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Evaluation of Wood Resource Scenarios relevant to the *Tasmanian Forests Statement of Principles to lead to an Agreement* – Final Report to Signatories

Forestry Tasmania

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1. SUMMARY

Forestry Tasmania has provided consultancy services to the signatories to the Tasmanian Forests Statement of Principles to evaluate the feasibility of the principles in relation to wood supply, particularly for two distinct scenarios:

- An ENGO Scenario which proposes additional reserves of 351 600 ha (within a total proposal of 572 000 ha, of which one-third is already reserved); and,
- An Industry Scenario which proposes 60 630 ha of additional reserves within a total proposal of 140 350 ha and includes areas that have been the subject of significant contemporary ENGO campaigns, but retains sufficient native forest to meet the processing industry's minimum position for products from native forests. This position has been articulated as 150 000 m^3/y of high quality sawlog, 265 000 m^3/y of peeler billets and 12 500 m^3/y of special timbers.

Both scenarios were compared against a Base Case, which reflects the wood supply if no additional reserves are created. The signatories have indicated that these scenarios are not, and are not to be interpreted as being, the signatories' positions on preferred outcomes. They are provided to generate information to help inform the development of thinking on transitions and creation of negotiating possibilities.

The focus of the evaluation is on native forest wood supply from public land over two periods: from 2011 until 2030 and from 2031 to 2050. The first twenty years broadly equates to the period to which current supply contracts will apply. The Industry signatories have insisted they will require access to logs from native forest over this period because they are not confident of their ability to produce sawn timber and veneer from eucalypt plantations. Assuming that the currently reported technical difficulties with the production of sawn timber and veneer from eucalypt plantations are resolved in the interim, significant volumes of eucalypt plantation logs meeting the size specifications for high quality eucalypt sawlogs will be available from plantations on state forests after 2030, and there is opportunity to include them in future wood supply contracts.

Under the ENGO Scenario, remaining production forest areas are capable of producing 117 000 m^3/y of high quality sawlog, 191 000 m^3/y of peeler billets and 6700 m^3/y of special timbers in the first period. These average volumes until 2030 represent 78% of the sawlog,

72% of the peeler billet and 54% of the special timbers requirement of the processing industry.

Under the Industry Scenario remaining production forest areas are capable of producing 199 000 m^3/y of high quality sawlog, 265 000 m^3/y of peeler billets and 11 500 m^3/y of special timbers in the first period. These average volumes until 2030 represent 133% of the sawlog, 100% of the peeler billet and 92% of the special timbers requirement of the processing industry. The 8% shortfall in the required special timbers supply cannot be mitigated from other sources.

The processing industry has stated no minimum requirement for pulpwood, but the sale of native forest pulpwood associated with sawlog and peeler sales is a key requirement for the financial viability of harvesting operations and for facilitating regeneration after harvesting, particularly in wet eucalypt forests.

There is a negligible supply of high quality sawlogs available from eucalypt plantations prior to 2016. Although not deemed suitable by the native forest processing industry, eucalypt plantations, wholly or partly owned by Forestry Tasmania, could yield an average of about 28 000 m^3/y of high quality eucalypt sawlogs from 2016 to 2020, increasing to an average of 82 000 m^3/y from 2021 to 2030.

From 2031-2050, there will be a significant increase in sawlog supply from eucalypt plantations to an average of 157 000 m^3/y. There will also be a large supply of peeler billets, at an average of 617 000 m^3/y, available from plantations. However, the willingness and capacity of the current sawlog and domestic peeler processing industries to process and market plantation wood is still uncertain.

An analysis of the effect of different start-dates to sourcing significant volumes of sawlogs from eucalypt plantations showed that a commencement in 2021 would result in a subsequent sustainable yield of 89 000 m^3/y of high quality sawlogs, even when replantings of the earlier plantations are included. If the start-date is 2026, then a sustainable yield of 124 000 m^3/y of high quality eucalypt sawlog could be maintained. If the start-date is 2031, then a sustainable yield of 157 000 m^3/y of high quality eucalypt sawlog could be maintained

If the ENGO Reserve proposal were to be fully adopted there are very limited ways to mitigate the effect on wood supply to the native forest processing industry. There is no scope to increase the plantation estate on state forest, although there may be scope for increasing joint venture arrangements with private landowners on cleared farmland. However such plantings will not provide sawlogs for another 25 years and cannot address an imminent shortfall. Another mitigation strategy would be to thin native forest regrowth, in order to hasten the growth of high quality sawlogs and to recover peeler billets and pulpwood which might otherwise be lost due to natural mortality.

An alternative option would be to establish a new resource dedicated to the production of high quality eucalypt sawlogs and peeler logs, primarily from private land. This resource would be based on *E. globulus* plantations and use multiple thinning ('Lonely Tree') silviculture to produce 150 000 m^3/y of high quality sawlogs, 265 000 m^3/y of peeler billets and a range of other products. This resource would require a gross estate of 130 000 ha and funding of about $500 M. If establishment commenced in 2011 the resource would become available from 2035.

Forestry Tasmania is well placed to explore and develop mitigation options with governments and signatories to the Statement of Principles, in order to facilitate an enduring Forest Agreement.

This preliminary evaluation of the wood resources available under ENGO and Industry Scenarios provides a basis for further detailed exploration of these scenarios and, if needed, for the development of additional scenarios.

2. INTRODUCTION

In October 2010, representatives of the forest industry, unions and environment non-government organisations (ENGOs) signed the *Tasmanian Forests Statement of Principles to lead to an Agreement* (the Statement). There is considerable detail to be developed before an Agreement could be concluded.

The Governments have jointly appointed an independent facilitator, Mr Bill Kelty AC, to assist the signatories to the Statement and other stakeholder groups to reach a common understanding and interpretation of the Statement and to develop an implementation plan that would allow an Agreement to be concluded. This process has resulted in an interim report (Kelty 2011). A final report to all parties is expected by the end of June 2011.

Forestry Tasmania is not a signatory to the Statement but has participated in meetings of the signatories' moratorium/secure wood supply subcommittee and has been engaged to provide consultancy services to the signatories and the facilitator to explore the feasibility of the Principles, particularly in relation to timber supply. On 4 May 2010 the signatories agreed on their resource modelling requirements, which were reviewed by Professor Jerry Vanclay and Forestry Tasmania (Appendix 1). The particular scenarios chosen for resource modelling are not, and are not to be interpreted as being, the signatories' positions on preferred outcomes. They are provided to generate information to help inform the development of thinking on transitions and creation of negotiating possibilities. A list of outputs required to meet the resource modelling requirements of the signatories was endorsed by Professor Vanclay on 12 May 2011 (Appendix 2).

This report provides a preliminary resource evaluation of two key scenarios arising from the Principles. One scenario, described hereafter, as the ENGO Scenario, explores the available timber supply from state forests if the ENGO identified HCV forests are excluded from harvesting. A second scenario, described hereafter as the Industry Scenario, focuses on maintaining supplies of native forest timber from state forests according to an industry view of a minimum quantity and quality sustainable resource profile.

Both scenarios need to be considered against the status quo wood supply position. Forestry Tasmania manages state forests to make available an ongoing annual supply of 300 000 cubic metres of high quality eucalypt sawlogs to local industry. This level is specified in the

Forestry Act 1920 and confirmed in the Tasmanian Regional Forest Agreement (Commonwealth of Australia and State of Tasmania 1997). Other wood products, such as pulpwood and peelers, are secondary products arising from sawlog harvest. Definitions for these products are provided in the attached glossary.

From a timber supply perspective, the sustainable yield of a forest is the level of commercial timber (or product mix) that can be maintained under a given management regime, without reducing the long-term productive capacity of the forest. Forestry Tasmania's sustainable yield model is based on a 90-year period and has the following elements: an extensive network of forest inventory and growth plot measurements; a sophisticated computer-based modelling and growth projection system; incorporation of environmental constraints; estimation of both native forest and plantation yields; and an independent audit.

Reviews of sustainable yield are undertaken at least every five years, as required by the RFA. Such reviews provide the opportunity for Forestry Tasmania to review the sustainable yield and to advise governments of the outcomes.

The most recent audited review of the sustainable yield of high quality eucalypt sawlog supply from Tasmanian state forest was published in 2007, based on area and productivity information collated in 2006, and is shown in Figure 1. The key features of this view were: a declining supply of high quality eucalypt sawlogs from mature forests to very low levels after 2030; a declining supply of unaged regrowth arising after wildfires and 'log-and-leave' operations over the past century; a substantial increase in the supply of regrowth arising from systematic harvesting and regeneration operations since 1960; and a major transition to eucalypt plantations after 2020, such that they contribute about half the sawlog supply thereafter.

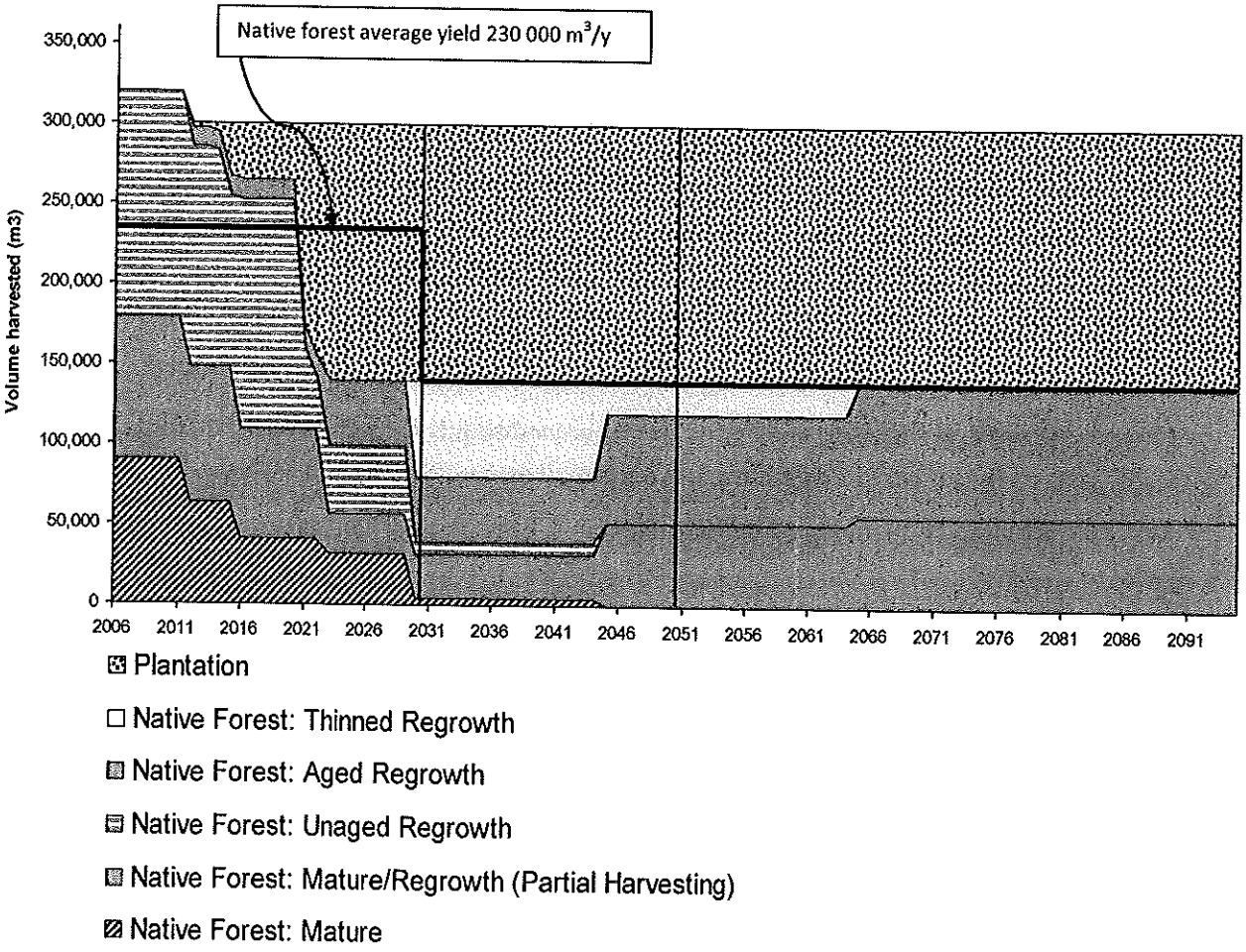
The focus of the current scenario analysis is on native forest. The 2007 view indicated a supply level of high quality eucalypt sawlogs which commenced at 320 000 cubic metres per year (m^3/y) and reduced in stages to 140 000 m^3/y before 2030. The average volume of native forest sawlogs over the period from 2006 to 2030, calculated by summing the sawlog for each year and averaging the total over the period, is about 230 000 m^3/y (Figure 1).

The periods of particular interest for consideration of the new scenarios are from the present until 2030 and from 2031 to 2050. The first twenty years was chosen because it broadly

equates with the period to which current supply contracts apply. The longest current contract applies to peeler billets and continues until 2027. Contracts with sawmillers are of shorter duration and are generally renegotiated as they approach their expiry date. By 2030 about half of the legislated annual supply of 300 000 m^3/y of high quality eucalypt sawlogs from state forests will be available from eucalypt plantations. The native forest sawmilling and veneer industry has indicated it is uncomfortable about its ability to process logs from existing eucalypt plantations and to meet the requirements of current customers. It has asked for supply scenarios to focus on the supply from native forests for the period up until 2030. The second period has been chosen to indicate a longer term view of the timber supply.

Forestry Tasmania has conducted this evaluation on the basis that the standing volume of native forests at the end of the 40-year period should be similar to the present standing volume (regardless of whether the native forests are subsequently harvested). This approach is consistent with its *Sustainability Charter* (Forestry Tasmania 2008) and with the National Forest Policy Statement (Commonwealth of Australia 1992). The latter requires that *Forests and their resources are used in an efficient, environmentally sensitive and sustainable manner*. This approach is also consistent with the Principles that refer to the provision of a sustainable resource supply profile to industry.

Figure 1. The 2007 view of high quality eucalypt sawlog sustainable yield from state forest (from Forestry Tasmania 2007). The black line indicates the average annual yield from native forests for the period until 2030 and from 2031-2050.



3. METHOD

The start point for the evaluation was to define the specifications for the three scenarios, ie. Base Case (an updated view of the status quo position), ENGO Scenario and Industry Scenario, so that they could be compared in terms of:

- gross areas removed from harvesting,
- effects on native forest timber yields of high quality eucalypt sawlogs, peeler logs, arisings (primarily pulpwood, but also including low quality eucalypt sawlogs) and special timbers (particularly blackwood).

All the comparisons are confined to state forest. The yield comparisons are based on a model which considers the next 50 years, and presents average annual yields for two 20-year periods. These are from 2011 until 2030 and from 2031 to 2050. The specifications for each scenario are discussed below.

Base Case

In 2007 Forestry Tasmania began compiling resource information in preparation for the next RFA Review, due to be published in mid 2012. This has included the development of regional models for the Northwest (Murchison District), Northeast (Mersey and Bass Districts), and South (Derwent and Huon Districts). These models are run independently, then aggregated to provide statewide totals.

In this report (as distinct from the RFA Review), the yields are from native forest only[1]. The yield of domestic peeler logs from native forests is identified separately, rather than being considered as part of the pool of arisings (which comprise mainly pulpwood and low quality sawlogs). Forestry Tasmania has supply contracts to Ta Ann's rotary peeled veneer mills for a combined requirement of 265 000 m^3/y of peeler billets until 2027.

The updated modelling has not yet been discounted for potential future effects of the following factors.

[1] Except for a supply of 39 000 m^3/y of peeler billets from plantations and/or private native forest, as recognised in the contract for the rotary veneer mill at Smithton.

- Coupe dispersal. The Forest Practices Code states that adjacent areas of native forests should not be clearfelled until the dominant height of the regeneration in any adjoining clearfelled coupe is at least 5 m tall.
- Forest Practices changes since 2006, e.g. upgraded prescriptions for Class 4 stream protection and for giant freshwater crayfish.
- Swift parrot restrictions. The Forest Practices Authority is developing new guidelines for protection of swift parrot habitat.
- Karst restrictions, e.g. areas of karst have recently been mapped in the Picton valley.
- Smoke management constraints. A Coordinated Smoke Management System, currently being trialled, has implications for the amount of harvesting and subsequent regeneration burns that can be concentrated in a particular locality.
- Local community agreements, e.g. it has been agreed with beekeepers to limit the rate of harvesting in areas south of Lake Gordon.
- Operational logistics. Although yield models can theoretically concentrate harvesting in particular localities for short periods, operational experience indicates the actual timber yield will be more protracted because of planning, harvesting, transport and regeneration logistics.
- Cable harvesting. The rate of harvesting is operationally constrained by the number of cable harvesting crews and machines available.
- Additional thinning of regrowth. Thinned stands represent an elevated fire risk, due to the presence of unburnt harvest debris. The risk is managed by a restriction, for at least five years, on commencing new coupes that require high intensive burns for regeneration within one kilometre of harvested coupes with unburnt fuels.
- 80/20 rule for clearfelling of oldgrowth. The Tasmanian Community Forest Agreement (Commonwealth of Australia and State of Tasmania 2005) included an aim to reduce the percentage of oldgrowth clearfelling to less than 20 percent of the annual oldgrowth harvest on public land. This will slow the rate of clearfelling of oldgrowth forest.
- Economic cost of forest access. Some forest areas modelled for wood production will not be harvested in practice, if the cost of roading becomes too high.

As a consequence, the initial results represent an overstatement of operational supply capability. This has been partially addressed by applying a notional "headroom" discount of 10% for each product in the reported volumes.

The 10% headroom may be insufficient, given the many factors listed above, but a better estimate is difficult to determine within the very limited time available for this evaluation. The effect of coupe dispersal is a good example. The Forest Practices Code lists coupe dispersal as desirable rather than mandatory, yet the Forest Practices Authority is becoming increasingly rigid about its application. Mandatory dispersal rules could make a big reduction in the rate of timber supply. Furthermore, some people believe that mandatory coupe dispersal can lead to perverse conservation outcomes because it can result in more road construction and maintenance than might otherwise be necessary.

Although the likely trend for native forest yields is generally expected to be lower, there are some initiatives that could improve product availability and recovery. These include:

- a review of the coupe dispersal requirements of the Forest Practices Code;
- a review of prescriptions for retention of habitat for threatened species in remaining production forests, if an enhanced reservation system is agreed;
- enhanced segregation processes at sorting yards using merchandiser technology such as laser scanning and precision sawing to recover lower quality sawlogs and peeler billets from logs that would otherwise be sold as pulpwood;
- enhanced segregation of forest products at forest landings;
- thinning of native forest regrowth to recover pulpwood and peeler billets otherwise lost to mortality as stands age; and
- increased use of the sawlog and solid wood resource coming on line from eucalypt plantations.

A detailed understanding of the likely discounts will be developed and reported as part of the report on sustainable yield for the 2012 RFA Review. In the meantime it should be noted that there is a significant risk that the 2012 RFA Review will conclude that the 10% "headroom" discount applied herein may not be sufficient.

ENGO Scenario

The ENGO Scenario was developed from a digital map known as the 'Verified ENGO Reserve Proposal' provided to Forestry Tasmania on 3 March 2011. This map had updated the identified High Conservation Value Forests map provided by ENGOs when the Statement was signed. The ENGO Scenario is described under Requirement 3.1 of Appendix 1 and requires a calculation of the maximum resource volumes Forestry Tasmania would be able to supply, on an ongoing sustainable yield basis, from the remaining native forest area if the ENGO identified HCV area was removed from production. Hence the yield scenario is simply the Base Case minus the projected yield from coupes that fall within the Verified ENGO Reserve Proposal. For convenience, the map of the Verified ENGO Reserve Proposal is described hereafter as the ENGO Map.

Industry Scenario

The Industry Scenario was developed by the the Forest Industries Association of Tasmania (FIAT) and is described under Requirement 3.4 of Appendix 1. This Scenario requires minimum industry wood requirements to be met and would allow continued harvesting in the ENGO identified HCV area if these areas were required to meet the minimum industry wood requirements. Its minimum position is:

- 150 000 m^3/y of high quality eucalypt sawlog;
- 265 000 m^3/y of peeler billets;
- Maintenance of the current level of supply and quality of current grade sawlogs to country sawmills;
- 12 500 m^3/y of special timbers sawlogs, including 10 000 m^3/y of blackwood;
- 5000 m^3/y of sliced veneer logs for the Somerset mill; and,
- Continued sales of woodchips to international markets from pulpwood arisings.

Note that this minimum position does not include 5000 high quality eucalypt poles per year (about 5000 m^3/y), for which Forestry Tasmania has supply contracts to businesses that supply treated poles for electricity supply and telecommunications.

This scenario was developed by starting with an approximation of the Verified ENGO Reserve Proposal, derived from a 1:500 000 map. The stated intention was to restore

regrowth areas, multi-aged *Eucalyptus delegatensis* forests (where less contentious partial harvesting techniques are applied) and blackwood swamp forests from the Verified ENGO Reserve Proposal to wood production. Plantations and most silvicultural regrowth were also excised from the Verified ENGO Reserve Proposal. Another focus was to exclude from harvesting those forests understood by FIAT, from significant contemporary ENGO campaigns, to be most sought for protection, such as the Upper Florentine, Weld Valley and Tarkine forests.

The Industry Scenario was based on the resultant map, described here as the Industry Map. Coupes within areas proposed for protection under the Industry Map were excised from the Base Case scenario to report yields.

Effects on blackwood and other special timbers supply

The Base Case adopted the supply targets outlined in the Special Timbers Strategy (Forestry Tasmania 2010) of 10 000 m^3/y for blackwood sawlogs logs, and 2500 m^3/y of special timbers other than blackwood for the ten-year period to 2019. This supply will be sourced from the Special Timbers Zone defined in the Special Timbers Strategy. Over the next 40 years, the blackwood volume is planned to be supplied primarily from blackwood swamps (6000 m^3/y) and from mature wet eucalypt and rainforest areas in the Special Timbers Zone (4000 m^3/y). The other special timbers will be sourced, at very low rates, primarily from non-swamp areas in the Special Timbers Zone.

The effects of the ENGO and Industry Scenarios on special timbers supply were calculated purely on an area basis. For example, the ENGO Map would exclude 10% of the blackwood swamp resource by area, which was calculated to reduce the sustainable yield from about 6000 to 5400 m^3/y.

Plantation scenario commencing 2011 (first rotation)

This scenario is described under Requirement 4 of Appendix 1 and involves reporting of the established plantations under Forestry Tasmania's management and their wood flow in smoothed 5-year periods from 2011 to 2035 for sawlogs, peelers and pulplogs. This period allows modelling of the twenty-five year rotation, assumed for pruned and/or thinned eucalypt regimes. A twenty year rotation has been assumed for untended regimes. The

analysis predicts the log products that would become available to processors, regardless of their capacity to process and market them.

The model was not run beyond 25 years because this would have required assumptions about replanting of existing plantations, including those on state forest which are not currently owned by Forestry Tasmania.

Plantation scenario with subsequent rotations

This scenario assumes that all eucalypt plantations on state forest will be replanted after harvesting, become fully owned by Forestry Tasmania and, wherever possible, will be managed on high-pruned rotations for sawlog production. Furthermore, this scenario assumes that no high quality sawlog, acceptable to industry, is available for eucalypt plantations on state forests until 2031.

Integration of plantation and native forest scenarios.

Although the main focus of this evaluation is on native forest availability and supply, this scenario integrates the yield projections from state forest plantations and native forest to indicate the extent to which these plantations might supplement the native forest resource. The native forest yield uses the base case scenario. The plantation yield uses the scenario with subsequent rotations.

Other transition scenarios.

Transition Scenario 3.2 A. Model the ability of the remaining native forest areas outside ENGO identified HCV to provide the 75 000 m^3/y of high quality sawlog and Ta Ann peeler requirements for the period until 2020.

Approach: the total volumes from 2011-2030 under the ENGO scenario were divided by ten years to indicate the feasibility of maintaining supply to 2020.

Transition Scenario 3.2 B. Model the ability of the remaining native forest areas outside ENGO identified HCV to provide 150 000 m^3/y of high quality sawlog until 2020 and Ta Ann peeler requirements for the period until 2030.

Approach: the total sawlog volumes from 2011-2030 under the ENGO scenario were divided by ten years to indicate the feasibility of maintaining supply to 2020. The peeler availability is the same as indicated under the ENGO scenario.

Transition Scenario 3.2 C. If provision of 150 000 m^3/y of high quality sawlog and/or Ta Ann peeler requirements cannot be met from these areas on a sustainable basis, at what date will the yield end or need to be reduced.

Approach: the total sawlog volumes from 2011-2030 under the ENGO scenario were divided by 150 000 to indicate the number of years that supply could be maintained at 150 000 m^3/y. Likewise, the total peeler volumes from 2011-2030 under the ENGO scenario were divided by 265 000 to indicate the number of years that supply could be maintained at 265 000 m^3/y.

Scenario 3.3. What alternative supply is available from state forests if native forest high quality eucalypt sawlog and peeler requirements end in 2014.

Approach: the supply from native forest until 2014 was verified and the alternative level of available supply from plantations was determined from the 'plantation scenario commencing 2011 (first rotation)' described above.

Scenario 4. Comment on the additional area of plantation forest required to facilitate any total transition from native forests to plantation resources whilst maintaining the minimum industry wood supply requirements of 150 000 m^3/y of high quality eucalypt sawlogs and a minimum of 265 000 m^3/y of appropriate peeler quality billets. The approach assumed:

- That a new plantation regime is required, based on *E. globulus*, which uses initial high stocking and multiple thinnings down to about 100 trees per hectare (compared to about 300 trees per ha with current sawlog plantations) in order to grow large diameter sawlogs in about 25 years. This regime, sometimes known as the 'Lonely

Trees' regime, is successfully applied in *E. globulus* plantations in Uruguay and is producing high value sawn timber.

- Application of the 'Lonely Trees' regime will deliver a relatively low annual growth rate of around 10 m^3/y (about half that of Forestry Tasmania's current sawlog rotations).
- No revision to silviculture practices on existing Forestry Tasmania plantations, implying that existing *E. nitens* plantations will reach maturity before conversion to *E. globulus*,
- No conversions of public land to plantations,
- Additional area should be advised as nett planted hectares, noting that as much as 20% of the average gross area cannot be planted, and
- New plantation areas to be mainly sourced from private property although a portion of the existing *E. nitens* plantation estate on state forest (between approximately 9 000 hectares and 18 000 hectares) can be converted to *E. globulus* plantations.

RESULTS

Areas

Table 1 provides an area statement of the Verified ENGO Reserve Proposal by broad forest type. The Proposal covers a gross area of 572 000 ha, of which one third is already reserved, and 352 000 ha is state forest available for wood production. Appendix 3 provides a summary of the area of regenerated forest, by decade of establishment, for areas of state forest outside the ENGO Scenario.

Table 2 indicates that the Industry Map covers a gross area of 140 000 ha, of which 40 percent is already reserved and 61 000 ha is available for wood production. The areas shown on the Industry Map are assumed to be fully contained within the ENGO Map.

Table 3 compares the ENGO and Industry Scenarios for wood production areas and reserved areas, including existing reserves areas not shown on the Industry Map but that are shown on the ENGO Map. The areas to be removed from wood production under the Industry Scenario are a 17% subset of the equivalent lands identified in the ENGO Scenario. The major differences, from a timber productivity perspective, are that the Industry Scenario: (i) excludes no plantation from wood production, (ii) includes 38 610 ha less aged (silvicultural) regrowth, (iii) includes 62 860 ha less regrowth arising from wildfire and/or early logging, and (iv) includes 104 690 ha less mature eucalypt forest. Furthermore, all areas of unreserved blackwood swamp remain available for harvesting under the Industry Scenario. The Industry Scenario excludes from harvesting those areas understood from significant contemporary ENGO campaigns to be most sought for protection, including forests of the Bay of Fires, Blue Tier, Upper Florentine, Wedge, Weld Valley (recognising that most of the Weld Valley is already reserved) and Wielangta. Some areas of Bruny Island, the Tarkine and the Styx Valley are also excluded from harvesting under the Industry Scenario.

The extent of the areas in the ENGO and Industry Scenarios is shown in Figure 2. Note that in preparing this composite map, some minor amendment of the Industry Map was required to ensure consistency with the ENGO Map, but this did not alter coupes proposed for protection under the Industry Scenario.

Table 1. Forest types within the Verified ENGO Reserve Proposal.

Forest type	Formal Reserves	Informal Reserves	Production forest	Other[2]	Total
	ha	ha	ha	ha	ha
Plantation		50	2160	40	2250
Mature eucalypt	640	72270	130910	8315	212135
Regrowth	530	26930	73155	3080	103695
Aged Regrowth	15	2440	40785	0	43240
Myrtle Rainforest	940	44380	44750	2010	92080
Other & Non-forest	650	40805	59775	17410	118640
Total	2775	186875	351535	30855	572040

Table 2. Forest types unavailable for harvesting under the Industry Scenario.

Forest type	Formal Reserves	Informal Reserves	Production forest	Other	Total
	ha	ha	ha	ha	ha
Plantation	0	0	0	0	0
Mature eucalypt	20	20350	26210	6765	53345
Regrowth	10	8170	10340	2260	20780
Aged Regrowth	0	165	2190	0	2355
Myrtle Rainforest	0	16255	8340	1370	25965
Other & Non-forest	30	11910	13550	12415	37905
Total	60	56850	60630	22810	140350

[2] The ENGO Reserve Proposal contains range of land tenures in addition to state forest, including lands managed by the Hydro-Electric Corporation, non-allocated crown land and approximately 1900 ha of private land.

Table 3. Comparison of forest areas within the ENGO and Industry Scenarios (all areas to be excluded from harvesting).

		ENGO Scenario (ha)	Industry Scenario (ha)
Wood Production Areas on state forest			
	Plantation	2160	0
	Aged Regrowth	40785	2190
	Regrowth	73155	10340
	Mature eucalypt	130910	26210
	Myrtle rainforest	44750	8340
	Other forest/non forest	59775	13550
Other unreserved lands		30855	22810
Reserve areas within scenario area		189650	56910
Total		**572040**	**140350**

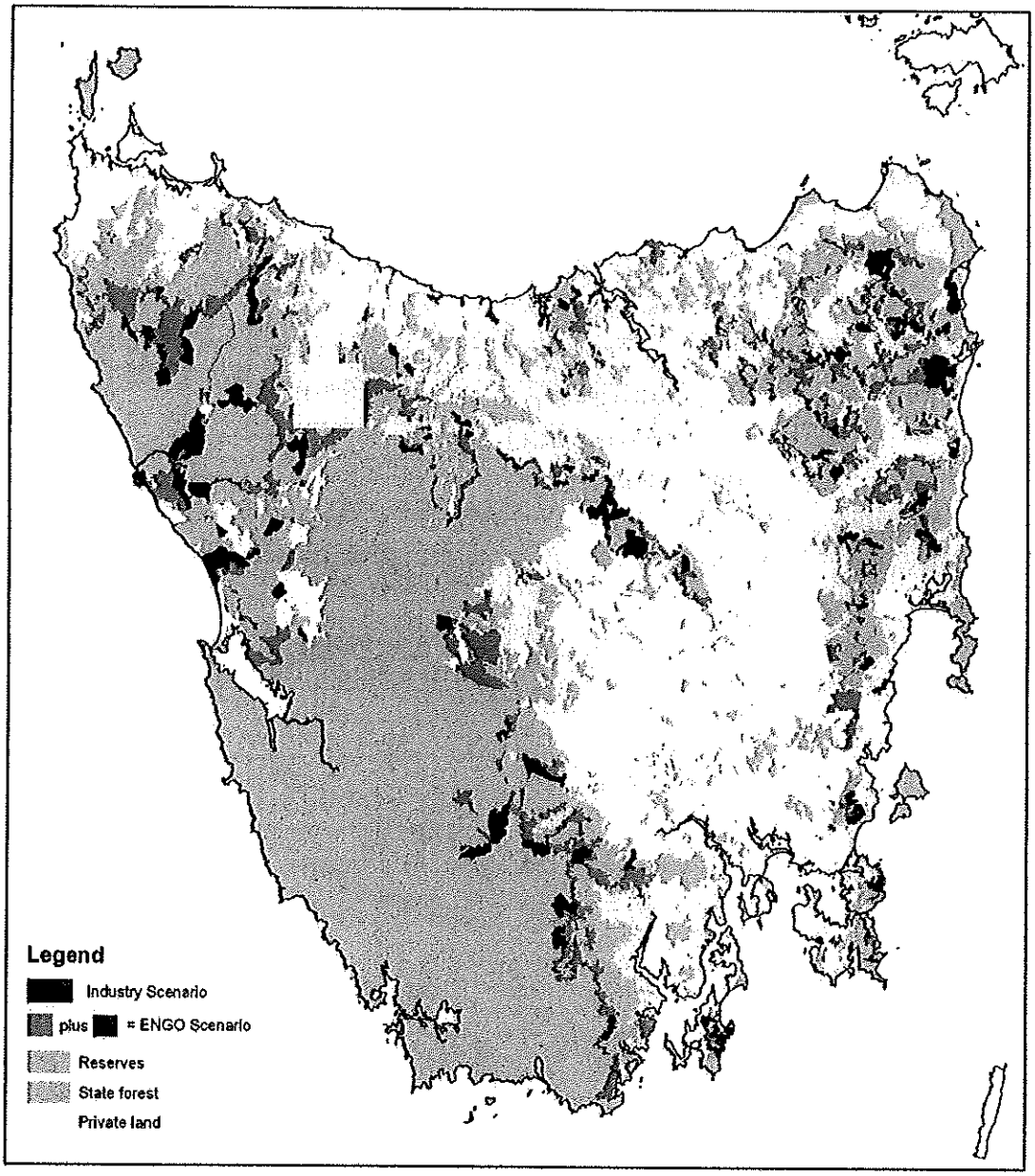


Figure 2. Areas derived from digitised Industry and ENGO Scenario maps.

Eucalypt Sawlog Yields

Table 4 summarizes the projected average annual high quality eucalypt sawlog yield from public native forests for 2011 to 2030 and for 2031 to 2050, for the Base Case, ENGO Scenario and Industry Scenario. All yields have been discounted by a notional 10% to account for forest practices constraints. The data are presented at a statewide level in Table 4 and separated into Northwest, Northeast and South regional yields in Appendix 4, which provides yield information by 10-year time periods.

Table 4. Average annual high quality eucalypt sawlog yield from public native forests for Base Case, ENGO and Industry Scenarios for the periods 2011-2030 and 2031-2050.

	Base	ENGO	Industry
	'000 m^3/y	'000 m^3/y	'000 m^3/y
2011-2030	204	117	199
2031-2050	166	130	164

At a statewide level, the Base Case of 204 000 m^3/y is consistent with the 230 000 m^3/yr average sawlog volume projected for native forest in 2007 for the period until 2030 (Forestry Tasmania 2007), noting that the Base Case includes a 10% discount. The average annual sawlog volume is projected to reduce to 166 000 m^3/y for the 2031-2050 period, compared to 140 000 m^3/yr estimated in 2007 for the same period (and thereafter). This difference arises because the 2007 model was required to identify a non-declining yield from native forests over a 90-year period, whereas the current model was required to identify the maximum yield available from native forest over 50 years.

The ENGO Scenario indicates a reduction in average annual sawlog yield to 117 000 m^3/y for the 2011-2030 period, which is below the industry position of a minimum high quality

eucalypt sawlog yield from native forests of 150 000 m^3/y. The yield recovers to an average 130 000 m^3/y in the 2031-2050 period, but still falls short of the industry's minimum sawlog position.

The Industry Scenario yields 199 000 m^3/y for the first period, and 164 000 m^3/y for the second period. This meets the industry's minimum sawlog position.

The regional data show that the impact of the ENGO Scenario on sawlog supply is greatest in southern Tasmania, where nearly half the eucalypt sawlog supply would be foregone over the 2011-2030 period compared to the Base Case (Appendix 4)

Peeler Billet Yields

Table 5 summarizes the projected average annual yield of peeler billets to be supplied by Forestry Tasmania for 2011 to 2030 and for 2031 to 2050 for the Base Case, ENGO and Industry Scenarios. All yields have been discounted by a notional 10% to account for forest practices constraints. The data are presented at a statewide level in Table 5 and separated into Northwest, Northeast and South regional yields in Appendix 5, which provides yield information by 10-year time periods.

The Base yield of 265 000 m^3/y of peeler billets matches the supply required by current contracts. This yield includes a supply of 39 000 m^3/y from plantations and/or private native forest in northern Tasmania, as recognised in the contract for the Smithton peeler mill [3]. It also assumes an increase in the utilisation of regrowth pulpwood as peeler billets at the Huon and Smithton peeler mills. This yield can be maintained, primarily from native forest, for the period 2011-2030 (which includes the supply contract period until 2027), but then reduces to 34% of the previous level for the period from 2031-2050. One means of meeting the shortfall in native forest supply will be through the use of maturing eucalypt plantations for future peeler supply. However there is considerable uncertainty around the acceptability of plantation material to the domestic peeler mills.

Table 5 indicates that the ENGO Scenario cannot meet the peeler billet requirement of the rotary veneer mills. It would meet 72% of the requirement in the next 20 years (the contract period) and only 27% of this level for the period from 2031-2050.

[3] The requirement of 39 000 m^3/y from additional sources was also included in the ENGO and Industry Scenarios.

The Industry Scenario would meet the annual requirement for peeler billets for the 2011-2030 period and 35% of this level for the 2031-2050 period. The close similarity in yield between the Base and the Industry Scenario is due to a focus on the retention of eucalypt regrowth forest (rather than mature forest) for wood production in the Industry Scenario.

Table 5. Average annual yield of peeler billets to be supplied by Forestry Tasmania for Base Case, ENGO and Industry Scenarios for the periods 2011-2030 and 2031-2050.

	Base '000 m^3/y	ENGO '000 m^3/y	Industry '000 m^3/y
2011-2030	265	191	265
2031-2050	93	71	92

The regional data show that the impact of the ENGO Scenario on peeler billet supply is greatest in southern Tasmania, where one-third of the peeler billet supply would be foregone over the 2011-2030 period compared to the Base Case (Appendix 5).

Native forest arisings (excluding domestic peelers)

Table 6 summarizes the projected average annual yield of native forest arisings (mainly eucalypt pulpwood, but also includes lower quality eucalypt sawlogs) from public native forests for 2011 to 2030 and for 2031 to 2050 for the Base Case, ENGO and Industry Scenarios. All yields have been discounted by a notional 10% to account for forest practices constraints. The data are presented at a statewide level in Table 6 and separated into Northwest, Northeast and South regional yields in Appendix 6, which provides yield information by 10-year time periods.

The supply of lower quality sawlogs, from what might otherwise be pulpwood, is directly related to harvesting of mature and multi-aged forests. The supply also varies with market conditions, i.e. more pulpwood can be sold as low quality sawlogs under favourable sawlog market conditions than when sawlog markets are weak.

Table 6. Average annual native forest arisings (pulpwood and low quality sawlogs) from public native forest for Base, ENGO and Industry Scenarios for the periods 2011-2030 and 2031-2050 (gmt = green metric tonnes and 1.1 green metric tonne of eucalypts is equivalent to 1.0 m^3).

	Base	ENGO	Industry
	'000 gmt/y	'000 gmt/y	'000 gmt/y
2011-2030	1409	841	1372
2031-2050	773	588	759

Table 6 indicates that under the Base Case about 1.4 million t/y of native forest pulpwood will arise from operations focussed on production of eucalypt sawlogs and peeler billets for the 2011-2030 period. This is projected to reduce to about 0.8 million t/y in the 2031-2050 period.

The ENGO Scenario would deliver about 0.8 million t/y (60% of the Base Case) in the 2011-2030 period and about 0.6 million t/y (76% of the Base Case) in the 2031-2050 period.

The Industry Scenario would deliver about 1.4 million t/y (97% of the Base Case) in the 2011-2030 period and about 0.8 million t/y (98% of the Base Case) in the 2031-2050 period.

The regional data show that the impact of the ENGO Scenario on native forest arisings is greatest in southern Tasmania, where 40% of the native forest arisings would be foregone over the 2011-2030 period compared to the Base Case (Appendix 6)

Summary of areas harvested under Base Case, ENGO and Industry Scenarios

Appendix 7 provides a summary of the areas to be harvested, by forest type, for each of the next two decades under the Base Case, ENGO and Industry Scenarios. The total harvest, and its composition by forest type, is similar under the Base Case and Industry Scenarios. The total area to be harvested is reduced under the ENGO Scenario and the harvested area of each forest type is also reduced, but not markedly so for aged regrowth.

Effects on blackwood and other special timbers

Table 7 summarizes the projected average annual yield of sawlog and utility log from blackwood and other special timbers from public native forests for 2011-2050 for the Base Case, ENGO and Industry Scenarios. This yield is sourced from small-scale harvesting operations in blackwood swamps and rainforests as well as from arisings associated with clearfell and variable retention operations in wet eucalypt forests within the Special Timbers Zone defined in the Special Timbers Strategy (Forestry Tasmania 2010). There has been no attempt to separately identify supply levels for the two 20-year periods 2011-2030 and 2031-2050. Nor has the 10% notional discount for forest practices constraints been applied.

Table 7. Sawlog and utility log yield of blackwood and other special timbers from public native forests for Base Case, ENGO and Industry Scenarios for the period 2011-2050

	Base 000's m^3/y	ENGO 000's m^3/y	Industry 000's m^3/y
Blackwood:			
Swamps	6.0	5.4	6.0
Other sources	4.0	0.8	3.4
Total Blackwood	10.0	6.2	9.4
Other special timbers	2.5	0.5	2.1
Total special timbers	12.5	6.7	11.5

The ENGO Scenario would reduce the blackwood swamp resource by 10% (based on areas), to about 5400 m^3/y. The ENGO Scenario would reduce other sources in the Special Timbers Zone by 80% which would reduce the sustainable yield from other sources to about 800 m^3/y. Hence the total blackwood supply under the ENGO Scenario would amount to about 6200 m^3/y, which is 62% of the supply under the Base Case.

The Industry Scenario envisages no additional reservation of blackwood swamps, but the Special Timbers Zone would be reduced by 16%. This would reduce the sustainable yield from other sources to about 3400 m^3/y and the total blackwood supply to 9400 m^3/y, which is 94% of the Base Case.

The 80% and 16% reductions in the Special Timbers Zone that result from the ENGO and Industry Scenarios respectively were applied to the 2500 m^3/y of other special timbers available from the Zone. This reduced the overall supply of special timbers, including blackwood, to 6700 m^3/y and 11 500 m^3/y respectively, which equates to 54% and 92% of the Base Case supply.

Projected eucalypt wood flows from plantations (first rotation)

The total hardwood plantation estate on state forests is 55 200 ha (Forestry Tasmania 2010) but the net area of productive eucalypt plantation in which Forestry Tasmania has, or shares, ownership of the tree crop is 36,674 ha. The difference in area includes eucalypt plantations owned by others on state forest, harvested land awaiting replanting, research trials and non-eucalypt hardwood plantations.

Table 8 provides a breakdown of the eucalypt plantation areas currently under Forestry Tasmania's management by area, species, region, establishment year and designated pruning regime. It indicates that 27 244 ha, or 76%, of the plantation estate is *Eucalyptus nitens.*

Table 8. Eucalypt plantation areas currently under Forestry Tasmania's management by area, species, region, establishment year and designated pruning regime.

	<1981	1981-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006+	Grand Total
Globulus	**28**	**80**	**119**	**27**	**4,311**	**1,926**	**934**	**7,426**
NorthEast		**3**	**17**		**779**	**613**	**35**	**1,447**
Unpruned		3	17		658	242	35	955
LowPruned					121	193		314
HighPruned						178		178
South	**28**	**39**	**103**	**27**	**1,679**	**1,069**	**899**	**3,844**
Unpruned	28	39	103	27	512	188		897
LowPruned					893	142	193	1,227
HighPruned					275	738	706	1,719
NorthWest		**38**			**1,853**	**245**		**2,135**
Unpruned		38			449	6		493
LowPruned					151	4		155
HighPruned					1,253	234		1,488
Nitens	**2**	**7**	**351**	**4,500**	**7,012**	**6,930**	**8,943**	**27,744**
NorthEast		**6**	**220**	**2,395**	**4,505**	**4,438**	**4,656**	**16,221**
Unpruned		6	89	318	557	858	536	2,365
LowPruned				706	959	585	149	2,399
HighPruned			131	1,371	2,989	2,996	3,971	11,457
South	**2**		**106**	**1,302**	**1,567**	**1,295**	**2,701**	**6,974**
Unpruned	2		106	1,186	382	142	7	1,825
LowPruned				28	198	158	102	486
HighPruned				88	987	995	2,593	4,663
NorthWest		**1**	**24**	**803**	**940**	**1,196**	**1,585**	**4,550**
Unpruned		1	2	21	242	162	11	438
LowPruned				250	123	58		431
HighPruned			22	532	575	976	1,574	3,680
Other	**184**	**103**	**433**	**656**	**128**			**1,503**
NorthEast	**30**	**34**	**33**	**16**	**71**			**183**
Unpruned	30	34	32		49			145
LowPruned				16				16
HighPruned			1		21			22
South	**154**	**46**	**400**	**640**	**57**			**1,298**
Unpruned	154	46	400	640	56			1,296
LowPruned					1			1
NorthWest		**23**						**23**
Unpruned		23						23
Grand Total	**214**	**191**	**903**	**5,183**	**11,451**	**8,856**	**9,877**	**36,674**

Figure 3 and Appendix 8 show the yield of sawlogs from currently established eucalypt plantations where the trees are wholly or partly owned by Forestry Tasmania. These plantations could supply an average of about 28 000 m^3/y of high quality eucalypt sawlogs from 2016 to 2020, increasing to an average of about 82 000 m^3/y from 2021 to 2030. This wood flow assumes that all pruned and/or thinned regimes are clearfelled at age 25 years and untended regimes are clearfelled at age 20 years. The great majority of the plantation sawlog supply will be *Eucalyptus nitens*. Appendix 8 indicates that by 2030, 20% of the plantation sawlog will be in the northwest, with 60% in the northeast and 20% in the south of the state.

Figure 3. Yield of sawlogs from currently established eucalypt plantations where the trees are wholly or partly owned by Forestry Tasmania.

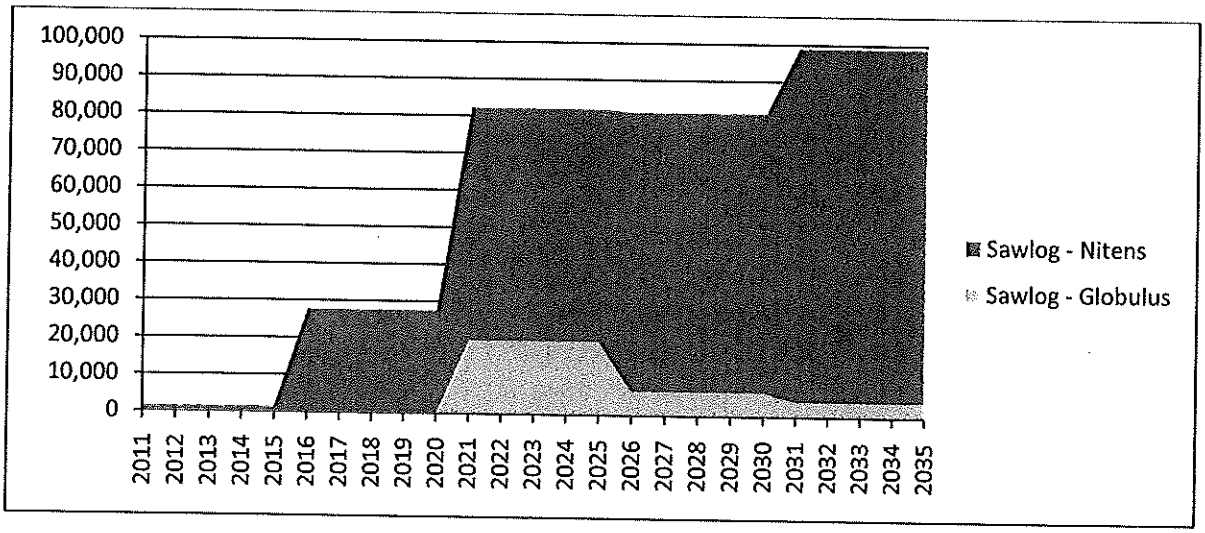
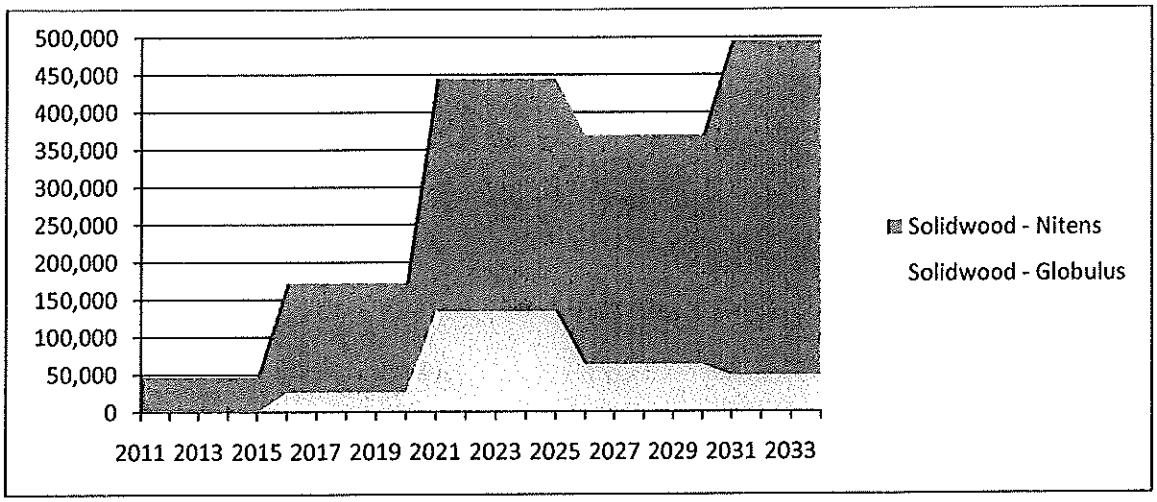


Figure 4 and Appendix 9 shows the yield of solid wood from currently established eucalypt plantations where the trees are wholly or partly owned by Forestry Tasmania. The term solid wood refers to wood (excluding high quality sawlog) that is suitable for lower grade sawn boards or for producing a range of products in sheet or beam form based on peeling and gluing technology. Currently, the processing industry in Tasmania is not confident of its ability to saw or peel this material and provide a viable product to customers. Figure 4 shows that plantations could currently supply about 47 000 m^3/y of solidwood, increasing to an

average of 172 000 m^3/y from 2016 to 2020 and varying between about 369 000 m^3/y to 444 000 m^3/y from 2021 to 2030. The great majority of the plantation solidwood supply will be *Eucalyptus nitens*. Appendix 9 indicates that by 2030, 18% of the plantation solidwood will be in the northwest, with 55% in the northeast and 27% in the south of the state.

Figure 4. Yield of solid wood from currently established eucalypt plantations where the trees are wholly or partly owned by Forestry Tasmania.



Projected eucalypt wood flows of eucalypt plantations (subsequent rotations)

Table 9 summarizes the projected average annual yield of high quality eucalypt sawlog, peeler billet and arisings (primarily pulpwood) from eucalypt plantations on state forests for 2011 to 2030 and 2031 to 2050 for the plantation scenario with subsequent rotations. This scenario assumes that no high quality sawlog acceptable to industry is available from eucalypt plantations on state forests until 2031. The yields are reported separately for *Eucalyptus globulus* and *E. nitens*.

The ENGO Map includes 2250 ha of eucalypt plantations on state forest (Table 1) which represents about 6% of the current eucalypt plantation estate where Forestry Tasmania has full or partial ownership of the trees. If these areas were unable to be harvested, then the yields in Table 9 should, by this simple analysis, be discounted by 6% under the ENGO

Scenario. This reduction could be less if the plantations in the ENGO Map were harvested after a single rotation and then restored to native forest. The ENGO signatories have indicated that restoration after single sawlog rotation is their intention.

The Industry Scenario is the same as the Base Case, as far as plantation yield is concerned.

Table 9. Average annual yield of high quality eucalypt sawlogs, peeler billets and arisings (primarily pulpwood) from eucalypt plantations on state forests for 2031 to 2050 for the plantation scenario with subsequent rotations.

	E. globulus plantation	*E. nitens* plantation	Total
High Quality Sawlog (000's m^3/y):			
2011-2030	0	0	0
2031-2050	50	107	157
Peeler Billets (000's m^3/y):			
2011-2030	33	69	102
2031-2050	192	425	617
Arisings (000's gmt/y):			
2011-2030	46	181	227
2031-2050	158	266	424

The 2007 Wood Review estimated a woodflow of high quality sawlog from eucalypt plantations, starting from about 2015, and ramping-up to be maintained at 160,000 m^3/y from 2024 onwards (see Figure 1). The current forest estate woodflow modelling presented here estimates a yield of 157,000 m^3/y of high quality sawlog from eucalypt plantations from 2031 onwards. This estimate assumes that there is no harvest of high quality sawlog from eucalypt plantations prior to 2031. The differences between the two models are related to:

- increased inventory measurement of the maturing resource, from about 10% of plantations in 2006, to 70% in 2010;
- an improved pruning algorithm that better predicts the size of trees that are pruned to produce high quality sawlogs;
- a realised, rather than predicted, increase in the total eucalypt plantation area landbase; and,
- different start-points to the plantation sawlog supply, which impact on the level of high quality sawlog from eucalypt plantations that can be maintained (see below).

The effect of start-dates on the level of high quality sawlog that can be maintained was explored using the current model and start-dates in 2021, 2026 and 2031. If the start-date for plantation sawlog yield is modelled at 2021, then a non-declining yield of 89 000 m^3/y of high quality eucalypt sawlog could be maintained. If the start-date is modelled at 2026, then a non-declining yield of 124 000 m^3/y of high quality eucalypt sawlog could be maintained. If the start-date is modelled at 2031, then a non-declining yield of 157 000 m^3/y of high quality eucalypt sawlog could be maintained, as shown in Table 9. This analysis showed that by delaying the harvest of the maturing plantations, the level that can be maintained in the longer term is increased.

Integration of plantation and native forest scenarios.

The integrated scenario assumes that no high quality eucalypt sawlog, acceptable to industry, is available from eucalypt plantations on state forests until 2031. From 2031, these plantations will supply an average sawlog yield of 157 000 m^3/y. The contribution of

plantations to the total yield of high quality eucalypt sawlogs (Base Case) for the 2031-2050 period is shown in Figure 5.

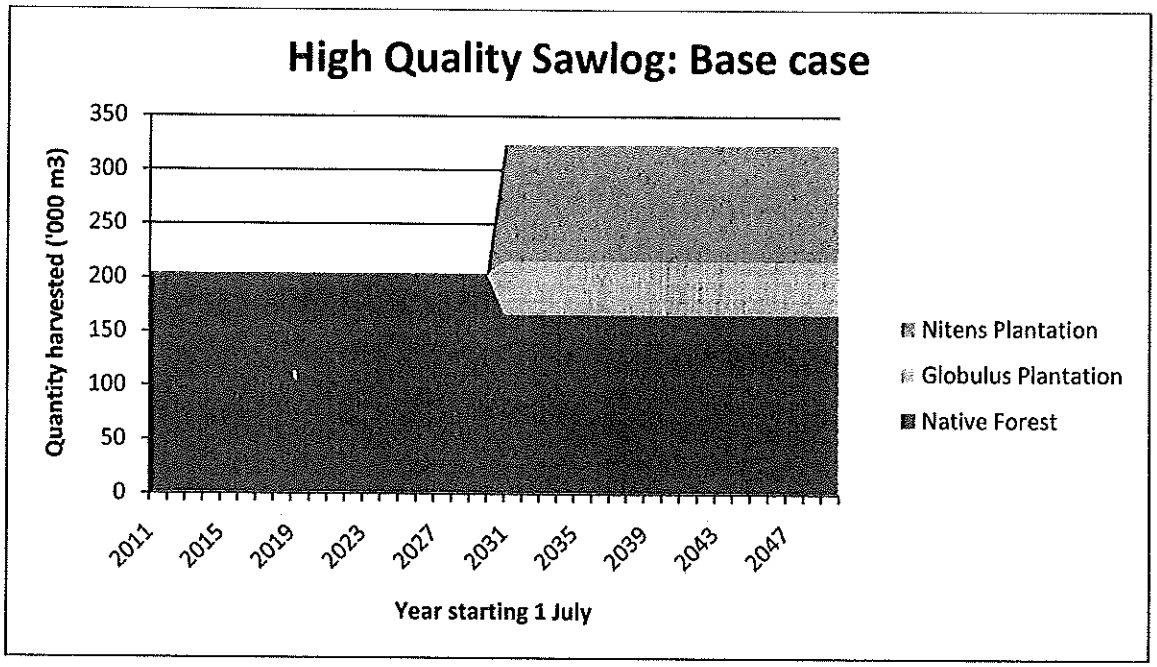


Figure 5. Average sustainable yield of eucalypt high quality sawlog from public native forests and plantations from 2011-2030 and 2031-2050.

The average annual yield of peeler billets from eucalypt plantations on state forests is 102 000 m^3/y for the period from 2011-2030, although this supply is negligible at the start of the period. Furthermore, the domestic peeler industry is uncomfortable about accepting billets from *Eucalyptus nitens* plantations, because of its lower bulk density compared to billets from *E. globulus* plantations or native forest regrowth. The average yield of peeler billets from eucalypt plantations is 617 000 m^3/y for the 2031-2050 period, which would amount to 2.3 times the current domestic peeler requirement (if uncertainties about the acceptability of *E. nitens* for peeler billets can be resolved). The contribution of plantations to the total yield of eucalypt peeler billets (Base Case) for the 2031-2050 period is shown in Figure 6.

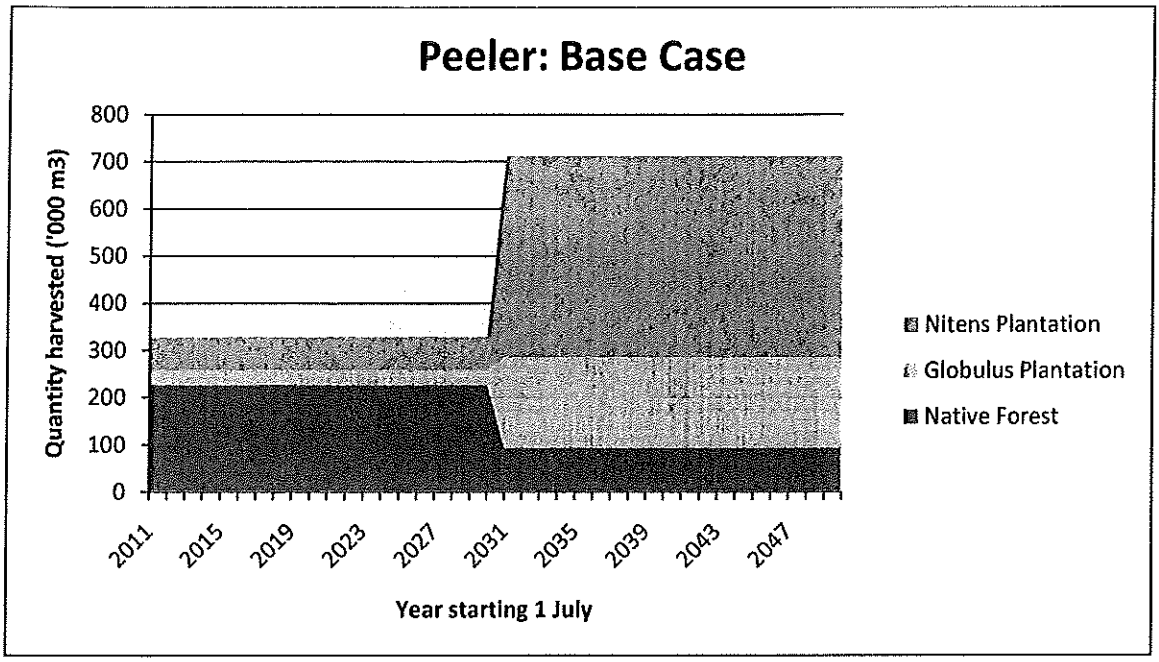


Figure 6. Average sustainable yield of eucalypt peeler billets from public native forests and plantations from 2011-2030 and 2031-2050.

The average annual yield of arisings (primarily pulpwood) from public eucalypt plantations is 424 000 t/y for the period from 2031 to 2050. This supply is quite modest compared to the yield from native forests. It represents about 35% of the total arisings from 2031-2050, under the Base Case. The contribution of plantations to the total eucalypt yield of arisings (Base Case) for the 2031-2050 period is shown in Figure 7.

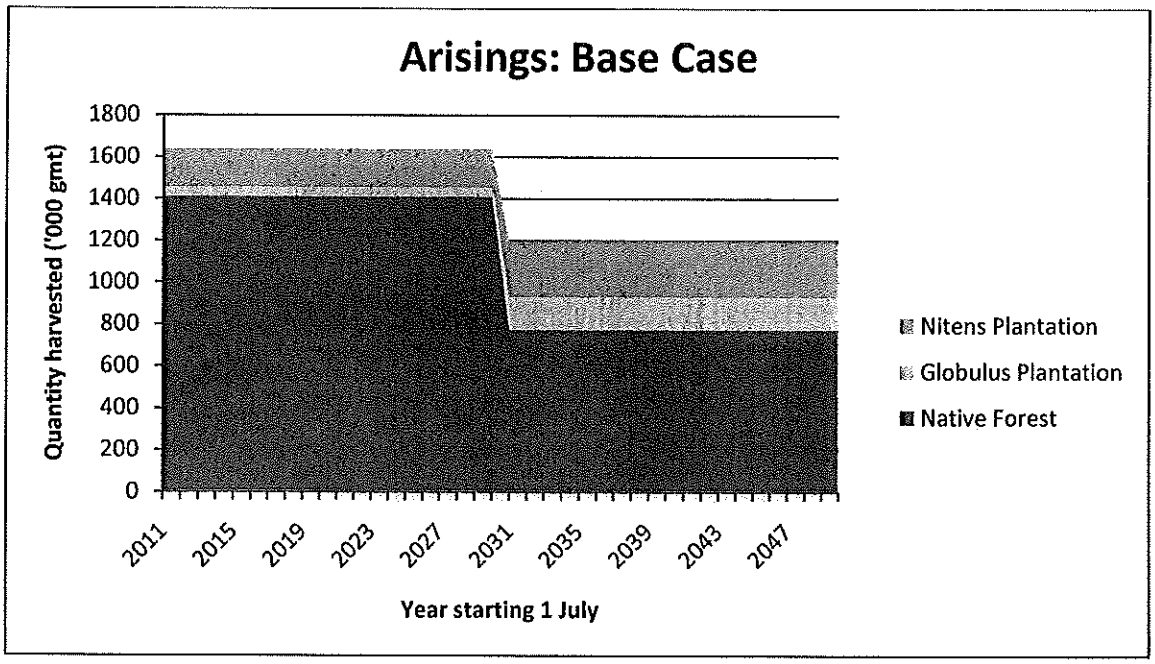


Figure 7. Average sustainable yield of eucalypt arisings from public native forests and plantations from 2011-2030 and 2031-2050.

Other transition scenarios

Transition Scenario 3.2 A modelled the ability of the remaining native forest areas outside ENGO identified HCV to provide the 75 000 m^3/y of high quality sawlog and Ta Ann peeler requirements for the period until 2020. Because the ENGO Scenario yields 117 000 m^3/y of high quality sawlog until 2030 (Table 4), it should be quite feasible to supply 75 000 m^3/y until 2020. The ENGO Scenario could deliver 191 000 m^3/y of peeler billets until 2030 (Table 5) but if this supply was to be limited to ten, rather than twenty, years the annual available supply would be calculated as 382 000 m^3/y (191*20/10), which is somewhat more than the annual supply target. This simple analysis ignores the relationship between forest products and it is likely that a modest sawlog target of 75 000 m^3/y would yield less than 265 000 m^3/y of associated peeler billets. Even so, the scenario should be feasible.

Transition Scenario 3.2 B explored the ability of the remaining native forest areas outside ENGO identified HCV to provide 150 000 m^3/y of high quality sawlog until 2020 and Ta

Ann peeler requirements for the period until 2030. The ENGO Scenario would deliver 117 000 m^3/y of high quality eucalypt sawlog until 2030. If this twenty-year supply was to be supplied over ten years, then 234 000 m^3/y would theoretically be available until 2020, which more than meets the sawlog requirement of 150 000 m^3/y. The sawlog supply under this scenario is calculated as 117 000*20/10 = 234 000. However, the ENGO Scenario would deliver 191 000 m^3/y of peeler billets until 2030, which is well short of the Ta Ann peeler requirement of 265 000 m^3/y. Hence Transition Scenario 3.2 B would not meet the requirements.

Transition Scenario 3.2 C explored the date when the yield would end, or need to be reduced, if provision of 150 000 m^3/y of high quality sawlog and/or Ta Ann peeler requirements cannot be met from outside ENGO identified HCV areas on a sustainable basis. If the 117 000 m^3/y of high quality eucalypt sawlog available for twenty years under the ENGO Scenario is supplied at 150 000 m^3/y then the resource would last for 15 years, until 2025. The period of supply at 150 000 m^3/y under this scenario is calculated as 117 000*20/150 000 = 15.6 years. Likewise, if the 191 000 m^3/y of peeler billets available for twenty years under the ENGO Scenario is supplied at 265 000 m^3/y, this resource would last for 14 years, until 2024. The period of supply at 265 000 m^3/y under this scenario is calculated as 191 000*20/265 000 = 14.4 years.

Scenario 3.3 explored the level of alternative supply available from state forests if native forest high quality eucalypt sawlog and peeler requirements end in 2014. Under this scenario, high quality eucalypt sawlog would only be supplied from eucalypt plantations. In 2015 only 1400 m^3/y of sawlogs would be available (Figure 3), although this would increase to 28 000 m^3/y in 2016 and to 82 000 m^3/y from 2021. However, the current sawlog industry is uncertain about its ability to process and market material from plantations. In 2015, Figure 4 indicates that 47 000 m3/y of solidwood from *Eucalyptus nitens* plantations would be available, but this material is outside the Ta Ann mill's peeler billet specification.

Scenario 4 explored the additional area of plantation forest required to facilitate any total transition from native forests to plantation resources whilst maintaining the minimum industry wood supply requirements of 150 000 m3/y of high quality eucalypt sawlogs and a minimum of 265 000 m3/y of appropriate peeler quality billets. This scenario is reliant on multiple thinning ('Lonely Tree') regimes to produce large, pruned high quality eucalypt sawlogs, greater than 40 cm small end diameter. Total transition will require new areas of plantation, although it is noted that a portion of the existing *E. nitens* plantation estate on state forest (between approximately 9 000 hectares and 18 000 hectares depending on the level of risk accepted with planting frost-sensitive *E. globulus*) can be converted to *E. globulus* plantations, reducing the total required new area. Delivering the required logs where each hectare holds 100 trees will require a total of 112 162 nett planted hectares. Assuming that 18 000 hectares of the existing *E. nitens* plantations on state forest can be converted at maturity to *E. globulus*, the requirement is 94 162 additional nett planted hectares. The optimal average harvest age to deliver the indicated outcomes is about 25 years and will additionally result in annual arisings of 427 000 m^3/y of unpruned sawlog, 202 000 m^3/y of pulpwood and 41 000 m^3/y of unallocated residues. About 4 400 to 4 800 gross hectares of new plantation will need to be established on average every year for 25 years, plus conversion of about 700 to 1100 gross hectares of existing *E. nitens* plantation to *E. globulus* each year. The new resource would theoretically come on line from 2035and would require a total estate of 130 000 ha. The estimated cost to a potential financier, if the program was to be funded by an upfront compensation amount, would be about $500 M.

4. DISCUSSION

This evaluation has been based on two distinct scenarios which result from an ENGO proposal, that would reserve 351 600 ha of state forest currently available for wood production, and a processing industry response that would reserve 60 630 ha of state forest currently available for wood production. The industry response, as represented by the Forest Industries Association of Tasmania (FIAT), includes those areas understood from significant contemporary ENGO campaigns to be most sought for protection, but retains sufficient native forest to meet the processing industry's minimum position for products from native forests.

The evaluation has shown that the ENGO Scenario cannot meet the processing industry's minimum requirement for 150 000 m^3/y of high quality eucalypt sawlog, 265 000 m^3/y of peeler billets and 12 500 m^3/y of special timbers sawlogs. Under the ENGO Scenario the average yields until 2030 would be 78% of the high quality eucalypt sawlog, 72% of the peeler billet and 54% of the special timbers requirement of the processing industry.

The evaluation has shown that the Industry Scenario would exceed the minimum sawlog and peeler billet requirement, but does not meet the special timbers requirement. The average yields would be 133% of the sawlog, 100% of the peeler billet and 92% of the special timbers minimum requirement of the processing industry. The peeler billet requirement could be met more confidently if some of the sawlog yield, particularly smaller diameter logs, was made available to the domestic peeler industry. The shortfall in special timbers supply cannot be mitigated from other sources. While the shortfall is modest in volume terms it would be significant in financial terms. This is because special timbers are the most valuable and highly processed product from native forests.

Although the processing industry has stated no minimum requirement for pulpwood, the sale of native forest pulpwood is a key requirement for the financial viability of harvesting operations and for facilitating regeneration after harvesting, particularly in wet eucalypt forests.

If there were to be a rapid transition out of public native forests by 2014 (which is one of the scenarios requested for exploration by the signatories), there would be no alternative supply of high quality eucalypt sawlogs available from eucalypt plantations managed by Forestry Tasmania. However, although not deemed suitable by the native forest processing industry,

eucalypt plantations wholly or partly owned by Forestry Tasmania, could supply an average of 28 000 m^3/y of high quality eucalypt sawlogs from 2016 to 2020, increasing to about 82 000 m^3/y from 2021 to 2030.

Under the base case, after 2030, there is a significant shift in eucalypt sawlog supply towards a supply from eucalypt plantations. After 2030, there is also an even greater supply of plantation peeler billets available. However the capacity of the current sawlog and domestic peeler processing industries to process and market plantation material is still uncertain.

If the ENGO Reserve proposal were to be fully adopted, there are very limited ways to mitigate the effect on wood supply to the native forest processing industry. Forestry Tasmania voluntarily ended the conversion of native vegetation to plantations on public land in 2007 and that position has become mandated since 2010 under the Tasmanian Government's Permanent Native Forest Estate Policy (Tasmanian Government 2009). Hence there is no scope to increase the plantation estate on public land, although there may be scope for increasing joint venture arrangements with private landowners through programs like the *Trees on Farms* project (Forestry Tasmania 2010), through which Forestry Tasmania establishes tree plantations on farmland at no up-front cash cost to landowners. After 15 to 25 years the trees are harvested and the profits shared between Forestry Tasmania and the landowner. While the *Trees on Farms* focus is on plantations for wood production, Forestry Tasmania can also partner with Greening Australia to offer an integrated package of plantings for biodiversity and carbon sequestration that can complement plantations for timber.

However, timber plantings will not provide sawlogs for another 25 years. They therefore offer little to the current industry in addressing an imminent shortfall. Another mitigation strategy would be to thin native forest regrowth, in order to hasten the growth of high quality sawlogs and to recover peeler billets and pulpwood which might otherwise be lost due to natural mortality. The intent would be to harvest peeler billets and pulpwood by thinning stands aged between 25 and 40 years and then conduct a final harvest for sawlogs at about age 65 years (rather than operate on the 90-year unthinned rotation typically required to grow sawlogs of the same size). Such a program would be best targeted on silvicultural regrowth established in the 1970s, because trees aged between 25-40 years are large enough to produce peeler billets and pulpwood in commercial piece sizes. Thinning of this age class has been demonstrated to deliver a significant diameter growth response in retained trees (Forestry Tasmania 2001). If commenced now, the peeler billets produced by thinning and the

subsequent sawlog harvest in 15 years' time would each partly address supply shortfalls facing the current processing industries. However, thinning of large areas has proved problematic in the past due to difficulties in assessing the thinnable resource, higher harvest costs and the increased fire risk posed to thinned stands, and adjacent forest, due to the presence of unburnt harvest debris. These problems could be potentially overcome by better resource estimation techniques (e.g. based on LiDAR imagery), increased payments to harvesting contractors to conduct thinning operations and the development of biomass markets to allow increased removal of harvest residues.

An alternative option would be to establish a new resource dedicated to the production of high quality eucalypt sawlogs and peeler logs, primarily from private land. This resource would be based on *E. globulus* plantations and use multiple thinning ('Lonely Tree') silviculture to produce 150 000 m^3/y of high quality sawlogs, 265 000 m^3/y of peeler billets and a range of other products. This resource would require a gross estate of 130 000 ha and funding of about $500M. If establishment commenced in 2011 the resource would become available from 2035.

Forestry Tasmania is well placed to explore and develop these, and further, options with governments and signatories to the Statement of Principles, in order to facilitate an enduring Forest Agreement.

5. REFERENCES

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6. Appendix 1. Resource Modelling Requirements of Signatories.

Following a meeting on May 4th at the Innovations Centre at Salamanca the following resource modelling requirements were agreed by representatives of the signatories to the Tasmanian forest agreement. These data outputs are required to allow the signatories to further negotiations and considerations of matters in the Statement of Principles. This would include using the resultant data from this modeling for further assessment of the range of impacts and opportunities that might arise from changes that might be agreed.

NB. The scenarios below are not, and are not to be interpreted as being, the signatories positions on preferred outcomes. They are provided to generate information to help inform the development of thinking on transitions and creation of negotiating possibilities.

Set out below are the resource modelling requests that we seek to be undertaken by Forestry Tasmania: -

- **Base Case Scenario - Native Forest**

Using the published five-yearly RFA wood review as a base, re-present the woodflow for eucalypt High Quality Sawlog and peeler logs by:-

- State Forest native forest only (excluding the plantation component);
- Reporting the woodflow in two smoothed 20-year periods (2011-2030 and 2031-2050);
- Report the capacity of the current State native forest to produce high quality sawlogs (as currently defined) and peeler logs (as defined by Ta Ann current specifications and contracted volumes).

We understand that the Special Timbers Zones (STZs) defined by the Special Timbers strategy provides the base case for special timbers supply.

2. ENGO Identified HCV

An assessment of the ENGO identified HCV including a map and an area statement of: -

- Total area covered by identified HCV;
- A breakdown of the following forest categories inside and outside of ENGO identified HCV, and a further break down for informal and formal reserves: -
    - Mature forest
    - Regrowth (from wildfire and other disturbance)
    - Aged Regrowth (Regeneration)
    - Non forest area
    - Plantations – pine and hardwood
    - Rainforest
- New 3 year plan coupes in relation to ENGO identified HCV (coupe list and areas in and out).

3. Possible Future Scenarios

For all scenarios the following data outputs are needed:

A. Area data to be provided on the breakdown of the general forest categories (including a decade by decade classification of ages where known)

- Mature forest
- Regrowth (from wildfire and other disturbance)
- Aged Regrowth (Regeneration)
- Non forest area
- Plantations – pine and hardwood
- Rainforest

B. For each scenario identify the area of the above forest categories (excluding plantations) needed for wood supply in the scenario and a balance figure in relation to the ENGO identified HCV (eg in scenario Y it will be found that an additional XX ha of Mature forest is

required from the ENGO identified HCV area to meet the scenario, or in Scenario Z XX ha of Unaged Regrowth from outside of the ENGO identified HCV area is not required for wood supply in scenario.)

C. Illustrative maps if necessary (noting FT is not expected to determine specific forest areas for inclusion / exclusion)

D. Reporting native forest yield and the woodflow in smoothed 10-year periods (2011-2020, 2021 – 2030, 2031 - 2040 and 2041-2050) where relevant – or earlier dates if specified.

E. All scenarios to be reported (in terms of wood supply and forest type impacts) on a statewide and regional basis (utilizing standard FT District amalgamation eg Murch., Bass/Mersey, Huon/Derwent)

F. The possible volumes of sliced veneer logs, high quality sawlog, rotary peeled veneer billets, lower grade sawlogs, special species and pulpwood logs. This will utilize standard current specifications unless otherwise specified in scenario.

G. The impact of scenario on Special Timbers and SMZs including what resource might or might not be available given changes in arisings.

H. Advise on what changes in silvicultural management might be required in each scenario, or could be considered, if any, to achieve desired scenario outputs and other scenario outputs.

I. Advise on what changes to wood supply might be achievable from revising peeler specifications to smaller dimensions.

3.1 Effect of ENGO identified HCV on Native Forest Resource Supply

Determine maximum resource volumes Forestry Tasmania would be able to supply from the remaining native forest area if the ENGO identified HCV forest area was to be removed from production on an ongoing sustainable yield basis.

3.2 Transition Scenarios out of Non ENGO Identified HCV Native Forest

Model the ability of the remaining native forest areas outside ENGO identified HCV to provide the following volumes and specifications for the periods designated:

A. 75,000m3 of HQ sawlog until and Ta Ann peeler requirements for the period until 2020.
B. 150,000m3 of HQ sawlog until 2020 and Ta Ann peeler requirements (as per minimum industry requirements below) for the period until 2030.
C. If provision of 150,000m3 and/or Ta Ann peeler requirements cannot be produced from these areas on a sustainable yield basis at what date will the yield end or need to be reduced (this woodflow to be shown on smoothed 10-year periods)

3.3 Assume native forest HQ sawlog and peeler requirements end in 2014

Report on the ability of the remaining native forest areas outside ENGO identified HCV to provide wood until 2014.

3.4 Industry Resource Requirements – Native Forest

Report on what native forest areas and types would be required to sustainably supply at least the industry minimum resource requirements as set out below (these volumes assume the withdrawal of Gunns Limited from all native forest wood processing activities but contemplates the continued operation of the sawmill at Southwood and the sliced veneer mill at Somerset).

Minimum Industry wood supply requirements

- Reduction from a legislated supply of 300,000 m^3 to a minimum of 150,000 m^3 per annum of high quality eucalypt saw logs from July 2011;
- A minimum of 265,000 m^3 per annum of appropriate peeler quality billets for the existing two commercial scale rotary veneer mills (115,000m^3 at Smithton and 150,000 m^3 at Southwood);

- Maintain the current level of supply and quality of current grade sawlogs to country sawmills;
- A minimum of 12,500 m^3 per annum of Category 4 sawlog speciality timbers for the furniture, cabinet making, craft and boat building industries. This volume to include 10,000 m^3 of Blackwood from the Blackwood Working Circle and fenced regenerated blackwood resource and 2,500 m^3 of special species from Special Species Timber Management Zones (STZs) including an area of 20,000 ha of Eucalypt forest identified in the Forestry Tasmania Special Species strategy to be harvested and regenerated on a minimum 200 year rotation.
- A minimum of 5,000 m^3 per annum of sliced veneer logs for supply to the Somerset mill.
- Continued sales of woodchips to international markets from pulp wood arising from these harvesting and processing operations.

Then provide an assessment of whether the above resource requirements are able to be met on a sustainable basis, and if not at what time the resource would cease to be available.

Plantations

- Maps and area statistics of what plantation areas are currently under Forestry Tasmania management broken down into the following categories: -
    - Total area of plantations;
    - What area is *E nitens* and what area is *E globulus*;
    - What is the geographical distribution of each of those species, and their distribution by region;
    - How much of the *E nitens* estate is capable of being changed to *E globulus* or other acceptable processing species and what is the geographical distribution of those plantation areas;

- Reporting plantation forest yield and the woodflow in smoothed 10-year periods (2011-2020, 2021 – 2030, 2031 - 2040 and 2031-2050) for sawlogs, peelers and pulp logs.
- An analysis of the establishment year for all hardwood plantations including breakdown of species and pruning treatments.

- What additional area of plantation forest will be required to facilitate any total transition from native forests to plantation resources whilst maintaining the level of resource supply set out in 3.4 above? This assessment should be undertaken on a Statewide basis and by regional distribution and utilizing the "lonely tree" silvicultural treatment.
- Provide an assessment of whether or not the above area requirements are reasonably going to be available.
- Assuming all of the additional area of plantation could be established, what is the earliest date a total transition from native forests could be achieved?

Appendix 2. Outputs required to meet resource modelling requirements of the signatories.

Forestry Tasmania outputs to meet Final Resource Modelling Requirements from Signatories Scenarios Workshop 4 May 2011

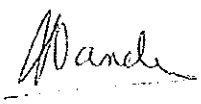
1. Report to Signatories, including a map, area statements and woodflow tables and graphs, covering:
    a. Base Case Scenario – Native Forest (Requirement 1)
    b. ENGO identified HCV Scenario – Native Forest (Requirement 3.1)
    c. Industry Resource Requirements – Native Forest (Requirement 3.4)
    d. Plantations (Requirement 4)

2. Based on the report above, commentary on the following scenarios:
    a. Transition out of non-ENGO identified HCV Scenarios (Requirement 3.2)
    b. HQ sawlog and peeler requirements end in 2014 Scenario (Requirement 3.3)

3. Further commentary on the following:
    a. What changes in silvicultural management might be required in each scenario, or could be considered, if any, to achieve desired scenario outputs and other scenario outputs.
    b. What changes to wood supply might be achievable from revising peeler specifications to smaller dimensions.
    c. If the Industry Resource Requirements are unable to be met, at what time would the resource cease to be available.
    d. What additional area of plantation forest will be required to facilitate any total transition from native forests to plantation resources whilst maintaining the level of resource supply set out in Requirement 3.4 above? This assessment should be undertaken on a Statewide basis and by regional distribution and utilizing the "lonely tree" silvicultural treatment.
    e. Whether or not the above plantation forest area requirements are reasonably going to be available.
    f. Assuming all of the additional area of plantation could be established, what is the earliest date a total transition from native forests could be achieved?

4. Timing:
    a. 19 May – Verbal report, covering item 1 above.
    b. 20 May – Interim Report, covering item 1 above.
    c. 27 May – Final Report, covering all items above.

5. Endorsed by Professor Jerry Vanclay:

Signed:  Date: 12-5-11

Appendix 3. Area of regenerated forest in production forest outside the ENGO Scenario.

Decade	Aged Regrowth primarily from CBS ha	Aged Regrowth from partial harvesting* ha
1960s	13,580	620
1970s	35,910	560
1980s	47,700	5,600
1990s	21,070	14,160
2000s	22,930	29,360
Total	141,190	50,300

*For partial harvesting, the decade indicates year of most recent harvest.

Note:

The distinction between the two columns is that areas reported in the 1st column have a single age and no significant older forest elements. The 2nd column includes regeneration that includes mature or regrowth overstorey elements.

Appendix 4. Regional comparisons of average annual yield of high quality eucalypt sawlog from public native forest for Base Case, ENGO and Industry Scenarios for the periods 2011-2030 and 2031-2050

	Base '000 m^3/yr	ENGO '000 m^3/yr	Industry '000 m^3/yr
NorthWest			
2011-2020	29	24	29
2021-2030	29	19	29
2031-2040	30	20	30
2041-2050	29	20	28
NorthEast			
2011-2020	45	24	45
2021-2030	45	25	43
2031-2040	34	25	33
2041-2050	33	27	33
South			
2011-2020	131	63	128
2021-2030	130	78	126
2031-2040	104	70	100
2041-2050	103	97	103
Total			
2011-2020	204	111	201
2021-2030	204	122	198
2031-2040	167	115	163
2041-2050	166	144	164

Appendix 5. Regional comparisons of average annual yield of peeler billets from public native forest for Base Case, ENGO and Industry Scenarios for the periods 2011-2030 and 2031-2050. NorthWest 2011-2030 assumes 39 000 m^3/yr from private/plantation

	Base '000 m^3/y	ENGO '000 m^3/y	Industry '000 m^3/y
NorthWest			
2011-2020	88	80	88
2021-2030	88	73	88
2031-2040	25	19	25
2041-2050	25	17	24
NorthEast			
2011-2020	27	16	27
2021-2030	27	14	26
2031-2040	29	21	28
2041-2050	27	21	27
South			
2011-2020	150	75	150
2021-2030	150	122	151
2031-2040	41	32	41
2041-2050	41	33	40
Total			
2011-2020	265	172	265
2021-2030	265	209	265
2031-2040	94	72	93
2041-2050	92	71	91

Appendix 6. Regional comparisons of average annual yield of arisings from public native forest for Base Case, ENGO and Industry Scenarios for the periods 2011-2030 and 2031-2050.

	Base '000 gmt/y	ENGO '000 gmt/y	Industry '000 gmt/y
NorthWest			
2011-2020	203	161	203
2021-2030	146	101	146
2031-2040	135	93	135
2041-2050	105	75	104
NorthEast			
2011-2020	454	244	445
2021-2030	446	238	427
2031-2040	229	151	218
2041-2050	214	160	211
South			
2011-2020	739	397	720
2021-2030	833	541	808
2031-2040	432	298	421
2041-2050	432	400	429
Total			
2011-2020	1396	802	1367
2021-2030	1425	880	1381
2031-2040	796	541	774
2041-2050	751	635	744

Appendix 7. Area of forest types to be logged for each decade until 2030 under the three scenarios.

Decade	Forest Type	Base ha	ENGO ha	Industry ha
2011 - 2020	Mature Eucalypt	43,190	22,620	41,380
	Mature (previously partially logged)	18,600	11,980	18,480
	Regrowth Eucalypt	35,390	19,930	34,990
	Aged Regrowth	21,300	17,710	21,270
	Myrtle rainforest	2,730	1,250	2,580
	Other / Non-forest	6,510	4,040	6,410
	Total	127,720	77,530	125,110
2021 - 2030	Mature Eucalypt	40,530	18,140	37,660
	Mature (previously partially logged)	5,280	3,610	5,240
	Regrowth Eucalypt	21,850	12,350	21,490
	Aged Regrowth	47,660	40,690	47,400
	Myrtle rainforest	2,310	1,030	2,190
	Other / Non-forest	6,370	3,900	6,240
	Total	124,000	79,720	120,220

Appendix 8. Regional comparisons of potential average annual sawlog yield from plantations for a single rotation of the currently established estate. Note that if these sawlog volumes were to be produced prior to 2030, then the subsequent sustainable yield would be compromised.

	Nitens	Globulus	Total
NorthWest	m^3/y	m^3/y	m^3/y
2011-2015	190	0	190
2016-2020	5,020	0	5,020
2021-2025	4,860	12,880	17,740
2026-2030	15,530	630	16,160
2031-2035	29,100	0	29,100
NorthEast			
2011-2015	1,210	0	1,210
2016-2020	21,960	0	21,960
2021-2025	43,620	1,190	44,810
2026-2030	47,730	1,170	48,900
2031-2035	53,510	0	53,510
South			
2011-2015	20	0	20
2016-2020	600	20	620
2021-2025	13,940	5,650	19,590
2026-2030	11,520	4,790	16,310
2031-2035	12,160	4,090	16,250
Total			
2011-2015	1,420	0	1,420
2016-2020	27,580	20	27,600
2021-2025	62,420	19,720	82,140
2026-2030	74,780	6,590	81,370
2031-2035	94,770	4,090	98,860

Appendix 9. Regional comparisons of potential average annual solid wood yield from plantations for a single rotation of the currently established estate.

	Nitens	Globulus	Total
NorthWest	m^3/y	m^3/y	m3/y
2011-2015	1,430	0	1,430
2016-2020	26,420	5,220	31,640
2021-2025	33,740	72,670	106,410
2026-2030	55,300	10,010	65,310
2031-2035	97,210	0	97,210
NorthEast			
2011-2015	11,990	0	11,990
2016-2020	100,260	12,900	113,160
2021-2025	210,350	8,670	219,020
2026-2030	190,010	12,900	202,910
2031-2035	238,210	0	238,210
South			
2011-2015	33,330	60	33,390
2016-2020	18,310	9,130	27,440
2021-2025	65,400	53,660	119,060
2026-2030	60,150	40,740	100,890
2031-2035	110,090	48,920	159,010
Total			
2011-2015	46,750	60	46,810
2016-2020	144,990	27,250	172,240
2021-2025	309,490	135,000	444,490
2026-2030	305,460	63,650	369,110
2031-2035	445,510	48,920	494,430

7. GLOSSARY

Arisings	Wood products produced additional to targeted products when harvesting an area (e.g. target is sawlogs and pulpwood is an arising).
CAR Reserve	Comprehensive, adequate and representative reserve system, established during the 1997 Tasmanian Regional Forest Agreement, meeting the JANIS criteria.
Forest Practices Code	The code established under the Forest Practices Act 1985, which prescribes the manner in which forest practices must be conducted in order to provide reasonable protection to the environment.
Forest Reserve	An area of State forest, formally gazetted for long-term intent, to be managed for recreational, scientific, aesthetic, environmental or protection purposes.
Formal Reserve	A reserve equivalent to the International Union for the Conservation of Nature and Natural Resources (IUCN) Protected Area Management Categories I, II, III, IV or VI as defined by the World Commission on Protected Areas (http://www.iucn.org). The status of formal reserves is secure, in that revocation requires approval of the Tasmanian Parliament. A forest reserve in a State forest.
High Conservation Value Forests	Forest areas required to maintain or enhance: globally, regionally or nationally significant concentrations of biodiversity values; globally, regionally or nationally significant landscape level forests; rare, threatened or endangered ecosystems; basic services of nature (eg. watershed protection, erosion control); the basic needs or the traditional cultural identity of local communities.
High Quality Eucalypt Sawlogs	First-grade eucalypt sawlogs as specified in the Forestry Regulations 2009, Schedule 1, Part 2. These logs are referred to as Category 1 sawlogs when derived from mature forests and Category 3 logs when derived from regrowth forests or plantations.
Informal Reserve	A reserve other than a forest reserve. In State forests, this comprises an area identified as a protection zone under the Management Decision Classification system. It also includes other administrative reserves on public land managed to protect CAR values.
Mature forest	Forest containing a majority of trees more than 110 years old.
Native forest	Forest consisting of tree species that are native to Tasmania, other than plantations. Native forests include mature, regrowth forests and regeneration forests.
Oldgrowth forest	Ecologically mature forest where the effects of disturbances are now negligible.
Partial harvesting	Harvesting systems which include the retention of some trees, for example, seed tree, shelterwood, thinning and variable retention.
Peeler log	Logs suitable for peeling on a lathe to produce veneer for a range of solid wood products. The veneer produced from rotary peeling is generally used for structural grade plywood, (c.f. veneer log, see below)

Plantation	Forest established by planting seedlings rather than sowing seed. Plantation areas usually have intensive site preparation prior to planting.
Pulpwood	Logs below sawlog quality but suitable for manufacturing pulp, paper and panel products.
Rainforest	Forest dominated by tree species such as myrtle, sassafras, celery-top pine and leatherwood, in which eucalypts comprise less than five per cent of the crown cover. Rainforest generally occurs in areas with high rainfall.
Regional Forest Agreement (RFA)	A long-term agreement between the Australian and State Governments, to ensure the sustainable management of Tasmania's forests.
(Aged) Regrowth forest	Forest that has been logged and regenerated, generally since 1960, using deliberate site preparation and seeding techniques. The year of sowing is documented and the age of the trees may be determined. Also referred to as silvicultural regeneration or even aged regrowth.
(Unaged) Regrowth forest	Forest regenerated after wildfire or other disturbances, and containing a majority of trees less than 110 years old, where there is no deliberate site preparation or seed sowing. Unaged regrowth forest may contain scattered individuals or stands of ecologically mature trees.
Solid wood	Wood (excluding high quality sawlog) that is suitable for lower grade sawn boards or for producing a range of products in sheet or beam form based on peeling and gluing technology.
Special timbers	Timbers used for high value furniture and craftwood products and including blackwood, myrtle, celery-top pine, sassafras, Huon pine and silver wattle. Burls and figured eucalypt timber are also included as special timbers as well as species such as cheesewood, musk, horizontal and leatherwood.
State forest	Land managed by Forestry Tasmania under the Forestry Act 1920, including purchased land.
Sustainable Forest Management	Management to maintain and enhance the long-term health of forest ecosystems while providing ecological, economic, social and cultural opportunities for the benefit of present and future generations.
Sustainable Yield	The level of commercial timber (or product mix) that can be maintained under a given management regime, without reducing the long-term productive capacity of the forest.
Tasmanian Community Forest Agreement (TCFA)	A supplement to the RFA (commonly referred to as the TCFA) signed in 2005 by the Australian and State Governments, that resulted in additional protection of oldgrowth forests in Tasmania.
Thinning	A silvicultural treatment to overstocked regrowth or plantation stands to release potential sawlogs from competition. There is no intention to induce regeneration.
Veneer log	A log suitable for producing veneer, by slicing rather than peeling.