Carbon sequestration potential of plantation forestry expansion in Australia

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Foreword

A few key factors influence the economic viability of new forest plantation development. Carbon is one of these factors. Carbon sequestration has the potential to make a difference to the economics of plantation forestry. At the same time, carbon sequestration by new plantation forests also has the potential to make a significant contribution to meeting Australia's greenhouse gas emission reduction targets.

Under the Paris climate agreement, Australia is committed to making a 26 to 28 per cent reduction in its emissions compared with those in the 2005 base year. Terrestrial carbon sequestration projects financed by the Emissions Reduction Fund (ERF) are already making a significant contribution to Australia's climate commitment. In the present report we illustrate that new plantation forests could make an additional net contribution.

To establish the impact on sequestration of a policy decision to increase the plantation forest area in Australia by 400,000 hectares over 10 years as an example, we calculated the aggregate carbon stock associated with new radiata pine planted in seven key forestry locations. These plantations were assumed to be established on a gradual basis, with an additional 5,700ha planted in each of the seven regions each year from 2020 to 2029.

On an annual basis, the aggregate carbon sequestered in one year from 2030 to 2031 across the seven regions would equate to around 13 million tonnes of carbon dioxide equivalent derived from the carbon stored in trees and in forest debris. If soil carbon and carbon stored in harvested products associated with these plantations are accounted for, the annual sequestration rate in 2030-31 for these new plantations rises to around 19 million tonnes of carbon dioxide equivalent.

Dr Brian Fisher, AO PSM

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Contents

List of figures

Executive Summary

BAEconomics has prepared this report for the Australian forest industries, to examine the carbon sequestration associated with potential plantation forestry expansion in Australia. As Australia seeks to meet its Paris Climate Accord commitments to reduce carbon dioxide emissions by between 26 and 28 per cent below 2005 levels by 2030, sequestration from plantation forestry activities could provide a significant contribution in meeting our national emissions target. The purpose in this report is to better understand the potential size of that sequestration contribution based on assumptions about industry growth and where plantation expansion might occur.

This carbon sequestration assessment is based on outputs of the Reforestation Modelling Tool, which provides an estimate of forest carbon stock, plus our own calculation derived from ABARES estimates of soil carbon and carbon stored in harvested products.

To establish the impact on sequestration of a policy decision to increase the plantation forest area in Australia by 400,000 hectares over 10 years, we calculated the aggregate carbon stock associated with new radiata pine planted in seven key forestry locations. These plantations were assumed to be established on a gradual basis, with an additional 5,700ha planted in each of the seven regions each year from 2020 to 2029.

On an annual basis, the aggregate carbon sequestered in one year from 2030 to 2031 across the seven regions would equate to 3.54 million tonnes of carbon (or 12.97 million tonnes of CO_2-e) derived from the carbon stored in trees and in forest debris. If soil carbon and carbon stored in harvested products associated with these plantations are accounted for, the annual sequestration rate in 2030-31 for these new plantations rises to 5.12 million tonnes of carbon or just under 19 million tonnes of CO_2-e.

1 Introduction and context

BAEconomics has prepared this report for the Australian forest industries, to examine the carbon sequestration associated with potential plantation forestry expansion in Australia.

Demand for Australian forest products is strong. Domestic demand for forest products is forecast to increase by 43 per cent over the next 25 years (NSW Department of Primary Industries 2017). Global demand is also expected to continue to increase in line with population growth, and growing product demand in developing countries.

Australia is currently a net importer of forest products; with a trade deficit of almost $2 billion in 2016-17. This deficit has remained quite stable over the past five years, despite growth in the value of trade in wood products. Australia imported $5.3 billion of forest products in 2016-17 and exported $3.4 billion in the same year (ABARES 2017). Increasing competition from international suppliers requires Australian manufacturers to continually improve competitiveness. In part, this competitiveness is influenced by the scale of processing facilities, the volume and efficiency of log production, and access to inputs (e.g. logs). It is also affected by forest growth rates, scale and location.

The Forest Industry Advisory Council (FIAC) (2015) identified that new investment in wood resources and processing facilities is required for the sector to meet future demand and maintain international competitiveness. FIAC also recommended that the Australian Government uses industry's strategic regional hub approach for setting government policy and funding infrastructure. Industry identified thirty strategic plantation hubs as priority areas for new plantation investment (AFPA 2016).

Increasing the plantation timber resource to grow Australia's forest industries and offset declining access to native forests was a key policy objective of the 1992 National Forest Policy Statement and the 1997 Plantations for Australia: 2020 Vision. The overarching principle of the 2020 Vision was to enhance regional wealth creation and international competitiveness through a sustainable increase in Australia's plantation resources. The 2020 Vision set out a target for commercial tree crops of 3 million hectares by 2020. However, survey results from the National Plantation Inventory and ABARES (2018) show that Australia's total plantation estate has stagnated around the current level of just under 2 million hectares.

As previously reported by BAEconomics (2016), significant barriers to plantation forestry development in Australia, such as land costs and distance to processing facilities, limit the economics of forestry expansion. This is reflected in the latest ABARES statistics which report that the total plantation area in Australia declined by around 20,000 hectares over the last

reporting period (Downham and Gavran 2018). BAEconomics (2016) also identified that carbon sequestration payments under programs such as the Emissions Reduction Fund (ERF) would assist in improving the financial viability of plantation forestry expansion, but only if land is located within a 100 km radius of major timber processing facilities and can be purchased below the average price for the region (consequently lower quality land).

As Australia seeks to meet its Paris Climate Accord commitments to reduce carbon dioxide emissions by between 26 and 28 per cent below 2005 levels by 2030, sequestration from plantation forestry activities could provide a significant contribution in meeting our national emissions target. The purpose in this report is to better understand the potential size of that sequestration contribution based on assumptions about industry growth and where plantation expansion might occur.

2 Sequestration potential from plantation forestry expansion

In 2015-16, Australia's total plantation estate was around 2 million hectares, of which approximately half were softwood species and half were hardwood species (ABARES 2017b). Plantation forestry occupies half of one per cent (0.5%) of the total rural land area in Australia (406 million ha). Softwood plantations are dominated by long rotation (25-30 years) radiata and southern pines (around 90 per cent), while hardwood plantations are primarily short rotation (10-12 years) southern blue gum and shining gum (around 75 per cent). Around 86 per cent of Australia's total log harvest comes from plantation forests.

Forestry has been identified as the simplest and most cost-effective land-based sequestration option to implement, in terms of both feasibility and verifiability, in Australia, New Zealand, Canada and the United States (Paul et al. 2013b).

It is against this backdrop, and the need to promote further expansion of plantation forestry resources in Australia to meet future wood fibre demand, that we examined the carbon sink capacity of new radiata pine plantations at selected locations across Australia.

Carbon stored in Australia's plantation forests increased from 137 million tonnes of carbon (C) in 2001 to 171 Mt C in 2010 (ABARES 2013). This increase in carbon stock was caused by the gradual expansion of Australia's plantation estate, as well as the continued growth of plantations established since 1990, and includes the net effect of harvesting and growth (Gavran and Parsons 2011).

2.1 Methodology

The former Department of Climate Change and Energy Efficiency (DCCEE) invested extensive time and resources in developing toolkits for modelling carbon sequestration, as part of Australia's verification requirements under our international climate commitments.

One such instrument, the Reforestation Modelling Tool (RMT), allows the estimation of greenhouse gas emissions and removals within the tree and debris carbon pools for individual Carbon Estimation Areas (CEAs) for reforestation projects. The current version of the RMT includes carbon stored in the tree (above and below ground) and debris pools, and carbon emissions from these pools due to fire. The RMT excludes crop, soil and harvested wood product carbon pools. The RMT models carbon emissions and removals at a single point within

the CEA and extrapolates this across the CEA area (Department of Environment and Energy 2018).

The RMT accesses the Department's extensive climate, soil and vegetation databases to provide the base data for modelling reforestation projects. It allows the user to specify the region (via latitude and longitude) for the project area requiring carbon estimation. To forecast abatement outcomes, the tool utilises input data on planned silvicultural management activities. Information required includes the period over which the project will run, the plantation species, and the regime under which the species will be managed. Regimes take account of the period over which the regime was used, region, prior land uses, initial stocking rates, number of thins, and number of branch prunes (Dept of Environment and Energy 2018).

The RMT yield calculation utilises two critical variables to arrive at default values based on region and species:

- age of maximum biomass increment - which occurs around the time of canopy closure when forests fully occupy a site, and
- species multiplier – which describes whether the maximum biomass of the plantation species established is above or below the long term carrying capacity benchmark for the site.

Further, the tool allows users to specify management events, for example forest fires or treatment regimes, that can affect the carbon uptake of the plantation.

The RMT produces output based on the assumptions provided for the time period over which the project runs, including:

- Carbon mass of trees (tC) – quantity of carbon in the above and below ground biomass of a forest, measured in tonnes of carbon.
- Carbon mass of forest debris (tC) - quantity of carbon in debris (large woody material, litter) present aboveground, measured in tonnes of carbon.
- Carbon mass on-site (tC) - Sum of the quantity of carbon in trees and debris, measured in tonnes of carbon.
- Carbon mass emitted due to fire, from forest debris (tC) - quantity of carbon emitted due to combustion of forest debris, measured in tonnes of carbon (Dept of Environment and Energy 2018).

BAEconomics utilised the RMT to estimate the carbon sink potential of additional plantations under the assumptions outlined below.

2.1.1 Assumptions

The key purpose of this exercise is to establish an estimate of the sequestration potential of further plausible plantation forestry expansion in Australia. Given softwood plantations make up approximately 90 per cent of Australia's long-rotation plantation estate, BAEconomics assumed new plantings of radiata pine plantation for the purposes of this estimation.

As referenced above, industry identified thirty strategic plantation hubs in its 'Plantations - Missing Piece of the Puzzle' document (AFPA 2016) as priority areas for new plantation investment. Although new plantation investment could occur in any of these hubs, for the purposes of this exercise it was decided that carbon sequestration modelling would be undertaken in seven sample areas across Australia.

Some prime areas where radiata pine thrive and are most commonly cultivated in Australia are located in the Green Triangle, the Murray Valley and Central Tablelands regions of NSW, and in Tasmania. As such, we have examined the implications of gradually accumulating an additional 57,000 hectares of plantation forests in each of these key regions as well as several other important forestry regions. These assumptions bring the total plantation forestry expansion examined in this report to 400,000 hectares over a ten year period.

In modelling the proposed new plantations, the RMT requires the user to specify additional assumptions regarding the time period for the simulation and the silvicultural management regime to be employed.

For the purposes of demonstrating carbon sink potential, we adopted a time frame commencing in 2020 and running through to 2100. We also assumed that Pinus radiata plantations would be grown on land previously used for pasture, be subject to low initial stocking rates (on the basis of lower land quality) and undergo 3-4 thinnings and no pruning within a rotation.

We examined the sequestration profiles across seven different forestry regions, as Paul et al. (2013a) caution that regional sequestration rates can vary up to 37 per cent depending on local variations in site quality and management.

2.1.2 Green Triangle

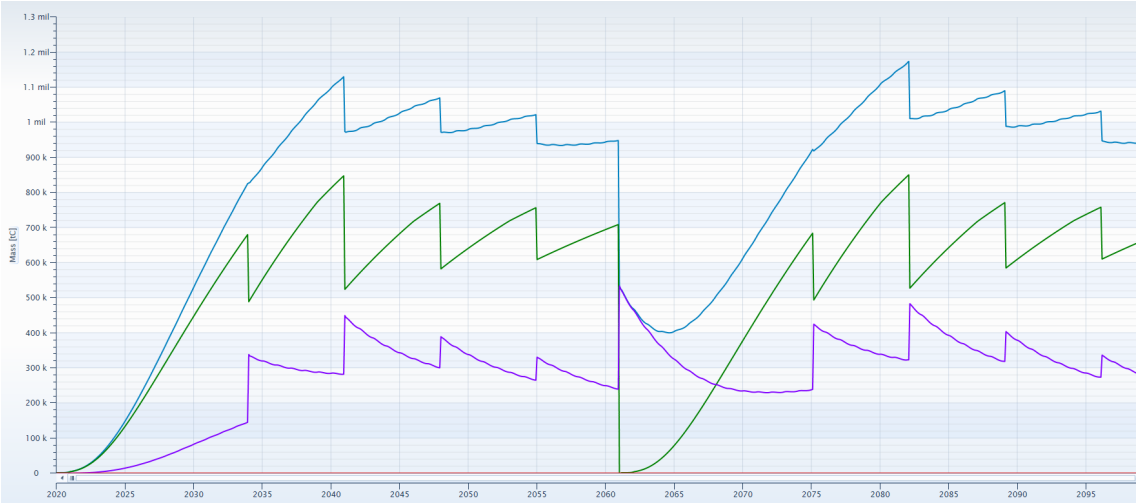
The Green Triangle is Australia's largest collective plantation and wood processing zone and disparately covers an overall land area of 6 million hectares in south east South Australia and south west Victoria. The forest industry in the Green Triangle is a major contributor to the regional economy, is strongly supported by State and local governments, and occupies 10 per cent of the region. In 2016, more than 330,000 hectares of land was occupied by softwood (50

per cent) and hardwood (50 per cent) plantations, equating to approximately 17 per cent of Australia's plantation estate (Downham and Gavran 2018). Around 7000 people are employed by the plantation and timber processing industry in this region, comprising over 23 per cent of regional employment (Regional Development Australia 2012).

Based on the assumptions supplied to the RMT, the model estimates the carbon sequestration profile depicted in Figure 2.1 for 5,700 hectares per year for 10 years of new radiata pine in the Green Triangle planted in 2020 and 2061 over two rotations. Based on the single 2020 planting, carbon sequestered equates to around 1.1 million tonnes by 2040, comprised of 0.85 million tonnes stored in trees and the remainder in forest debris.

The annual rate of sequestration in the Green Triangle in 2030-31 across the ten new plantation stands assumed in this report is approximately 0.67Mt carbon.

Figure 2-1: Green Triangle: sequestration profile for 5,700ha radiata pine planted in 2020 and 2061



Notes: Blue = C mass on site (tC), Green = C mass of trees (tC), Purple = C mass of forest debris (tC), Red = C mass emitted due to fire, from forest debris (tC) n/a.

Assumptions – Pinus radiata (1984-present SA/Vic pasture low: 4 thins; no prunes)

2.1.3 Gippsland

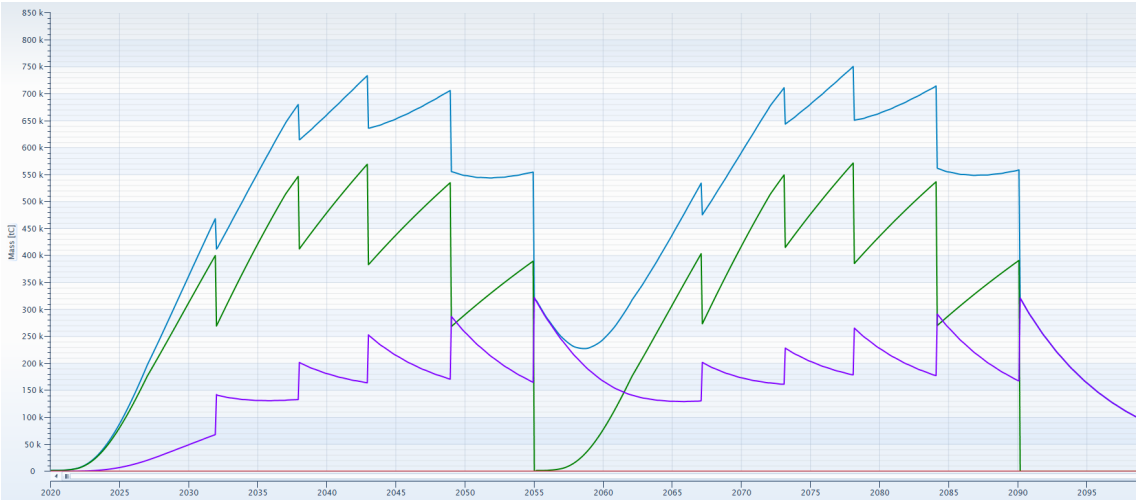
Gippsland in Victoria is home to the Latrobe Valley, an important forestry region comprised of Latrobe City, Baw Baw and Wellington Shire Councils. In 2012, 89 per cent of the Gippsland region's forest plantations were located in the Latrobe Valley, representing around 90,000 hectares of plantation estate. The Gippsland region also has around 1 million hectares of harvestable native forests. The region's hardwood plantations occupy 33,000 hectares of land,

while softwood plantations span 62,000 hectares and are comprised almost entirely of radiata pine (Gavran and Parsons, 2011).

Based on the assumptions supplied to the RMT, the model estimates the carbon sequestration profile depicted in Figure 2.2 for 5,700 hectares per year for 10 years of new radiata pine in Gippsland planted in 2020 and 2055 over two rotations. Based on the single 2020 planting, carbon sequestered equates to around 0.74 million tonnes by 2042, comprised of 0.57 Mt stored in trees and the remainder in forest debris.

The annual rate of sequestration in Gippsland in 2030-31 across the ten new plantation stands assumed in this report is approximately 0.46Mt carbon.

Figure 2-2: Gippsland: sequestration profile for 5,700ha radiata pine planted in 2020 and 2055



Notes: Blue = C mass on site (tC), Green = C mass of trees (tC), Purple = C mass of forest debris (tC), Red = C mass emitted due to fire, from forest debris (tC) n/a.

Assumptions: Pinus radiata, 1998-present Vic pasture low: 4 thins, no prunes

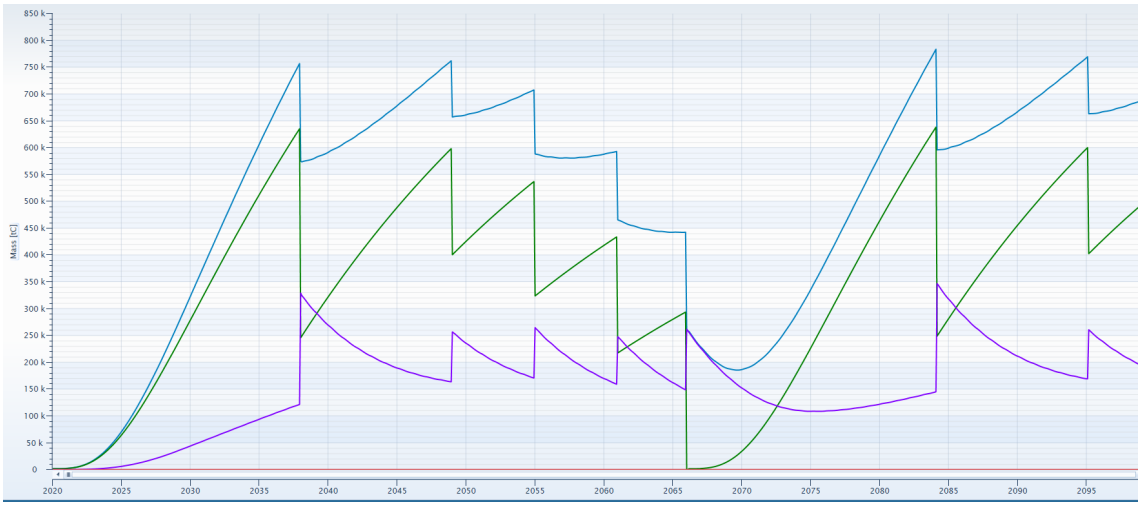
2.1.4 Riverina

The Riverina region in southern NSW covers an area from the Snowy Mountains through to the Murrumbidgee River catchment zone. ABARES (2017a) estimates the total plantation area in the Riverina at 96,000 hectares, comprised almost entirely of radiata pine. In addition, the region boasts around 1.1 million hectares of native forests. There are significant processing facilities at Tumut, Tumbarumba and Gilmore, and it is also an important region for forestry education in New South Wales.

Based on the assumptions supplied to the RMT, the model estimates the carbon sequestration profile depicted in Figure 2.3 for 5,700 hectares per year for 10 years of new radiata pine in Tumut planted in 2020 and 2066 over two rotations. Based on the single 2020 planting, carbon sequestered equates to about 0.75 million tonnes by 2038, comprised of 0.63 Mt stored in trees and the remainder in forest debris.

The annual rate of sequestration in the Riverina in 2030-31 across the ten new plantation stands assumed in this report is approximately 0.43Mt carbon.

Figure 2-3: Riverina: sequestration profile for 5,700ha radiata pine planted in 2020 and 2066



Notes: Blue = C mass on site (tC), Green = C mass of trees (tC), Purple = C mass of forest debris (tC), Red = C mass emitted due to fire, from forest debris (tC) n/a

Assumptions: Pinus radiata, 1987-present, NSW pasture low: 4 thins, no prunes

2.1.5 Central Tablelands

The Central Tablelands forestry region is concentrated around Oberon, Orange, Bathurst and Lithgow. Gavran and Parsons (2011) estimated that in 2010, the region contained 81,000 hectares of plantations and ABARES suggests that this area has remained quite stable over the past decade. In 2017, the NSW Government purchased an additional 7,000 hectares of existing pine plantation and plantable land around Oberon and Tumut, adding to its State portfolio of 220,000 hectares of softwood plantations.

The predominant plantation species in the area is Pinus radiata. Forestry activity employs around one fifth of workers in the region (Regional Development Australia 2015), with processing facilities located in Oberon, Bathurst and Burraga (Gavran et al. 2012)

Based on the assumptions supplied to the RMT, the model estimates the carbon sequestration profile depicted in Figure 2.4 for 5,700 hectares per year for 10 years of new radiata pine in Oberon planted in 2020 and 2066 over two rotations. Based on the single 2020 planting, carbon sequestered equates to 0.73 million tonnes by 2038, comprised of 0.6 Mt stored in trees and the remainder in forest debris.

The annual rate of sequestration in the Central Tablelands in 2030-31 across the ten new plantation stands assumed in this report is approximately 0.41 Mt carbon.

Figure 2-4: Central Tablelands: sequestration profile for 5,700ha radiata pine planted in 2020 and 2066

Notes: Blue = C mass on site (tC), Green = C mass of trees (tC), Purple = C mass of forest debris (tC), Red = C mass emitted due to fire, from forest debris (tC) n/a

Assumptions: Pinus radiata, 1987-present, NSW pasture low: 4 thins, no prunes

2.1.6 North Coast NSW

The North Coast region of NSW covers the coastal area from Newcastle to the Queensland border. In 2015, the total plantation area was just over 94,500 hectares, representing a decline of over 4 per cent on the previous year (ABARES 2016). This forestry area is predominantly hardwood species, however some radiata pine is also grown in the region.

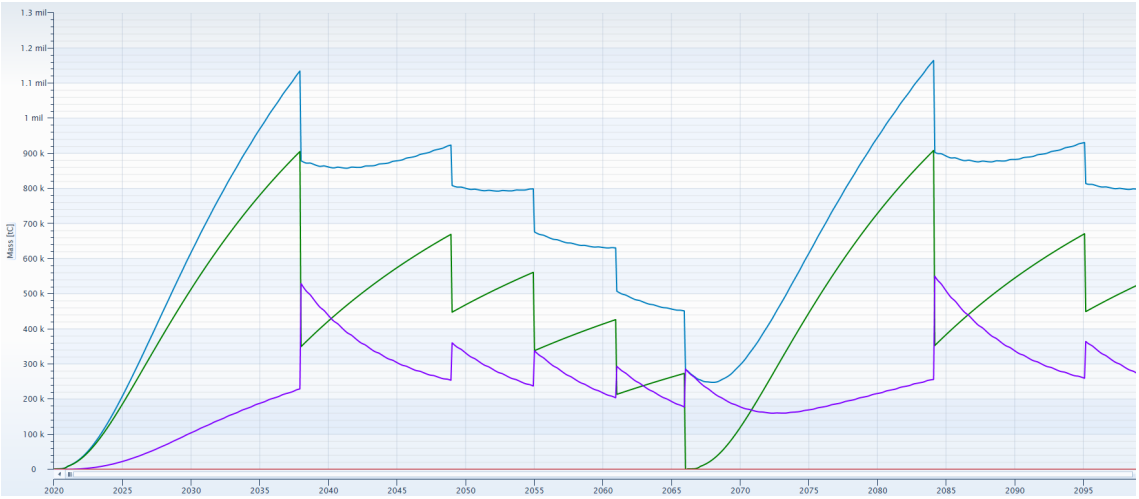
Forestry is responsible for around 5 per cent of direct employment in the region (BAEconomics 2016), with processing facilities located in Grafton, Casino, Lismore, Urbenville and Wyan (Gavran et al. 2012).

Based on the assumptions supplied to the RMT, the model estimates the carbon sequestration profile depicted in Figure 2.5 for 5,700 hectares per year for 10 years of new radiata pine in the

Grafton region planted in 2020 and 2066 over two rotations. Based on the single 2020 planting, carbon sequestered equates to 1.14 million tonnes by 2038, comprised of 0.9 Mt stored in trees and the remainder in forest debris.

The annual rate of sequestration in the North Coast region in 2030-31 across the ten new plantation stands assumed in this report is approximately 0.73 Mt carbon.

Figure 2-5: North Coast: sequestration profile for 5,700ha radiata pine planted in 2020 and 2066



Notes: Blue = C mass on site (tC), Green = C mass of trees (tC), Purple = C mass of forest debris (tC), Red = C mass emitted due to fire, from forest debris (tC) n/a

Assumptions: Pinus radiata, 1987-present, NSW pasture low: 4 thins, no prunes

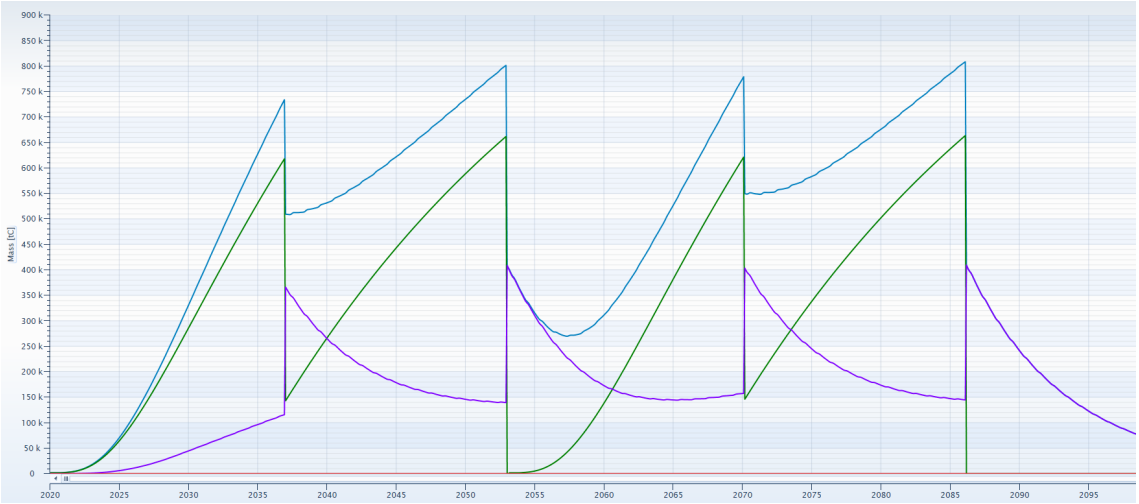
2.1.7 Tasmania

The majority of Tasmania's plantation forests are located in the north of the State, with processing facilities and ports in the Tamar Valley and Burnie. An area of around 76,000 hectares is planted under radiata pine in Tasmania, and another 234,000 hectares is dedicated to hardwood species (Downham and Gavran 2018).

Based on the assumptions supplied to the RMT, the model estimates the carbon sequestration profile depicted in Figure 2.6 for 5,700 hectares per year for 10 years of new radiata pine in Tasmania planted in 2020 and 2053 over two rotations. For the single 2020 planting, carbon sequestered equates to around 0.75 million tonnes by 2037, comprised of 0.62 Mt stored in trees and the remainder in forest debris.

The annual rate of sequestration in Tasmania in 2030-31 across the ten new plantation stands assumed in this report is approximately 0.44Mt carbon.

Figure 2-6: Tasmania: sequestration profile for 5,700ha radiata pine planted in 2020 and 2053



Notes: Blue = C mass on site (tC), Green = C mass of trees (tC), Purple = C mass of forest debris (tC), Red = C mass emitted due to fire, from forest debris (tC) n/a.

Assumptions: Pinus radiata, 1970-present, Tas pasture low: 1 thin, no prunes

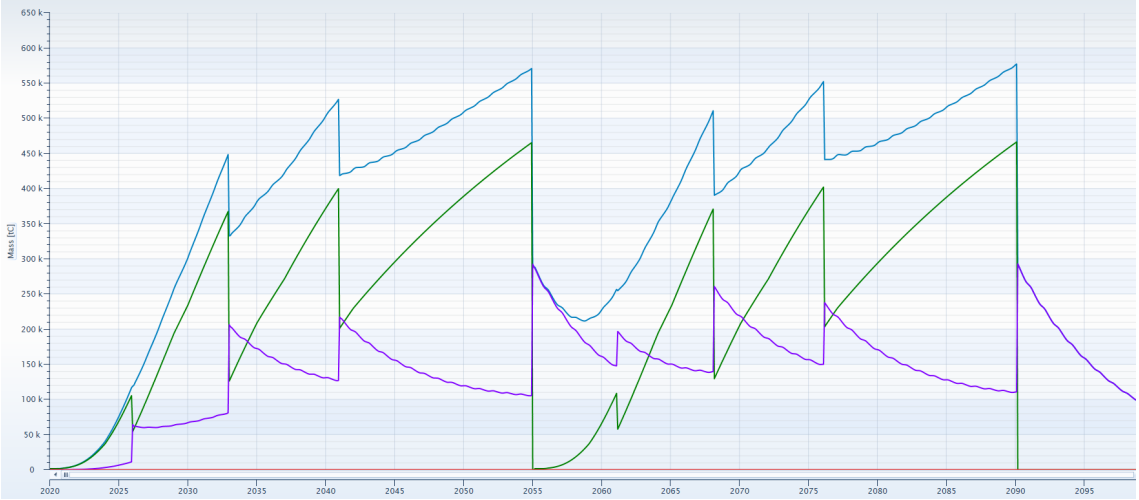
2.1.8 South-West Western Australia

The South-Western forestry area of Western Australia extends from Esperance along the coastline to Perth, and as far inland as Jingalup. The total plantation estate of Western Australia was 383,000 hectares in 2015, with ABARES (2018) reporting a general decline in plantation area over the previous five year period. In the same year, softwood plantations comprised 98,000 hectares and were predominantly radiata pine (ABARES 2016).

Based on the assumptions supplied to the RMT, the model estimates the carbon sequestration profile depicted in Figure 2.7 for 5,700 hectares per year for 10 years of new radiata pine in south-western WA planted in 2020 and 2055 over two rotations. For the single 2020 planting, carbon sequestered equates to 0.45 million tonnes by 2033, comprised of 0.36 Mt stored in trees and the remainder in forest debris.

The annual rate of sequestration in south-west WA in 2030-31 across the ten new plantation stands assumed in this report is approximately 0.4Mt carbon.

Figure 2-7: SW Western Australia: sequestration profile for 5,700ha radiata pine planted in 2020 and 2055



Notes: Blue = C mass on site (tC), Green = C mass of trees (tC), Purple = C mass of forest debris (tC), Red = C mass emitted due to fire, from forest debris (tC) n/a.

Assumptions: Pinus radiata, 1999-present, WA pasture low: 3 thins, no prunes

2.2 Sequestration impact

At the end of 2010, Australia's forests and harvested wood products were estimated to hold 13.067 billion tonnes of carbon (DCCEE 2012). Ninety-eight per cent of this carbon was stored in living forests.

To establish the impact on sequestration of a policy decision to increase the plantation forest area in Australia by 400,000 hectares over 10 years, we calculated the aggregate carbon stock associated with new radiata pine planted in seven key forestry locations. These plantations were assumed to be established on a gradual basis, with an additional 5,700ha planted in each of the seven regions each year from 2020 to 2029.

The cumulative sequestration impact of a single planting in 2020 from across these regions is 3.2 million tonnes of carbon by 2030. An aggregate 400,000 hectares of softwood plantation established over 10 years across the seven regions would provide 14.05 million tonnes of carbon sequestration by 2030. Of this amount, around 12 Mt derives from the carbon stored in trees, while 2 Mt is carbon stored in forest debris.

On an annual basis, the aggregate carbon sequestered in one year from 2030 to 2031 across the seven regions would equate to **3.54 million tonnes of carbon** (or **12.97 million tonnes of CO2-e**).

2.2.1 Additional carbon benefits

The figures referenced above are likely an underestimate of carbon sequestration potential, as the RMT does not take account of soil carbon or carbon stored in harvested forest products. ABARES (2013) estimates that around 30 per cent of total forest carbon stock is stored in soil, and 1.7 per cent is stored in harvested wood products.

Based on these estimates, the total carbon stock sequestered by 400,000 hectares of softwood (Pinus radiata) plantation established in the 2020 to 2029 timeframe across these locations would be 20.3 million tonnes by 2030. On an annual basis, the incremental amount of carbon sequestered from 2030 to 2031 across the seven regions is 5.1 million tonnes.

As land under silvicultural management is likely to remain under plantation given viable economics, it is reasonable to assume that further rotations will occur. As such, this land could maintain or perhaps increase (depending on growing conditions and silvicultural advancement) its contribution to sequestration activities through time.

3 Conclusions

Australia's Paris Accord commitment to reduce our emissions by 26-28 per cent below 2005 levels by 2030 equates to a reduction of around 47 million tonnes of carbon annually by 2030 or, expressed in terms of tonnes of carbon dioxide equivalent, 171Mt CO_2e. The actual emissions reduction task in 2030 is likely to be larger than this simply because the Australian economy has grown since 2005 and can be expected to continue to grow to and beyond 2030.

If an additional 400,000 hectares of softwood plantation can be established, as an example only, across seven prime forestry locations between 2020 to 2029, BAEconomics estimates that around 20 million tonnes of carbon could be cumulatively sequestered by 2030. Assuming, the size of the new plantation estate was maintained over time it would also be expected that the cumulative carbon sequestration would increase as trees planted later in the planting cycle mature. The contribution of an expansion of the plantation estate could be expected in 2030 to contribute an amount of carbon sequestration in that year equivalent to a reduction in annual emissions of 5.1Mt C or, expressed in tonnes of CO_2e, an amount of 18.7Mt CO_2e or around 11 per cent of Australia's emissions reduction task. If the new plantation estate's contribution to soil carbon and carbon stored in products is not counted then an extension of the plantation estate would contribute 3.54Mt C or around 13Mt CO_2e in 2030. This would represent almost 8 per cent of Australia's emission reduction task in 2030.

This carbon sequestration assessment is based on outputs of the Reforestation Modelling Tool, which provides an estimate of forest carbon stock, plus our own calculation derived from ABARES estimates of soil carbon and carbon stored in harvested products.

Clearly, sequestration from plantation forestry has the potential to provide a significant contribution to our international climate commitments. This is a particularly interesting finding considering carbon forestry has been ranked as the simplest and most cost-effective land-based sequestration option to implement on a per unit basis in Australia and several other countries.

However, for this extent of new plantation area to be established in Australia over the next decade, significant policy decisions would be required. Australia's plantation estate is currently in decline, with challenged economics and previous short rotation plantation areas not being replanted. In addition to ongoing recognition under the Carbon Farming Initiative (CFI), coordinated planning is needed to establish new plantations in the most value-accretive locations, paving the way to longstanding forest estates that can contribute to long-term carbon sequestration and Australia's international climate goals.

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