940	42%	465078	Dryer operator L3 aft/nights	8	40940	42%	465078	Dryer operator L3 aft/nights	8	40940	42%	465078	Dryer operator L3 aft/nights	8	40940	42%	465078	Dryer operator L3 aft/nights	8	40940	42%	465078
Clipping/stacking line assistants L2 day	2	34290	42%	97384	Clipping/stacking line assistants L2 day	2	34290	42%	97384	Clipping/stacking line assistants L2 day	2	34290	42%	97384	Clipping/stacking line assistants L2 day	2	34290	42%	97384	Clipping/stacking line assistants L2 day	2	34290	42%	97384	Clipping/stacking line assistants L2 day	2	34290	42%	97384
Clipping/stacking line assistants L2 aft/night	4	40940	42%	232539	Clipping/stacking line assistants L2 aft/night	4	40940	42%	232539	Clipping/stacking line assistants L2 aft/night	4	40940	42%	232539	Clipping/stacking line assistants L2 aft/night	4	40940	42%	232539	Clipping/stacking line assistants L2 aft/night	4	40940	42%	232539	Clipping/stacking line assistants L2 aft/night	4	40940	42%	232539
Wrapping/Stores/Despatch L2 day	2	34290	42%	97384	Wrapping/Stores/Despatch L2 day	2	34290	42%	97384	Wrapping/Stores/Despatch L2 day	2	34290	42%	97384	Wrapping/Stores/Despatch L2 day	2	34290	42%	97384	Wrapping/Stores/Despatch L2 day	2	34290	42%	97384	Wrapping/Stores/Despatch L2 day	2	34290	42%	97384
Wrapping/Stores/Despatch L2 aft/night	4	39434	42%	232985	Wrapping/Stores/Despatch L2 aft/night	4	39434	42%	232985	Wrapping/Stores/Despatch L2 aft/night	4	39434	42%	232985	Wrapping/Stores/Despatch L2 aft/night	4	39434	42%	232985	Wrapping/Stores/Despatch L2 aft/night	4	39434	42%	232985	Wrapping/Stores/Despatch L2 aft/night	4	39434	42%	232985
Control room operator/leading hand L6 day	2	40000	42%	113600	Control room operator/leading hand L6 day	2	40000	42%	113600	Control room operator/leading hand L6 day	2	40000	42%	113600	Control room operator/leading hand L6 day	2	40000	42%	113600	Control room operator/leading hand L6 day	2	40000	42%	113600	Control room operator/leading hand L6 day	2	40000	42%	113600
Control room operator/leading hand L6 aft/night	4	46000	42%	261280	Control room operator/leading hand L6 aft/night	4	46000	42%	261280	Control room operator/leading hand L6 aft/night	4	46000	42%	261280	Control room operator/leading hand L6 aft/night	4	46000	42%	261280	Control room operator/leading hand L6 aft/night	4	46000	42%	261280	Control room operator/leading hand L6 aft/night	4	46000	42%	261280
Maintenance Staff rotat. Shift Staff	3	55000	42%	234300	Maintenance Staff rotat. Shift Staff	3	55000	42%	234300	Maintenance Staff rotat. Shift Staff	3	55000	42%	234300	Maintenance Staff rotat. Shift Staff	3	55000	42%	234300	Maintenance Staff rotat. Shift Staff	3	55000	42%	234300	Maintenance Staff rotat. Shift Staff	3	55000	42%	234300
Sales, Admin & Accounting Staff	3	60000	42%	255600	Sales, Admin & Accounting Staff	3	60000	42%	255600	Sales, Admin & Accounting Staff	3	60000	42%	255600	Sales, Admin & Accounting Staff	3	60000	42%	255600	Sales, Admin & Accounting Staff	3	60000	42%	255600	Sales, Admin & Accounting Staff	3	60000	42%	255600
General Manager Staff	1	100000	42%	142000	General Manager Staff	1	100000	42%	142000	General Manager Staff	1	100000	42%	142000	General Manager Staff	1	100000	42%	142000	General Manager Staff	1	100000	42%	142000	General Manager Staff	1	100000	42%	142000
\$Total annual :	74			4427647	\$Total annual :	74			4427647	\$Total annual :	74			4427647	\$Total annual :	74			4427647	\$Total annual :	74			4427647	\$Total annual :	74			4427647



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## Costs, prices and assumptions

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INTEGRATED & DRYING/GRADING MILL AT AN EXISTING HEAT PLANT, NEW PEELING PLANT- x3 SHIFTS																						
PRODUCTION TARGET 100000 m3 p.a. LOG SUPPLY FOR DRY VENEER																						
	YEAR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
EXPENSES																						
CAPITAL COSTS		11,698,500																				
WORKING CAPITAL FOR START-UP		4,318,212																				
OPERATING COSTS		12,155,600	12,155,600	12,155,600	12,155,600	12,155,600	12,155,600	12,155,600	12,155,600	12,155,600	12,155,600	12,155,600	12,155,600	12,155,600	12,155,600	12,155,600	12,155,600	12,155,600	12,155,600	12,155,600	12,155,600	
VEHICLE LEASES		457,600	457,600	457,600	457,600	457,600	457,600	457,600	457,600	457,600	457,600	457,600	457,600	457,600	457,600	457,600	457,600	457,600	457,600	457,600	457,600	
GENERAL EXPENSES		223,000	223,000	223,000	223,000	223,000	223,000	223,000	223,000	223,000	223,000	223,000	223,000	223,000	223,000	223,000	223,000	223,000	223,000	223,000	223,000	
STAFFING		4,427,647	4,427,647	4,427,647	4,427,647	4,427,647	4,427,647	4,427,647	4,427,647	4,427,647	4,427,647	4,427,647	4,427,647	4,427,647	4,427,647	4,427,647	4,427,647	4,427,647	4,427,647	4,427,647	4,427,647	
TRAINING AND DEVELOPMENT		55,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	
SUB-TOTAL EXPENSES (Incs. Inflation p.a. @ 2.5%)		16,071,712	17,272,847	17,704,668	18,147,284	18,600,967	19,065,991	19,542,641	20,031,207	20,531,987	21,045,286	21,571,419	22,110,704	22,663,472	23,230,058	23,810,810	24,406,080	25,016,232	25,641,638	26,282,679	26,939,746	27,613,239
DEPRECIATION		0	1,169,850	1,169,850	1,169,850	1,169,850	1,169,850	1,169,850	1,169,850	1,169,850	1,169,850	1,169,850	0	0	0	0	0	0	0	0	0	
		16,071,712	18,442,697	18,874,518	19,317,134	19,770,817	20,235,841	20,712,491	21,201,057	21,701,837	22,215,136	22,741,269	22,110,704	22,663,472	23,230,058	23,810,810	24,406,080	25,016,232	25,641,638	26,282,679	26,939,746	27,613,239
REVENUE (Incs. Price Increase p.a. @ 2.5%)																						
Dry veneer		0	22,660,000	23,226,500	23,807,163	24,402,342	25,012,400	25,637,710	26,278,653	26,935,619	27,609,010	28,299,235	29,006,716	29,731,884	30,475,181	31,237,060	32,017,987	32,818,436	33,638,897	34,479,870	35,341,867	36,225,413
412 \$/m³																						
EBIT		-16,071,712	4,217,303	4,351,982	4,490,028	4,631,525	4,776,559	4,925,220	5,077,596	5,233,782	5,393,873	5,557,966	5,728,124	5,896,012	6,063,412	6,235,250	6,407,638	6,584,676	6,767,464	6,956,052	7,149,540	
m³ p.a.																						
NET CASH FLOW		-16,071,712	5,387,153	5,521,832	5,659,878	5,801,375	5,946,409	6,095,070	6,247,446	6,403,632	6,563,723	6,727,816	6,896,012	7,068,412	7,245,122	7,426,250	7,611,907	7,802,204	7,997,259	8,197,191	8,402,121	
55000 CUMULATIVE CASH FLOW		-16,071,712	-10,684,558	-5,162,726	497,152	6,298,527																

[illegible]

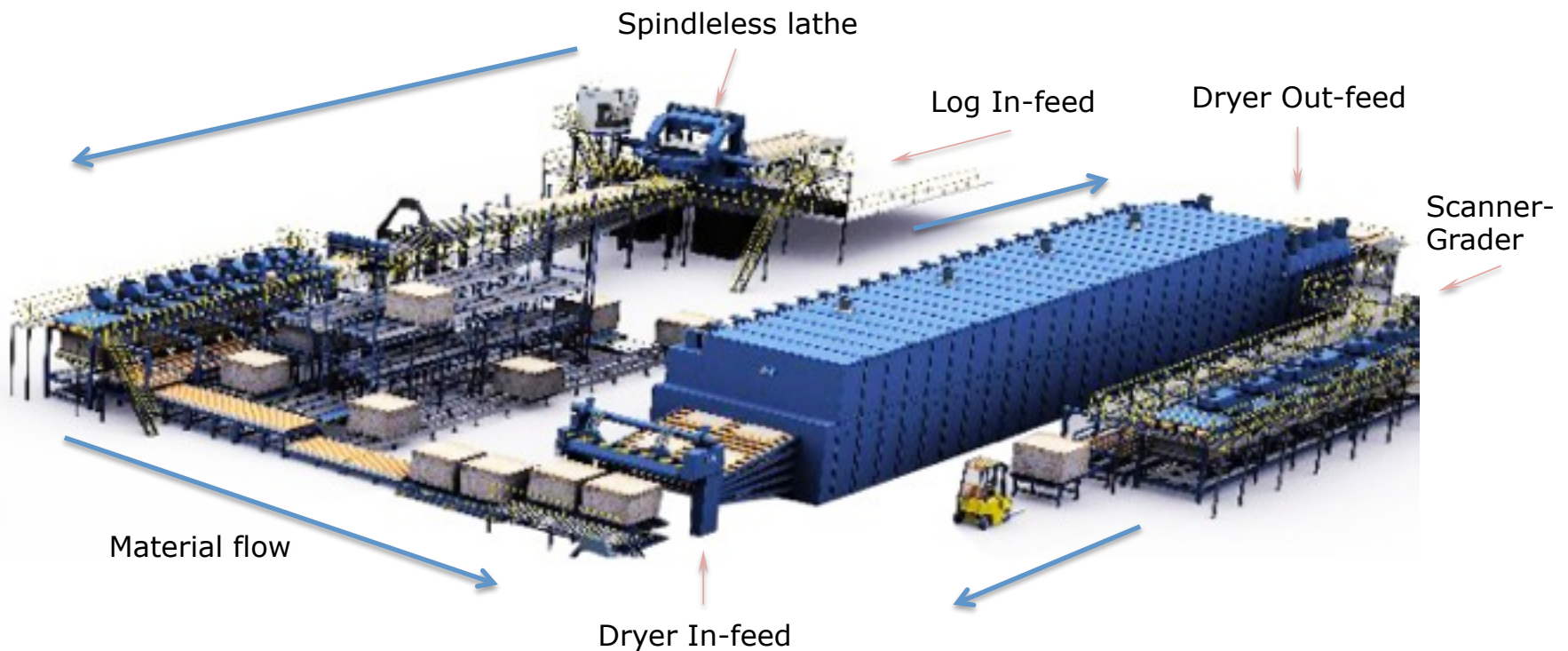
## Product prices

<b>Product</b>	<b>Source</b>	<b>\$AUD per m<sup>3</sup></b>
Veneer - Non-structural eucalypt RPV	Various Asian suppliers - Alibaba.com	170-300
Plywood - Non-structural eucalypt core birch/poplar faced plywood board	Various Chinese suppliers - Alibaba.com	250-450
Plywood - Non-certified eucalypt core form plywood.	Various Chinese suppliers - Alibaba.com	200-450
Plywood - F14 stress graded form plywood (FORMrite – Carter Holt Harvey)	Australian retailers	1654
Plywood - F11 stress graded concrete form plywood (FORMrite – Carter Holt Harvey)	Australian retailers	1420
LVL Carter Holt Harvey hySPAN F17 graded (200 x 63 mm)	Australian retailers	1650
Plywood - General purpose plywood (most likely imported)	Australian retailers	1160

## Sensitivity analysis

Enterprise Option	Product Price	Base Assumption Costs IRR 12% at year 5	New IRR -5% @ 5 years	New IRR +5% @ 5 years	New IRR +10% @ 5 years
<b>Option 1.</b> A single low cost RPV line at an existing sawmill operating a single day shift	Green veneer product price \$/m <sup>3</sup>	<b>\$271.00</b>	<b>-11%</b>	<b>31%</b>	<b>48%</b>
<b>Option 2.</b> Two low cost spindleless RPVs at an existing sawmill operating two, day shifts.	Green veneer product price \$/m <sup>3</sup>	<b>\$259.00</b>	<b>-16%</b>	<b>36%</b>	<b>55%</b>
<b>Option 3.</b> Two High quality spindleless RPV line operating two, day shifts.	Green veneer product price \$/m <sup>3</sup>	<b>\$235.00</b>	<b>-5%</b>	<b>28%</b>	<b>42%</b>
<b>Option 4.</b> Four high quality spindleless RPV lines operating three shifts.	Green veneer product price \$/m <sup>3</sup>	<b>\$233.00</b>	<b>-7%</b>	<b>29%</b>	<b>44%</b>
<b>Option 5.</b> Independent veneer drying and grading facility. New automated dryer and scanner/grader, operating three shifts.	Dry veneer product price \$/m <sup>3</sup>	<b>\$494.00</b>	<b>-3%</b>	<b>25%</b>	<b>37%</b>
<b>Option 6.</b> Integrated Mill - Four high quality RPV lines, and an automated dryer and scanner/grader operating three shifts	Dry veneer product price \$/m <sup>3</sup>	<b>\$412.00</b>	<b>1%</b>	<b>22%</b>	<b>31%</b>

## Medium-large scale – Integrated dry veneer mill.



Source: Raute ([www.raute.cn/](http://www.raute.cn/)).

## Conclusions: Options 1 and 2 - low cost peeling lines

- A high green veneer sale price is needed to achieve an attractive Internal Rate of Return at five years.
- The veneer produced on these types of lathes will have reasonably low quality surface finish and a relatively wide thickness range, meaning it is unlikely to command a high veneer sale price.
- It is therefore unlikely that these options would be financially attractive enough for existing sawmillers to consider joint RPV/sawmill operations in regional Tasmania.

## Conclusions: Options 3 and 4 - high quality peeling lines

- Processing efficiency is improved by approximately 20% when compared to the lower cost spindleless lathes. This increased efficiency substantially and reduced the green veneer sales price set to achieve the IRR benchmark.
- The higher quality green veneer is more likely to produce a superior quality dry veneer in terms of surface finish and thickness range, that would command a higher market price.

## Conclusions: Option 5 - independent drying and grading operation

- For an independent drying/grading enterprise without onsite peeling, a relatively high dry veneer product price is required to achieve the IRR benchmark. This means that any green veneer supplied for drying and then subsequent sale, would need to be of superior quality and of a consistent thickness.
- The main shortcoming of the stand-alone drying-grading facility is that all the fuel required would need to be supplied from external sources.
- Establishing the drying and grading facility at an existing heat plant, was considered the only possible option that would make this enterprise financially feasible at the chosen 12% IRR benchmark.

## Conclusions: Option 6 – Integrated peeling and drying operation

- Integrating high quality spindleless RPV production lines with an automated drying and grading facility was the most financially attractive option examined.
- The peeling produces a residual that can be processed at minimal cost for use as a fuel source for the heat plant and transportation costs between peeling and drying/grading facilities are eliminated, both factors substantially reducing the dry veneer price to achieve the benchmark 12% IRR benchmark target.
- Handling equipment can be utilised across the whole facility and labour can be multi-skilled to operate anywhere across the plant.

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Thank you for listening

Questions?