Blueprint Institute

Seeing the forest for the trees

Exploring alternate land use options for the native forests of Tasmania

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About Blueprint Institute

Every great achievement starts with a blueprint.

Blueprint Institute is an independent public policy think tank established in the era of COVID-19, in which Australians have witnessed how tired ideologies have been eclipsed by a sense of urgency, pragmatism, and bipartisanship. The challenges our nation faces go beyond partisan politics. We have a once-in-a-generation opportunity to rethink and recast Australia to be more balanced, prosperous, resilient, and sustainable. We design blueprints for practical action to move Australia in the right direction.

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Attribution

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About the authors

David Cross

David is a public policy expert and leader with extensive experience managing large teams and providing advice across multiple portfolio areas to senior government ministers, heads of departments, c-suite business leaders, and university Vice-Chancellors. As CEO of Blueprint Institute, David leads one of Australia's newest and most dynamic public policy think tanks—crafting policy roadmaps for our political leaders in climate and energy policy, education, tax and fiscal policy, and productivity reform. His commentary has been featured in the Sydney Morning Herald, The Australian Financial Review, The Daily Telegraph, the ABC, and Sky News—as well as on numerous other outlets. Prior to joining Blueprint, David was Chief of Staff to the NSW Minister for Education and Early learning and led the crafting of significant pieces of education reform. He has also worked as a public policy adviser to the University of Sydney and as a business analyst in the private sector. David holds a Masters degree (MPhil) from the University of Cambridge in politics and international studies, and a first class honours degree from ANU. He is presently completing a PhD in public policy decision making processes at the University of Sydney.

Mark Ouliaris

Mark holds a Master of International Relations from the University of Melbourne and a Bachelor of Arts in Economics and Political Science from McGill University. Prior to joining Blueprint Institute, his passion for pragmatic and evidence-based policy reform led to stints at the Institute of Health and Social Policy at McGill University—a multidisciplinary institute for research in support of effective social policy—and Reset Australia—an initiative working to counter digital threats to democracy across the world.

Lauren Williams

Lauren holds a Bachelor of Science (Hons) in Psychology and went on to complete a Masters in International Development and Public Health (Distinction) from the University of Sheffield. Her research involved collaborating with organisations based in Nepal, South Sudan and London, working on a wide range of social policy and development issues. Following her Masters, she worked for CARE International UK, to campaign for sustainable development projects.

Claire Poulton

Claire holds a Master of International Relations from the University of Sydney with a specialisation in social research. Her thesis examined evolving conceptions of sovereignty and the nature of global environmental agreements. She has also completed a Bachelor of Communication and Media studies. Prior to joining Blueprint she worked in several digital marketing agencies, crafting strategic communication campaigns for clients in the non for profit, financial services and business space.

Jae Lubberink

Jae holds a Bachelor of Politics, Philosophy and Economics (Honours) from the University of Queensland and plans for further postgraduate study abroad. He completed a major of Economics with a focus on behavioural economics, complementing a research background in applied philosophy, geopolitics and public policy. His Honours thesis modelled the behavioural drivers of speculative asset markets, examining the implications for public policy design in the Australian housing market.

Sophie Black

Sophie holds a MA (Hons.) in International Relations from the University of St Andrews and a Graduate Diploma of Law from the University of Law in London. Her research focuses on marginalised groups in society, and she has previously written papers exploring how feminist approaches can inform policies related to human trafficking and the reintegration of Foreign Terrorist Fighters (FTFs). Sophie has experience in international development, ranging from domestic non-profit organisations to volunteer projects abroad.

Minh An Tran

Minh is completing a Bachelor of Commerce at the University of Melbourne, majoring in Economics. Throughout her degree, she has achieved a number of academic awards including Dean's List and top performer in several subjects. Minh has also previously worked as Academic Tutor for the university and plans to pursue an Honours Degree in Economics in 2023.

Executive summary

Australia is home to some of the world's most ancient forests. These native forests are some of the most biodiverse environments on the planet, and are a valuable tool in the fight against climate change through their ability to capture and store carbon and regulate the water cycle.

This paper offers policymakers a blueprint for assessing the true value of our native forests. Recognising the inherent preferencing of the quantitative (particularly when it comes to Expenditure Review Committee processes), we conduct a comprehensive cost-benefit analysis of conserving Tasmania's native forests, in particular those which are currently subject to logging by the state-run firm Sustainable Timber Tasmania (STT). This paper builds upon Blueprint's previously published studies on the economic potential of alternate land uses of native forests in Victoria's Central Highlands, and New South Wales' North Coast.

Using a cost-benefit analysis based on cash flows, we evaluate the economic potential of native forest conservation by modelling the value of carbon sequestration against continued logging. Our forecast shows that if STT ceased their native logging operations in FY2025 instead of FY2049, the use of this land for carbon sequestration would provide a **net-benefit valued at $72 million** in present day dollars. We find that a move to alternate land uses will result in a positive net present value, even when factoring in the estimated cost of providing a transitional package to the broader forestry industry to facilitate its move toward a more sustainable plantation-based future.

Our cost-benefit analysis incorporates a range of assumptions that were deliberately designed to overstate the costs and minimise the benefits of halting STT's native timber logging. Were we to remove these assumptions from our cost-benefit analysis, we find a **net benefit of $936 million** in ceasing logging immediately.[1] By including these favourable assumptions, we, methodologically speaking, have given the logging industry the benefit of the doubt—demonstrating that even when every conceivable dollar is counted in favour of STT's native timber operations, it nevertheless shows itself economically uncompetitive against alternate land uses.

The native forests of Tasmania have significant capacity to generate major alternate revenue streams that can replace that which is generated from logging—on the proviso that a robust carbon methodology is put in place, to enable the generation of Australian Carbon Credit Units (ACCUs) from a cessation of timber harvesting. In particular, we find that managing Tasmania's native forests in a manner consistent with conservation principles would abate an average of one million tonnes of carbon annually. This equates to a **net present value of $345 million** at current ACCU spot prices.

Lastly, we must comment upon the unusual and declining transparency in STT's annual reports. Other state-run forestry corporations that we have studied were noticeably less opaque, particularly with respect to pricing information. The lack of publicly available pricing information likely acts as an impediment to private investment by increasing uncertainty, thus deterring private plantation-based competitors from entering the market.

[1] For detailed information on these assumptions, please refer to the Appendix at the end of this paper.

In light of our findings, we encourage the Tasmanian Government and Opposition to work in concert with the Federal Government to enact the following recommendations:

1. Immediately cease all government subsidies to STT.
2. Legislate the end of STT's native forest logging operations in Tasmania by FY2025.
3. Implement a robust carbon methodology that would enable the generation of ACCUs through the cessation of native timber harvesting and a suite of conservation-based management practices.
4. Expand timber plantations to meet timber demand.
5. Incentivise private investment in timber plantations.
6. Improve STT's transparency to match that of other state-run forestry corporations, particularly as it relates to the price of timber.
7. Create a 'natural capital' weighting that increases the value of native forests, thus ensuring that they have a higher Benefit Cost Ratio when Expenditure Review Committee decisions affecting them are made.
8. Support the development of environmental markets to channel private capital toward nature-positive biodiversity outcomes in Tasmania.

Australian forestry

Native forestry in Australia has fallen into structural decline over the past two decades. As **Figure 1** shows, production of hardwood native logs has plummeted nationwide, falling from 10,090 million cubic metres in FY2004 to a mere 3,357 million cubic metres in FY2022.

Australian state governments have long subsidised the native logging industry, despite persistent mounting financial losses and clear warning signs of the industry's deteriorating business model. State governments across the political spectrum hold a long and unenviable record of channelling taxpayer funds to subsidise and prop up failing and unprofitable state-owned forestry firms.

There is cause for optimism, however, as a growing number of Australian states have in recent years appeared to tire of subsidising a loss-making industry—with momentum building nationwide to phase out state-backed native logging altogether.

The Victorian government was first to act. The Andrews government announced in 2019 that it planned to ban native forest logging by 2030, and recently accelerated its plans. Native logging will now end in Victoria at the beginning of 2024. Western Australia is not far behind. Citing declining native timber yields, biodiversity loss, and the potential for increased carbon sequestration by leaving native forests intact, the state decided in 2021 to cease native logging statewide entirely from January 2024 in favour of a transition to plantation forestry. Queensland, too, has initiated a process to phase out state-run native timber production—albeit at a gradual pace—starting in South East Queensland at the end of 2024.

The decline in native forest logging has coincided with the adoption of more sustainable and efficient silvicultural practices such as plantation forestry. **Figure 2** demonstrates a noticeable increase in the volume of plantation logs harvested across Australia, indicating that the goal of ending native timber logging need not necessarily result in a failure to meet ongoing demand.

New South Wales and Tasmania now stand alone as the only states without a specified timeline to end native logging. While this paper will focus its analysis on Tasmanian native forestry, it should be noted that prior Blueprint Institute research has concluded that an immediate end to native timber logging in the North Coast of New South Wales in favour of alternate land uses such as carbon sequestration and tourism will generate economic benefits to the tune of $45 million in Net Present Value (NPV).

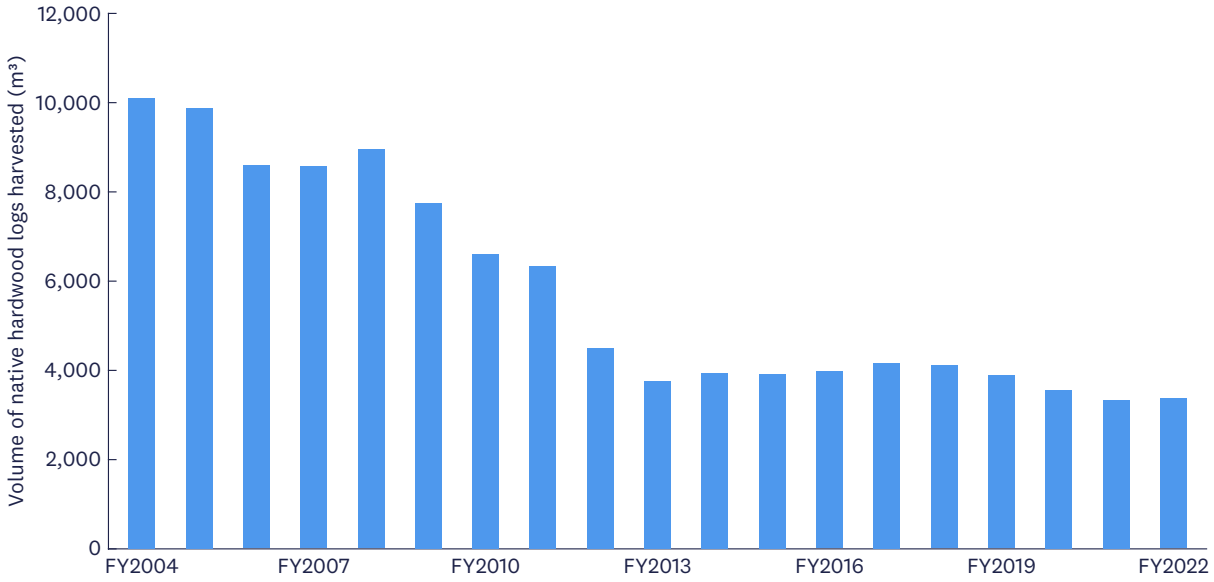


Figure 1 Decline of native hardwood logs harvested in Australia (FY2004–FY2022)
Source ABARES

Australia's environmental laws have become the subject of vigorous critique. Earlier this year a scathing review of the New South Wales Biodiversity Conservation Act led by Dr Ken Henry declared the legislation no longer fit for purpose and "incapable of achieving its objectives." The review called for a fundamental shift in public policy to one committed to "nature positive outcomes." These findings reflected those of the 2019 review of the EPBC Act.

In response, the Australian government has committed to a major overhaul of national environmental laws. Central to these reforms is the creation of legally binding national environmental standards to protect 'Matters of National Environmental Significance', including the protection of federally listed threatened species.

The Australian Government is aiming to have these laws passed by mid-2024. It has committed to applying these new standards to a range of policy instruments, including existing Regional Forest Agreements, which are foundational to how native forests are currently managed.

Given the results of several court cases in recent years that have prioritised the protection of listed threatened species over ongoing native forest wood production, it is highly likely that the combination of reformed legislation and litigation will further reduce the legal and financial viability of native forest wood production, including in Tasmania.

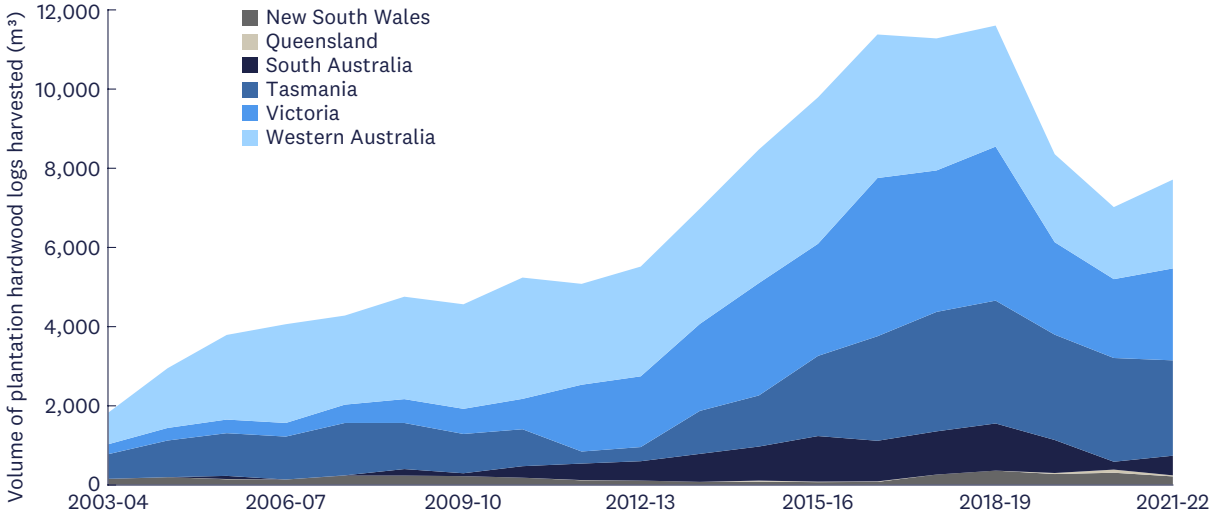


Figure 2a Volume of plantation hardwood logs harvested by state (FY2004–FY2022)
Source ABARES

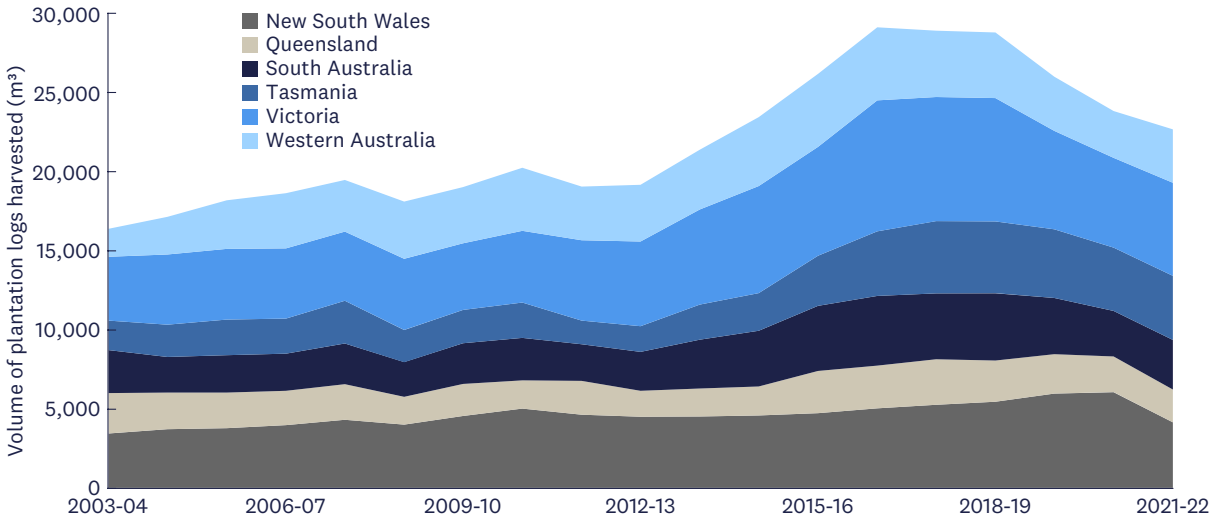


Figure 2b Volume of plantation hardwood and softwood logs in Australia by state (FY2004–FY2022)
Source ABARES

Tasmanian forestry

Tasmania has 3.045 million hectares of native forest, covering a land area of approximately 44% of the state. Two thirds of the total forest area is publicly owned, the majority of which is in conservation and public reserves.

STT, the government owned entity previously known as Forestry Tasmania, is responsible for managing over 812,000 hectares of a Permanent Timber Production Zone (PTPZ). STT is only permitted to log in areas designated as PTPZ land. This figure represents approximately 12% of Tasmania's total land area and includes 107,000 hectares of hardwood and softwood plantations, of which STT now directly owns and manages just 27,000 hectares.

As shown in **Figure 3**, approximately 21% of publicly owned forest (471,000 hectares) is currently available for timber production. The remaining PTPZ land is either earmarked for future logging operations, deemed to be of unsuitable timber quality, or forms part of the state's reserve system. In addition to state forestry land, 833,000 hectares of native forest is privately owned.

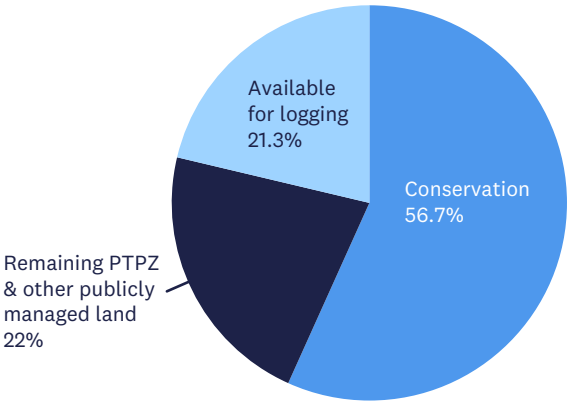


Figure 3 Composition of Tasmania's publicly owned forest estate

Source State of the Forest Tasmania 2022 Report

Note 'Available for logging' figure calculated in 2021

The Tasmanian forestry industry, like that throughout the rest of Australia, has been the subject of repeated operational restructuring. This has been a response to both environmental opposition and declining profitability.

To balance these conflicting considerations, four different agreements have been established in the last 30 years. These are the Tasmanian Regional Forest Agreement (1997), the Community Forest Agreement (2005), Tasmanian Forest Agreement (2012), and Forestry (Rebuilding the Forest Industry) Act (2014).

In 2017, the Tasmanian Regional Forest Agreement was extended for another 20 years up until 2037. This bilateral agreement between the state government and the commonwealth is subject to indefinite extension on a rolling basis, provided it passes a review conducted every five years. The most recent review of the Agreement, initially scheduled to be released during mid-2023, has yet to be published at the time of this report's writing.

Successive agreements have gradually shrunk the area of land available for logging operations. For STT, this reduction in harvestable land area has been accompanied by concurrent increases in conservation areas, which it is expected to manage. To compensate for these structural adjustments, STT has received significant government funding—between 2004–2017, the organisation was awarded an estimated $331 million in Federal and State subsidies.

STT is commercially responsible for the annual supply of 137,000 cubic metres of high quality sawlog. Additionally, per their long term contract, STT must supply 157,000 cubic metres of peeler log to the Malaysian owned timber company Ta Ann. Yet, it is crucial to note that less than 10% of the total volume of harvested timber from native forest is high quality sawlog, with the majority of wood harvested being processed as low value pulpwood.

Tasmania currently has approximately 278,000 hectares of plantations, the majority of which (250,000 hectares) are privately owned. Although Tasmania derives a greater share of timber from its native forest, both the volume and value of timber from its plantations vastly exceeds that from its native forests. In 2021, approximately 78% of wood products in Tasmania came from plantations.

The forest wars

Tasmania has a long and proud history of environmental activism. The United Tasmania Group, the forerunner to the world's first ever Greens party, arose in opposition to rapid, large-scale development. Specifically, it was the decision to flood Lake Pedder as part of the Upper Gordon River Hydro-electricity Scheme in 1972 that saw a group of activists unite in opposition to what they saw as wholly unnecessary environmental destruction.

The campaign to stop the destruction of the lake was ultimately unsuccessful, but a decade later a larger, more sophisticated campaign did indeed prevent the destruction of the Franklin River. By the 1980s, disputes over the construction of hydroelectric dams began to evolve into conflicts over the logging of native forests, which persist to this day.

The federal government first awarded funding to states for investment into softwood plantations in the 1960s. Given the fast-growing nature of pine, it was deemed an expedient, cost-effective material to support the needs of the nation's growing population. However, to make room for the plantations, native forests were cleared at double the rate they had previously been. Around the same time, the forestry sector changed from a relatively labour-intensive industry that primarily consisted of "small sawlog production for local need" to one of industrialised clearfelling for woodchip exports.

This rapid destruction of native forest incensed the growing environmental movement. As dramatic images of clear felled forests were circulated in the media, protestors took to the streets in the name of preserving 'wilderness.'

The environmental movement, led by organisations such as the Australian Conservation Foundation, proved highly effective political campaigners. Over time, areas of native forest were placed into reserves, thereby limiting the total land area available for logging operations. Since the 1980s, members of the environmental movement have argued for an end to native logging and a transition to a wholly plantation focused industry. This has sparked considerable resentment amongst foresters, who perceive such a proposal as a denigration of the industry many have committed their lives to, as well as displaying a callous disregard for the economic wellbeing of forest dependent communities.

These disputes led to some of the most protracted and hostile exchanges between foresters, conservationists, and politicians in Australia. The infamous 'forest wars' moniker was coined in reference to this fierce opposition that (though in a more muted fashion) prevails to this day.

Successive Regional Forest Agreements have sought to quell this social unrest and balance economic and environmental concerns. One such agreement was entered into in 2012 after negotiation with the timber industry, government and environmental groups. At the time, Forestry Tasmania was obligated to make available 300,000 cubic metres of high quality sawlog. Under the new agreement this was reduced to 137,000 cubic metres whilst an additional 500,000 hectares of forests were placed into reserves. Funding of $277 million was also pledged to compensate workers in light of the downturn in the industry, as well as facilitate the creation of new reserves and fund appropriate regional development projects.

The agreement was subsequently torn up in 2014 upon the election of the new Liberal government, and replaced with the (Rebuilding the Forest Industry) Act. Under this new agreement, the minimum volume of high quality sawlog Forestry Tasmania was to provide remained at 137,000 cubic metres per year, but 400,000 hectares of previously protected reserves were reclassified as Future Potential Production Forest (FPPF). This area of forest was thus made available for logging operations, but not until after 2020.

Perhaps due to a reluctance to antagonise environmental groups, however, nearly a decade after the repeal of the 2012 Tasmanian Forest Agreement, the FPPF lands remain largely untouched. It has not been until recently that the Tasmanian Sawmillers Association has called for access to the FPPF.

takayna

takayna / Tarkine, in northwest Tasmania, has become a contemporary focal point of the bitterly contested forest wars. It is a place of significant Aboriginal cultural heritage with signs of human activity dating back at least 40,000 years. The Tarkine is home to a range of endemic native species and holds significant economic potential as a source for mining activities, carbon trading and tourism.

Disputes over competing land uses have existed in the region for decades, and have been the source of deep political tension throughout the Tasmanian economy. Contemporary sources of conflict centre around mineral extraction and the logging of old growth forest. Approximately five percent of the Tarkine's native timber is available for logging and managed by STT, whilst a further 19% has been placed in a 'wood bank' for potential future harvest.

Conflict also persists around heritage status. In 2004 the Tarkine National Coalition nominated 447,000 hectares of the Tarkine to the National Heritage List. The Tasmanian government vehemently opposed the proposal on the basis that it would impede the development of the mining and forestry sectors, and exacerbate Tasmania's struggles with unemployment. Thus, despite the conclusion of the AHC that the Tarkine was likely to be of "outstanding heritage value," the then federal environment minister Tony Burke conceded to only list 21,000 hectares of the Tarkine as protected heritage land—just 5% of the originally nominated area.

A brief financial history of Sustainable Timber Tasmania

Since the 1970s, the majority of timber extracted from native forests has been exported as low value woodchips, primarily to Asia. This has left the industry vulnerable to external market fluctuations. The woodchip market showed signs of diminishing returns from as early as FY2006. That year, the Chairman's report described the trading situation as "difficult." As sales revenue fell, harvest and haulage related costs did not, leading to greater year-on-year losses.

A series of Auditor-General reports investigating the long term financial sustainability of Forestry Tasmania found that between FY1994–2010, the company's net debt and superannuation obligations ballooned whilst profits declined. Central to the report's findings was the need for greater economic agility from Forestry Tasmania, with the Auditor-General noting that they had failed to adapt to changes in the wider industry.

From 2010 onward, export demand for woodchips declined dramatically, particularly within Japan, which up until that point, had been the primary destination for Australian woodchip exports.[2] This, combined with the lingering effects of the Global Financial Crisis, the relatively strong Australian dollar, and the growing preference amongst export markets for forest stewardship certified timber (a certification STT has yet to acquire), saw Forestry Tasmania's sales plummet by over 40% in FY2012. This resulted in an operating loss of $27.6 million.

The diminishing woodchip market eventually led to the collapse of Gunns Limited in 2011, culminating in the sensational arrest of its CEO for insider trading. Gunns was, at the time, the largest hardwood sawmiller in the Southern Hemisphere and a major source of employment in Tasmania. Forestry Tasmania would later cite the consequent increase in transport costs due to the redirecting of supply chains in the wake of Gunn's closure as one of the reasons for the diminishing financial results.

After its collapse, areas of native forests previously managed by Gunns were placed in interim reserves as the various stakeholders negotiated a new forestry agreement. As a result, Forestry Tasmania's sales revenue fell to a record low of $56,338 during FY2013—a 63% decline from two years earlier.

In light of its diminishing financial position, Forestry Tasmania responded by cutting costs by $13 million the following year, primarily through redundancies. Between FY2013-FY2015 Forestry Tasmania culled approximately 30% of its workforce.

[2]The FAOSTAT data we are referring to can be replicated by selecting the following variables: Element: export value; Item: Wood chips, particles and residues + (Total); Area: Australia; Aggregation: average; From year: 2010; To year: 2022.

When the newly elected Hodgman government came into office in 2014, it pledged to reinvigorate the industry and transition Forestry Tasmania to a commercially viable entity. However, far from dispensing with government subsidies, the new Liberal government assumed "responsibility for $113m of unfunded superannuation liabilities that Forestry Tasmania had on its books for past employees."

The reasons for STT's inevitable financial decline are simple. Like other state-run logging enterprises, STT sells its wood to sawmills as part of long term wood supply contracts. The exact price at which STT sells its timber, as well as information related to the age of the forest at harvest, is hidden behind an opaque veil of "commercial in confidence." However, the company's Board admitted in 2016 that the price was too low to make a profit.

Proponents of the forestry sector have long argued that their diminishing financial position is due to areas of native forests being locked up for conservation, but the true problem is that STT is selling its harvested timber for too cheap a price and undercutting competitors. The only possible effect of exposing more areas of native forest to logging would be to increase supply, putting further downward pressure on prices.

Anticompetitive practices have been propagated by powerful lobbying forces, including the Tasmanian Forest Products Association (TFPA), an industry group representing forest growers and processors in Tasmania. Earlier this year, STT commenced an open Expression of Interest (EOI) for the sale of future supply of high quality plantation sawlog. The TFPA responded in a letter to the state Premier, asking him to intervene by immediately putting an end to the EOI process, and guaranteeing local sawmills preferential access to all of STT's high quality sawlog.

The response to the letter was remarkable and sheds a great deal of light on the political dynamics underlying STT's chronic predatory pricing of timber. The leader of the Tasmanian Labor Party seized upon the opportunity to profess their support for regional jobs by pledging to adhere to the TFPA's requests under a so-called 'Tasmanian First Forest Policy'. Both leaders fell over themselves attempting to assuage the TFPA's concerns.

Since Braddon has historically been a key swing seat, both sides of politics have been eager to appear as allies to the forestry industry. Election campaigns often dissolve into a competition between the major parties at who can sympathise with the status quo the loudest.

However, from an economic perspective, the twin goals of both providing first preference to local sawmillers and achieving a sustainable, market value price of timber are at odds with each other. If STT is barred from the most basic operational principles of a functional commercial entity, namely the ability to sell its product on an open competitive market, it is hardly set for success.

Given Tasmania's history of relatively high unemployment and the fact that the majority of forestry related employment is concentrated in the wood manufacturing sector, it is understandable why both major parties would seek to support local industry. But persisting with interventionist policies to manipulate the market does little to ensure the sustainability of the forestry sector. Rather, it entrenches dependence on government intervention.

We have seen this precise dynamic play out before. In 2016, the Board of Forestry Tasmania formally advised shareholder Ministers that the company would be unable to meet their legislated quota of high quality sawlog and remain profitable. The government rejected a proposal to reduce the wood supply quota—given that it would harm the interests of local sawmillers—and instead responded to the Board's concerns by repackaging and rebranding the company as Sustainable Timber Tasmania.

The new operation promised to be more efficient, leaner and agile. To service the company's debt and transition it to a more sustainable financial future, 29,000 hectares of hardwood plantations were sold off for $62 million. Selling off core assets at a loss to remain solvent in the short-term is a technique that has been utilised previously. After selling its remaining 50% stake in 46,000 hectares of softwood plantations in 2012, the $78 million Forestry Tasmania received

from this sale was used to repay $40 million in debt.[3] However, this period of solvency proved short-lived—the fundamental flaws in Forestry Tasmania's operating model meant that by 2017 the company once again had $30 million worth of debt on its books.

Since the rebrand, STT claims to have transitioned to a more sustainable financial model, reporting modest headline profits over the last five financial years. However, when assessing STT's financial history, the reported headline figure is misleading. Significant fluctuation in the value of the forest estate and other non-cash items obscure the actual financial position of the company.

Evaluating cash flow from operations is a more accurate means of assessing commercial viability. Cash earnings from operations paint a damning picture—STT has made an operational loss of **$7.7 million** over the past six financial years, dating back to FY2017.[4] Forest product sales revenue has also decreased significantly within the last two years—and these losses do not reflect the diminishing value of the forest estate itself.

At the time of writing this report (before the release of STT's FY2023 annual report) the methodology used by STT when valuing the forest estate is based on estimated future net income minus harvesting and other costs. This value is then split amongst the three component parts of the forest—the land, roads, and trees themselves. The utility derived from a rich ecological and biodiverse ecosystem within these forests is not considered in the valuation.

Since 2010, the land has been attributed zero value, whilst the worth of the trees and roads has steadily dwindled. In 2014 the value of the trees was almost equal to that of the roads. This indictment calls into question the financial sustainability of native forest logging. It is hardly sound economic logic to harvest timber when the infrastructure essential for the task holds an equivalent value to the timber itself.

The response from Forestry Tasmania was to alter the accounting methodology used to determine the value of the roads. Whereas previously the roads had been valued according to their estimated present worth less depreciation, from 2015 they were instead allocated a value based

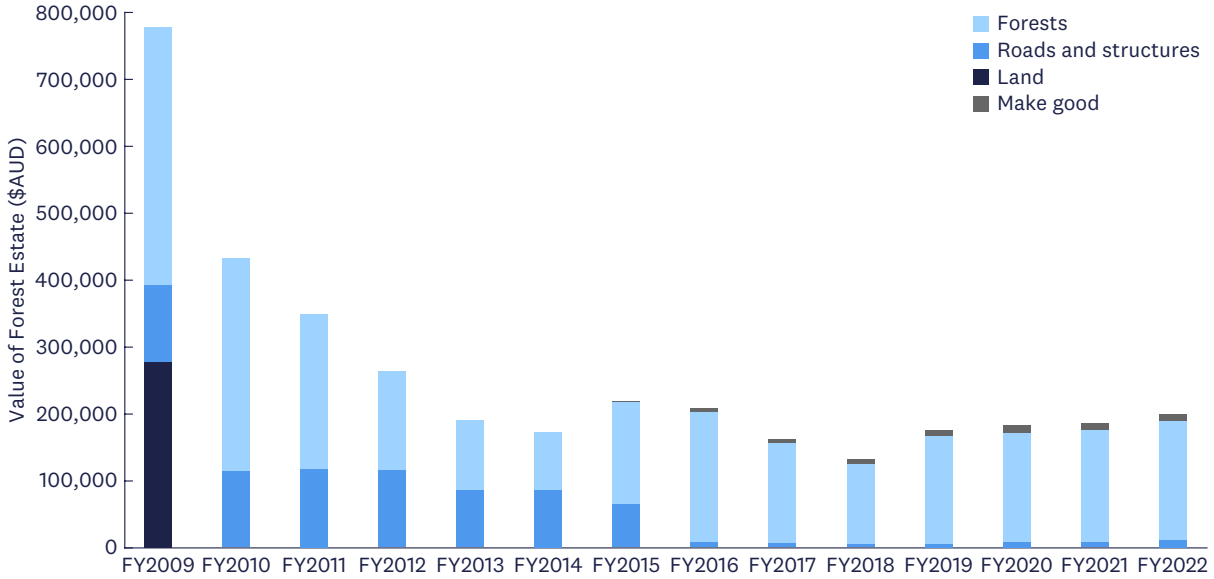


Figure 4 Declining value of the Tasmanian Forest Estate (in nominal terms) and changing accounting methodology after FY2010 (FY2009–FY2022)

Source Sustainable Timber Tasmania annual reports 2009–2022

[3]See Statements of Cash Flows (pg11) in STT's FY2013 annual report to observe a total of $39.8 million in the "Repayment of borrowings" line item over FY2012 and FY2013.
[4]Note that this includes "Payments for property, plant and equipment and other assets" which STT treats as an investment outflow. Based on past performance, we do not believe such investments are likely to yield future profits and have therefore treated this line item as an operational expense. We have likewise treated the line item "Payments to suppliers and employees for biological assets" similarly and expensed 50%.

on road tolls earned. This led to a massive write-down in the value of the roads (see **Figure 4**).

Resorting to accounting sophistry to obfuscate the financial realities of the company's position is typical of Forestry Tasmania. According to STT's FY2022 financial report, the forest estate including the land, trees, and roads were valued at just under $200 million. While this represents a six-year high, it remains well below the FY2009 value of $778 million. In short, the forest estate is now deemed to be worth $578 million dollars less than it was over a decade ago.

For the past 20 years, policymakers have sought to scale up plantations and transition away from reliance on native forest operations. Between FY2005-2010, Forestry Tasmania invested $450 million in asset and plantation development. Approximately half of these funds were awarded to the company by various government subsidies. However, little has come from these efforts, as STT now directly owns and manages just 27,000 hectares of plantations.

The situation for STT now appears to be similar to that of VicForests. To service its contracts, it must venture into more remote coupes, thereby increasing costs. STT is required to publish a review every five years examining the sustainable yield of high quality eucalypt sawlogs from state forests. In the latest report, the company openly concedes that from FY2028 onwards the predicted high quality sawlog yield from eucalypt native forests is expected to decline by 60% to approximately 58,000 cubic metres per year.

In order to meet the legislated quota of 137,000 cubic metres, STT claims that the remaining amount will be "augmented by significant additional quantities of high-quality eucalypt sawlogs from eucalypt plantations." Thus, STT now has little choice but to embrace a plantation focused future.

Plantations

Hardwood plantations in Australia have predominantly been managed to produce pulpwood for export markets, first to Japan and more recently to China. In contrast, softwood plantations, many of which were established in the 1960s, have been used for the supply of sawn timber.

Tasmania currently has approximately 278,000 hectares of plantations. 250,000 of these hectares are privately owned or managed, with the remainder directly owned by STT.

While plantations should not be expected to replace native forests tree for tree, an expansion in plantation forestry is essential to ensure a sustainable future for the forestry industry. Yet, as **Figure 5** demonstrates, plantation establishment in Australia has largely stagnated over the past 10 years.

Whilst Tasmania currently has the largest share of hardwood plantations of any Australian state, the number of these has been in decline. The total area of hardwood plantations decreased by 14% during the period of 2016–2021, largely due to private owners converting their land to agricultural purposes after harvest. At present, the Tasmanian Government has no plan for plantation expansion to replenish the area lost.

The federal government, by contrast, has acknowledged that plantation establishment is key in expanding domestic timber supply, committing $74 million in last year's budget to the expansion of softwood and hardwood plantations over four years from FY2024.

Attracting adequate private investment remains one of the foremost barriers to expanding plantations. This is primarily due to the high upfront costs and extended period between planting and harvesting, which makes it difficult for plantations to compete with the more immediate returns of agricultural land use. These factors combined with limited available land means that the most viable avenue for increasing plantations in Tasmania lies in agroforestry—namely, the practice of planting trees on existing agricultural land.

The agricultural industry constitutes a substantial contributor to the Tasmanian economy, with livestock alone generating a gross value-add of $1.3 million in the 2020–2021 period. By incentivising private owners with the opportunity to diversify their income streams and thus the profitability of their land, agroforestry emerges as the attractive solution for expanding Tasmanian plantations without compromising agricultural output. Studies also

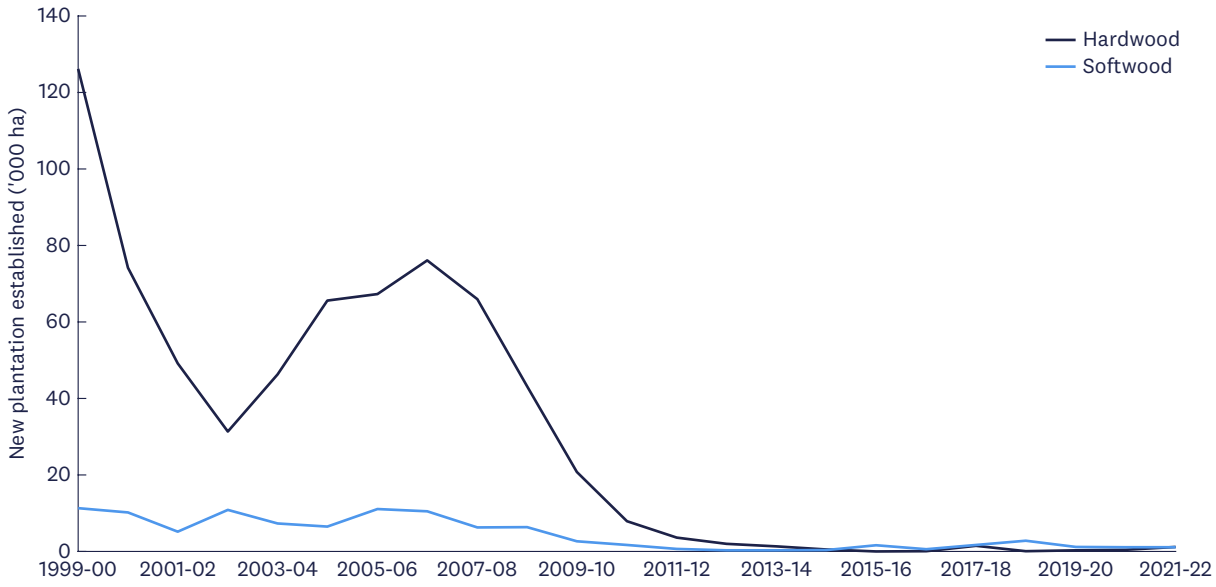


Figure 5 Plantation establishment in Australia has stagnated over the past 10 years (2000–2022)
Source ABARES

indicate that agroforestry has the additional benefit of providing shade to livestock, thereby improving paddock productivity by up to 8%.

Notwithstanding these potential benefits, both financial and knowledge barriers may be inhibiting the uptake of agroforestry practices. These barriers include both the cost of planting, and a lack of information on the benefits of agroforestry and appropriate planting practices.

Encouraging farmers to adopt agroforestry practices will involve a multi-faceted approach that combines financial incentives with technical support—including expert consultations, training, and research and development. Financial support could come in the form of philanthropic grants, public finance, impact investment, tax incentives for income generated from agroforestry activities, or revenue through carbon credit schemes by planting the trees.

Awareness and education initiatives will be vital for uptake—developing resources that provide farmers with comprehensive information on the benefits and methodologies will be crucial to scale agroforestry. Case study farms could also be utilised to demonstrate successful models in action.

Most critical to ensuring the viability of farmers' wood-based products will be the creation of a competitive market with high accessibility for private growers. Historically, STT has sold its wood to sawmills at prices that are substantially lower than observed in other states, indicating that it will be difficult for private companies to compete in the current market.

New Zealand sets a positive example of how a transition to a plantation focused industry may be managed. Indeed, forestry is projected to become the country's leading export industry within the next two years. Even when comparing plantation forestry to agricultural land use, plantations offer substantially greater value-add.

Under the One Billion Trees program, launched in 2018, the New Zealand government allocated $234 million worth of grant funding to incentivise landowners to plant trees and foster native species regeneration. In addition to landowner grants, partnership grants were also offered to share the cost of large-scale planting projects. The program also included increased support for research to enable more productive forestry management practices.

Another relevant case study to consider is Victoria. To compensate for the reduction in native timber harvesting, the Victorian Government has invested $120 million to grow the state's domestic plantation industry. This is being matched by private plantation company Hancock Victorian Plantations (HVP), which plans to plant 16 million new trees.

Existing private landowners are being encouraged to enter leasehold agreements with HVP, while also being offered a farm forestry option to enable the integration of plantation forestry into their existing agricultural practices. Additionally, through the Forestry Transition Program, the government is providing support to businesses in the native logging industry to adapt their practices, thereby allowing them to process logs from plantation-grown trees.

Hydrowood

Hydrowood, an innovative approach originating in Tasmania, offers a promising solution for diversifying the supply of native timber while also buying time for a transition toward plantation focused silvicultural practices. Hydrowood involves salvaging timber from submerged forests nestled within hydroelectric dam reservoirs which have remained underwater for more than three decades—a consequence of hydroelectric projects in the region.

The method has already resulted in 6,000 cubic metres of hydrowood being harvested from Lake Pieman, with 60,000 cubic metres yet to be uncovered. The timber species accessible through the Hydrowood process includes Myrtle, Blackwood, Celery Top Pine, Huon Pine, and Sassafras.

Hydrowood has the potential to supplement the supply of Tasmanian native hardwood by providing an additional source of timber that does not necessitate harvesting from existing native forests. This process therefore reduces the environmental impact of logging and safeguards the biodiversity of native forests.

While hydrowood presents a viable avenue for timber acquisition, it is inherently a finite resource. As such, it cannot serve as a sole and enduring solution for the production of Tasmanian hardwood timber, but could serve as an interim measure during the transition towards more long-term plantation forestry practices.

A cost-benefit analysis of STT's native logging operations

Australian forestry policy has long been overly and narrowly focused on the commercial value of native timber. This has led to distorted outcomes that undervalue the more intangible—but nevertheless legitimate—benefits that could be derived from a policy shift toward conserving our distinctive ecosystems. These intangible benefits include improvements to social, psychological, and physical well-being, safeguarding habitats for endangered species, and enhancing biodiversity.

While there is a strong argument that such benefits should be accounted for in any cost-benefit analysis, we have chosen not to include them in this particular analysis. Due to their intangible nature, any valuation we arrived at would be subjective, and could ultimately divert attention away from our main conclusion that STT's native logging operations are unsustainable based only on quantifiable economic variables.

Our omission of intangible benefits is far from the only assumption we have made that tilts this analysis in STT's favour. In addition, we have also significantly underestimated STT's cost of logging native forests, inflated the price of their wood products, underestimated the value of carbon abatement from ceasing native logging, left out the potential benefits from expanded tourism on newly conserved land, and overestimated the impact of ceasing STT's native logging operations, thus inflating the cost of our industry transition package.

We made these choices deliberately, both to inoculate this analysis against any criticism that we have somehow been unfair to STT, and to demonstrate that even when every assumption is biased in its favour, we cannot come to the conclusion that continued native logging makes economic sense.

Specifically, our cost-benefit analysis concludes that ending state-run native logging operations in Tasmania would deliver a social benefit of $72 million in present day dollars compared to the business as usual case of continuing to log until FY2049 (see **Table 1**).

Benefits	
Avoided costs from logging	$637 million
Carbon sequestration value	$345 million
Total	**$983 million**
Costs	
Forgone logging revenue	$719 million
Industry adjustment package	$192 million
Total	**$911 million**
Net present value (Benefits less Costs)	**$72 million**
Benefit-cost ratio	**1.08**

Table 1 Cost-benefit analysis comparing business as usual to ceasing STT's native forestry operations in FY2025

Source Professor Andrew Macintosh, Blueprint Institute analysis

Notes NPV factors in a seven percent discount rate. For technical details on our cost-benefit analysis, refer to the Appendix at the end of this paper.

[5]For detailed information on these assumptions, please refer to the Appendix at the end of this paper

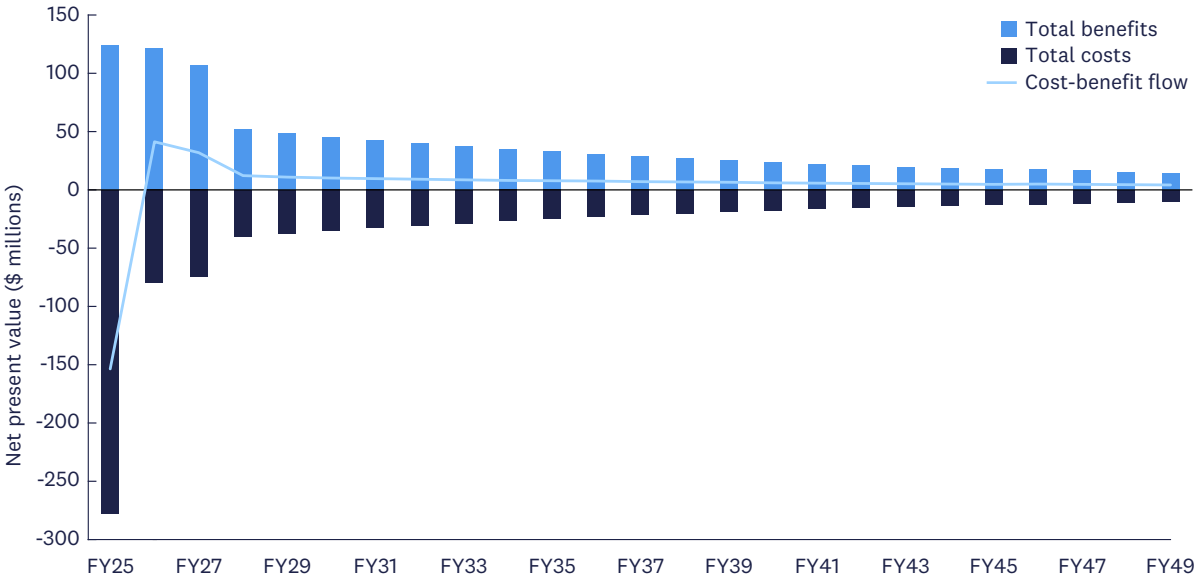


Figure 6 Annual cost-benefit flow in the scenario STT ceases native timber harvesting, including carbon benefits and cost of an industry transition package (FY2025–FY2049)

Source Blueprint Institute analysis

Note A seven percent discount rate is applied.

Carbon

We project that halting native timber logging in favour of managing Tasmanian native forests in accordance with conservation principles would abate an average of roughly one megaton of carbon dioxide equivalent annually.

Valuation of this amount of carbon sequestration is unavoidably imprecise. There is no one uniform carbon price in Australia, and the trajectory of prices is subject to market fluctuations and unpredictability.

During the Emissions Reduction Fund (ERF) most recent auction in March 2023, the average price per tonne of contracted carbon abatement was $17.12. By contrast, Australian Carbon Credit Units (ACCUs) were auctioned at a spot, or marginal, price of $31.00 in October 2023.

Since it is a marginal price, and these ACCUs would hypothetically be introduced into the market on a marginal basis, we have chosen to value the carbon abatement using the ACCU price instead of the ERF average price. As opposed to the business-as-usual approach of continued native timber logging from FY2025-FY2049, a cessation of native timber logging beginning in FY2025 would translate to a NPV of $345 million (see **Table 2**).

Cumulative carbon abatement from stopping native logging from FY2025–FY2049	25.30 $MtCO_2$-e
Cumulative ACCU potential from stopping native logging from FY2025–FY2049	23.657 million
Australian carbon credit unit spot price (per tonne of CO_2, October 2023)	$31.00
Net present value	$345 million

Table 2 Net present value of carbon abatement due to cessation of logging (2023–40)[6]

Source Professor Andrew Macintosh, Blueprint Institute analysis

Note A seven percent discount rate is applied

[6]Please see the appendix for a detailed explanation of our carbon projection methodology.

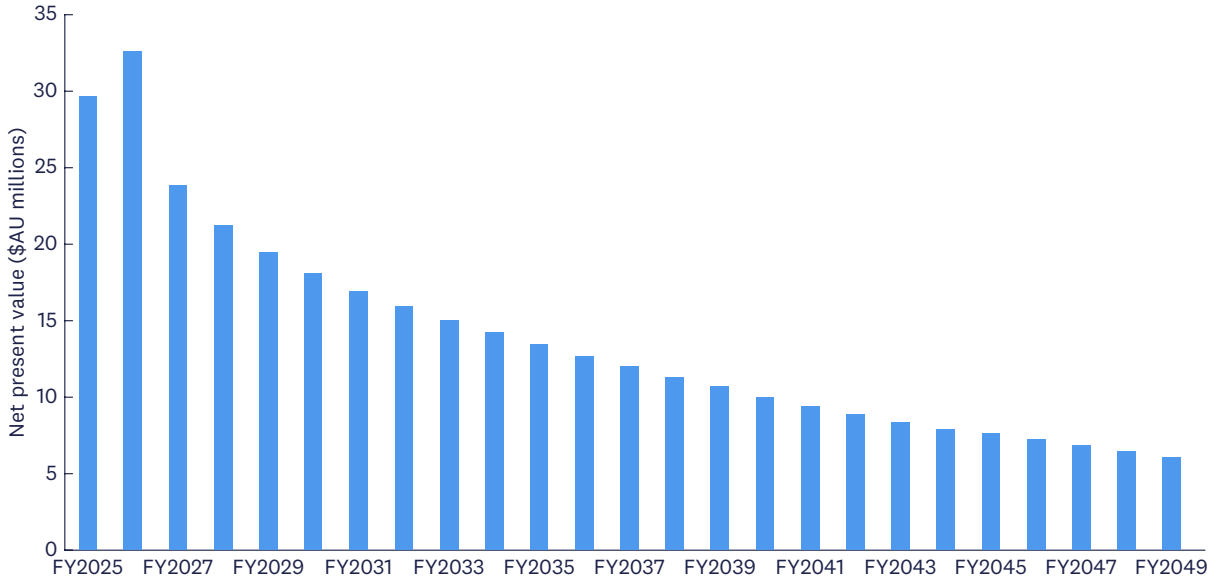


Figure 7 Net present value of carbon abatement due to cessation of logging (FY2025-FY2049)
Source Blueprint Institute analysis
Note A seven percent discount rate is applied.

While we recognise that there is no current legal mechanism to allow conserved native forest to generate ACCUs, it is our position that this should be rectified. The generation of ACCUs from native forests would generate significant revenue for the Tasmanian Government to fund reform and strengthen the long-term management of native forests in Tasmania. Such a legislative change is timely, since STT will be required to dramatically decrease wood production through reduced sustainable yield calculations in any case.

We are pleased to report that proposals have been developed by the Australian Climate and Biodiversity Foundation, with the backing of key stakeholders, to develop a carbon methodology that would enable the generation of ACCUs through a cessation of native timber harvesting and a suite of complementary management practices.

In the meantime, we readily concede that it would arguably be more appropriate to use a social price of carbon for our valuation. However, using a social price of carbon would violate the guiding principle of this paper—that is, to tilt every assumption in favour of STT.

Estimates of social prices of carbon vary widely, but are all universally much higher than the current ACCU price. For example, estimates from credible sources vary from $81 to around $300. In the same spirit as eschewing the use of the comparatively higher social price of carbon, we have not accounted for any real growth in ACCU prices through to FY2049. That is to say, we assume that the price of ACCUs will remain at $31 for the entire projected period, leading to an extremely conservative valuation.

Carbon myths debunked

Native forests act as natural carbon sinks, absorbing carbon dioxide from the atmosphere and storing it. This means that when a forest is logged or cleared, carbon is released back into the atmosphere. To account for this, foresters are legally obligated to replant native forests after logging. However, it takes centuries for a young forest to reach maturity and capture the carbon released through logging. Recent analysis has shown that logging activities in Tasmania's native forests are responsible for emitting 4.65 million tonnes of carbon annually. This makes the forestry sector Tasmania's highest emitter, akin to the emissions produced by 1.1 million cars.

Research into carbon dioxide removal strategies has stressed the critical significance of expanding forest carbon sinks and lessening deforestation emissions to effectively limit global warming to either 1.5°C or 2°C.

Tasmania's native forests are among the most carbon-dense in the world—the Tarkine rainforest alone is responsible for storing over

100 million tonnes of carbon. Assessments of carbon stock in live vegetation in Tasmania's forests show that 97% of the carbon is stored in native forests, compared to just three percent in plantations. Preserving native forests offers significant climate positive outcomes compared to a continuation of harvesting activities.

This link between forestry and carbon emissions was demonstrated in the 2011 collapse of Gunns Limited, which led to a sudden and precipitous drop in Tasmanian pulp log production. Correspondingly, this period saw a significant decrease in emissions from the forestry sector, with a recent study indicating that the relative contraction in the forestry sector between 2005–2018 resulted in "large scale avoided anthropogenic emissions."

A common misconception among proponents of native logging is the notion that carbon continues to be stored in wood products after processing. Whilst this is true to a minor extent, the amount of carbon stored in wood products is miniscule compared to that stored in undisturbed forests, as illustrated in **Table 3**. Moreover, only around a quarter of the total volume of wood derived from native forests is converted into timber based products. The remaining 75% is turned into disposable products such as paper or wood chips, which is even less effective at storing carbon.

Tenure	Year	Live Vegetation		Debris		Wood products	
		Min	Max	Min	Max	Min	Max
Public							
	1990	1023	1291	776	1006		
	2000	1059	1337	799	1036		
	2010	1048	1343	779	1060	0.3	0.5
	2020	1036	1326	825	1090	1.7	2.4
	2030	1037	1327	830	1106	1.9	2.6
	2040	1058	1354	829	1127	1.6	2.2
	2050	1061	1354	828	1149	2.1	2.9

Table 3 Estimated native forest carbon stocks (Mt CO_2-e) in live vegetation, debris, and wood products from 1990–2050

Source CO_2 Australia Limited, Tasmanian Forest Carbon Study

The forestry industry also frequently posits that any reduction or cessation of native logging activities within Australia would result in a corresponding increase in emission intensive hardwood products imported from unsustainable Southeast Asian forests, thereby increasing net global emissions.

However, such arguments do not reflect historical reality. Although the forestry sector has undergone a significant decline (see **Figure 8**) in the last 30 years across all state jurisdictions, Australia has not seen a concurrent increase in the volume of imported wood products.

Historically, timber from Australia's publicly owned native forests was used for either the domestic supply of sawnwood (the processed product of sawlog) and wood-based panels, or the sale of pulpwood (to be processed into paper or woodchips) to domestic and international manufacturers.

As seen in **Figures 9a, 9b** as the volume of Australian native hardwood sawnwood has declined, it has largely been substituted by sawnwood from domestic softwood plantations. Most of these plantations were established over the period 1960–1990. As the below figures show, rather than demand for native sawnwood being met with overseas product, there has in fact been a decline in imports of hardwood sawnwood since the 1990s.

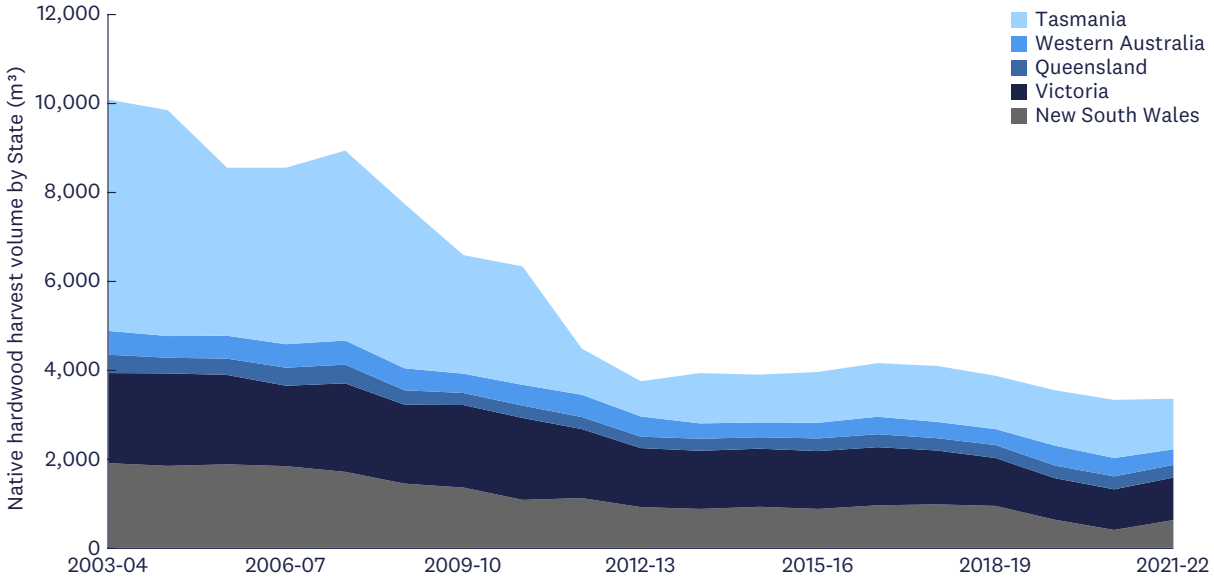


Figure 8 Volume of hardwood native logs harvested by state (2003–2022)
Source ABARES

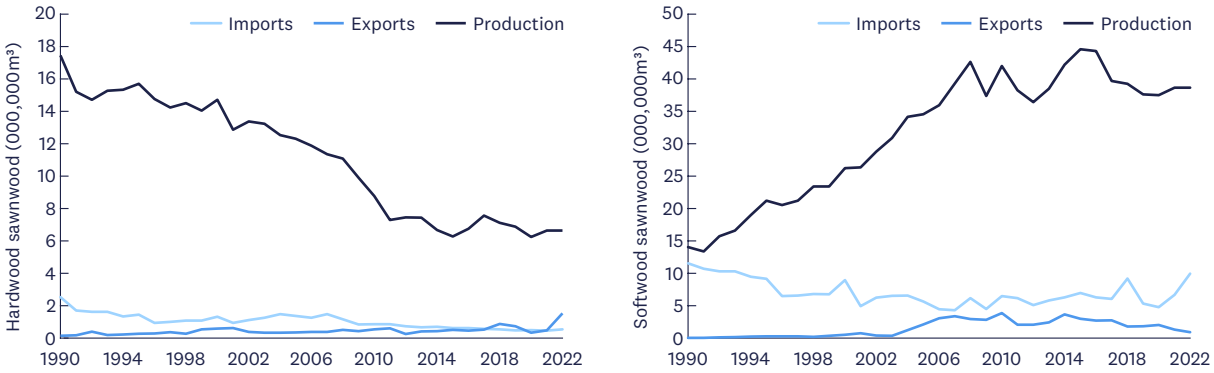


Figure 9a, 9b Import, export and production volume for hardwood and softwood (1990–2022)
Source FAO

Hardwood plantations have also been able to adequately compensate for the reduction in native pulpwood. This is demonstrated by **Figure 10**, which shows the significant increase in hardwood plantation pulplog over the past two decades.

Moreover, claims made by those in the forestry industry that a decline in Australian woodchip exports would be substituted by increased imports from developing countries with less stringent regulations on native logging such as Indonesia have proven false. Within international markets wood chips are increasingly being sourced from plantations, specifically from Vietnam. For instance, both Japan and China have significantly increased their share of Vietnamese sourced pulplog over the past decade.

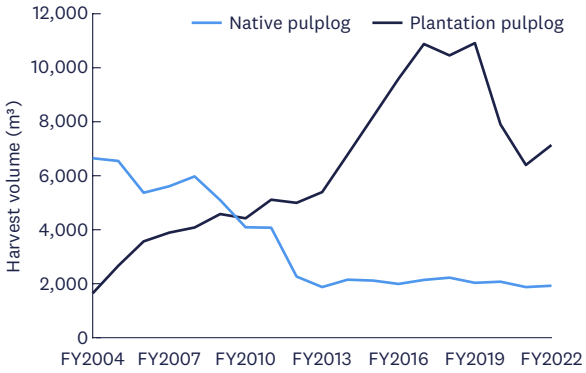


Figure 10 Comparison of harvest volume between plantation and native pulplog (FY2004-FY2022)

Source ABARES

Historical precedent and the dynamics within international markets suggests that any decrease in the supply of native timber is likely to be met by plantations, thus presenting minimal carbon leakage risk.

Previous studies which have emphasised a significant risk of carbon leakage have made methodological assumptions we regard as inappropriate in the context of this report. Specifically, the use of Attributional Life Cycle Assessment tends to rely on data pertaining to historical flows, for this reason it is often referred to as backward-looking. Such a methodology does not account for likely future practice or consider how law and policy changes may affect the consequences of a reduction in wood supply.

Proponents of continued native logging also argue that a decline in native timber will prompt reliance on emission intensive substitutes such as steel and concrete. However, an increase in such materials should not increase emissions provided relevant policies function as intended.

The recently strengthened safeguard mechanism is designed to act as a kind of emissions trading scheme. It subjects industrial facilities emitting more than 100,000 tonnes of carbon dioxide equivalent per year to an emission reduction cap or baseline, which gradually declines over time.

If a participating facility exceeds their emission baseline, they are required to purchase Australian Carbon Credit Units or Safeguard Mechanism Credits. This is designed to ensure that total aggregate emissions across all facilities does not exceed the legislated threshold.

Therefore, if a steel manufacturing facility increased its emissions to meet heightened demand, there should be a proportional reduction in emissions from other facilities within the scheme, thus ensuring total aggregate emissions do not increase. Accordingly, if federal government policies function as intended, the increased use of substitute materials should not result in significant carbon leakage.

Industry transition package

Whilst forestry constitutes a very small share of total employment in Tasmania, we recognise the timber industry has been an important source of employment within certain Local Government Areas (LGAs). The LGAs with the highest proportion of forestry dependent jobs are: Derwent Valley (17.8%) Georgetown (11%) Dorset (6%) Circular Head (5%) and Burnie (2.2%)

In keeping with our prior reports, we propose that the cessation of STT's native logging activities should be accompanied by an industry transition package to support displaced workers and businesses (see **Table 4**).

Part of our transition package would include approximately $80 million in worker redundancy and retraining payments, which would be open to all employees (on an opt-in basis) in the native wood manufacturing, and harvesting and haulage sectors, who are dependent on STT's continued operations.

As in Victoria, our transition package includes funds specifically directed at supporting forestry-dependent regional communities. These provisions consist of $36 million aimed at growing local business and creating jobs, $22 million for local development plans, and $5.5 million for supporting communities' economic diversification into sustainable industries. As such, approximately $64 million of our transition package directly addresses the concerns of communities most vulnerable to a transition away from native logging.

As for sawmillers who may be affected by the transition, we would make available a timber innovation grant to enable them to adapt to processing plantation timber. In addition, a voluntary transition package would compensate sawmillers seeking to exit the industry for non-fully depreciated plant and equipment up to a cap of $1 million per firm.

The notoriety of the 'forest wars' has created a distorted perception of the size and economic significance of the forestry industry. Although primary production industries including forestry formed the backbone of the Tasmanian economy in the early 19th century, today the Tasmanian economy is far more diverse and no longer as dependent on resource extraction.

According to 2022 data, 3,315 people were employed in the Tasmanian forestry sector in both native forests and plantations. As **Figure 11** illustrates, this constitutes nearly a 40% decrease from 2001 figures. However, employment figures have stabilised since 2013, largely due to growth in the hardwood plantations sector. The number of workers directly dependent on native forest logging has been estimated at 1,118. This includes those involved in growing, harvest, haulage and primary processing.

	Inputs	Payment per unit	Total
Redundancy and retraining for directly employed workers	670 workers[7]	$120,000 per worker	$80,400,000
Timber innovation grant	24 sawmills[8]	$1,000,000 per firm	$24,000,000
Sawmill Voluntary Transition package	24 sawmills	$1,000,000 per firm	$24,000,000
Regional economic diversification			$64,000,000
Total			**$192,400,000**

Table 4 Industry transition package inputs
Source Blueprint Institute Analysis

[7]Based on a 2018 study, quoting 197 jobs in harvesting and haulage and 656 jobs in primary wood and paper processing directly dependent on the native logging industry in Tasmania, these figures have been proportionally scaled down based on the average native timber product that STT produces relative to the private sector over the five financial years from FY2016–FY2021.
[8]Based on a 2016 paper, which cites 19 hardwood and five wood-based panel sawmills operating in Tasmania

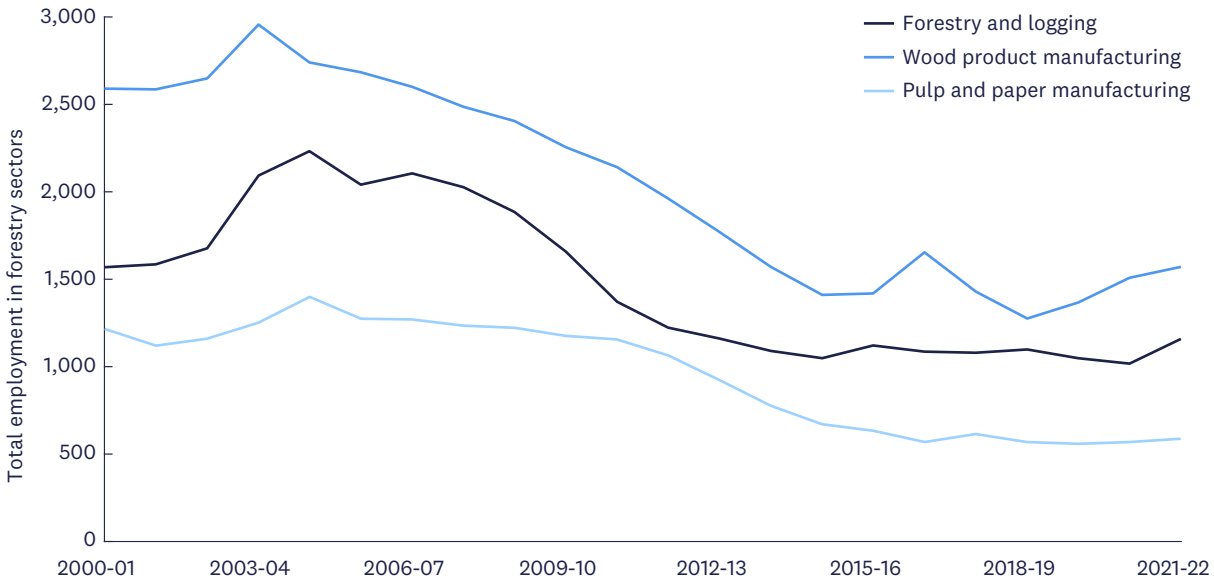


Figure 11 Total employment in forestry sectors (2000-2022)

Source NIEIR

The transition to a woodchip export orientated market which began in the latter half of the 20th century made forestry less labour-intensive. This, coupled with the preference for the exportation of raw materials, resulted in job losses in harvesting and wood manufacturing.

As international competition in the woodchip market intensified and the Tasmanian timber industry found it increasingly difficult to compete, a contraction in total employment followed. Between 2008 and 2011, employment in forestry jobs declined by around 50%, or 3,500 jobs. As pulpwood constituted the bulk of product extracted from public native forests since the 1970s, these job losses were primarily concentrated within the native logging sector. The downturn led to not only the bankruptcy of the largest wood processor Gunns Limited, but also a significant number of smaller hardwood-dependent businesses taking advantage of various government-backed exit schemes.

If the native logging industry were to end, the jobs that would be most at risk would be those in sawmills responsible for processing high quality sawlog, as well as in the harvest and haulage sector. The successful implementation of agroforestry practices have the potential to supplement timber supply, although it is uncertain to what extent. It is unlikely that a reduction in pulpwood supply would affect local jobs in pulp and paper mills, given that these businesses are likely "already using plantation timber."

Sensitivity analysis

We conducted a sensitivity analysis to ensure our results were robust to variance in discount rates and timber prices (see **Table 5a, 5b, 5c**).

We have, in prior papers, also conducted a sensitivity analysis with respect to timber harvest volumes. However, in the Tasmanian case, such an analysis would not provide meaningful information. Given the significant additional discount we have applied to STT's costs in the baseline case, over and above the expected change in costs on a proportional basis as timber volumes vary, the effect of altering the former would dominate the effect of altering the latter. Such an analysis would thus shed more light on the generous assumptions we have allocated to STT than the true effect of variance in harvest volumes.

Low discount rate	Base discount rate	High discount rate
5%	7%	9%

Table 5a Sensitivity analysis—Discount rates
Source Blueprint Institute analysis

Timber types	Low timber price (-10%)	High timber price (+10%)
Sawlog category 1&3 (m^3)	$116	$142
Sawlog category 2&8 (m^3)	$85	$103
Sliced veneer grade (m^3)	$158	$194
Export peeler log (tonnes)	$56	$68
Export peeler log (tonnes)	$56	$68
Domestic peeler log (m^3)	$76	$92
Special species timber and craftwood (m^3)	$139	$169
Pulpwood (tonnes)	$64	$78
Post, poles, and piles (units)	$231	$283

Table 5b Sensitivity analysis—Timber outputs, FY2025 prices
Source Blueprint Institute analysis

	Baseline (7% discount rate)	5% discount rate	9% discount rate	Low timber price (-10%)	High timber price (+10%)
Benefits (millions)	$983	$1,163	$847	$983	$983
Costs (millions)	$911	$1,045	$810	$803	$983
Net present value (millions)	$72	$118	$37	$180	$0
Benefit-cost ratio	1.08	1.11	1.05	1.22	1

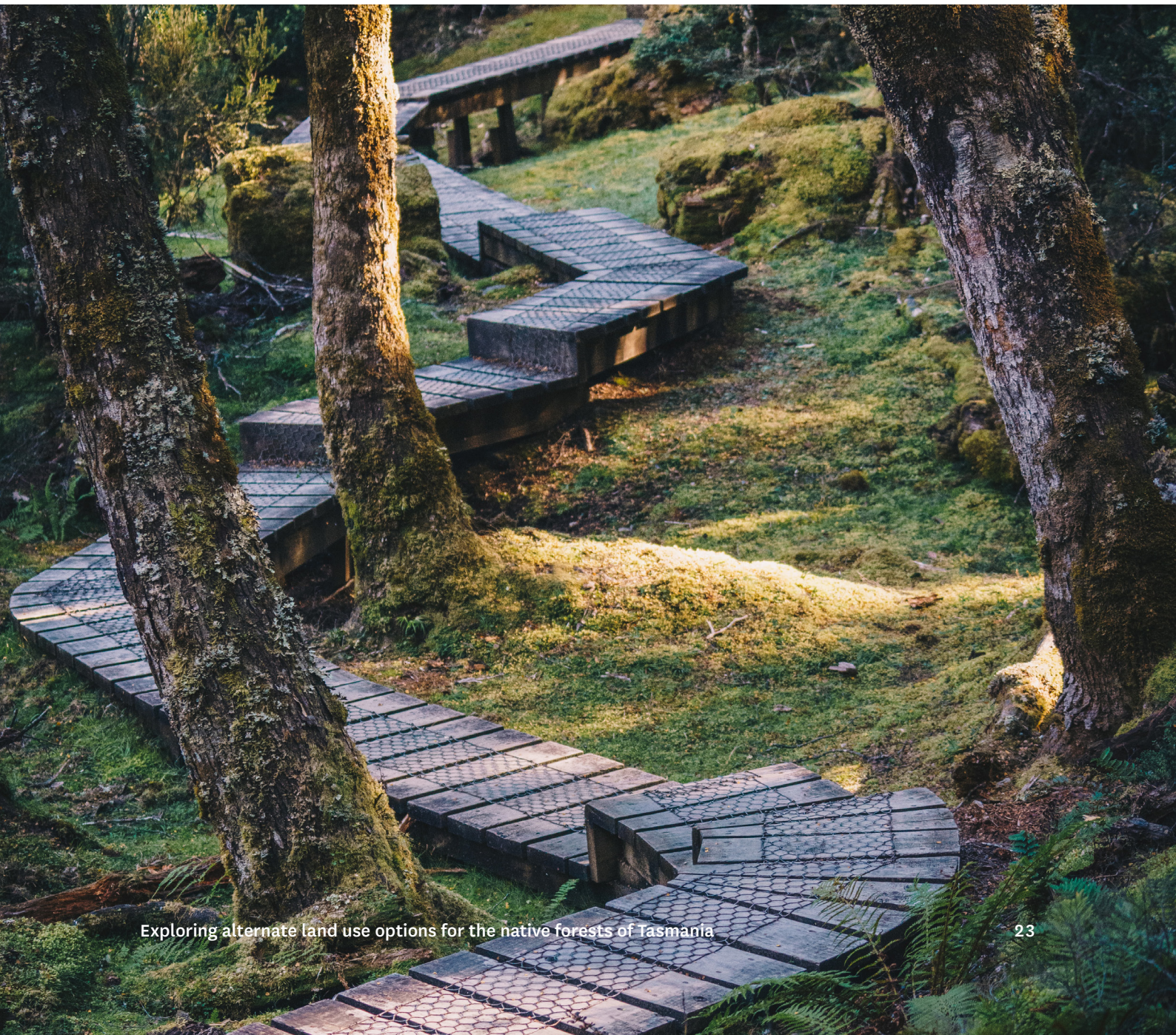
Table 5c Sensitivity analysis—Results
Source Blueprint Institute analysis

Save the scenario where timber prices are high, the NPV of immediately ceasing native timber logging remains positive in all cases. This indicates that our results are robust. Differing discount rates produce only a minor variance in results relative to the baseline case.

Our results are considerably more sensitive with respect to variance in timber prices. A substantial increase in timber prices in the range of 10+% does erase any NPV of ceasing native timber logging. However, the significance of this finding should not be overstated.

Over the long-run (FY2002–FY2022) our estimated price data shows no real growth in STT's native timber prices. Granted, this may change in the future if STT does genuinely achieve a market-based price for their native timber. However, as previously stated, our cost-benefit analysis grants considerable assumptions in favour of STT's bottom line—eliminating any such concessions from our calculation would easily return the NPV under high timber prices to a positive number.[9]

[9]For detailed information on these assumptions, please refer to the Appendix at the end of this paper.



Further opportunities

Tourism

Tasmania is home to one of the most vibrant tourism sectors in Australia, boasting some of the rarest and most pristine natural assets that attract millions of tourists each year. Tasmania's tourism sector generated $2.59 billion in FY2023—approximately 6.7 percent of Tasmania's Gross State Product. 12.1% of Tasmania's employment is tied to tourism—the highest rate in the country. Tasmania consistently records over one million tourists who visit national parks and reserves.

Tourism in Tasmania often revolves around its rich and revered ecological assets. Most prominent are Tasmania's native forests—home to iconic and critically endangered species such as the famous Tasmanian devil, and the swift parrot. These species, amongst many more, are a key driver of Tasmania's tourism economy each year. The swift parrot is dependent on the blue and black gum eucalypts—found exclusively in Tasmania's native forests. For the Tasmanian devil, scientific eco-tourism schemes are in place, leveraging Tasmania's tourism appeal for endangered species conservation.

We have decided to omit tourism from our direct cost-benefit model because this sector is highly speculative, particularly with regard to the government's fiscal appetite. Estimates of park infrastructure cost can only be derived from similar past projects across Australia, which are not identical case studies. Extrapolating costs from prior wide-ranging and idiosyncratic projects would render our estimates conditional on specific political circumstances and potentially compromise the generous assumptions we have granted STT.

Demand-side factors also skew results. Although metrics such as 'average spend' and 'spend-per-night' may suggestively indicate the consumption of a standard tourist, spending habits are more idiosyncratic than such homogenised metrics might suggest. For example, common tourist activities in national parks, like camping and hiking, are far less costly than those available in metropolitan Tasmania. As the error margin in attributing static consumer spending estimates to revenue forecasts is wide, we have therefore erred on the side of caution in omitting speculative variables to uphold the integrity of our model.

Furthermore, many of the benefits associated with tourism in conservation areas are intangible and thus difficult to measure. The value of native forests extends far beyond the spot price of the land's commodities or the tourism revenue it can attract—in addition to cultural significance a natural site may be attributed, other well documented benefits of nature reserves such as in respect to mental health and wellbeing cannot be accounted for in financial models.

Nevertheless, as an environmentally conscious think tank, we believe that it is an incontrovertible fact that conservation policy, coupled with an investment in tourism infrastructure, would lead to a healthier Tasmanian economy in the long run. In contrast to maintaining the status quo, if native forestry was phased out in favour of creating tourist attractions, a benefit in the magnitude of millions in present-day dollars could be expected.[10]

Conservation and the machinery of government—reforming ERC processes

Often overlooked when assessing best conservation practice is the role played by the machinery of government, and the way in which the architecture of decision-making bodies within government can have significant, and often adverse, impacts on policy outcomes.

In the context of the native forest debate in Tasmania, these machinery of government constraints take the form of the Expenditure Review Committee of Cabinet (ERC). ERC is a Cabinet committee responsible for examining all proposals, new policies, and initiatives in light of the government's overall fiscal strategy.

[10]Based on Blueprint Institute's previous modelling of forestry tourism in Victoria and New South Wales.

It advises Cabinet on Budget spending priorities and (in theory) initiates reviews of individual ongoing programmes. Every government in Australia, both state and federal, has an ERC (or some variation thereof).

Yet, some aspects of policy making are better suited to ERC processes than others. Indeed, most investment decisions that are made via ERC rely on a policy's Benefit Cost Ratio (BCR). A BCR is a measure commonly used in cost benefit analysis to capture the overall relationship between a proposal's relative costs and benefits. If a proposal has a BCR greater than 1.0, the project is expected to deliver a positive NPV (i.e. for every dollar invested, more than a dollar is made). If the proposal has a BCR of less than 1.0, then the government is likely to see a net loss on its investment.

At face value, a BCR seems like a sensible tool to use when making investment decisions. Indeed, for investment banks—or any other entity solely focused on return on investment measured in terms of dollars—a BCR provides an effective lens through which to evaluate decision making.

Yet, BCRs also have inherent limitations. They are unable to properly account for qualitative variables that may add value to investment, and they require an arbitrary limit to be applied to investment horizons (in the case of ERC this is usually the four years over the forward estimates). This means that there are certain policy areas that are disadvantaged by the ERC process—policy areas that, in addition to monetary value, offer intangible benefits that are better measured over decades (and sometimes centuries).

Conservation policy in particular suffers when subject to ERC decisions. As has been explored in this paper, there is increasingly clear monetary value in conserving native forest, thanks to the burgeoning carbon market.

Yet the natural capital value of native forests far exceeds that which can be quantified within a BCR. They provide critical health benefits, maintain the health of the water table, support biodiversity, improve air quality and so on. All of these 'value-adds' do not fit into a BCR constrained by needing to project return of investment to the end of the forward estimates only—hence the BCR generated with regard to policies and initiatives aimed at conserving native forest (and indeed other natural assets such as coral reefs, alpine environments and tropical rainforest) is often artificially low.

As with all strategically selective structural environments, there are ways around the structural biases that exist within ERC processes. Specifically, certain policy areas can be given a 'weighting' to account for the fact that their value, while real, may not be accurately captured by rigid quantitative accounting frameworks used by Treasury (and ERC).

Blueprint Institute recommends that a 'natural capital weighting' be developed for conservation based proposals brought before ERC. The weighting mechanism should then be applied to any investment decision that affects conservation of native forest—accounting for the long term nature of their quantitative benefits, and the intangible nature of their qualitative ones.

Creating such a mechanism would equip Ministers and Secretaries who seek improved conservation outcomes with the policy levers needed to increase government investment, and would reset the strategically selective nature of the structural environment in which public policy decision makers act. In the forestry space, this might include increased budgets for forest management, subsidies for expanded hardwood plantations whilst their timber stocks are immature, or underwriting the early works processes for major ecotourism ventures.

Environmental markets

While the traditional vehicle for environmental reform is government regulation, there remains significant scope for private investment to contribute toward broader conservation goals. In the face of Australia's emerging biodiversity crisis, it is prudent to develop mechanisms such as environmental markets to leverage the rapid growth in investor demand for financial products linked to nature repair.

While big-government supporters and free-market adherents argue for a unilateral economic approach to address environmental issues, neither the public nor private sector alone can offer sufficient financing for biodiversity conservation goals.

As Target 19 of the Kunming-Montreal Global Biodiversity Framework indicates, an increase of financing from all sources will be required to close the biodiversity funding gap—estimated to be one trillion dollars globally per year. So far, investment opportunities have been sparse—but meeting climate and biodiversity targets requires capital, and investors require robust market infrastructure to deploy capital. Accordingly, environmental markets could serve as a potential pathway to mobilise investment.

We urge all stakeholders to welcome a new conservation paradigm—one that recognises the need to progress beyond the devastating status quo, the scale and urgency of the biodiversity crisis, and the need to break the ideological divide between conservationists, foresters, policymakers, and investors. In acknowledgement of the importance of an 'all-hands' approach to scaling conservation finance, we envision a proactive role for the state as a 'market shaper'—in tandem with the private sector—which will crowd in as much catalytic capital as possible. For improved biodiversity outcomes, governments need to move toward actionable solutions—and refrain from reigniting the forest wars.

This section is not so much an instructive suite of formal recommendations for governments as it is a blue-sky exploration of the potential of environmental markets as a means to channel catalytic private capital into conservation outcomes. Indeed, this section serves as a primer for a collaborative paper Blueprint will be undertaking in early 2024 focusing on a 'roadmap for conservation of forests' that will be published following extensive consultation with experts.

What are environmental markets?

Environmental markets are an emerging solution to mobilise private capital toward regenerative conservation practices. They are designed to achieve large scale environmental protection and sustainable land use. Since environmental markets aim to address externalities, it is important to recognise that the amount of stakeholders who will contribute to market design should extend far beyond market participants.

Environmental markets are created when economic value is assigned to an improvement in environmental conditions. This could include a specific metric that measures land or species restoration, or ecosystem services that deliver public goods—such as water management from trees, or pollination from bees. This leads to the formation of a credit or offset to be exchanged on a market, thereby enabling environmental goods or services to be bought and sold.

The most common form of environmental markets are offset and credit markets for carbon. Simply, an offset or credit is assigned when a specific amount of carbon emissions is avoided (usually one tonne), to offset an equivalent amount of carbon emitted by a firm. As such, offsets enable firms to compensate for adverse environmental impacts as a result of firm activity. Although carbon credit prices fluctuate and accounting methodologies differ worldwide, they are often considered a valuable compliance mechanism for extractive industries—where environmental impact is unavoidable.

Biodiversity offsets differ significantly from carbon offsets due to their non-fungibility. The complex and localised nature of ecosystems make it impossible to draw equivalences between positive biodiversity impacts in one ecosystem to offset adverse impacts in another. In contrast, carbon can be measured uniformly across the world. The equivalence condition for biodiversity offsets explains why many existing schemes are localised. Many conservationists are thus sceptical of biodiversity markets and are particularly opposed to offsets.

However, biodiversity credit markets are emerging as a mechanism with improved integrity. In contrast to the false equivalence of biodiversity offsets, credit markets are representative of tangible, nature-positive outcomes—those that actively contribute to regeneration and restoration. Provided that measurement, reporting and verification (MRV) standards continue to develop, biodiversity credit markets have potential as a high-integrity mechanism for biodiversity improvement.

Potential initiatives in Australia also include linking biodiversity co-benefits to ACCUs—referred to as a 'stacked' or 'stapled' credit—which would attract a price that reflects the

additional biodiversity co-benefit. Incentives for landholders to transition to sustainable land use practices may align most effectively if benefits are pooled together.

Why are they being considered in Australia?

To understand the use case for these markets in Tasmania, we must first examine the national context. Despite being one of the richest and biodiverse nations in the world, Australia faces a biodiversity crisis that continues to worsen—and environmental policy in Australia has been described as being in a state of "complete inertia." The damning 2021 State of the Environment report outlined Australia's biodiversity loss as some of the worst in the developed world. There were no marked improvements since the 2016 report, with the overall health of the environment and its ecosystems graded as poor.

Without significant improvement to current land management practices, we can expect further environmental degradation in the decades to come—consistent with global extinction trends. Climate change, pollution, and extractive land and water use continue to exacerbate the declining health of the environment.

Significant investment is urgently needed for conservation and biodiversity in Australia to reverse our environmental decline. The status quo is unsustainable and the scale of the task is beyond governments alone—a major contribution must be made through voluntary private and corporate investment. De-risking private capital through blended finance will be an imperative tool to sustain investment demand.

The Australian economy and business sector is dependent on nature. Approximately half of Australia's gross domestic product—around $893 billion—is dependent on ecosystem services. Sectors with a high dependency on nature account for 80% of export earnings. Part of the new conservation paradigm is the fundamental view that both domestic economies, and the global economy, are embedded in nature, rather than external to it. Existing norms in the corporate sector are shifting—legal opinion argues that company directors who fail to account for their nature-related dependencies should be held liable.

To gain bipartisan support for greater conservation outcomes in Tasmania, it is imperative that policymakers are presented with an appealing economic case to progress beyond the status quo. As well-intentioned as strong conservationist policy may be, these approaches are likely both politically unfeasible and beyond the fiscal capacity of governments. Proposals without a sufficient economic alternative have no basis in the political reality. In Tasmania's case, activists have campaigned for the legal protection of native forests for decades—to no avail.

Will environmental markets advance conservation?

Environmental markets offer a promising opportunity to increase uptake of regenerative forestry practices. Pricing natural assets in environmental markets that more accurately aligns their economic value with their intrinsic ecological importance will stymie the unchecked destruction of the native forests and provide landowners with economic incentives for environmental stewardship. They will open up investment opportunities for the private sector to invest in a nature-positive future. Of course, price discovery is likely to take time since it is difficult to price in environmental benefits that are public goods, and temporally distant.

Some environmentalists are understandably hesitant to entertain market-based mechanisms for climate action—but expecting government expenditure to play a lone hand in protecting nature is not a realistic political goal. This notion overlooks the scale of finance required to deliver nature-positive outcomes. Regulation is indeed an important player—but true environmental protection will require a significant increase in funding into conservation efforts. Rejecting nascent ideas on ideological grounds, without serious scrutiny, is not constructive.

We do recognise, however, environmental markets alone are not the panacea to environmental degradation in Australia. Most biodiversity markets are nascent and unproven at scale, and face a myriad of integrity issues. These range from scientific integrity, MRV technology-readiness, greenwashing and other demand-side scale risks, and an ideological aversion to the premise of nature as an asset class itself.

A well-functioning environmental market will depend on data integrity, robust governance and regulatory systems to mitigate against these challenges—and these remain distant goals for market proponents. The government will need to take the lead role in building the market infrastructure—but this will take considerable time, which may deter prospective investors.

Given the lack of both a standardised carbon methodology in Australia and the applicable nature credit schemes thus far, we warn against an expectation that environmental markets will 'save the forests'. However, they are one tool in a broad arsenal that, if scaled appropriately, could improve environmental outcomes by closing the biodiversity finance gap.

In recognition of the significant cultural heritage value that Tasmania's native forests hold for Aboriginal communities, environmental markets present an opportunity to engage Indigenous communities in the design and implementation of schemes created to conserve and restore biodiversity—consistent with a key recommendation from the Henry Review of the EPBC Act earlier this year. The review implored the need to recognise the intrinsic relationship between Aboriginal culture and biodiversity, and embed the participation of Indigenous communities at advisory, implementation and delivery levels.

As environmental markets continue to emerge, there remains significant scope to deliver on this recommendation, and ensure traditional culture and knowledge of First Nations communities are incorporated in environmental markets, and that First Nations communities are the foremost beneficiaries of nature stewardship. It holds true globally that the rights and needs of Indigenous communities must be understood to de-risk investments in environmental markets.

Why could environmental markets be deployed in Tasmania?

With private freehold land accounting for around 33% of Tasmania's native forests, it is clear that a policy approach which only targets public sector logging will be insufficient in addressing the state of Tasmania's forests in total. We see an opportunity to implement pilot market-based projects to complement the recommendations we put forward in this paper—something the Tasmanian native forests have hosted in the past.

Tasmania's forests are ripe to pioneer nascent biodiversity markets due to the wealth of pre-existing local knowledge of Australia's native forests. Decades of localised stewardship has culminated in complex ecological monitoring methodologies to measure environmental impacts. Leveraging the existing data to guide the design of standardised biodiversity metrics will accelerate the development of robust governance and compliance frameworks.

If bolstered by proactive market-shaping from the government, Tasmania's comparative advantage in ecological data and localised stewardship presents an opportunity to become a leader in the environmental market space.

Appendix

Carbon methodology

Carbon emissions and removals under the two scenarios were modelled by Professor Andrew Macintosh using the following four carbon sinks and sources:

- onsite forest carbon;
- harvested wood products;
- landfill; and
- fossil emissions from forest management, and harvest and haulage when attributable to the relevant state forest agency.

Onsite forest carbon

Onsite forest carbon was modelled using the Tier 2 capabilities of the Australian government's Full Carbon Accounting Model (FullCAM). The modelling covered the above-and below-ground live biomass, litter, and dead wood carbon pools. Soil carbon was excluded. This is a product of the uncertainty associated with soil carbon stocks in the native forest estate and the impacts of harvesting on soil carbon.

To model the forest carbon stocks and fluxes, three representative FullCAM forest plots were devised for Tasmania's public native forest estate. The plots were based on the 'medium dense eucalypt forest', 'tall dense eucalypt forest' and 'rainforest' plots used in the Australian government's harvested native forest estate model. Adjustments were made to these base plots to account for the assumed silviculture practices, basic density and above-ground biomass yields in the regions. Notably, the above-ground biomass yields in each plot were modelled using the equation:

$$AGB_i = M * e^{-k/Ai}$$

Where:

AGB_i = above-ground biomass (AGB) in year *i*

M = maximum AGB in undisturbed native vegetation

e = Euler's number, i.e. the mathematical constant equal to ~2.71828

k = 2 × G – 1.25, where G = age of maximum growth rate of the trees

A_i = age of forests in year *i* (in years)

A summary of the parameters used in the representative forest plots is provided in **Table 6**.

Harvested wood products and landfill

Harvested wood products and landfill carbon stocks and emissions were modelled using an integrated version of the Australian government's models. The log inputs for the integrated product/landfill model were derived from the FullCAM outputs. The assumed breakdown of roundwood by log type that was used in the model is summarised in **Table 7**.

Plot name	Age of maximum growth (G)	Maximum AGB (M)	% forest affected by harvest	Harvest age	Stem density	Carbon content of stems	Stem % to product	Product yield (m^3)
Tas1C	10	358	95%	80	0.550	0.52	80%	269
Tas2R	10	264	80%	80	0.625	0.52	80%	134
TasSST	10	288	5%	80	0.500	0.52	70%	10

Table 6 Summary of parameters used in representative forest plots

	Sawlogs	Veneer logs	Pulplogs	Other logs
Tasmania	16.7%	15.7%	67.1%	0.5%

Table 7 Roundwood removal log type percentages

The processing destination fractions for logs and wood waste were derived from the Australian government's harvested wood products model. The destination fractions provided the basis from which end-products were assigned to the product pools contained in the harvested wood products model (see **Table 8**). The maximum age and decay rates for the product pools are summarised in **Table 9**.

Pool	Product types
1	Paper and paper products
2	Pallets, palings, plywood formboard & hardboard packaging
3	Sleepers and other miscellaneous hardwood products & other plywood
4	Poles, piles and girders
5	Green framing, dried framing, flooring and boards, timber furniture, structural plywood & hardboard weathertex, lining, bracing and underlay

Table 8 Harvested wood product pools, Australian Government model

The Australian government's landfill model is based on the IPCC Tier 2 FOD model. The key parameters of the model are:

- the fraction of degradable organic carbon in each individual waste type (DOC);
- the rate of decay assumed for each individual waste type (decay function 'k');
- the fraction of degradable organic carbon that dissimilates through the life of the waste type (DOCf);
- the methane correction factor (MCF);
- the methane recovery rate (proportion of methane captured for flaring and energy generation); and
- the oxidation factor (the proportion of methane that oxidises prior to reaching the surface of the landfill).

Details of these parameters are provided in **Table 10**.

Pool	Product pool age classes		
	Young	Mid	Old
	Maximum time in age class (years)		
1	1	1	1
2	2	4	4
3	10	10	10
4	20	10	20
5	30	20	40
	Proportion of in use pool exposed to decay		
1	60%	65%	90%
2	30%	50%	90%
3	15%	65%	45%
4	25%	65%	80%
5	20%	55%	95%
	Annual fractional decay losses		
1	100%	100%	100%
2	50%	25%	25%
3	10%	10%	10%
4	5%	10%	5%
5	3%	5%	3%

Table 9 Harvested wood product pools, maximum age and decay rates

	DOC	k	DOCf	MCF	Recovery	Oxidation factor
Wood and wood waste	0.43	0.025	0.10	1	35%	0.1
Paper	0.4	0.05	0.49	1	35%	0.1

Table 10 Landfill model parameters

Fossil emissions from transport, processing and management

Emissions associated with the use of fossil fuels were confined to those associated with forest management, and harvest and haulage when attributable to state forest agency. Modelling of emissions in both scenarios assumed improving fuel use efficiency over the projection period. Fossil fuel use in the baseline scenario was estimated using data published by STT, with decline percentages applied to account for improvements in fuel use efficiency over the projection period. In the project scenario, fossil emissions were confined to those associated with forest management. Again, a decline percentage was applied to account for improvements in fuel efficiency and related decarbonisation efforts.

Modelling for status quo of logging from FY2025 to FY2049

Our status quo or baseline scenario assumes continued native timber logging by STT in the area defined by Tasmania's Regional Forest Agreement from FY2025—when our counterfactual scenario assumes native timber logging stops—through to FY2049.

Our projection of STT's future native timber harvest levels is based on the output of the carbon modelling described above, combined with a 10-year historical average of STT's native timber yields, to further breakdown roundwood removals (that is, sawlog, veneer log, and pulplog) into the eight main categories of native timber sold by STT (see **Table 11**).

Compared to the Forestry Corporation of New South Wales and VicForests, where native timber price data were either readily available or easily reverse engineered, STT exhibits a remarkable lack of transparency, particularly given that it is a publicly owned Tasmanian Government Business.

Due to the lack of publicly published data, we instead attempted to secure price figures through a Right to Information Act application. Rather bizarrely, STT replied to our request for pricing information from any of the past five financial years not by claiming such information was commercial in confidence, but by claiming that it "does not exist."

The only available price data we found were contained in STT's annual reports—although these figures were estimated mill door landed values, and only published for eight financial years from FY2006–FY2013.

In order to project prices forward from FY2013 to FY2022, we first took the FY2013 price for category 1&3 sawlog ($105/m^3) as a baseline. We then used all eight financial years of available data to derive the average ratios between the other seven categories and category 1&3 sawlog. We assumed that these ratios would stay constant over time. The fact that there was little variance in the ratios observed over the eight financial years of data we analysed gave us greater confidence in this assumption.

Given the inherent 'noisiness' and uncertainty to be expected when projecting data forward nine years, we chose to apply a Kalman filter to estimate FY2022 prices. We then inflated those prices by seven percent per year for an additional three-year period to achieve the estimated FY2025 price data as seen in **Table 12**.

	Sawlog category 1&3 (m^3)	Sawlog category 2&8 (m^3)	Sliced veneer grade (m^3)	Export peeler log (tonnes)	Domestic peeler log (m^3)	Special species timber and craftwood (m^3)	Pulpwood (tonnes)	Post, poles, and piles (units)
FY2025–FY2027	100,490	30,066	676	49,522	93,325	10,032	524,486	3,782
FY2028–FY2045	45,893	13,731	309	22,617	42,621	10,032	239,529	1,727
FY2046–FY2049	49,058	14,678	330	24,177	45,560	10,032	256,048	1,846

Table 11 Annual yield projections for STT's native forest operations (FY2025–FY2049)

Source STT Sustainable Yield Review, Professor Andrew Macintosh, Blueprint Institute analysis

	Sawlog category 1&3 (m^3)	Sawlog category 2&8 (m^3)	Sliced veneer grade (m^3)	Export peeler log (tonnes)	Domestic peeler log (m^3)	Special species timber and craftwood (m^3)	Pulpwood (tonnes)	Post, poles, and piles (units)
Price	$129	$94	$176	$62	$84	$154	$71	$257

Table 12 Projected price of STT's native timber products in FY2025
Source Sustainable Timber Tasmania and Forestry Tasmania annual reports, Blueprint Institute analysis

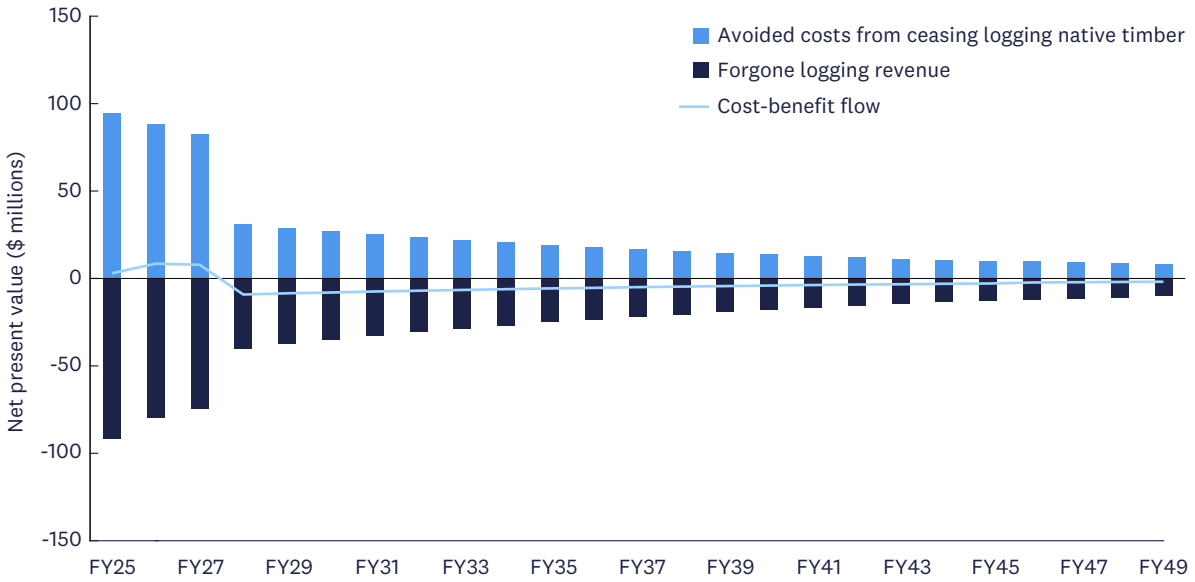


Figure 12 Annual cost-benefit flow for STT's native timber harvesting alone (FY2025–FY2049)
Source Blueprint Institute analysis
Note A seven percent discount rate is applied

Other operational inflows include government funding and interest received. These were projected using a historical average from the last six financial years, and then inflated by seven percent per year for three years to arrive at a FY2025 baseline.

Operational outflows were projected using a similar methodology. All three line items were scaled down proportionally relative to FY2022 based on the forecast harvested volume of category 1&3 sawlog. The line item 'payments to suppliers for biological assets' was scaled down a further 50% based on the assumption that half of it could be attributed to plantation forestry. Outflows were then inflated by five percent per year for three years to arrive at a FY2025 baseline.

A further adjustment was made to 'cash paid to suppliers and employees' line item in **Table 13**. STT has, in the past, maintained that it cannot profitably meet its current quota of 130,000m^3 of category 1&3 sawlog per year. Specifically, in 2016, STT's Board claimed that it was losing money in part because "above around 96,000m^3 of high quality sawlog, the cost of production is higher than the revenue generated at current prices."

We have interpreted this to mean that STT's marginal cost of native timber harvesting increases sharply as it approaches 96,000m^3 of category 1&3 sawlog per year. Given that both our projections and STT's sustainable yield review forecast an abrupt drop in category 1&3 sawlog supply, we have further discounted the 'cash paid to suppliers and employees' line item according to the figures seen in **Table 14**.

Projection of STT's operational cash flows derived from native timber logging (undiscounted; per financial year)

	FY2025–FY2027 (per year)	FY2028–FY2045 (per year)	FY2046–FY2049 (per year)
Operational inflows			
Cash receipts from customers (Forest product revenue + 10% GST)	$73,081,846	$34,314,043	$36,561,335
Government funding	$17,681,950	$17,681,950	$17,681,950
Interest received	$793,359	$793,359	$793,359
Operational outflows			
Cash paid to suppliers and employees	($90,108,093)	($36,007,706)	($39,865,646)
Payments to suppliers for biological assets	($2,014,014)	($804,811)	($891,041)
Payments for property, plant, equipment, and other assets	($3,147,712)	($1,257,843)	($1,392,611)
Net cash provided by/used in operating activities	($3,712,663)	$14,718,992	$12,887,346

Table 13 Inputs for cash flow analysis of STT's native logging in Tasmania
Source Blueprint Institute analysis

Additional discount applied to STT's costs	
FY2025–FY2027	15%
FY2028–FY2045	25%
FY2046–FY2049	22.5%

Table 14 Additional discount applied to STT's costs after scaling costs down on a proportional basis based on projections of STT's declining output.
Source Blueprint Institute analysis

Valuation of assumptions made in favour of STT

As seen in **Table 15**, we have made a range of assumptions that undervalue the benefit of and overvalue the costs of ceasing native logging that tilt our cost-benefit analysis significantly in STT's favour. Most notably, were we to use a conservative price that attempts to capture the full social cost of carbon emissions instead of the ACCU spot price, the NPV of halting STT's native timber logging would be a startlingly $557 million higher.

Assumptions with a smaller, but nevertheless significant effect, include the discount we applied to STT's costs—on the premise that the marginal cost of harvesting native timber rises sharply as it approaches 96,000m^3 of category 1&3 sawlog (NPV of $169 million)—and inflating prices two percent more than costs for three years to arrive at our baseline FY2025 figures (NPV of $27 million).

Lastly, a more realistic transition package would not assume all employees have accumulated sufficient seniority to be eligible for the highest payment ($120,000), nor would it assume all employees and sawmills choose to exit the market. After all, the supply of native timber from private land would not be affected. A more conservative approach would be to assume that 75% of employees choose to opt-in at 75% of the highest payment, and that just half of sawmills exit the industry. This would result in a transition package that costs just $81 million, and thus increase the NPV estimate by $111 million.

	NPV with favourable assumption	NPV without favourable assumption	NPV of assumption
Assumption underestimating benefit of halting native logging			
Use of ACCU spot price instead of social price of carbon	$345 million	$902 million	$557 million
Assumptions overestimating costs of halting native logging			
Additional discount applied to STT's costs	$81 million	($88,000,000)	$169 million
Inflation of timber prices by 7% but costs by just 5% over three financial years (from FY2022–FY2025) to arrive at baseline prices and costs	$81 million	$54 million	$27 million
Inflated cost of industry transition package	$192 million	$81 million	$111 million
			$864 million

Table 15 NPV of assumptions made in favour of STT's native logging operations from FY2022-FY2049
Source Blueprint Institute analysis