



Green Triangle
Forest Industries Hub

Trees on Farms initiative

A comparison of participating in the Emissions Reduction Fund under the plantation forestry method versus the farm forestry method

Prepared by Esk Spatial for the Green Triangle Forestry Industries Hub Project 4 – June 2023

This project is delivered by the Green Triangle Forest Industries Hub (GTFIH) as part of the South Australian Trees on Farms Initiative and is only possible from the support and funding provided by the South Australian Government through the Department of Primary Industries and Regions, and funding contributed by the Australian Government.



Australian Government
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**Government
of South Australia**
Department of Primary
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A comparison of participating in the Emissions Reduction Fund under the plantation forestry method versus the farm forestry method

Information current as of 30 June 2023

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About the Trees on Farms initiative

Launched in March 2022, the Trees on Farm initiative is aimed at growing and developing the on-farm forest plantation sector, particularly in the Green Triangle region. Key components of the program, including this report, are being delivered in partnership with the Green Triangle Forest Industries Hub (GTFIH).

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Acronyms

Acronym	Definition
ACCU	Australian Carbon Credit Unit
BAU	Business-as-usual
CER	Clean Energy Regulator
CFI	Carbon Farming Initiative
DAFF	Department of Agriculture, Fisheries and Forestry
DISR	Department of Industry Science Energy and Resources
ERF	Emissions Reduction Fund
GHG	Green-House Gas
GTFA	Green Triangle Fire Alliance
GTFIH	Green Triangle Forestry Industries Hub
MAI	Mean annual increment
NPI	National Plantation Inventory
PIRSA	Department of Primary Industries and Regions, South Australia

Glossary

Term	Definition
CFI Act	Carbon Credits (Carbon Farming Initiative) Act 2011
CFI Rule	Carbon Credits (Carbon Farming Initiative) Rule 2015
Carbon credit	A certified and tradeable unit that represents one tonne of carbon dioxide equivalent that has been removed from the atmosphere. By purchasing or generating, and then retiring a carbon credit an entity can offset one tonne of carbon dioxide equivalent emissions they generate.
Carbon dioxide equivalent (CO _{2-e})	A standard measurement unit to compare the emissions from various greenhouse gases (for example methane,

		CH ₄ , and nitrous oxide, N ₂ O, which are common GHG's emitted in forestry activities) on the basis of their global-warming potential (GWP), by expressing the impact of each different green-house gas in terms of the amount of CO ₂ that would create the same amount of warming
Farm Forest		Forest that is established on a farm, where a farm is a tract of land primarily used for agriculture
Forest		Land on which trees: <ul style="list-style-type: none"> - have attained, or have the potential to attain, a crown cover of at least 20% across the area of land; and - have reached, or have the potential to reach, a height of at least 2 metres
Forest Cover		An area has forest cover if the vegetation on the land includes trees that have achieved: <ul style="list-style-type: none"> - 2 metres or more in height; and - crown cover of at least 20% of the land
Green-House Gas		A green-house gas (GHG) is a gas in the Earth's atmosphere that can absorb radiation being emitted from the earth's surface, despite being transparent to radiation from the Sun. These gases trap that radiation in the atmosphere in the form of heat, and so have been referred to as acting like a green-house. The primary greenhouse gases in Earth's atmosphere are water vapor (H ₂ O), carbon dioxide (CO ₂), methane (CH ₄), nitrous oxide (N ₂ O), and ozone (O ₃).
Inset		A carbon sequestration project set up by the business that is used to account for emissions directly within the business rather than sold on the market
Plantation Forest		A planting of forest tree species for the harvest of saleable forest products
Permanent Planting		A planting of tree species in which the trees are not generally intended to be harvested, and certainly not for generation of saleable forest products

Executive summary

Background

With an increasing global awareness and scientific understanding of the effects of climate change, the ratification of the Paris Agreement in 2016 opened the way for countries to actively commit to mitigating such change. Since then, this commitment has increased demand for trading into existing and new carbon markets, with future projections predicting continuous growth in such markets. Australia is one of about 70 countries who have now committed to achieving net zero carbon, specifically the Australia Government passed the Climate Change Act 2022 which outlines Australia's targets to cut carbon emissions by 43% in 2030 and to net zero by 2050. These targets have been accepted by the National Farmers Federation, the Grain Growers, and Meat and Livestock Australia within their own climate change policies. To meet such targets various methodologies have been developed by the Australian Government to generate carbon credits, and the concepts of green-house gas (GHG) accounting and achieving carbon neutral certification are becoming common across a range of industries within Australia, including the agricultural sector.

The planting of trees is hoped to make a significant contribution to achieving the net zero 2050 target by way of carbon sequestration and can also achieve other on-farm benefits such as providing shelter for stock and mitigation of erosion. Under various methodologies of the Australian Emissions Reduction Fund (ERF), the sequestered carbon can be converted into a tradeable carbon credit by the landholder, either tradeable on the available carbon markets, or kept to account for on-farm emissions within their GHG account. Similarly, carbon neutral certification programs allow the landowner to plant trees to act as insets against their own internal emissions without the need to convert the sequestered carbon into carbon credits.

Esk Spatial were invited by the Green Triangle Forestry Industries Hub (GTFIH) to prepare this report to compare the two main pathways for plantation forests to be entered into the ERF to generate carbon credits, and to also review alternative pathways for the own-use option outside of the ERF.

This project is one of a portfolio of research activities, including specific outcome communications, to underpin support of expansion of the planted forest resources of South Australia, with an emphasis on integrating forestry enterprise into the existing productive farming environment.

The activities were developed under a Funding Deed between the GTFIH (the recipient) and the Department of Primary Industries and Regions, South Australia (PIRSA - the funder). The funding for these projects from PIRSA, while directed at South Australia, will provide benefit to all the Green Triangle.

Project Objectives

With an emphasis on the Green Triangle region, the primary aim of this report is to compare the two 'new tree planting' methodologies currently available under the ERF which can generate carbon credits for the landowner when they establish a carbon project. The two methods compared in this report are:

1. Plantation Forestry 2022 – Schedule 1 Methodology ('Plantation Forestry method'), which focuses on commercial harvest plantation forest establishment; and
2. Measurement Based Methods for New Farm Forestry Plantations Methodology ('Farm Forestry method'), which incorporates both:
 - harvest plantation projects, which allow harvesting for saleable forest products; and
 - permanent planting projects, in which harvesting for commercial gain is not permitted.

A secondary aim of this report is to expand on the 'own-use' (insetting) approach for GHG accounting purposes, and where possible compare this to the above ERF methodologies. As an example of an own-use option, the draft guidelines for accounting for carbon sequestration from tree plantings ('Climate Active method') under Climate Active's carbon neutral certification program was used.

Key Findings

Esk Spatial's review of the three methodologies provided these key findings:

- if you are planning on establishing a plantation for harvest of saleable wood products, the Plantation Forestry method is the recommended option, as it avoids the need for complex and costly field measurements, has no penalty associated with reversals resulting from thinning and harvest events and, provides tradeable ACCUs to retain control over current and future financial decisions. The risks associated with the Plantation Forestry permanence period can be mitigated with a solid permanence

plan (and its implementation) and if available and financially viable, appropriate insurance to cover reversal from disturbance.

- if you are planning on establishing a permanent planting for on-farm benefits such as shelter and erosion control, the Climate Active method may yield more insets, has a lower risk profile and has a lower cost of entry than the Farm Forestry permanent planting method, but will not yield any tradeable ACCUs to gain you financial planning flexibility. Although not reviewed in this report, the ERF's 'Reforestation by Environmental or Mallee Plantings' Method should also be considered as option to generate ACCUs from a permanent planting.
- entry under a 100-year permanence obligation for any of the ERF methods should not be undertaken without lengthy consideration of possible ramifications for yourself, the business and the future owners of the land.
- the ability to scale up the project area and/or pool resources and costs among multiple proponents is a key path to reducing any financial stress associated with the administrative costs required for entry and running a project under all methods reviewed.
- entering the ERF and receiving credits provides much more flexibility to manage return on investment against the costs associated with entering such projects and future emissions, and still provides good options to achieve carbon neutral status should such certification become a market standard, or should such requirements become more widely legislated or tax incentivised as Australia attempts to reach net zero by 2050. However, given the long-term commitment and return profile for such an enterprise, an understanding of the carbon market space is key to make effective use of ACCUs generated.

Introduction

Project Background

This project is one of a portfolio of research activities, including specific outcome communications, to underpin support of expansion of the planted forest resources of South Australia, with an emphasis on integrating forestry enterprise into the existing productive farming environment.

The activities were developed under a Funding Deed between the Green Triangle Forest Industries Hub (GTFIH - the recipient) and the Department of Primary Industries and Regions, South Australia (PIRSA - the funder). The funding for these projects from PIRSA, while directed at South Australia, will provide benefit to all the Green Triangle.

Project Objectives

With an emphasis on the Green Triangle region, the primary aim of this report is to compare the two 'new tree planting' methodologies currently available under the Australian Emissions Reduction Fund (ERF), which can generate carbon credits¹ for the landowner when they establish a carbon project. The two methods compared in this report are:

1. Plantation Forestry – Schedule 1 Methodology ('Plantation Forestry method'); and
2. Measurement Based Methods for New Farm Forestry Plantations Methodology ('Farm Forestry method')

Both methodologies provide financial incentives to promote carbon sequestration in the land sector. However, they each have different eligibility criteria, project design, baseline, and additionality requirements, credit period, and monitoring and verification processes. Possibly of more importance for a farmer, they also have different financial cost, and risk, profiles. Both methods generate Australian Carbon Credit Units (ACCU) which can be traded on regulated or voluntary markets or can be held for 'own-use' (insetting²).

¹ Under the ERF, carbon credits are generated in the form of Australian Carbon Credit Units (ACCU). One ACCU represents one tonne of carbon dioxide equivalent greenhouse gas that is not released into the atmosphere.

² An inset is a carbon sequestration project set up by the business that is used to account for emissions within the same business rather than being sold into a market for third party businesses to use as offsets against their emissions.

A secondary aim of this report is to expand on the own-use approach for GHG accounting purposes, and where possible compare this to the above ERF methodologies.

The following are out of scope for this project and addressed by other projects as part of the PIRSA portfolio of projects:

- the mapping of carbon potentials across the Green Triangle region will be addressed by the PIRSA and GTFIH Project 3 (Wilson, Nermut, & Hay, 2023).
- the treatment of taxation in relation to carbon matters will be addressed by the PIRSA and GTFIH Project 5 (Jenkin, 2023).

Global Agreement on Climate Change Response

The Paris Agreement is an international treaty negotiated by the United Nations Framework Convention on Climate Change (UNFCCC) and entered into force in 2016 following ratification by 195 of the 198 parties to the Convention (UNFCCC, 2015). The United States, which is the world's second-largest emitter of greenhouse gases, withdrew from the Paris Agreement in 2020 but rejoined the agreement in 2021 under the Biden Administration.

The agreement aims to reduce or reverse the threat of climate change by keeping global temperature rise well below 2 degrees Celsius above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 degrees Celsius (UNFCCC, 2023).

The Paris Agreement builds upon the UNFCCC's previous efforts to address climate change, including the Kyoto Protocol, which was adopted in 1997 (UNFCCC, 2023). Unlike the Kyoto Protocol, the Paris Agreement is a legally binding agreement that includes all countries, both developed and developing, in the effort to address climate change.

Under the Paris Agreement, each country sets its own climate targets, called nationally determined contributions (NDCs), which are updated every five years. The NDCs are submitted to the UNFCCC and are intended to represent a country's best efforts to address climate change based on its national circumstances and capabilities. The agreement also includes provisions for transparency, reporting, and review to ensure that countries are meeting their commitments.

Net Zero 2050

The Australian Emissions Reduction Fund has three key elements, including crediting, purchasing, and safeguarding emissions reductions. The safeguard mechanism commenced in 2016 and complements the emissions reduction elements of the Emissions Reduction Fund by placing a legislated obligation on Australia's largest greenhouse gas emitters (more than 100,000 tonnes of carbon dioxide equivalent (CO₂-e) per year) to keep net emissions below their emissions limit (or baseline) (Clean Energy Regulator, 2019). As of the 2023 amendment, this applies to industrial facilities across the mining, oil and gas, manufacturing, transport and waste sectors. Collectively, these facilities account for about 28% of Australia's emissions (DCCEEW, 2023 [1]). The electricity generation sector is also covered under the Safeguard Mechanism but via a 'sectoral' baseline rather than targeting specific generators (DCCEEW, 2023 [2]). Whether this mechanism will need to be extended to smaller emitters or across more sectors, or some other mechanism will need to be introduced to ensure Australia meets its targets, remains to be seen.

In late 2022, the Australia Government passed the Climate Change Act 2022 which outlines Australia's targets to cut carbon emissions by 43% in 2030 and to net zero by 2050 (Commonwealth of Australia, 2022 [2]). These targets have been incorporated into the climate policies of national bodies such as the National Farmers Federation (National Farmers Federation, 2021) and the Grain Growers (Grain Growers, 2022), with Meat and Livestock Australia reporting that the Australian red meat industry will meet the net zero target by 2030 (Meat and Livestock Australia, 2023). Information from the United Nations suggest that about 70 countries, including the biggest polluters – China, the United States, and the European Union - have committed to net zero targets to date (United Nations, 2022).

With such regulation and commitments in place within Australia and globally, it is clear there will continue to be growing pressure for businesses across all sectors to account for their emissions and contribute to the net zero targets, either to meet these global targets or to achieve market pull in such an environment.

The two ERF methodologies reviewed in this report, and the example of a possible own-use approach which will be discussed soon, are ways in which a farming enterprise can contribute to the net zero target by way of generating carbon sequestration offsets for use by external parties, or insets for internal business use.

Carbon Markets

Under the ERF methodologies, ACCUs issued for a project can be traded on a range of markets. In early 2022 tax concessions were introduced for farmers that mean carbon farming income can be treated like other primary production income for tax reasons. The following sections provide an overview of the markets currently available, with specific mention of the ACCU market.

International carbon markets

A decade ago, only 7% of global emissions were covered by either a carbon tax or an emissions trading scheme. Currently almost a quarter of global greenhouse gas emissions (23%) are now covered by 73 instruments (The World Bank, 2023).

International carbon markets include the Clean Development Mechanism and voluntary emissions reduction standards administered by non-government organisations, such as the Gold Standard and Verra (previously known as the Verified Carbon Standard) (Carbon Market Institute, 2023). In 2021, the voluntary carbon market grew to US\$2 billion, four times its value in 2020, and was recorded to be still accelerating in 2022. By 2030, the market is expected to reach anywhere between US\$10 billion and US\$50 billion (BCG, 2023) (McKinsey, 2021).

Demand for purchase of international units and certificates in Australia is primarily driven by voluntary emissions reduction ambition, including businesses certifying their actions against the government-backed Climate Active Carbon Neutral Standard (Carbon Market Institute, 2023).

National carbon markets

The Clean Energy Regulator administers national carbon markets for:

- the Emissions Reduction Fund, which supplies Australian carbon credit units (ACCUs)
- the Renewable Energy Target, which creates tradable large-scale generation certificates (LGCs) and small-scale technology certificates (STCs)
- the Safeguard Mechanism, with reformed legislation to be passed 1 July 2023, creates tradable Safeguard Mechanism Credits (SMCs)

The Clean Energy Regulator is the major purchaser of ACCUs, however there is increasing demand for ACCUs from businesses and other levels of government, with some purchasers seeking ACCUs with co-benefits. Co-benefits relate to additional benefits generated from a project in addition to carbon abatement (Clean Energy Regulator, 2022). This might include a range of other environmental, economic, social and cultural benefits, for example (Clean Energy Regulator, 2022):

- increasing biodiversity from the protection and regeneration of native vegetation
- use of traditional fire management practices providing new income streams for Indigenous communities, and
- improved soil health and resilience in the land sector

The Renewable Energy Target consists of two schemes: the Large-scale Renewable Energy Target (LRET) that provides incentives for large-scale renewable energy power stations and the Small-scale Renewable Energy Scheme (SRES) that creates incentives to install small-scale renewable energy systems. Demand for renewable energy certificates is set in legislation each year. However, there is increasing demand from businesses and other levels of government for LGCs to offset emissions.

Under the Safeguard Mechanism, SMCs will be issued to facilities that 'beat' their emissions limit or 'baseline'. The facilities covered by the Safeguard Mechanism are currently those that emit more than 100,000 tonnes of carbon dioxide equivalent (tCO_{2-e}) per annum. Facilities will be credited one SMC for every below-baseline tCO_{2-e} (Carbon Market Institute, 2023).

State and territory carbon markets

State and territory government schemes include the New South Wales Energy Saving Scheme and the Victorian Energy Efficiency Target which incentivise the installation of energy efficient equipment and appliances (Carbon Market Institute, 2023). These schemes supply tradable certificates with demand set in legislation under the relevant state targets.

State and territory governments have in the past purchased ACCUs to offset emissions for state-based carbon targets, for example for the operation of desalination plants and vehicle fleet emissions (CER, 2021) but such purchases have not been reported again since 2022 (CER, 2023).

ACCU Market Options

There is the option to register a project and participate in the Emissions Reduction Fund without bidding into an auction or securing a contract. Further, in early 2022 it was announced that carbon abatement suppliers who were in fixed delivery contracts with the Federal Government could exit from their contracts, allowing more participants to also sell their carbon credits on the open market to other buyers including emitters and corporates, rather than the government.

In all these cases you are still required to provide offset and audit reports for the registered project and will be issued with ACCUs for emissions abatement achieved. However, the Clean Energy Regulator will not purchase ACCUs from projects without a contract. Any ACCUs generated can be sold on the secondary market or directly to other parties. The secondary market refers to transactions of ACCUs outside of schemes administered by the Clean Energy Regulator. Anyone can trade and sell ACCUs on the secondary market.

Following the market fallout from the announced exit arrangements from Commonwealth fixed delivery contract milestones, the Clean Energy Regulator reported in March 2022 on the subsequent market response and stated that *'there is evidence of strongly increasing business demand to use ACCUs to reduce net emissions, and it is expected this will be the key determinant of the uptake of contract milestone exit applications'*. The average ACCU spot price dropped from about \$47³ (the peak being \$57) to \$32 after this announcement, from which it returned to about \$35 after the 2022 federal election. There has been at least one more significant, but less dramatic, price drop following the announcement of the ACCU review. Since then the price continually increased to around \$38 in January 2023 (refer Figure 1) and has steadily declined to around \$32 in June 2023⁴, but these are just short term observations which should not be taken to reflect any long term trends.

³ All dollar values in this report refer to Australian Dollars (AUD) except where otherwise noted

⁴ Source: Jarden spot price website [accus.com.au](https://www.acccus.com.au)

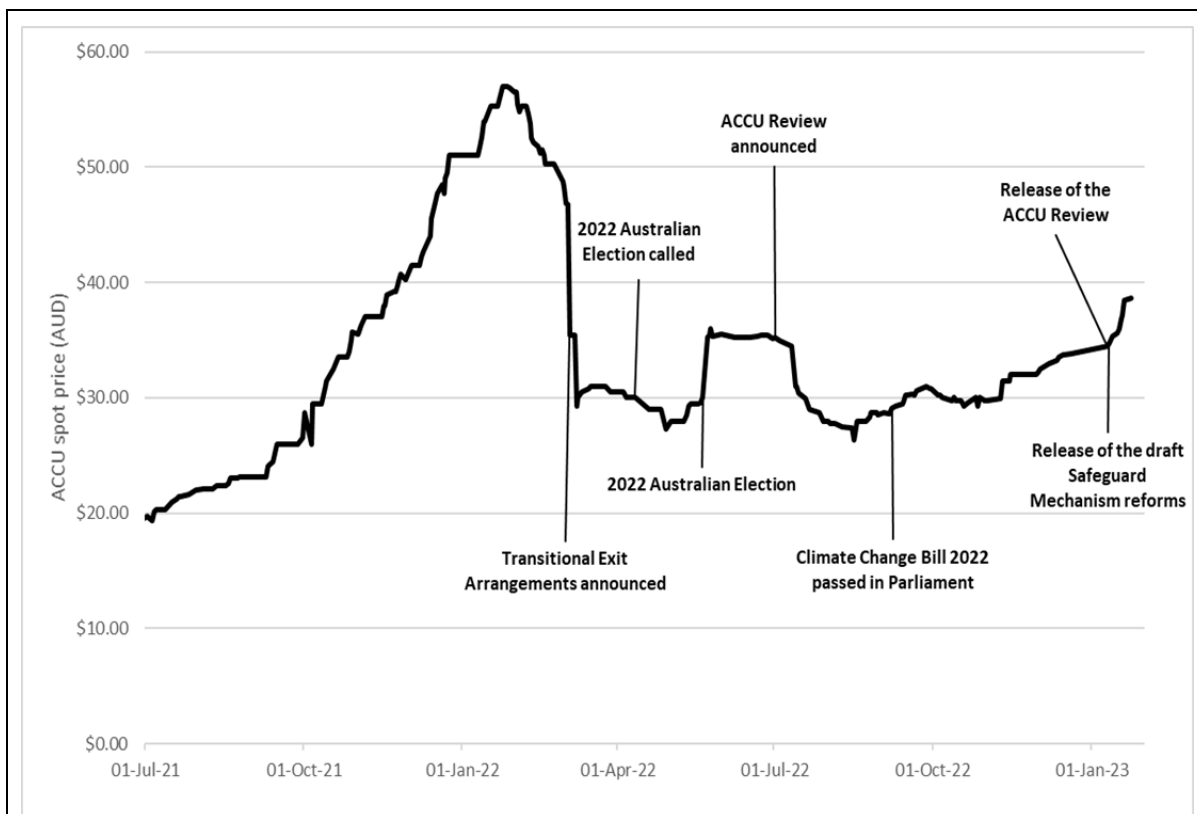


Figure 1: Generic ACCU spot price, July 2021 to January 2023⁵

The sale of ACCUs on the regulated or voluntary markets provides short to medium benefits in the form of early cash revenue to fund the forest establishment costs and the project establishment, monitoring, and reporting costs. But under the growing pressure and commitments to emissions accounting and net zero targets described above, the 'own-use' (insetting) option is worth considering.

For farmers, the ability to establish and manage offset projects on their own land to receive ACCUs provides a self-manageable buffer for any potential need to purchase external offsets against internal business emissions, potentially at much higher cost should ACCU and equivalent crediting mechanisms continue to rise in price.

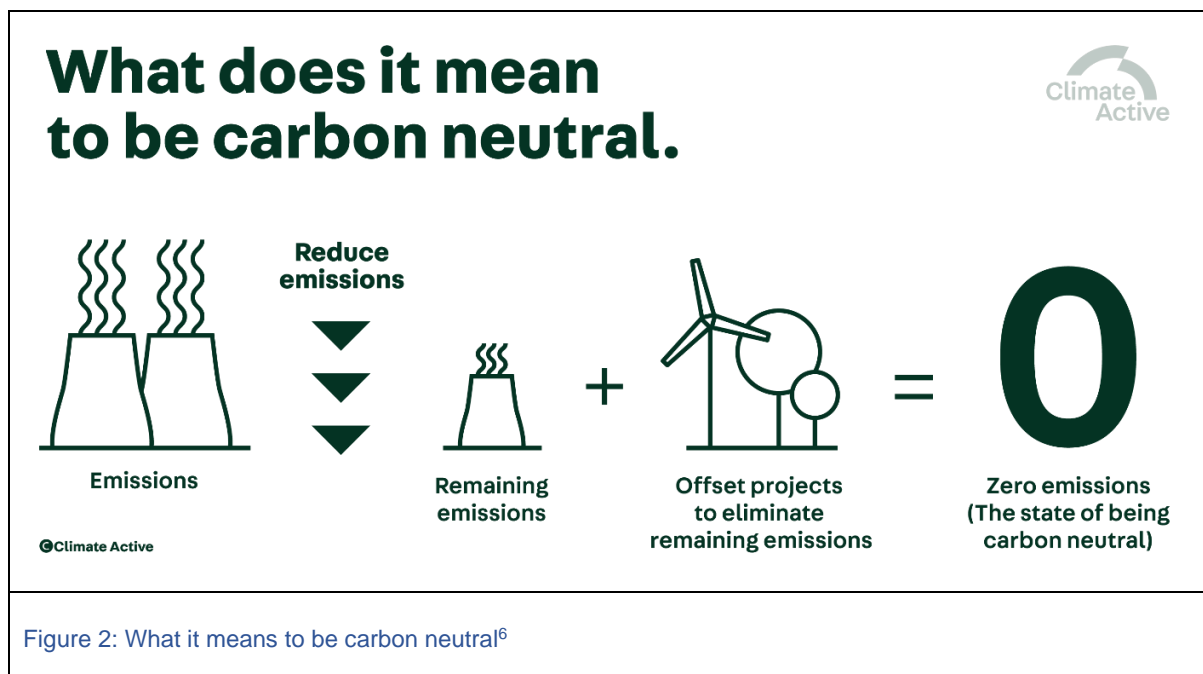
There is of course the choice to utilise both alternatives to balance a reduction in immediate financial obligations against the long-term risk of a high future cost to offset emissions.

⁵ Source: Quarterly Carbon Market Report December Quarter 2022, Clean Energy Regulator website.

Carbon Neutral Certification

There are a range of privately run voluntary carbon neutral and carbon reduction certification programs running in Australia that can cover farm enterprises. For example, carbon reduction certification is offered under the 'LowCO2' program by the Carbon Reduction Institute and the 'Agricultural Sustainability Certification' program offered by Carbon Friendly. Carbon neutral certification is offered under the 'NoCO2' by the Carbon Reduction Institute and the 'Climate Active' program by the Australian Government. These types of certifications are voluntary, they do not generate tradeable carbon credits, and can be available for organisations (business operations), products, services, events, precincts and buildings.

Carbon reduction certification is achieved where there has been a reduction in GHG emissions between the base year and assessment year by introducing new technology or changing the way a business operates. Carbon neutral certification then requires the entity to purchase carbon offsets to 'cancel out' any remaining emissions generated (refer Figure 2). Carbon offset units are generated by third parties for activities that prevent, reduce, or remove greenhouse gas emissions from being released into the atmosphere. When the offsets purchased by an organisation equal the emissions produced, they are carbon neutral.



⁶ Source: Climate Active website (Climate Active, 2023)

Climate Active currently list the following units as being eligible offsets under their certification program:

- Australian Carbon Credit Units (ACCUs) issued by the Clean Energy Regulator in accordance with the framework established by the Carbon Credits (Carbon Farming Initiative) Act 2011.
- Certified Emissions Reductions (CERs) issued as per the rules of the Kyoto Protocol from Clean Development Mechanism projects.
- Removal Units (RMUs) issued by a Kyoto Protocol country on the basis of land use, land-use change and forestry activities under Article 3.3 or Article 3.4 of the Kyoto Protocol
- Verified Emissions Reductions (VERs) issued by the Gold Standard
- Verified Carbon Units (VCUs) issued by the Verified Carbon Standard

Under carbon neutral certification, a carbon account typically only measures sources of greenhouse gas emissions. In October 2022 Climate Active released for public consultation a draft guideline to explain how businesses can also measure carbon sinks from trees and shrubs they have planted, without the creation of offset units. If released, this inset mechanism could be used for both organisation and product certifications under Climate Active.

With this new approach under consideration there could soon be two pathways for own-use offsets, certainly under the Climate Active program:

- Register a project under the ERF methodologies to generate ACCU's for offsetting your business emissions and use them within the Climate Active program as required to offset your own business emissions.
- Use the Climate Active guidelines to measure carbon sinks from trees and shrubs to account for them as offsets against your own business emissions.

The methodology explained in the draft guidelines have been included in this review as a possible example of a certification-based method for 'own-use' carbon abatement and is referred to in this document as the 'Climate Active method'.

The Green Triangle Forestry Landscape

In early 2019 the Australian Government announced funding for the 'A Billion Tees' Plan, the aim being to establish significant additional plantations across Australia by 2030, with a strong emphasis for plantings on farming land to meet both forecasted timber demand in Australia by 2050 and on-farm benefits including provision of shelter, reducing erosion and reducing dryland salinity (DAFF, 2018). This original plan was aimed at establishing an additional 400,000 hectares to the 2 million hectares of plantations that were in place at the time, and the regional forestry hubs such as the Green Triangle Forestry Industries Hub (GTFIH), were established to support and promote forest industries locally (DAFF, 2018).

Softwood plantation areas nationally have remained steady at approximately 1 million hectares since 1999, hardwood plantation area having declined from a peak of 1 million in 2012-13 to a current national area of about 0.75 million hectares (ABARES, 2022). This trend continues, and since 2019 there has been a small decline of hardwood plantation area and no significant new plantings recorded either locally in the Green Triangle or nationwide (ABARES, 2022). Within the Green Triangle, the decline in total area is likely attributed to the high agricultural land prices currently being experienced, with median prices anywhere from \$4,600/ha to \$15,000/ha (Regan & Connor, 2022), coupled with the long standing barriers to new forest establishment including the long time frames associated with return on investment and their high initial establishment costs (Whittle, Lock, & Hug, 2019).

In 2022 the Emissions Reduction Fund defined methodologies that would provide ACCUs for the establishment and retention of commercial plantations. A recent report for the GTFIH prepared by the University of South Australia (UniSA) modelled the effect that carbon pricing would have on overcoming these financial barriers in terms of the potential area for new planting that might become financially feasible under these new methodologies. The UniSA's findings suggested that under ACCU issuance from Schedule 1 of the Plantation Forestry Method this would provide the financial incentive to establish anywhere from an additional 1,000ha (at \$30/ACCU) to 121,000ha (at \$50/ACCU) of longer rotation softwood plantations within the region, or 128,000 hectares (at \$30/ACCU) to 621,000ha (at \$50/ACCU) of short rotation hardwood plantations (Regan & Connor, 2022). As mentioned earlier in this report, the spot price for ACCUs has ranged from \$38 to \$32 in the last year.

Within the Green Triangle (and Central Victoria) National Plantation Inventory (NPI) regions the dominant commercial plantation species are *Eucalyptus globulus* (Tasmanian Blue Gum)

and *Pinus radiata* (Radiata Pine or Monterey Pine) as shown in Figure 3 and Figure 4, accounting for only about 6% of the total land use in the region⁷.

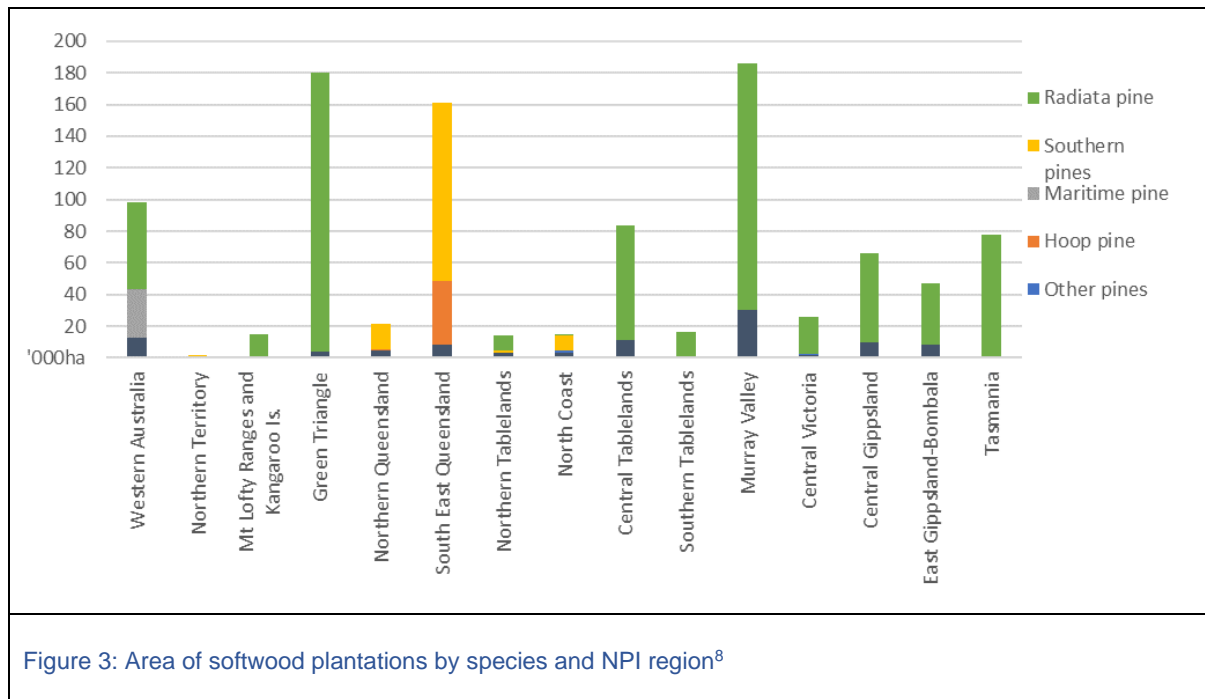


Figure 3: Area of softwood plantations by species and NPI region⁸

Radiata pine is generally grown as long rotation crops (28-40 years) with one two or three thinning events required to maximise the production of larger diameter sawlog products, Blue Gum plantations are typically managed as short rotation (10-15 years) crops and remain unthinned to generate for pulp-based products (PIRSA, 2023). To this end, these two species are the focus for this report for establishment of harvest plantations.

⁷ Source: GTFIH website (<https://gtfih.com.au/>)

⁸ Source: National Plantation Statistics 2022 (ABARES, 2022)

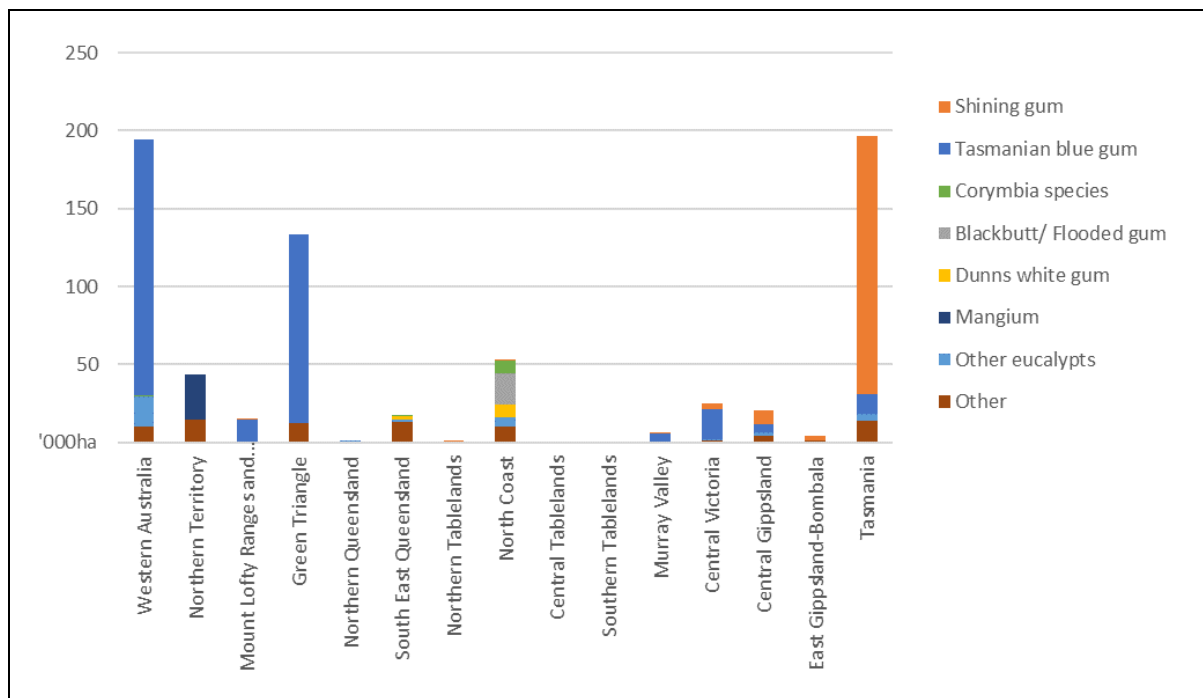


Figure 4: Area of hardwood plantations by species and NPI region⁹

It is generally recommended that these be planted in higher rainfall areas to achieve acceptable returns at harvest, about 600-700mm rainfall being an acceptable cut-off within the existing forestry industry to achieve a viable plantation for these species (Severino & Hasanka, 2018). However, two of the methods reviewed do allow for permanent plantings which might be more appropriate in areas of lower rainfall as they have no commercial harvest outcome. Although not reviewed in this report, there is also a separate ERF Methodology which deals solely with new environmental or mallee plantings¹⁰.

In general, the less removal of trees that takes place during the life of the project by way of thinning, or harvesting and replanting, the higher the yield in terms of long-term average carbon abatement over a 100-year period, so permanent plantings can have advantages over traditional harvest plantations in terms of total carbon sequestration benefits.

Some areas in the Green Triangle have specific water licensing requirements for plantation forestry activities. The Lower Limestone Coast Prescribed Wells Area (LLCPWA) is a declared forestry area which all commercial forests must have a forest water licence

⁹ Source: National Plantation Statistics 2022 (ABARES, 2022)

¹⁰ Carbon Credits (Carbon Farming Initiative) (Reforestation by Environmental or Mallee Plantings—FullCAM) Methodology Determination 2014

including a water allocation that offsets the plantation's impact on the groundwater resource, unless the forest is classified as farm forestry (PIRSA, 2023).

In the Eastern and Western Mount Lofty Ranges Prescribed Water Resources Areas, forestry is a water affecting activity that requires a commercial forest water permit.

Methodologies Overview

This section provides a broad overview of the three methodologies reviewed in this report. A Methodology Determination (or Method) is a framework document that defines the rules and eligible activities for running a carbon offset project or certification scheme.

The individual ERF Carbon Farming Initiative Methodology Determinations and the relevant Carbon Farming Initiative Act (Commonwealth of Australia, 2011) ('CFI Act') and Carbon Farming Initiative Rules (Commonwealth of Australia, 2015) ('CFI Rule') as reviewed in this report were sourced from the Federal Register of Legislation at 15/05/2023 For the latest information on Australian Government law refer: <https://www.legislation.gov.au>.

The Climate Active method¹¹ for including carbon sequestration from tree plantings as reviewed in this report is currently only in draft as of October 2022, awaiting review of feedback from a consultation process. Until the guidelines are finalised, the information within this report cannot be relied upon, but is likely to provide an indicative overview of the differences of a certification-based method versus the carbon-credit based methods.

Plantation Forestry Method

The *Carbon Credits (Carbon Farming Initiative-Plantation Forestry) Methodology Determination 2022* (Commonwealth of Australia, 2022 [1]) (the plantation forestry method) provides the framework for planning, registering, delivering and reporting on a plantation forestry project for generating Australian Carbon Credit Units (ACCUs) in order to participate in Australia's Emissions Reduction Fund (ERF). A plantation being defined as a forest established for harvest.

In simple terms, it incorporates four approaches to plantation forestry (relating to four specific Schedules in the legislated methodology determination) for plantation forestry projects, with credits available for carbon which is accumulated and stored in growing trees, debris and wood products, accounting for carbon stock changes and emissions resulting from plantation management activities, including material fossil fuel use, which include:

- Planting/Seeding/Coppicing

¹¹ Relevant documentation reviewed included: the 'Climate Active Carbon Neutral Standard for Products & Services' (Commonwealth of Australia, 2022 [3]) and the 'Guideline: Accounting for Carbon Sequestration from Tree Plantings (DRAFT)' (Commonwealth of Australia, 2022 [4])

- Fertilising/Weed control/Pruning/Thinning with or without harvest
- Controlled burning
- Salvage harvest/Clearfell (i.e., 100%) harvest
- Chopper rolling windrowing and burning

Carbon stock changes for any reporting period are estimated using the computer modelling software FullCAM, as developed by the CER. GHG emissions and abatements are modelled using the current management regime, and any carbon dioxide equivalent abatements reported are used to issue credits (ACCUs). FullCAM is used to calculate the long-term average abatement which caps total issue of credits over the 25-year crediting period.

Schedule 1 of the Plantation Forestry Method, referred to simply as the 'Plantation Forestry' method herein, is the focus for comparison in this report and allows for participation of projects which involve the establishment of new plantations on land where there has been no forest (natural¹² or plantation) or wetland for at least 7 years. There is a rotation limit of 60 years on such projects. Permanent plantings are not provided for under the Plantation Forestry method¹³.

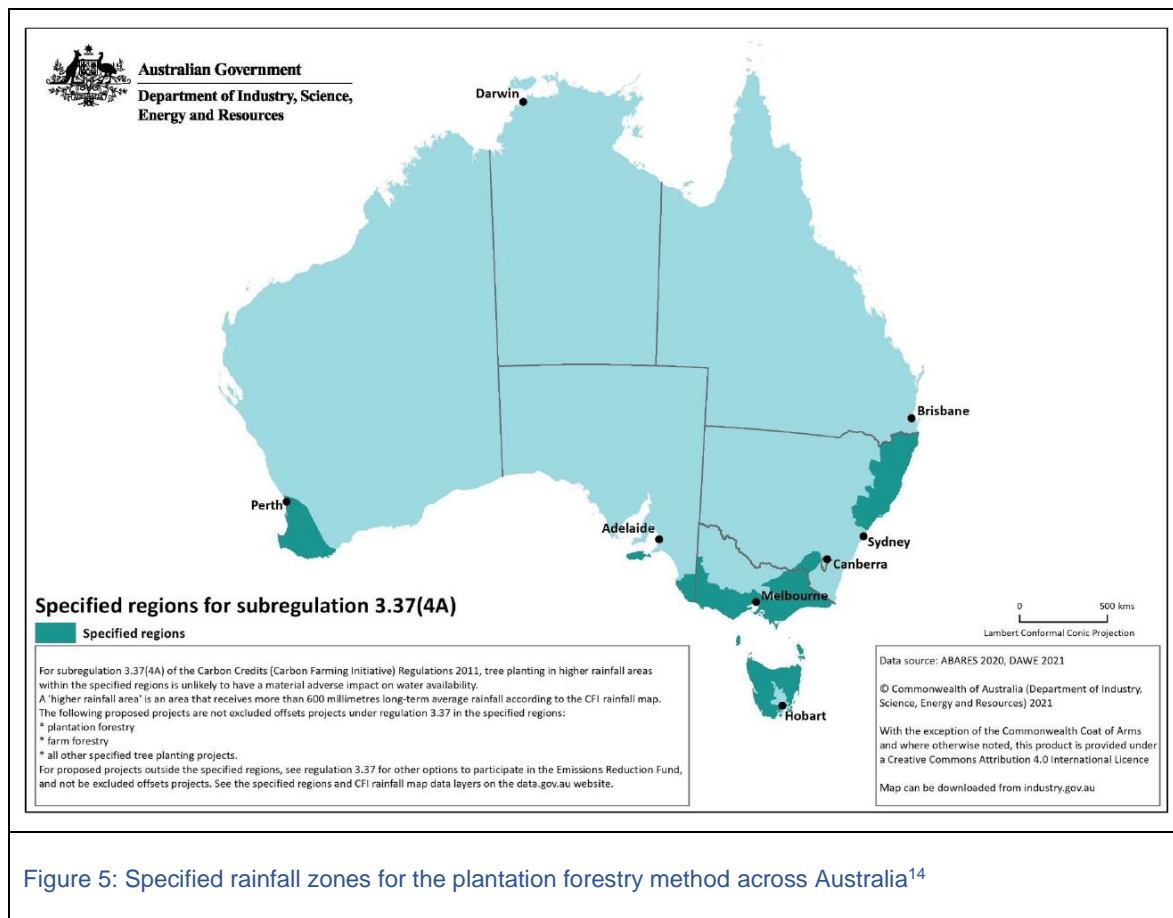
Although not reviewed in this report, Schedules 2, 3 and 4 relate to pre-existing plantation forests, namely:

- Schedule 2 ('Conversion Plantation'): conversion of a short rotation plantation to a long rotation plantation.
- Schedule 3 ('Continuing Plantation'): avoiding conversion of a plantation to non-forested land by continuing plantation project activity.
- Schedule 4 ('Ex-Plantation'): transitioning a harvest plantation to a permanent planting.

¹² A natural forest is defined as woody vegetation that includes trees that have reached or have the potential to reach at least 2 metres or more in height and have attained, or have the potential to attain, a crown cover of at least 20% of the area of the land.

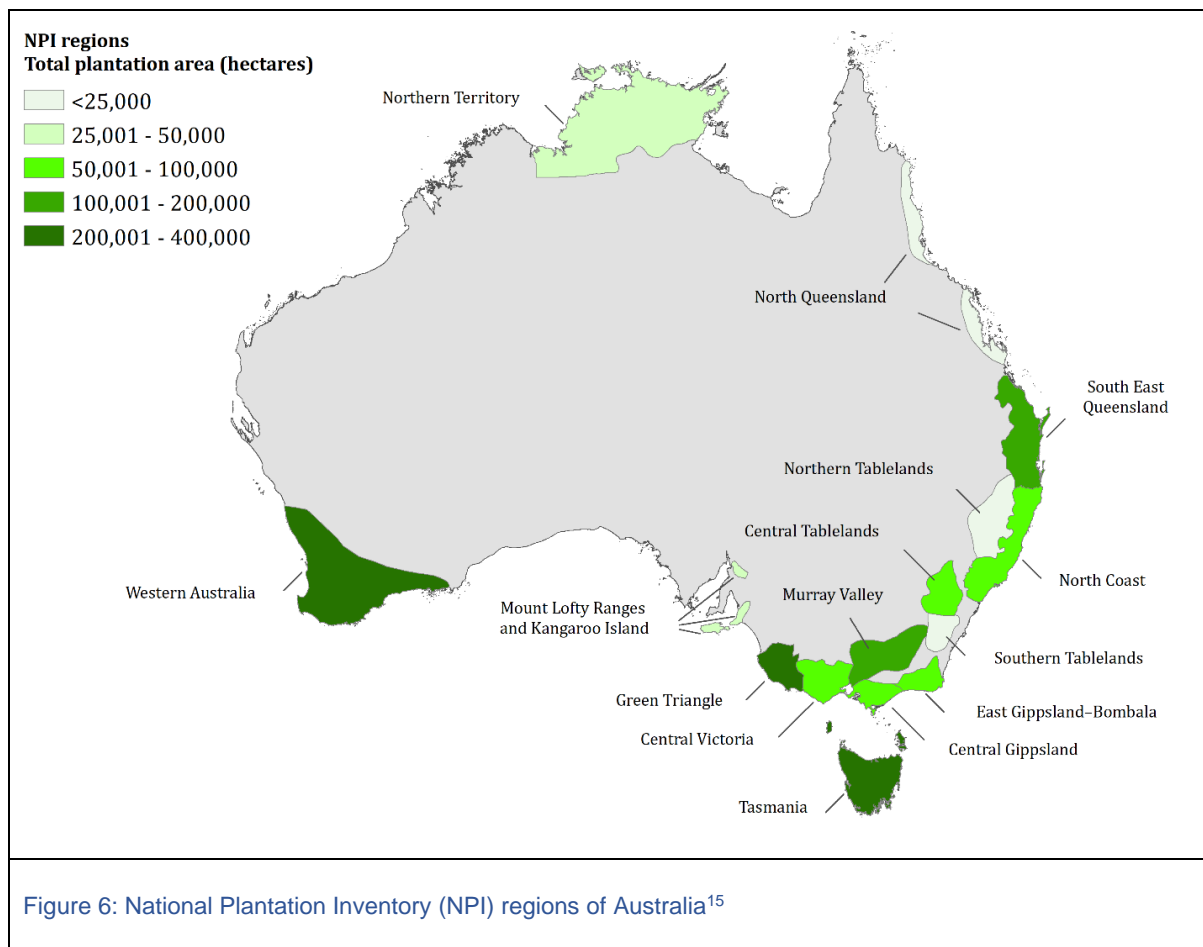
¹³ Permanent plantings, in the form of environmental plantings or mallee plantings can be entered into the ERF by way of the Carbon Credits (Carbon Farming Initiative) (Reforestation by Environmental or Mallee Plantings—FullCAM) Methodology Determination 2014 or by the Farm Forestry method reviewed in this report.

Under the 2022 methodology, plantation forestry projects can be located anywhere in Australia, but eligibility requirements become stricter outside specified regions (refer to Figure 5) and outside the National Plantation Inventory (NPI) regions (refer to Figure 6).



For all sites, a project is required to notify the commonwealth minister for Agriculture (via the Department of Agriculture, Fisheries and Forestry) who must make an assessment and determination as to whether the project may lead to an undesirable impact on agricultural production in the region where the project is located. Given that the aim of 'A Billion Trees' Plan is to integrate forest-based carbon projects into productive farming enterprises, it is unlikely that this would be the case. Forest plantations can be considered as just another crop that a farmer can introduce into their business to diversify income, the decision based on the best use case for a piece of land, with the added benefit of providing on-farm benefits such as shelter and soil protection which can boost overall farm productivity (Cleugh, 2003).

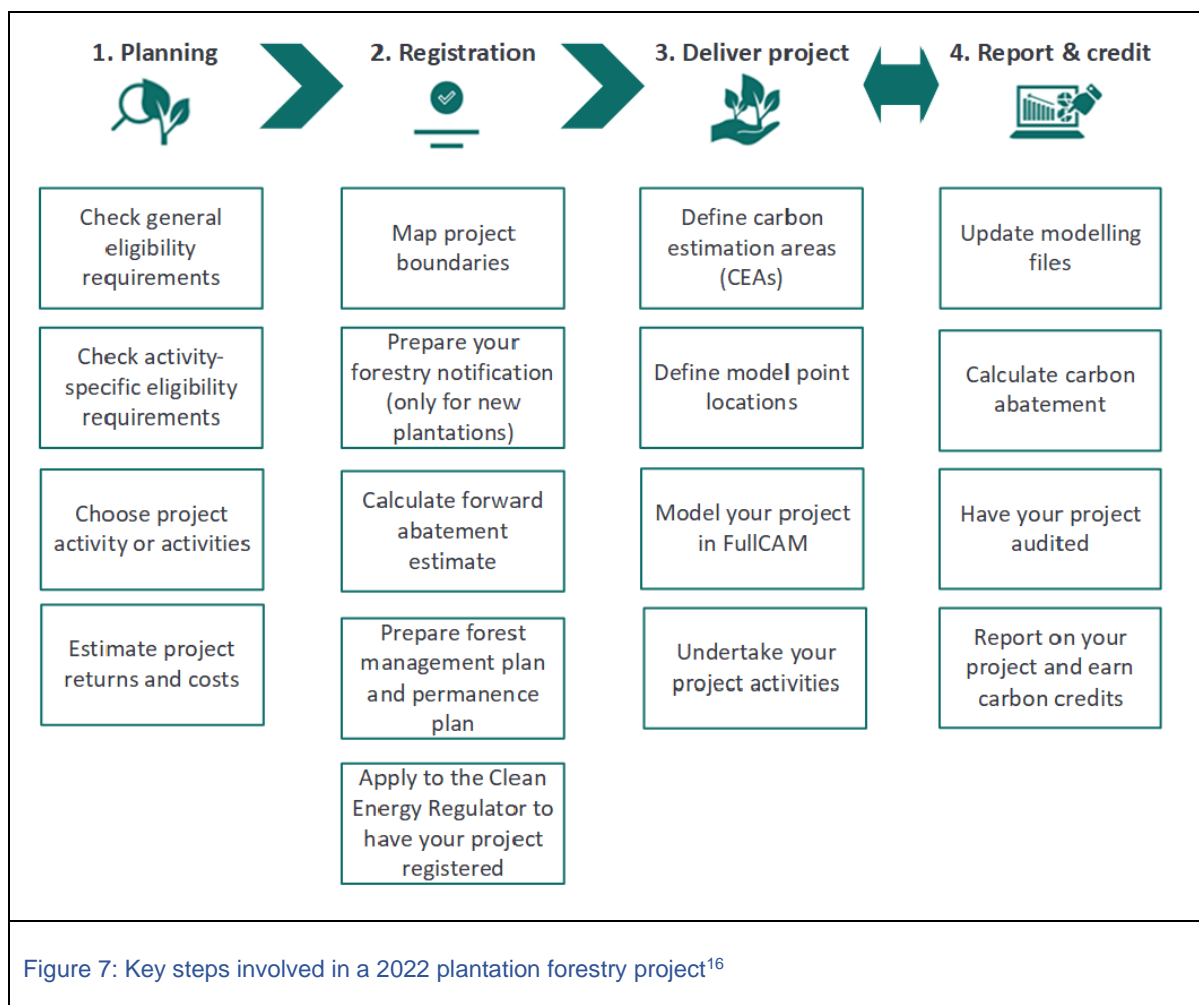
¹⁴ Source: Australian Government website



There are four generic steps involved with application of any of the four schedules (refer to Figure 7) for applying the plantation methodology to a project to generate ACCUs:

- Identify and plan the project, ensure eligibility and that the proponent holds the legal right to undertake the project and earn ACCUs.
- Register the project with the ERF.
- Implement the project and deliver carbon sequestration.
- Report, audit and claim ACCUs which can be retained by the proponent, sold through ERF reverse auctions, sold on the secondary market to other buyers or kept for own-use.

¹⁵ Source: National Plantation Statistics 2022 (ABARES, 2022)



Farm Forestry Method

The Carbon Credits (Carbon Farming Initiative) (Measurement Based Methods for New Farm Forestry Plantations) Methodology Determination 2014 (Commonwealth of Australia, 2014), referred to as the ‘Farm Forestry’ method in this report encompass establishment of plantations for commercial harvest (‘harvest projects’) and plantings for on-farm benefit (‘permanent planting projects’).

The overall aim of this method is to integrate trees for harvest or on-site benefits into an agricultural enterprise. The Plantation Forestry method has a more industrial scale background but can achieve same the integration of trees for harvest with less complex measurement and modelling requirements than the Farm Forestry equivalent.

¹⁶ Source: Clean Energy Regulator website

To run a Farm Forestry project, you will require access to forestry expertise – either your own or from external sources – to run the measurements and calculations in the method.

If you are planning a harvest project, you must propose a specific management regime. The proposed regime may include practices such as planting, weed control, harvesting, debris removal, and rotation length (i.e., the length of time between planting and harvesting). Harvesting is permitted as long as it is done in accordance with the management regime. After harvesting, you must re-establish the project trees by planting, seeding or coppice regrowth, and begin a new management regime cycle.

Carbon stock changes for any reporting period are calculated from field-based carbon inventory, and any carbon dioxide equivalent abatements reported are used to issue credits. FullCAM is used to calculate the long-term average abatement for harvest projects which is used to cap total issue of credits over the 25-year crediting period.

For Farm Forestry harvest projects, it is a requirement to notify the Commonwealth Minister for Agriculture (via the Department of Agriculture, Fisheries and Forestry) who must make an assessment and determination as to whether the project may lead to an undesirable impact on agricultural production in the region where the project is located. There is no such requirement for a Farm Forestry permanent planting project.

Climate Active Method

As mentioned earlier in this report, in October 2022 Climate Active released a draft guideline to explain how businesses can also measure carbon sinks from trees and shrubs they have planted, without the creation of offset credit units. Rather, they would be used as ‘insets’ to internally account against internal business emissions within their Climate Active GHG Account, reducing the need to buy external offset credits to achieve carbon neutral certification.

The draft guideline document was developed with reference to the Carbon Credits (Carbon Farming Initiative) (Reforestation by Environmental or Mallee Plantings—FullCAM) Methodology Determination 2014 so will have many elements common to the other two ERF methodologies. However, there are key distinctions between the requirements for a Climate Active project and the Emissions Reduction Fund (ERF) projects reviewed in this report:

1. The Guideline applies for both organisation and product certifications. For product certifications, multiple entities may be assessed within one project; and

2. Vegetation planted after 1990 may be included within the assessment, though only carbon abatement achieved from the point of certification onwards can be accounted as an offset. This contrasts completely with the 'newness' requirements of the Plantation Forestry project and is more generous than the Farm Forestry harvest project which limits plantings to 2010 onwards, with some minor exceptions. The Farm Forestry permanent planting project can include plantings prior to 2007, if you can provide evidence it was planted for carbon offset generation, again with some minor exceptions.

As of writing, the draft guidelines are still under review so the comparison with ERF methodologies presented in this report might not be completely accurate when compared with any final version that is released.

Like the ERF methodologies, FullCAM is used in this method too. Carbon stock changes for any reporting period are estimated using FullCAM, and the calculated carbon dioxide equivalent abatements become a line item in the GHG account, acting as insets against emissions.

Detailed Methodologies Comparison

This section provides a detailed comparison of the three methodologies reviewed in this report. The methodologies, and any corresponding Commonwealth Acts and Rules, were reviewed in detail to compare differences in criteria for their requirements of eligibility, the registration process and ongoing reporting and monitoring once registered/certified. The three methodologies reviewed were:

- ERF Plantation Forestry – Schedule 1 ('Plantation Forestry') Method
- ERF Measurement Based Methods for New Farm Forestry Plantations ('Farm Forestry') Method
- Climate Active's Draft Guideline for accounting for Carbon Sequestration from Tree Plantings under their Carbon Neutral Certification program (referred to in this report as the 'Climate Active' method)

To assist with understanding the likely barriers to entry from a farming enterprise perspective, a difficulty rating for each criterion was developed, as described below, and where external support or specialist technical consultation was likely required, an indicative range of cost likely to expected was developed.

A direct page or section reference to the source legislation or technical guideline for each criterion has been provided in Appendix 3 - References for Comparison Tables.

Difficulty Rating and External Cost Estimation

To assist the reader with an understanding of which criteria could likely be managed with internal business resources and expertise versus those that would likely need external specialist or technical assistance, the following difficulty rating was applied to each criterion as follows:

- **Low:** likely to be undertaken by proponent without the need for external assistance
- **Moderate:** likely to require some external assistance at moderate cost
- **High:** likely to require considerable external assistance at moderate to high cost
- **Very High:** very likely to require considerable external assistance at high cost

The definitions of 'moderate cost' and 'high cost' are purely subjective but have been generally equated to the difference between costs in multiples of \$1,000's and \$10,000's

respectively¹⁷. The cost ratings are also based on running the project yourself, outside of any pooled carbon service provision or cooperative which might provide cost efficiencies.

Although a separate table describing detail around the difficulty ratings have been provided, for ease of reference these difficulty ratings are also indicated at the bottom of each cell in the criteria comparison tables where the criteria were considered to have moderate, high or very high difficulty. Where there is no rating supplied, this indicates a low difficulty rating.

Eligibility Comparison

To establish a credible carbon offset or certification project, several tests are typically required to ensure that the project is delivering real, additional, and measurable emissions reductions. These tests generally include:

- **Additionality** Test: This test ensures that the project's emissions reductions are additional to what would have occurred in the absence of the project. It is used to demonstrate that the project is making a real and measurable contribution to addressing climate change.
- **Baseline** Test: This test establishes a baseline scenario that represents what would have happened in the absence of the project. It is used to calculate the emissions reductions achieved by the project and to ensure that the project's emissions reductions are accurately quantified.
- **Leakage** Test: This test assesses whether the project's emissions reductions are offset by increased emissions elsewhere in the economy. It is used to ensure that the project is not causing unintended consequences, such as the displacement of emissions to another location.
- **Permanence** Test: This test ensures that the emissions reductions achieved by the project will be permanent and not reversed in the future. It is used to account for the risk of carbon sequestration being reversed, such as through forest fires or disease outbreaks.
- **Monitoring, Reporting, and Verification (MRV)** Test: This test establishes a system to monitor, report, and verify the emissions reductions achieved by the project. It is used to ensure that the project's emissions reductions are accurately quantified and that the

¹⁷ All dollar values in this report refer to Australian Dollars (AUD) except where otherwise defined.

project is complying with the requirements of the carbon offset standard or certification program.

These tests may vary depending on the carbon offset standard or certification program being used but were common elements in our review of the three methodologies in this report and the global voluntary methodologies developed by Verified Carbon Standard (VCS) (Verra, 2023) and the Gold Standard (The Gold Standard Foundation, 2022).

The criteria, difficulty rating and potential external provider costs to prove eligibility under the Plantation Forestry method, the Farm Forestry method and the Climate Active method are summarised in Table 1, Table 3 and Table 4 respectively.

Note that the criterion comparison in Table 1 also includes a difficulty rating tag based on the ratings in Table 3 to highlight any criterion which were considered to have moderate, high or very high difficulty. Where there is no rating supplied, this indicates a low difficulty rating.

Based on the review of eligibility requirements in Table 1, the key differences between the three methods are:

- Farm Forestry harvest projects have a maximum area restriction of:
 - 300ha in areas of 400mm or less long-term average rainfall, or
 - 100ha in areas of 400mm or more long-term average rainfall, or
 - 30% of the total farm area in either case (whichever is smaller).

The Plantation Forestry and Climate Active methods have no such restrictions.

- The two ERF methods have the following eligibility rules that are not applicable to the Climate Active certification process:
 - required determination from the Minister of Agriculture that the project will not lead to an undesirable impact on agricultural production.
 - plantations currently under a forestry managed investment scheme (MIS) are excluded.
 - projects that are required to be carried out under a law of the Commonwealth, State or Territory, or are likely to be carried out under another

Commonwealth, State or Territory government program or schema are excluded.

- The Plantation Forestry method requires the project has not commenced (i.e., planting essentially) prior to registration. The Farm Forestry and Climate Active methods allow some pre-existing plantations planted post-1990 to be reported, though you do not get any ACCUs, or emission inset for carbon abatement that occurred prior to registration/certification.
- Plantation Forestry and Farm Forest harvest projects in areas over 600mm rainfall need to either be in a specified region or have evidence of appropriate water entitlement. Farm Forestry permanent plantings and Climate Active projects have no such restrictions.
- Although the ‘business-as-usual’ land-use test¹⁸ for all three methods is similar in that they require non-forest land use prior to planting, they do differ slightly:
 - Plantation Forestry method requires evidence that no plantation or native forest existed on the area in the previous 7 years.
 - Farm Forestry method requires evidence that the area was not covered by forest and was used for agriculture for the previous 5 years.
 - Climate Active method requires evidence that no forest existed on the area in the previous 5 years.

Table 1: Eligibility Criteria Comparison

Scheme Criterion	Plantation Forestry	Farm Forestry	Climate Active (Draft)
1. Legal right	You will need to hold and maintain the exclusive legal right and forestry right to run your project and claim ACCUs. The carbon sequestration right is evidenced by way of holding legal estate or interest in the area of land (i.e., Torrens system, Crown Land or Native Title).	You will need to hold and maintain the exclusive legal right and forestry right to run your project and claim ACCUs. The carbon sequestration right is evidenced by way of holding legal estate or interest in the area of land (i.e., Torrens system, Crown Land or Native Title).	The planted trees and shrubs need to be in an area that falls under the operational control or supply chain of the responsible entity. The responsible entity is the organisation or person (with appropriate delegation) that has taken responsibility for making a carbon neutral claim or seeking carbon neutral certification. A licence agreement between the responsible entity and the Department, providing use of the certification trademark.

¹⁸ Also referred to as the Project or Activity Test

			Under carbon neutral certification the responsible entity must also be mindful of its obligations under Australian Consumer Law. Australian Consumer Law applies to all forms of marketing. The responsible entity must ensure any claim made regarding compliance with the standard is accurate and appropriately substantiated.
2. Eligible interest-holder consent	You will need consent from eligible interest-holders (i.e., mortgagees, shared landowner/rights interests). You can demonstrate eligible interest-holders have consented to your project by getting each eligible interest holder to sign a Clean Energy Regulator eligible interest-holder consent form. (Moderate)	You will need consent from eligible interest-holders (i.e., mortgagees, shared landowner/rights interests). You can demonstrate eligible interest-holders have consented to your project by getting each eligible interest holder to sign a Clean Energy Regulator eligible interest-holder consent form. (Moderate)	Not Applicable.
3. Establish the emissions boundary	Not Applicable	Not Applicable	Carbon sequestration from tree plantings can fall within the boundary of either organisations or products: - Tree plantings can be included in an organisation certification emissions boundary where the entity responsible for certification has operational control of the land the plantings are on. - Tree plantings from entities within a product supply chain, such as on a farm supplying an agricultural product to a wholesaler, can be included in the emissions boundary. This process, where an entity sequesters carbon within its supply chain, is called insetting. Once plantings are included in the emissions boundary, they must always be included for the purposes of Climate Active certification, even in a situation where there is a break in certification.
4. Regulatory approvals	You will need all relevant regulatory approvals to undertake plantation forestry activities. In SA this might include: - in SA, commercial forestry licence for plantation development proponents - in SA, local government approval for plantations > 10ha - in SA, water licence - in VIC, adherence to the Code of Practice for Timber Production (2016): - in VIC, lodgement of Plantation Development Notice or a planning permit with local government.	You will need all relevant regulatory approvals to undertake plantation forestry activities. In SA this might include: - in SA, commercial forestry licence for plantation development proponents - in SA, local government approval for plantations > 10ha - in SA, water licence - in VIC, adherence to the Code of Practice for Timber Production (2016): - in VIC, lodgement of Plantation Development Notice or a planning permit with local government.	You will need all relevant regulatory approvals to undertake plantation forestry activities. In SA this might include: - in SA, commercial forestry licence for plantation development proponents - in SA, local government approval for plantations > 10ha - in SA, water licence - in VIC, adherence to the Code of Practice for Timber Production (2016): - in VIC, lodgement of Plantation Development Notice or a planning permit with local government.

5. Fit and proper person assessment	You must be recognised as a fit and proper person (i.e., no convictions, insolvency).	You must be recognised as a fit and proper person (i.e., no convictions, insolvency).	Not Applicable.
6. Area restrictions	Minimum area for plantation forests is 0.2ha.	Minimum area for permanent planting projects and harvest projects is 0.2ha. For permanent planting projects there is no upper limit on area. For harvest projects, a long term average historical rainfall-based criteria is applied: - if rainfall > 400 mm per year, plantations can occupy an area no more than 100 hectares, or 30% of a farm (whichever smaller) - if rainfall is < 400 mm per year, plantations can occupy an area no more than 300 hectares, or 30 per cent of a farm (whichever is the smaller).	The practical minimum area is 0.2ha.
7. Species restrictions - achieve forest cover	The plantation forest species planted must be expected to reach forest cover before harvest, specifically taller than 2m in height and more than 20% crown cover.	The plantation forest species planted must be expected to reach forest cover, specifically taller than 2m in height and more than 20% crown cover.	The species planted must be able to attain and maintain forest potential: - a height of 2 metres or more; and - a crown cover of at least 20% over the plot area; and - a density of at least 200 stems per hectare. The following types of species are eligible: - Native vegetation that was planted is a mix of trees, shrubs, and/or understorey species that reflects the structure and composition of the vegetation that is expected to occur naturally in that area. - A single mallee species that conforms with latest version of the 'Carbon Credits (Carbon Farming Initiative) (Reforestation by Environmental or Mallee Plantings—FullCAM) Methodology Determination 2014' - The choice of other species planted must be consistent with the practices of commercial forestry operations in the area and available within FullCAM.
8. Species restrictions - not a known weed	The species cannot be a known weed species.	The species cannot be a known weed species.	Not stated but achieved by default via species restrictions described above.
9. No undesirable impact on agricultural production	The Minister for Agriculture will need to determine that the project will not lead to an undesirable impact on agricultural production.	The Minister for Agriculture will need to determine that the project will not lead to an undesirable impact on agricultural production.	Not Applicable.
10. Not currently under a forestry	The plantation cannot currently be under a forestry	The plantation cannot currently be under a forestry	Not Applicable.

managed investment scheme (MIS)	managed investment scheme (MIS). Ex-MIS plantations are eligible.	managed investment scheme (MIS). Ex-MIS plantations are eligible.	
11. Not previously cleared native forest	The land to be planted must not have been legally cleared of native forest in the previous 7 years (in perpetuity if the clearing was illegal). (Moderate)	The land to be planted must not have been cleared of native forest in the previous 7 years (5 years if change of ownership within that timeframe, but in perpetuity if the clearing was illegal). (Moderate)	Over the 5 years prior to planting, the land must not contain woody biomass or an invasive native scrub species that need to be cleared for planting to occur, other than known weed species required or authorised by law to be cleared. (Moderate)
12. Not previously drained wetland	The land to be planted must not have been drained of wetland in the previous 7 years (5 years if change of ownership within that timeframe, but in perpetuity if the draining was illegal). (Moderate)	The land to be planted must not have been drained of wetland in the previous 7 years (5 years if change of ownership within that timeframe, but in perpetuity if the draining was illegal). (Moderate)	Not Applicable.
13. ERF 'water rule'	In areas > 600mm long term average rainfall, the plantation will need to be either: - in a specified region - an environmental planting; or - you have suitable water access entitlement or that project manages dryland salinity. (Moderate)	For a harvest project in areas > 600mm long term average rainfall, plantation will need to be either: - in a specified region - an environmental planting; or - you have suitable water access entitlement or that project manages dryland salinity There is no such rule for permanent plantings projects. (Moderate)	Not Applicable.
14. Within national plantation inventory (NPI) region	Schedule 1 plantation projects outside of the National Plantation Inventory (NPI) regions are now eligible to participate in the 2022 plantation forestry method ¹⁹ (they were not eligible under the superseded 2017 method).	Not Applicable.	Not Applicable.
15. Additionality - starting dates (i.e., newness)	The project must not have commenced at the time the ERF project is registered. For Schedule 1 there are exemptions whereby some activities can commence after an application has been submitted, prior to actual registration being achieved, though this is at your own risk given that project registration is not guaranteed. These permitted activities include: - preparation of a forest	Under the Act, the project must not have commenced at the time the ERF project is registered but the Farm Forestry method provides some 'specified' offset project exceptions, typically where historic plantings can be proved to have been planted for the purpose of carbon credits. Note that where you are including pre-existing plantation forest in a project, you do not get any ACCUs	The plantings must: - have taken place in or after 1990; and - at the time of current reporting period, not be older than the upper age limits for which FullCAM can reliably return estimates of sequestration. This age varies by species and may be adjusted over time. For upper age limits for standard forestry plantation species refer Table 2, for mallee plantings this age is 30, and for all unlisted species this is 50.

¹⁹ Please note that Schedule 2 and 3 projects under the plantation forestry 2022 method are required to be located within 100km and 50km of an NPI region respectively.

	<p>management plan</p> <ul style="list-style-type: none"> - site preparation and planting activities - leasing or purchasing of land for such purposes. <p>(Moderate)</p>	<p>for any carbon abatement achieved up to the project registration date.</p> <p>(Moderate)</p>	<p>Note that where you are including pre-existing forest in a emissions boundary, you do not get any carbon insets for any carbon abatement achieved up to the certification date.</p> <p>(Moderate)</p>
16. Additionality - 'business-as-usual' (BAU) land use prior to planting must not have been forest-based	<p>You will need to demonstrate that there had been no plantation or native forest on the land within the previous 7 years prior to the project eligibility date.</p>	<p>You will need to demonstrate that for at least 5 years prior to the project commencement the land was used for either or both of:</p> <ul style="list-style-type: none"> - land used for grazing or cropping; or - land that was fallow between grazing or cropping activities. 	<p>You will need to demonstrate the planting area has been clear of forest cover for at least 5 years before the date of the first planting.</p>
17. Additionality - baseline emissions or sequestrations	<p>Demonstrate what emissions or sequestrations would be if the project was not implemented (these are zero in the case of new plantings).</p>	<p>Demonstrate what emissions or sequestrations would be if the project was not implemented (these are zero in the case of new plantings).</p>	<p>Not Applicable.</p>
18. Additionality - not already part of a carbon offsets scheme (i.e., no double counting)	<p>The project area must not already be part of the ERF or any other carbon offset program.</p>	<p>The project area must not already be part of the ERF or any other carbon offset program.</p>	<p>The project area must not already be part of the ERF or any other carbon offset program.</p>
19. Additionality - no regulatory requirement	<p>Confirm that the project is not required to be carried out by or under a law of the Commonwealth, a State or a Territory.</p>	<p>Confirm that the project is not required to be carried out by or under a law of the Commonwealth, a State or a Territory.</p>	<p>Not Applicable.</p>
20. Additionality - not carried out under other government programs	<p>Confirm the project is not likely to be carried out under another Commonwealth, State or Territory government program or scheme, for example the '20 Million Trees Programme'.</p>	<p>Confirm the project is not likely to be carried out under another Commonwealth, State or Territory government program or scheme, for example the '20 Million Trees Programme'.</p>	<p>Not Applicable.</p>
21. Estimating returns	<p>Although not an eligibility requirement, it is recommended that you calculate likely ACCUs you will be issued from which you can determine the method for managing ACCUs:</p> <ul style="list-style-type: none"> - ERF auction; - secondary market; or - hold. <p>(High)</p>	<p>Although not an eligibility requirement, it is recommended that you calculate likely ACCUs you will be issued from which you can determine the method for managing ACCUs:</p> <ul style="list-style-type: none"> - ERF auction; - secondary market; or - hold. <p>(High)</p>	<p>Not Applicable.</p>
22. Estimating costs	<p>Although not an eligibility requirement, it is recommended that you determine likely sources of cost, including:</p> <ul style="list-style-type: none"> - Planning, establishment, 	<p>Although not an eligibility requirement, it is recommended that you determine likely sources of cost, including:</p> <ul style="list-style-type: none"> - Planning, establishment, 	<p>Not Applicable.</p>

	and operating costs - Offset reporting costs (at least every five years) - Independent auditor costs (at least three in the 25-year crediting period). (Moderate)	and operating costs - Offset reporting costs (at least every five years) - Independent auditor costs (at least three in the 25-year crediting period). (Moderate)	
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Table 2: Ages of maximum confidence for FullCAM 2016 calibrations beyond which insets cannot be reported under the Climate Active method²⁰

Species	Age
<i>Acacia mangium*</i>	8.5
<i>Araucaria cunninghamii</i>	60.5
<i>Corymbia citriodora</i>	45.5
<i>Corymbia maculata</i>	45.5
<i>Eucalyptus argophloia</i>	40.5
<i>Eucalyptus cladocalyx</i>	45.5
<i>Eucalyptus cloeziana</i>	45.5
<i>Eucalyptus dunnii</i>	34.5
<i>Eucalyptus globulus</i>	21.5
<i>Eucalyptus grandis</i>	45.5
<i>Eucalyptus nitens</i>	21.5
<i>Eucalyptus pilularis</i>	45.5
<i>Eucalyptus regnans</i>	60.5
<i>Eucalyptus saligna</i>	45.5
<i>Khaya senegalensis</i>	25.5
<i>Pinus caribaea</i>	40.5
<i>Pinus elliotii</i>	40.5
<i>Pinus radiata</i>	40.5
<i>Pinus pinaster</i>	40.5

²⁰ Source: FullCAM Guidelines – Requirements for using the Full Carbon Accounting Model (FullCAM) in the Emissions Reduction Fund (ERF) methodology determination: Carbon Credits (Carbon Farming Initiative-Plantation Forestry) Methodology Determination 2022

Based on the review of difficulty ratings for eligibility requirements in Table 3, the key differences between the three methods in terms of difficulty are:

- The two ERF Methods require:
 - consent from all eligible interest holders to be confirmed which might be complex in some situations, especially if any eligible interest holder withholds consent.
 - evidence to confirm the area was not drained of wetland in the last 7 years, which may require specialist mapping support.
 - confirmation that the project is within a specified region to be exempt from the water rule, which may require specialist mapping support in borderline cases.

Table 3: Eligibility Criteria - Difficulty Rating Comparison			
Scheme Criterion	Plantation Forestry	Farm Forestry	Climate Active (Draft)
1. Legal right	Low	Low	Low
2. Eligible interest-holder consent	Moderate - may require legal understanding and support to demonstrate eligible interest-holder consent for more complex arrangements.	Moderate - may require legal understanding and support to demonstrate eligible interest-holder consent for more complex arrangements.	Low
3. Establish the emissions boundary	NA	NA	Low
4. Regulatory approvals	Low	Low	Low
5. Fit and proper person assessment	Low	Low	NA
6. Area restrictions	Low	Low	Low
7. Species restrictions - achieve forest cover	Low	Low	Low
8. Species restrictions - not a known weed	Low	Low	Low
9. No undesirable impact on agricultural production	Low	Low	NA

10. Not currently under a forestry managed investment scheme (MIS)	Low	Low	NA
11. Not previously cleared native forest	Moderate - may require specialist mapping software for borderline cases.	Moderate - may require specialist mapping software for borderline cases.	Moderate - may require specialist mapping software for borderline cases.
12. Not previously drained wetland	Moderate - may require specialist mapping software for borderline cases.	Moderate - may require specialist mapping software for borderline cases.	NA
13. ERF 'water rule'	Moderate - may require specialist mapping software for borderline cases.	Moderate - may require specialist mapping software for borderline cases.	NA
14. Within national plantation inventory (NPI) region	Low	NA	NA
15. Additionality - starting dates (i.e., newness)	Low	Low	Low
16. Additionality - 'business-as-usual' (BAU) land use prior to planting must not have been forest-based	Moderate - requires understanding of remote sensed imagery sources, their acquisition and interpretation.	Moderate - requires understanding of remote sensed imagery sources, their acquisition and interpretation.	Moderate to Low - may require understanding of remote sensed imagery sources, their acquisition and interpretation.
17. Additionality - baseline emissions or sequestrations	Low	Low	NA
18. Additionality - not already part of a carbon offsets scheme (i.e., no double counting)	Low	Low	Low
19. Additionality - no regulatory requirement	Low	Low	NA
20. Additionality - not carried out under other government programs	Low	Low	NA
21. Estimating returns	High - requires modelling of FullCAM and calculations to generate ACCUs, and understanding of market options, including own-use options, based on financial analysis.	High - requires modelling of FullCAM and calculations to generate ACCUs, and understanding of market options, including own-use options, based on financial analysis.	NA
22. Estimating costs	Moderate - requires financial modelling and understanding of project administration costs.	Moderate - requires financial modelling and understanding of project administration costs.	NA

Where the rating in Table 3 above is not 'Low', an estimate of likely cost to obtain third party support has been provided in Table 4 below.

To avoid any double counting of costs between eligibility and registration, only likely external support costs associated with self-testing your own eligibility prior to application to register are included in Table 4. Any likely external support costs to produce evidence to pass these eligibility tests at the time of registration were all aggregated under the 'Registration Comparison' section in Table 7.

Table 4: Eligibility Criteria - External Support Cost Comparison			
Scheme Criterion	Plantation Forestry	Farm Forestry	Climate Active (Draft)
1. Legal right	NA	NA	NA
2. Eligible interest-holder consent	\$2,000 to \$10,000 to determine and notify all eligible interest holders.	\$2,000 to \$10,000 to determine and notify all eligible interest holders.	NA
3. Establish the emissions boundary	NA	NA	NA
4. Regulatory approvals	NA	NA	NA
5. Fit and proper person assessment	Refer 'Registration Comparison' section of this document.	Refer 'Registration Comparison' section of this document.	NA
6. Area restrictions	NA	NA	NA
7. Species restrictions - achieve forest cover	NA	NA	NA
8. Species restrictions - not a known weed	NA	NA	NA
9. No undesirable impact on agricultural production	NA	NA	NA
10. Not currently under a forestry managed investment scheme (MIS)	NA	NA	NA
11. Not previously cleared native forest	Cost of evidence accounted for under '8. Provide evidence for business-as-usual (BAU) land use' under the 'Registration Comparison' section of this document.	Cost of evidence accounted for under '8. Provide evidence for business-as-usual (BAU) land use' under the 'Registration Comparison' section of this document.	Cost of evidence accounted for under '8. Provide evidence for business-as-usual (BAU) land use' under the 'Registration Comparison' section of this document.

12. Not previously drained wetland	Cost of evidence accounted for under '8. Provide evidence for business-as-usual (BAU) land use' under the 'Registration Comparison' section of this document.	Cost of evidence accounted for under '8. Provide evidence for business-as-usual (BAU) land use' under the 'Registration Comparison' section of this document.	NA
13. ERF 'water rule'	Up to \$500 for once-off mapping support.	Up to \$500 for once-off mapping support.	NA
14. Within national plantation inventory (NPI) region	NA	NA	NA
15. Additionality - starting dates (i.e., newness)	Cost of evidence accounted for under '4. Provide evidence for starting date(s)' under the 'Registration Comparison' section of this document.	Cost of evidence accounted for under '4. Provide evidence for starting date(s)' under the 'Registration Comparison' section of this document.	Cost of evidence accounted for under '4. Provide evidence for starting date(s)' under the 'Registration Comparison' section of this document.
16. Additionality - 'business-as-usual' (BAU) land use prior to planting must not have been forest-based	Cost of evidence accounted for under '8. Provide evidence for business-as-usual (BAU) land use' under the 'Registration Comparison' section of this document.	Cost of evidence accounted for under '8. Provide evidence for business-as-usual (BAU) land use' under the 'Registration Comparison' section of this document.	Cost of evidence accounted for under '8. Provide evidence for business-as-usual (BAU) land use' under the 'Registration Comparison' section of this document.
17. Additionality - baseline emissions or sequestrations	NA	NA	NA
18. Additionality - not already part of a carbon offsets scheme (i.e., no double counting)	NA	NA	NA
19. Additionality - no regulatory requirement	NA	NA	NA
20. Additionality - not carried out under other government programs	NA	NA	NA
21. Estimating returns	Potential cost might be up to \$1,000 for build, run and analysis of a one-off FullCAM run. More cost might be expected for advice on any returns from harvested wood products at the end of the rotation.	Potential cost might be up to \$1,000 for build, run and analysis of a one-off FullCAM run. More cost might be expected for advice on any returns from harvested wood products at the end of the rotation.	NA
22. Estimating costs	\$2,000 to \$10,000 depending on complexity of financial plan required. Building a net present model, including the calculated returns, would be useful due diligence for a forestry project in general.	\$2,000 to \$10,000 depending on complexity of financial plan required. Building a net present model, including the calculated returns, would be useful due diligence for a forestry project in general.	NA

Registration Comparison

The application for registration process for the two ERF Methods is an online process and involves supply of the following details:

- information about the proponent, to confirm identity and assess the proponent against the Fit and Proper Person (FPP) test requirements.
- a Forward Abatement Estimate covering the 25 crediting period for your project.
- a question about the proponent's legal right to conduct the project.

For Climate Active Carbon Neutral Certification, to include carbon sequestration planting as insets to emissions you first need to achieve certification for the business, and the insets simply become a line item in the overall accounting report. The general eligibility and registration process of the wider certification process is out of the scope of this review, though is occasionally referenced where it has a direct bearing on establishment or ongoing maintenance of the inset project.

The criteria, difficulty rating and potential external provider cost for registration under the Plantation Forestry method, the Farm Forestry method and the Climate Active method are summarised in Table 5, Table 6 and Table 7 respectively.

Note that the criterion comparison in Table 5 also includes a difficulty rating tag based on the ratings in Table 6 to highlight any criterion which were considered to have moderate, high or very high difficulty. Where there is no rating supplied, this indicates a low difficulty rating.

Based on the review of the criteria in Table 5, the key differences between the registration process for the three methods are:

- The Climate Active Certification requires carbon accounting for the whole of your business and certification has an annual fee.
- Under the Plantation Forestry method, you must provide with your application an estimate of likely total ACCU's to be credited over the 25 years.
- The two ERF Methods must be submitted with the following which are not required under the Climate Active method:

- nomination of either a 25-year or 100-year permanence period. Although there is no permanence period for the Climate Active Method, once an inset project area is entered into the certification process it cannot be removed.
- a permanence plan (refer Appendix 2 for an example permanence plan).
- a management regime for harvest projects.
- a plantation forestry notification for harvest projects.
- evidence the proponent passed a fit and proper person test.

Table 5: Registration Criteria Comparison

Scheme Criterion	Plantation Forestry	Farm Forestry	Climate Active (Draft)
1. Register your project or apply for certification	<p>Apply to register your project with the Clean Energy Regulator (CER) before you start any project activities. This can be done online.</p> <p>Identify for each CEA what Schedule your project will be registered under and what the associated activities are.</p> <p>A sample application form can be downloaded from the CER website²¹ for an example of the exact details required in an application to register a project.</p>	<p>Apply to register your project with the Clean Energy Regulator (CER) before you start any project activities. This can be done online.</p> <p>Identify the project type being undertaken, either: - a permanent planting; or - a harvest project</p> <p>A sample application form can be downloaded from the CER website¹⁹ for an example of the exact details required in an application to register a project.</p>	<p>To include carbon sequestration within a Climate Active account, the business needs to achieve certification first. Responsible entities considering applying for carbon neutral certification should contact the Department (www.environment.gov.au/carbon-neutral) early in the process to discuss the suitability of the Product & Service Standard for their circumstances.</p> <p>An application must include as minimum a carbon account for the base year, a public report, and independent validation.</p> <p>There is an annual licence fee associated with certification, the cost scaled to the amount of annual emissions within the certification emission boundary. Once certified, the carbon sequestered from the planting will become a line item in the Climate Active account.</p> <p>(High)</p>
2. Choose project proponent	<p>Declare the project proponent. The project proponent is the party who has the legal right to undertake the project. This means that they control the project, will be issued carbon credits created by the project and are legally responsible for meeting all obligations under the Carbon Credits (Carbon Farming Initiative) Act 2011 for the life of the project. The project proponent can be:</p>	<p>Declare the project proponent. The project proponent is the party who has the legal right to undertake the project. This means that they control the project, will be issued carbon credits created by the project and are legally responsible for meeting all obligations under the Carbon Credits (Carbon Farming Initiative) Act 2011 for the life of the project. The project proponent can be:</p>	<p>Not Applicable.</p>

²¹ Source: <https://www.cleanenergyregulator.gov.au/ERF/Forms-and-resources/apply-to-participate>

	<p>- yourself - an engaged person/organisation, or - yourself, but enacted by an engaged agent.</p> <p>(Moderate)</p>	<p>- yourself - an engaged person/organisation, or - yourself, but enacted by an engaged agent.</p> <p>(Moderate)</p>	
<p>3. Submit plantation forestry notification</p>	<p>Submit notification to DAFF for ministerial approval. Schedule 1 projects (new or expanded plantations) require that the Minister for Agriculture assess and decide as to whether the project may lead to an undesirable impact on agricultural production.</p> <p>There is no prescribed 'application form' for a proponent, instead a notification is to take the form of a written statement sent to the Department of Agriculture, Water and the Environment via email. The notification, and any supporting information must be included in your registration application to the Clean Energy Regulator.</p>	<p>Submit notification to DAFF for ministerial approval. Farm Forestry harvest projects (new or expanded plantations) require that the Minister for Agriculture assess and decide as to whether the project may lead to an undesirable impact on agricultural production. Permanent planting projects are exempt.</p> <p>There is no prescribed 'application form' for a proponent, instead a notification is to take the form of a written statement sent to the Department of Agriculture, Water and the Environment via email. The notification, and any supporting information must be included in your registration application to the Clean Energy Regulator.</p>	<p>Not Applicable.</p>
<p>4. Fit and proper person (FPP) test</p>	<p>The proponent must pass a fit and proper person test. This might include submission of an Australian Federal Police National Police Check form and demonstrate that you meet the good character expectations of the Clean Energy Regulator (e.g., solvency etc.).</p>	<p>The proponent must pass a fit and proper person test. This might include submission of an Australian Federal Police National Police Check form and demonstrate that you meet the good character expectations of the Clean Energy Regulator (e.g., solvency etc.).</p>	<p>Not Applicable.</p>
<p>5. Provide map of project area</p>	<p>Based on CFI Mapping Guidelines [currently Version 5 (2018)], you need to use a GIS to define and supply the following GIS layers to 10m accuracy:</p> <ul style="list-style-type: none"> - Project Area (i.e. Title area) - Carbon Estimation Areas (CEAs - homogeneous land/forest area units to undertake carbon project activity) - must be at least 0.2ha in area and if multiple areas, not separated by more than 250m - Exclusion Areas (i.e. non-productive plantation land, grazing land, cropping area) - Model Location Point (i.e. approximate centre of CEA which is used for FullCAM model). <p>(Moderate)</p>	<p>Based on CFI Mapping Guidelines [currently Version 5 (2018)], you need to use a GIS to define and supply the following GIS layers to 10m accuracy:</p> <ul style="list-style-type: none"> - Project Area (i.e. Title area) - Strata (homogeneous land/forest area units to undertake carbon project activity) - must be at least 0.2ha in area and if multiple areas, not separated by more than 250m - Exclusion Areas (i.e. non-productive plantation land, grazing land, cropping area) - Model Location Point (i.e. approximate centre of CEA which is used for FullCAM model). <p>(Moderate)</p>	<p>Based on CFI Mapping Guidelines [currently Version 5 (2018)], you need to use a GIS to define and supply the following GIS layers to 10m accuracy:</p> <ul style="list-style-type: none"> - Project Area (i.e. Title area) - Plots (homogeneous land/forest area units to undertake carbon project activity) - must be at least 0.2ha in area and if multiple areas, not separated by more than 250m - Exclusion Areas (i.e. non-productive plantation land, grazing land, cropping area) - Model Location Point (i.e. approximate centre of CEA which is used for FullCAM model). <p>(Moderate)</p>

<p>6. Calculate a forward abatement estimate (FullCAM)</p>	<p>Provide your best estimate of the total number of ACCUs likely to be earned during the 25-year crediting period which is based on the modelled long term (100 years) average net abatement is calculated over the 100 years by accounting for carbon stock changes in trees, debris, and harvested forest products, taking into account forest growth, disturbances and harvesting. It also accounts for carbon stock changes and emissions due to management activities such as thinning, pruning, fertilising and controlled burning, and emissions from fossil fuel use.</p> <p>You must use FullCAM for estimating the forward carbon abatement estimate. You need to use calculations as described in the method determination to convert FullCAM outputs into ACCUs, allowing for permanence and risk of reversal buffer discounts.</p> <p>(High)</p>	<p>Provide your best estimate of the total number of ACCUs likely to be earned during the 25-year crediting period which is based on the modelled long term (100 years) average net abatement is calculated over the 100 years by accounting for carbon stock changes in trees, debris, and harvested forest products, taking into account forest growth, disturbances and harvesting. It also accounts for carbon stock changes and emissions due to management activities such as thinning, pruning, fertilising and controlled burning, and emissions from fossil fuel use.</p> <p>You must use FullCAM for estimating the forward carbon abatement estimate. You need to use calculations as described in the method determination to convert FullCAM outputs into ACCUs, allowing for permanence and risk of reversal buffer discounts.</p> <p>(High)</p>	<p>Not Applicable.</p>
<p>7. Provide evidence for starting date(s)</p>	<p>Provide evidence that the project had not begun at the time the ERF project is registered, though some activities can commence after an application has been submitted, prior to such registration (at own risk given that project registration is not guaranteed).</p> <p>For Schedule 1, these permitted activities include preparation of a forest management plan, site preparation and planting activities and/or leasing or purchasing of land for such purposes.</p>	<p>Provide evidence that either the project had not begun at the time the ERF project is registered or evidence that the planting:</p> <ul style="list-style-type: none"> - was a permanent planting commenced on or after 1 July 2007 or - was a forestry project accredited under the Commonwealth Government's Greenhouse Friendly™ initiative - was a permanent planting accredited under: <ul style="list-style-type: none"> (a) the New South Wales Government's Greenhouse Gas Reduction Scheme or (b) the Australian Capital Territory Government's Greenhouse Gas Abatement Scheme or - was a permanent planting established before 1 July 2007 for which there is documentary evidence that the primary purpose of the planting was generation of carbon offsets <p>Such evidence to prove that the primary purpose of the planting was generation of carbon credits, the documentary evidence may include the contracts for the sale of offsets and must:</p> <ul style="list-style-type: none"> - be dated no later than 2 years after the date the 	<p>You must provide evidence to verify that the planting took place after 1990 which can include any of the following:</p> <ul style="list-style-type: none"> - prior to certification (i.e. baseline period): aerial or satellite images showing the presence of plantings at a time point up to 10 years after planting; - during the project period: a date-stamped photograph taken no more than 12 months after planting from a known location and direction, in which plantings are visible - a date-stamped record of hiring contractors to assist with planting; - a date-stamped record of plant or seed purchases; - during the project period: aerial or satellite images showing (1) no forest cover at a time point up to 18 months prior to planting, and (2) the presence of plantings at a time point up to 3 years after planting; or - canopy area estimates obtained on a representative individual tree that is within ± 25% of the canopy area expected for that combination of planting type, age and region. <p>(Moderate)</p>

		<p>plantings were established;</p> <ul style="list-style-type: none"> - show that the carbon rights had been registered for the plantings; and - include a statutory declaration that the plantings were entirely privately-funded. 	
<p>8. Provide evidence for business-as-usual (BAU) land use</p>	<p>Provide evidence that the land was not plantation or native vegetation at any time during the previous 7 years.</p> <p>The evidence needs to include time-stamped and geo-referenced imagery for the last 7 years showing that no plantation forest and no native vegetation was on the land.</p> <p>(Moderate)</p>	<p>The first offsets report must contain the following information in relation to each stratum that it references:</p> <ul style="list-style-type: none"> - a written statement confirming the stratum area was clear of non-project forest for at least 5 years before commencement; - if the stratum area was clear of forest at 31 December 1989, a written statement confirming the stratum area was clear of forest at that time; - a description of the land use occurring within the stratum area for at least 5 years before commencement; and - ortho-rectified aerial imagery demonstrating: <ul style="list-style-type: none"> (1) ongoing management of land under a cleared regime for at least 5 years before commencement; and (2) historic non-project forest cover in relation to the stratum area, including at the times specified in the first two points above. <p>(Moderate)</p>	<p>You must provide evidence that the planting area has been clear of forest cover for at least 5 years before the date of the first planting with any of the following evidence:</p> <ul style="list-style-type: none"> - aerial or satellite images showing no forest cover prior to planting. - a date-stamped photograph taken from a known location and direction, showing no forest cover prior to planting. <p>(Moderate)</p>
<p>9. Permanence period and discounts</p>	<p>Choose a 25 or 100-year permanence period during which the project activities must be maintained. The permanence period starts when your project first receives ACCUs.</p> <p>The total amount of ACCU's you can receive is discounted depending on which permanence period you choose:</p> <ul style="list-style-type: none"> - Schedule 1 long (≥ 20 yrs) rotation 25-year permanent period: a 20% discount - Schedule 1 short (< 20 yrs.) rotation 25-year permanence period: a 25% discount - 100-year permanence period: no discount <p>This discount is in addition to a 5% risk of reversal buffer discount on all Schedules.</p> <p>(High)</p>	<p>Choose a 25 or 100-year permanence period during which the project activities must be maintained (refer 'Permanence obligations' below for details). The permanence period starts when your project first receives ACCUs.</p> <p>The total amount of ACCU's you can receive is discounted depending on which permanence period you choose:</p> <ul style="list-style-type: none"> - 25-year permanent period: a 20% discount - 100-year permanence period: no discount <p>This discount is in addition to a 5% risk of reversal buffer discount.</p> <p>(High)</p>	<p>There is no permanence period required but any intentional (clearing/harvesting) reversals will directly affect your carbon account. The amount of modelled abatement that contributes towards your carbon offset for a reporting period is subject to a combined 30% permanence and risk of reversal buffer discount regardless of planting type.</p>

10. Management Regime	<p>The Management Regime is incorporated into the Forest Management Plan - refer Reporting and Monitoring. The Default Management Regime informs the FullCAM modelling for forward abatement estimation.</p> <p>(Moderate)</p>	<p>A harvest project requires that you supply with your application the management regime, which includes spatial extent and timing of events that are undertaken to establish, grow, manage and harvest the trees, and includes records of any disturbance events that occur.</p> <p>(Moderate)</p>	<p>Not Applicable.</p>
11. Permanence obligations	<p>Once the project is registered the carbon will need to be protected for the permanence period (25 or 100 years). This is the responsibility of the landholder even if project registration is revoked.</p> <p>Specifically, if there has been a reduction below the benchmark sequestration level of the sequestration of carbon in the relevant carbon pool on the area or areas, the owner or occupier of the land must take all reasonable steps to ensure that the number of tonnes of carbon sequestered in the relevant carbon pool on the area or areas is not less than the benchmark sequestration level.</p> <p>(Moderate) to (High)</p>	<p>Once the project is registered the carbon will need to be protected for the permanence period (25 or 100 years). This is the responsibility of the landholder even if project registration is revoked.</p> <p>Specifically, if there has been a reduction below the benchmark sequestration level of the sequestration of carbon in the relevant carbon pool on the area or areas, the owner or occupier of the land must take all reasonable steps to ensure that the number of tonnes of carbon sequestered in the relevant carbon pool on the area or areas is not less than the benchmark sequestration level.</p> <p>(Moderate) to (High)</p>	<p>There is no permanence obligation but once a tree planting has been included in a Climate Active carbon neutral certification, it must remain in the emissions boundary for the duration of certification.</p>
12. Permanence plan	<p>Provide a permanence plan, which provides an explanation of how you will retain stored carbon during the entire permanence period (25 or 100 years), including risk abatement (i.e., fire management plan). The permanence plan may be included in the Forest Management Plan. Refer Appendix 2 for an example permanence plan.</p> <p>(Moderate)</p>	<p>Provide a permanence plan, which provides an explanation of how you will retain stored carbon during the entire permanence period (25 or 100 years), including risk abatement (i.e., fire management plan).</p> <p>Refer Appendix 2 for an example permanence plan.</p> <p>(Moderate)</p>	<p>Not Applicable.</p>
13. Additional documentation and evidence	<p>Provide any additional documentation or evidence to support the validity and viability of the project.</p>	<p>Provide any additional documentation or evidence to support the validity and viability of the project.</p>	<p>Provide any additional documentation or evidence to support the validity and viability of the certification.</p>
14. ANREU account	<p>Open an Australian National Register of Emissions Units (ANREU) account with the Clean Energy Regulator to receive or transfer carbon credits</p>	<p>Open an Australian National Register of Emissions Units (ANREU) account with the Clean Energy Regulator to receive or transfer carbon credits</p>	<p>Not Applicable.</p>
15. Register and land title registry	<p>Once your project has been registered as an eligible offset project: - the CER must record the project against the ERF</p>	<p>Once your project has been registered as an eligible offset project: - the CER must record the project against the ERF</p>	<p>Not Applicable.</p>

	project register - the relevant land registration official may make an entry against the relevant land title registers to flag the existing of the project and any carbon maintenance obligations.	project register - the relevant land registration official may make an entry against the relevant land title registers to flag the existing of the project and any carbon maintenance obligations.	
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Based on the review of difficulty rating for registration requirements in Table 6 below, the key differences between the three methods are:

- To initially achieve certification under Climate Active so that a tree planting project can be included, the process may require significant support to understand GHG accounting.
- The two ERF methods:
 - may require legal support to establish a project proponent under complex arrangements.
 - require a FullCAM forward abatement to be submitted with the application to register which is a reasonably complex software modelling and spreadsheet calculation exercise.
 - require a forest management regime to be submitted requiring good forestry understanding.
 - require a commitment to either a 25-year or 100-year permanence period, which could have significant and long-term ramifications for the land holding and business which may need legal support to fully comprehend.

Table 6: Registration Criteria - Difficulty Rating Comparison			
Scheme Criterion	Plantation Forestry	Farm Forestry	Climate Active (Draft)
1. Register your project or apply for certification	Low	Low	High - requires carbon accounting knowledge and an independent validation.
2. Choose project proponent	Moderate - requires legal understanding for more complex business models.	Moderate - requires legal understanding for more complex business models.	NA
3. Submit plantation forestry notification	Low	Low	NA

4. Fit and proper person (FPP) test	Low	Low	NA
5. Provide map of project area	Moderate - requires specialist mapping software.	Moderate - requires specialist mapping software.	Moderate - requires specialist mapping software.
6. Calculate a forward abatement estimate (FullCAM)	High - requires modelling of FullCAM and calculations to generate ACCUs.	High - requires modelling of FullCAM and calculations to generate ACCUs.	NA
7. Provide evidence for starting date(s)	Low	NA	Moderate - may require understanding of remote sensed imagery sources, their acquisition and interpretation.
8. Provide evidence for business-as-usual (BAU) land use	Moderate - requires understanding of remote sensed imagery sources, their acquisition and interpretation.	Moderate - requires understanding of remote sensed imagery sources, their acquisition and interpretation.	Moderate to Low - may require understanding of remote sensed imagery sources, their acquisition and interpretation.
9. Permanence period and discounts	High - requires understanding of FullCAM and calculations to generate ACCUs.	High - requires understanding of FullCAM and calculations to generate ACCUs.	Low
10. Management Regime	Moderate - requires understanding of plantation forest management.	Moderate - requires understanding of plantation forest management.	NA
11. Permanence obligations	Moderate to High - requires some consideration and possibly legal support to fully understand obligations.	Moderate to High - requires some consideration and possibly legal support to fully understand obligations.	NA
12. Permanence plan	Moderate - requires understanding of forest management and relevant risk mitigation (typically from bushfire).	Moderate - requires understanding of forest management and relevant risk mitigation (typically from bushfire).	NA
13. Additional documentation and evidence	Low	Low	Low
14. ANREU account	Low	Low	NA
15. Register and land title registry	NA	NA	NA

Where the rating in Table 6 above is not 'Low', an estimate of likely cost to obtain third party support for registration has been provided in Table 7 below.

Table 7: Registration Criteria - External Support Cost Comparison			
Scheme Criterion	Plantation Forestry	Farm Forestry	Climate Active (Draft)
1. Register your project or apply for certification	NA	NA	Refer Table 8 below for annual licence fee, which ranges from \$840 to \$19,394 for a single organisation.

2. Choose project proponent	\$2,000 to \$10,000 to set up legal entity and agreements, depending on complexity of arrangement.	\$2,000 to \$10,000 to set up legal entity and agreements, depending on complexity of arrangement.	NA
3. Submit plantation forestry notification	NA	NA	NA
4. Fit and proper person (FPP) test	The cost of an FPP assessment may include various components, such as application fees, background checks, interviews, reference checks, and administrative expenses. Additionally, there might be ongoing fees for maintaining the FPP status or renewing the assessment periodically.	The cost of an FPP assessment may include various components, such as application fees, background checks, interviews, reference checks, and administrative expenses. Additionally, there might be ongoing fees for maintaining the FPP status or renewing the assessment periodically.	NA
5. Provide map of project area	Potential cost for mapping might range from \$1,000 to \$5,000 depending on availability of current imagery and mapping support. Cost sources might include: - Aerial imagery from state government might cost up to \$100 per image and another \$300 might be required to get a specialist to geo-reference it for use in GIS software - Satellite imagery cost is about \$1,000 per scene to acquire and geo-reference for use in GIS software - labour costs for any interpretation/mapping of the CEAs.	Potential cost for mapping might range from \$1,000 to \$5,000 depending on availability of current imagery and mapping support. Cost sources might include: - Aerial imagery from state government might cost up to \$100 per image and another \$300 might be required to get a specialist to geo-reference it for use in GIS software - Satellite imagery cost is about \$1,000 per scene to acquire and geo-reference for use in GIS software - labour costs for any interpretation/mapping of the Strata.	Potential cost for mapping might range from \$1,000 to \$5,000 depending on availability of current imagery and mapping support. Cost sources might include: - Aerial imagery from state government might cost up to \$100 per image and another \$300 might be required to get a specialist to geo-reference it for use in GIS software - Satellite imagery cost is about \$1,000 per scene to acquire and geo-reference for use in GIS software - labour costs for any interpretation/mapping of the Plots.
6. Calculate a forward abatement estimate (FullCAM)	Potential cost might be up to \$1,000 for build, run and analysis of a one-off FullCAM run to generate an ACCU issuance profile for the crediting period.	Potential cost might be up to \$1,000 for build, run and analysis of a one-off FullCAM run to generate an ACCU issuance profile for the crediting period.	NA
7. Provide evidence for starting date(s)	NA	NA	Potential cost might range from \$2,000 to \$5,000 depending on if historic imagery is required. Imagery sources might include: - Historic aerial imagery from state government might cost up to \$100 per image. Another \$300 might be required to get a specialist to geo-reference it for use in GIS software - Satellite imagery cost is about \$1,000 per scene to acquire and geo-reference.
8. Provide evidence for business-as-usual (BAU) land use	Potential cost might range from \$2,800 to \$7,000 depending on availability of historic imagery. Sources might include: - Historic aerial imagery from state government might cost up	Potential cost might range from \$2,000 to \$5,000 depending on availability of historic imagery. Sources might include: - Historic aerial imagery from	Potential cost might range from \$2,000 to \$5,000 depending on if historic imagery is required. Imagery sources might include:

	to \$100 per image. Another \$300 might be required to get a specialist to geo-reference it for use in GIS software - Satellite imagery cost is about \$1,000 per scene to acquire and geo-reference.	state government might cost up to \$100 per image. Another \$300 might be required to get a specialist to geo-reference it for use in GIS software - Satellite imagery cost is about \$1,000 per scene to acquire and geo-reference.	- Historic aerial imagery from state government might cost up to \$100 per image. Another \$300 might be required to get a specialist to geo-reference it for use in GIS software - Satellite imagery cost is about \$1,000 per scene to acquire and geo-reference.
9. Permanence period and discounts	Cost accounted for in '6. Calculate a forward abatement estimate (FullCAM)' above.	Cost accounted for in '6. Calculate a forward abatement estimate (FullCAM)' above.	NA
10. Management Regime	Cost accounted for under '9. Forest Management Plan' in the 'Reporting and Monitoring Comparison' section.	Cost accounted for under '9. Forest Management Plan' in the 'Reporting and Monitoring Comparison' section.	NA
11. Permanence obligations	Potential cost might range from \$2,000 to \$5,000 to obtain legal advice to confirm full ramifications of permanence obligations, depending on complexity of proponent arrangement.	Potential cost might range from \$2,000 to \$5,000 to obtain legal advice to confirm full ramifications of permanence obligations, depending on complexity of proponent arrangement.	NA
12. Permanence plan	Potential cost for fire management plan might start from \$2,500 per property.	Potential cost for fire management plan might start from \$2,500 per property.	NA
13. Additional documentation and evidence	NA	NA	NA
14. ANREU account	NA	NA	NA
15. Register and land title registry	NA	NA	NA

Table 8: Example of annual licence fee for Climate Active Carbon Neutral Certification	
Annual Emissions Within the Certification Emission Boundary	Fee (GST Inclusive) as at 1 July 2021
≤ 2,000t CO ₂ -e	\$840 if a Small Organisation or \$2,692 otherwise
2,000 ≤ 10,000t CO ₂ -e	\$8,184
10,000 ≤ 80,000t CO ₂ -e	\$13,569
> 80,000t CO ₂ -e	\$19,384

Reporting and Monitoring Comparison

All the methods reviewed require reporting and monitoring. The ERF methods require reporting to issue credits, and the Climate Active method requires reporting to keep annual carbon accounts up to date to maintain certification. In terms of monitoring, all the methods need to ensure that forest cover is maintained.

The criteria, difficulty rating and potential cost for ongoing reporting and monitoring under the Plantation Forestry method, the Farm Forestry method and the Climate Active method are summarised in Table 9, Table 10 and Table 11 respectively.

Note that the criterion comparison in Table 9 also includes a difficulty rating tag based on the ratings in Table 10 to highlight any criterion which were considered to have moderate, high or very high difficulty. Where there is no rating supplied, this indicates a low difficulty rating.

Based on the review of the criteria in Table 9, the key differences between the reporting and monitoring requirements for the three methods are:

- Reporting is required annually for Climate Active certification whereas you can elect to report anywhere between every 6 months to every 5 years for the ERF methods.
- No credits are issued under Climate Active certification.
- FullCAM is used to model abatement for each reporting period in the Plantation Forestry and Climate Active methods but not the Farm Forestry method.
- Carbon inventory, and potentially destructive sampling, is required in the Farm Forestry method to estimate abatement (and therefore credit issuance) in each reporting period. No field measurements are required in the other methods.
- The total amount of credits that can be issued in the crediting period is capped for the Plantation Forestry and Farm Forestry harvest project. This cap is set by the long term (100 year) average abatement modelled by FullCAM. There is no such cap for the Farm Forestry permanent plantings project or the Climate Active method.
- A forest management plan (FMP) is to be submitted each reporting period under the Plantation Forestry method (refer to Appendix 1 for an example FMP).
- A sampling plan is to be submitted each reporting period under the Farm Forestry method.

- Significant reversals of carbon sequestration caused by natural disturbance may result in the relinquishment of credits under both the ERF methods. Under the Climate Active method, reversals caused by natural disturbance simply pause inseting until such time as carbon stocks recover. Reversals caused by clearing/harvesting are accounted for as emissions.
- Under the ERF Methods, at least 3 audits are required over the 25-year crediting period, the first is required is to be submitted with your first offset report. For the Climate Active method, verification of the sequestration planting is required with the first reporting period, and audits/verifications of the over-arching carbon neutral claim are required at least once every 3 years.

Table 9: Reporting and Monitoring Criteria Comparison

Scheme Criterion	Plantation Forestry	Farm Forestry	Climate Active (Draft)
1. Reporting requirements	<p>Information is required regarding the success of the project in the form of offsets reports to be issued credits. Refer Figure 12 and Figure 13 for examples of credit issuing profiles.</p> <p>The first report must be submitted within the first five years of project life and not before 6 months after project (crediting period) commencement.</p> <p>At least five additional offsets reports must be submitted (minimum of one every five years). Reports can be submitted more frequently if the proponent wishes to receive credits more frequently (this is referred to as a crediting round).</p> <p>Reporting is required for the full 25-year crediting period even if ACCUs are no longer being issued.</p> <p>(Moderate)</p>	<p>Information is required regarding the success of the project in the form of offsets reports to be issued credits. Refer section 'Managing Returns' for example of credit issuing profile.</p> <p>The first report must be submitted within the first five years of project life and not before 6 months after project (crediting period) commencement.</p> <p>At least five additional offsets reports must be submitted (minimum of one every five years). Reports can be submitted more frequently if the proponent wishes to receive credits more frequently (this is referred to as a crediting round).</p> <p>Reporting is required for the full 25-year crediting period even if ACCUs are no longer being issued.</p> <p>(Moderate)</p>	<p>Carbon stock change for the reporting period, expressed in tonnes of CO_{2-e} (carbon dioxide carbon equivalent), must be reported at the end of each reporting period.</p> <p>Evidence to confirm compliance with approved carbon abatement calculations includes provision of date-stamped FullCAM plot files (.PLO) and a copy of the associated output data in a spreadsheet file for each plot in the project area.</p> <p>(Moderate)</p>
2. Reporting period	<p>You choose the length between each offsets report, which can be between 6 months and 5 years. The time between offsets reports is referred to as the 'reporting period'.</p>	<p>You choose the length between each offsets report, which can be between 6 months and 5 years. The time between offsets reports is referred to as the 'reporting period'.</p>	<p>Annual reporting is an obligation to maintain carbon neutral certification.</p>

<p>3. Crediting period</p>	<p>The time over which credits can be issued for a project is known as a 'crediting period' and is 25 years.</p> <p>The length over which credits are issued within a crediting period will vary depending on total credits available to the project and the plantation growth rates. After the period of issuance is up, you receive no more credits, but must continue to report up until 25 years of age.</p>	<p>The time over which credits can be issued for a project is known as a 'crediting period' and is 25 years.</p> <p>The length over which credits are issued within a crediting period will vary depending on total credits available to the project and the plantation growth rates. After the period of issuance is up, you receive no more credits, but must continue to report up until 25 years of age.</p>	<p>Not Applicable.</p>
<p>4. Abatement calculations</p>	<p>Net abatement is calculated in each reporting period by accounting for carbon stock changes in trees, debris, and harvested forest products, taking into account forest growth, disturbances (i.e., fire, flood) and harvesting. It also accounts for carbon stock changes and emissions due to management activities such as thinning, pruning, fertilising and controlled burning, and emissions from fossil fuel use.</p> <p>You must use FullCAM for estimating carbon abatements and sequestration, but no physical measurements of trees or biomass on the site are required. You need to use calculations as described in the method determination to convert FullCAM outputs into ACCUs, allowing for permanence and risk of reversal buffer discounts.</p> <p>In some reporting periods the net abatement value might be negative (i.e., thinning, disturbance). In such cases zero credits will be issued for that reporting period and the negative abatement value gets carried through subsequent reporting periods until sufficient positive abatement has been accounted for. Once the net abatement for a reporting period returns to a positive value, credits will be issued up to the total available amount.</p> <p>The units for ACCUs are tonnes of carbon dioxide equivalent (tCO_{2-e}) so the FullCAM outputs (tonnes of carbon/ha, tonnes of nitrous oxide/ha and tonnes of methane/ha) all need converting.</p> <p>(High)</p>	<p>Net abatement ('carbon stock' change) is calculated in each reporting period by physical measurements of project trees (e.g., stem diameter, tree height or crown dimensions), taken during a 'carbon inventory'. Project trees can be either living or dead, and can also be fire-affected, but must be standing. You can also count the carbon stored in forest litter and fallen dead wood, but this is optional.</p> <p>For harvest projects only, FullCAM is used to model the predicted project average carbon stocks (PPACS) over a 100-year period. The PPACS estimate defines the upper limit of carbon stock for a project which can be issued as credits for the reporting period. The carbon inventory informs how much carbon stock has changed within each reporting period and credits are issued accordingly up until the PPPACS amount is reached.</p> <p>For permanent plantings the carbon inventory informs how much carbon stock has changed within each reporting period and if the carbon stock change is positive for that reporting, credits are issued accordingly until the end of the crediting period (25 years).</p> <p>The units for ACCUs are tonnes of carbon dioxide equivalent (tCO_{2-e}) so the FullCAM outputs (tonnes of carbon/ha, tonnes of nitrous oxide/ha and tonnes of methane/ha) all need converting.</p> <p>(Very High)</p>	<p>Net abatement ('carbon stock' change) is calculated in each reporting period by accounting for the change in total carbon stock for all the plots within all project areas (i.e., above and below ground forest biomass and debris), less emissions resulting from fire and clearing/harvesting events. Other emissions associated with forest management (i.e., fuel) are accounted for in the overarching Climate Active GHG account.</p> <p>You must use FullCAM for estimating carbon abatements and sequestration, but no physical measurements of tree or biomass on the site are required.</p> <p>The units reported from the project as a line item in the Climate Active GHG account are tonnes of carbon dioxide equivalent (tCO_{2-e}), so the FullCAM outputs (tonnes of carbon/ha, tonnes of nitrous oxide/ha and tonnes of methane/ha) all need converting.</p> <p>(High)</p>

<p>5. FullCAM - approved version</p>	<p>Until the FullCAM2023 version is released, it is still mandatory to use the older FullCAM2016 for modelling (you cannot use the interim FullCAM2020 version under the 2022 plantation forestry method).</p>	<p>Until the FullCAM2023 version is released, it is still mandatory to use the older FullCAM2016 for modelling (you cannot use the interim FullCAM2020 version under the farm forestry method).</p>	<p>Until the FullCAM2023 version is released, it is still mandatory to use the older FullCAM2016 for modelling (you cannot use the interim FullCAM2020 version under the farm forestry method).</p>
<p>6. FullCAM - baseline scenario</p>	<p>You must model what would have occurred in the absence of the project. For Schedule 1, the baseline scenario is assumed to be zero.</p> <p>(High)</p>	<p>You must model what would have occurred in the absence of the project. For the Farm Forestry Method, the baseline scenario is assumed to be zero.</p> <p>(High)</p>	<p>You must model what has occurred since planting up to the start of the first reporting period including changes in carbon stock, and emissions resulting from disturbance and the effects of management events.</p> <p>(High)</p>
<p>7. FullCAM - project scenario (reporting period)</p>	<p>To calculate an offset report, you must model what has occurred since the project commencement as a result of the project.</p> <p>(High)</p>	<p>Not Applicable, instead carbon inventory results are used to calculate the abatement for a reporting period.</p>	<p>To calculate net abatement amount for a reporting period you must model what has occurred since the end of the last reporting period including changes in carbon stock, and emissions resulting from disturbance and the effects of management events.</p> <p>(High)</p>
<p>8. FullCAM - long-term project scenario (100 years)</p>	<p>The FullCAM long term model scenario is used to calculate the total issuance of ACCU's likely to be issued over the life of the project. For each reporting period you must remodel the long-term project scenario to include what has occurred since project commencement and what will occur in the future because of the project management regime.</p> <p>(High)</p>	<p>The FullCAM long term model scenario is used to calculate the total issuance of ACCU's likely to be issued over the life of a harvest project. This is referred to as the predicted project average carbon stocks (PPACS) under the Farm Forestry Method. For each reporting period you must remodel the PPACS to include what has occurred since project commencement and what will occur in the future because of the project management regime.</p> <p>(High)</p> <p>This does not apply to a permanent planting project.</p>	<p>Not Applicable</p>

<p>9. Forest management plan</p>	<p>A Forest Management Plan (FMP) is required with each offsets report which includes:</p> <ul style="list-style-type: none"> - management records, including how they are to be evidenced - default and current management regimes and how they are modelled through FullCAM - explanation of any changes to the management regime - where relevant, explanation of how records of monitoring and evidence of management actions, natural disturbances and forest development are being maintained - the management activities that have been or will be implemented to address identified adverse impacts and permanence risks. <p>Under Schedule 1 the FMP does NOT need to be reviewed and signed-off by a qualified independent person.</p> <p>Refer Appendix 1 for an example FMP.</p> <p>(Moderate)</p>	<p>Not Applicable.</p>	<p>Not Applicable.</p>
<p>10. Sampling plan</p>	<p>Not Applicable</p>	<p>A sampling plan must be developed and documented for the project and provided with offset reports. This plan identifies the quantity, intended and actual location coordinates of permanent sample plots, biomass sample plots, and the quantity and actual location coordinates of biomass sample trees, within a stratum or the geographic limits of an allometric domain. Additional assessment for coarse woody material (CWD) and litter is optional.</p> <p>(High)</p>	<p>Not Applicable.</p>

<p>11. Carbon inventory</p>	<p>Not Applicable.</p>	<p>A carbon inventory must be conducted at least 6 months before each reporting period²² and as required to account for natural disturbance events. Abatement and crediting issuance are calculated for each reporting period based on the carbon inventory results.</p> <p>A carbon inventory can be conducted via either permanent sample plots (PSPs) or temporary sample plots (TSPs) or a combination of both. Plots need to be 0.02ha or larger. If destructive sampling biomass sample trees are required then TSPs will be required.</p> <p>The Technical Reference Guide states that the minimum number of plots is:</p> <ul style="list-style-type: none"> - 30 for <= 30ha - 50 for 30ha to <= 100ha - 70 for 100ha to <= 1,000ha - 100 for 1,000ha to <= 10,000ha - 200 for > 10,000ha <p>For a harvest project a carbon inventory is no longer needed once the predicted project average carbon stocks have been met (i.e. ACCU issuance has finished).</p> <p>(High)</p>	<p>Not Applicable.</p>
<p>12. Carbon Inventory - Precision Standard</p>	<p>Not Applicable.</p>	<p>The precision standard that must be achieved for a reporting period is a probable limit of error (PLE) of less than or equal to 10% (at the 90% confidence limit) for the estimate of the closing carbon stocks. The PLE is calculated from the results of the carbon inventory and is heavily influenced by the number of plots measured and the variability within the forest metrics (i.e. height, diameter, stocking).</p> <p>If the precision standard is not met, and no more plots are measured to attempt to improve the precision standard, then if the PLE is less than 20% then the lower bound of the closing carbon stocks will be used instead of the average closing carbon stock (i.e. you get issued less credits).</p> <p>(High)</p>	<p>Not Applicable.</p>

²² In general, you can elect a reporting period as short as 6 months but not more than 5 years.

<p>13. Destructive sampling for developing allometric functions</p>	<p>Not Applicable.</p>	<p>Allometric equations are mathematical relationships between easily/cheaply measured project tree dimensions (i.e., diameter, height) and more difficult/costly measured tree dimensions (i.e., biomass). Once an allometric function is built and validated for a stratum or region, the carbon inventory can predict total tree biomass (i.e. carbon stock) more efficiently, keeping overall carbon inventory costs down.</p> <p>You must develop your own allometric function by way of destructive sampling if there is no pre-existing validated allometric function (i.e. a 'CFI Function') for your species or region, as developed in compliance with an existing CFI methodology determination.</p> <p>To build an allometric function at least 20 individual biomass sample trees from the relevant stratum/region and species are measured as per standard inventory plots, then cut down and all components (stem, crown & any attached dead material) weighed (wet/green-weight). A sub-sample of each component is then taken and dried, then re-weighed to calculate original water content of the wood. A regression relationship is then built between the tree measurements and the wet/dry weighed components to develop the allometric function relevant to that stratum/region and species. A further 10 trees must then be destructively sampled in the same manner and used to validate that the previously developed allometric functions statistically sound.</p> <p>As the trees grow in size, you will need to update or rebuild the allometric functions so that they are still representative of the trees being inventoried. Updating an existing allometric function may be achieved with only 10 destructive sample trees.</p> <p>(Very High)</p>	<p>Not Applicable.</p>
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<p>14. Significant reversal requirements to relinquish ACCUs or account for emissions (i.e., natural disturbance)</p>	<p>A significant reversal is the reversal of removal of carbon dioxide from the air caused by:</p> <ul style="list-style-type: none"> - natural disturbance (bushfire, flood, drought, parts attack, disease, etc.) if it affects greater than 5% of the total project area; or - conduct engaged in by a person (not the proponent) if it affects at least the smaller of 5% of the total project area or 50ha. <p>The ACCU's retained by the CER via the 5% risk of reversal buffer discount applied to ACCU issuance accounts for reversals which affect 5% or less of the total project area.</p> <p>If a significant reversal occurs and the CER is not satisfied that the project proponent has within a reasonable period, taken steps to mitigate the effect of the natural disturbance or conduct, then the CER may require the project proponent to relinquish a specified number of ACCUs. If the request to relinquishment ACCUs is not complied with within 90 days, a carbon maintenance obligation may be imposed on the project land. If an area of land is subject to a carbon maintenance obligation, a person must not engage in conduct that:</p> <ul style="list-style-type: none"> - results, or is likely to result, in a reduction below the benchmark sequestration level of the sequestration of carbon in the relevant carbon pool on the area or areas; and - is not a permitted carbon activity. <p>Salvage harvesting is permitted if a fire or natural disturbance event affects the whole CEA. If such a disturbance only affects part of a CEA (>5% area), the affected part would need to be mapped out into a separate CEA prior to salvage harvesting.</p> <p>If for a reporting period following a disturbance event that has occurred at least 6 months prior the vegetation in the CEA has progressed towards achieving forest cover then that CEA satisfies the forest development condition event and may not trigger a significant reversal.</p>	<p>A significant reversal is the reversal of removal of carbon dioxide from the air caused by:</p> <ul style="list-style-type: none"> - natural disturbance (bushfire, flow, drought, parts attack, disease, etc.) if it affects greater than 5% of the total project area; or - conduct engaged in by a person (not the proponent) if it affects at least the smaller of 5% of the total project area or 50ha. <p>The ACCU's retained by the CER via the 5% risk of reversal buffer discount applied to ACCU issuance accounts for reversals which affect 5% or less of the total project area.</p> <p>If a significant reversal occurs and the CER is not satisfied that the project proponent has within a reasonable period, taken steps to mitigate the effect of the natural disturbance or conduct, then the CER may require the project proponent to relinquish a specified number of ACCUs. If the request to relinquish ACCUs is not complied with within 90 days, a carbon maintenance obligation may be imposed on the project land. If an area of land is subject to a carbon maintenance obligation, a person must not engage in conduct that:</p> <ul style="list-style-type: none"> - results, or is likely to result, in a reduction below the benchmark sequestration level of the sequestration of carbon in the relevant carbon pool on the area or areas; and - is not a permitted carbon activity. <p>Under the Farm Forestry method, if a growth disturbance affects more than 10ha of a stratum, that area will need to be mapped out as a new stratum within 6 months of the event, and carbon stocks within that stratum assessed. The death of project trees is not a growth disturbance if infill planting is undertaken to replace the dead project trees within 36 months of the planting finish date for the stratum.</p>	<p>Reversals are accounted for differently depending on whether they are due to clearing (i.e., harvesting) versus disturbance events such as fire. Emissions due to clearing are treated as a distinct line item in a carbon account (i.e., an emission), whereas emissions due to other disturbance events have the effect of lowering the net abatement amount</p> <p>For example:</p> <ul style="list-style-type: none"> - if a plot is affected by fire, then this effectively pauses the inclusion of carbon sequestration by plantings in a Climate Active report. Sequestration is included again once the cumulative sequestration across reporting periods is greater than zero - If a plot is cleared/harvested then the full carbon abatement sequestered since the tree plot was included in a Climate Active carbon account will be classified as an emission. Note that this amount is not subject to the 30% permanence and risk of reversal discount - this is because the effect of the clearing is certain (to the degree that the model achieves). <p>Up to 10% of fallen timber may be removed from a plot in a calendar year for personal use. Removals below this threshold do not need to be modelled. Removals above this threshold should be modelled as the harvest of fallen timber.</p>
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<p>15. Auditing your project</p>	<p>The Clean Energy Regulator will set an audit schedule for your project at the time of project registration. The audit schedule sets out the level of assurance, frequency, and scope of audits required for your project.</p> <p>The number of scheduled audits will depend on your project size in terms of average annual abatement expected to be generated, generally at least 3 audits are required over the 25-year crediting period. The first audit is due with your first offsets report.</p>	<p>The Clean Energy Regulator will set an audit schedule for your project at the time of project registration. The audit schedule sets out the level of assurance, frequency, and scope of audits required for your project.</p> <p>The number of scheduled audits will depend on your project size in terms of average annual abatement expected to be generated, generally at least 3 audits are required over the 25-year crediting period. The first audit is due with your first offsets report.</p>	<p>The sequestration from plantings within a Climate Active carbon neutral claim must be independently verified by a third party in the first year plantings are included in the emissions boundary.</p> <p>It is up to the discretion of the verifier to determine the appropriate level of sampling of plot data to give assurance over the sequestration estimates, and the draft guidelines outline requirements under simplified and full verification options.</p> <p>Under the full verification option, it must include a statutory declaration declaring that:</p> <ul style="list-style-type: none"> - no vegetation clearing or harvesting that has not been accounted for within the carbon stocks in the reporting period have been undertaken anywhere else in the emissions boundary of the enterprise (i.e. no leakage). - the reported carbon stocks have not been used in another Climate Active carbon neutral report or any other carbon abatement claim, nor have they been used to generate carbon credits under the ERF or any other carbon credit scheme (i.e. no double-counting). - since its first inclusion as an accounting item, carbon sequestration has been continuously included in the Climate Active report for this enterprise. <p>Under the wider certification requirements, an independent validation (i.e. audit or verification) of the carbon neutral claim must be undertaken by an environmental auditor or carbon consultant at least once every three years. The independent validation report findings and/or assurance statement should be made publicly available.</p>
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<p>16. Engaging an auditor</p>	<p>An audit must have an audit team leader who is registered as a Category 2 auditor or a Category 3 auditor under sub regulation 6.25(3) of the <i>National Greenhouse and Energy Reporting Regulations 2008</i>. The list of current auditors is available on the CER website.</p> <p>(Very High)</p>	<p>An audit must have an audit team leader who is registered as a Category 2 auditor or a Category 3 auditor under sub regulation 6.25(3) of the <i>National Greenhouse and Energy Reporting Regulations 2008</i>. The list of current auditors is available on the CER website.</p> <p>(Very High)</p>	<p>Verifications for plantings can be undertaken by entities with vegetation assessment experience also meeting either Type 1, 2 or 3 criteria in the Validation Schedule of the Climate Active Licence Agreement.</p> <p>The Type of third-party validation required will vary based on the type of certification achieved, for example organisations (small, medium, large), service (simple, complex) products or precinct.</p> <p>(Very High)</p>
<p>17. Notification requirements</p>	<p>The CER needs to be notified of all and any significant changes to your project, including:</p> <ul style="list-style-type: none"> - ceasing to be the proponent - natural disturbance events - reversal of sequestration due to conduct of another person - if covered by a natural resource management plan, the project becomes inconsistent with that plan - event relevant to whether a proponent is a fit and proper person. 	<p>The CER needs to be notified of all and any significant changes to your project, including:</p> <ul style="list-style-type: none"> - ceasing to be the proponent - natural disturbance - reversal of sequestration due to conduct of another person - if covered by a natural resource management plan, the project becomes inconsistent with that plan - event relevant to whether a proponent is a fit and proper person. 	<p>Not Applicable</p>
<p>18. Making changes to your project</p>	<p>Changes to the project are allowed after registration but must be implemented under a 'Project Variation' form available in the CER Client Portal.</p>	<p>Changes to the project are allowed after registration but must be implemented under a 'Project Variation' form available in the CER Client Portal.</p>	<p>Not Applicable</p>
<p>19. Monitoring requirements</p>	<p>For each CEA in the project you must:</p> <ul style="list-style-type: none"> - monitor management actions required or permitted - monitor any natural disturbance events - undertake sufficient monitoring to assess whether the forest development conditions is satisfied <p>The forest development condition is satisfied if at the end of the reporting period:</p> <ul style="list-style-type: none"> - the CEA has forest cover (or is fallow between rotations); or - since harvest or a disturbance event, the CEA is progressing towards achieving forest cover <p>Such monitoring may include:</p> <ul style="list-style-type: none"> - date-stamped and geo-referenced time-series ground-based photography; or - date-stamped and geo-referenced time-series remote sensed imagery; or - permanent plot data. 	<p>Every 5 years contemporary ortho-rectified aerial imagery of each stratum must be sourced as evidence to ensure that the stratum has a crown cover of at least 20% of the total land area.</p> <p>The first imagery must be sourced with the first offset report and the last with the end of the crediting period.</p> <p>All growth disturbance events must be monitored and recorded if they occur.</p>	<p>Evidence demonstrating the presence of plantings in each plot at the end of the reporting period must be provided, including either:</p> <ul style="list-style-type: none"> - a date-stamped remotely sensed imagery, including indicators of vegetation cover obtained within 12 months of the end of the reporting period, or - a date-stamped photograph obtained within 6 months of the end of the reporting period from a known location and direction.

20. Record keeping requirements	<p>To assist with auditing and monitoring, all relevant records relating to the registration, monitoring, project location and results of on-ground management activities of the project, including disturbance, need to be recorded and retained for at least 7 years.</p> <p>These can include tax invoices and receipts for management activities, and where monitoring to assess natural disturbance or whether the forest development conditions have been met, records must include either:</p> <ul style="list-style-type: none"> - date-stamped and geo-referenced time-series ground-based photography; or - date-stamped and geo-referenced time-series remote sensed imagery; or - permanent plot data. 	<p>To assist with auditing and monitoring, all relevant records relating to the registration, monitoring, project location and on-ground management activities of the project, including disturbance, need to be recorded and retained for at least 7 years.</p> <p>These include records relating to:</p> <ul style="list-style-type: none"> - strata descriptions, locations, and areas - sampling plans - project tree measures and allometric functions - carbon stock calculations - fuel use, and - quality assurance and control measures. 	<p>The responsible entity must maintain appropriate records for an audit trail of how the carbon account was created. Records should be kept for seven years after the end of the carbon neutral period. For responsible entities seeking certification against the Products & Services Standard, records must be kept for the period specified in the licence agreement.</p>
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Based on the review of difficulty rating for reporting and monitoring requirements in Table 10, the key differences between the three methods are:

- The Farm Forestry method requires skills in carbon inventory, destructive tree sampling and building of allometric function, all of which are specialist forestry skills.

Table 10: Reporting and Monitoring Criteria - Difficulty Rating Comparison			
Scheme Criterion	Plantation Forestry	Farm Forestry	Climate Active (Draft)
1. Reporting requirements	Moderate - some support required to collate all relevant calculations, FullCAM files, plans, audits, monitoring, and other relevant information may be required.	Moderate - some support required to collate all relevant calculations, FullCAM files, permanence plan, sampling plan, carbon inventory results, allometric function validation, audits, monitoring and other relevant information may be required.	Moderate - some support required to collate all relevant calculations, FullCAM files, plans, audits, monitoring, and other relevant information may be required
2. Reporting period	Low	Low	Low
3. Crediting period	NA	NA	NA
4. Abatement calculations	High - requires understanding of FullCAM and calculations to generate ACCUs.	Very High - requires understanding of FullCAM, running, and analysing a forestry inventory and calculations to generate ACCUs.	High - requires understanding of FullCAM.
5. FullCAM - approved version	NA	NA	NA

6. FullCAM - baseline scenario	High - requires understanding of FullCAM.	High - requires understanding of FullCAM.	High - requires understanding of FullCAM.
7. FullCAM - project scenario (reporting period)	High - requires understanding of FullCAM.	NA	High - requires understanding of FullCAM.
8. FullCAM - long-term project scenario (100 years)	High - requires understanding of FullCAM.	High - requires understanding of FullCAM.	NA
9. Forest management plan	Moderate - requires understanding of forest management to develop the plan.	NA	NA
10. Sampling plan	NA	High - requires understanding of forest mensuration design and implementation.	NA
11. Carbon inventory	NA	High - requires understanding of forest inventory design, implementation, and analysis of results.	NA
12. Carbon Inventory - Precision Standard	NA	High - requires statistical understanding.	NA
13. Destructive sampling for developing allometric functions	NA	Very High - requires understanding of forest mensuration and regression modelling.	NA
14. Significant reversal requirements to relinquish ACCUs or account for emissions (i.e., natural disturbance)	Low	Low	Low
15. Auditing your project	Refer '16. Engaging an Auditor' below.	Refer '16. Engaging an Auditor' below.	Refer '16. Engaging an Auditor' below.
16. Engaging an auditor	Very High - requires approved third-party auditor.	Very High - requires approved third-party auditor.	Very High - requires approved third-party assessment.
17. Notification requirements	Low	Low	NA
18. Making changes to your project	Low	Low	NA
19. Monitoring requirements	There are two options provided for evidence of monitoring each with a different difficulty rating: (1) use of remotely sensed imagery: Moderate. Requires understanding of remote sensed imagery sources, their acquisition and interpretation	Moderate - requires understanding of remote sensed imagery sources, their acquisition and interpretation.	There are two options provided for evidence of monitoring each with a different difficulty rating: (1) use of remotely sensed imagery: Moderate. Requires understanding of remote sensed imagery sources, their acquisition and interpretation (2) use of on-ground photography:

	(2) use of on-ground photography: Low. Can be undertaken without need for external support.		Low. Can be undertaken without need for external support.
20. Record keeping requirements	Low	Low	Low

Where the rating in Table 10 above is not 'Low', an estimate of likely cost to obtain third party support for reporting and monitoring has been provided in Table 11 below.

Table 11: Reporting and Monitoring Criteria - External Support Cost Comparison			
Scheme Criterion	Plantation Forestry	Farm Forestry	Climate Active (Draft)
1. Reporting requirements	Potential cost might range from \$1,000 to \$5,000 depending on complexity of project.	Potential cost might range from \$3,000 to \$8,000 depending on complexity of project.	Potential cost might range from \$1,000 to \$5,000 depending on complexity of project.
2. Reporting period	NA	NA	NA
3. Crediting period	NA	NA	NA
4. Abatement calculations	Potential cost might be up to \$1,000 for build, run and analysis of a one-off FullCAM run to generate an ACCU issuance profile for the crediting period.	Potential cost might be up to \$1,000 for build, run and analysis of a one-off FullCAM run to generate an ACCU issuance profile for the crediting period.	Potential cost might be up to \$1,000 for build, run and analysis of a one-off FullCAM run.
5. FullCAM - approved version	NA	NA	NA
6. FullCAM - baseline scenario	Included in 'Abatement Calculations' above as consolidated cost estimate.	Included in 'Abatement Calculations' above as consolidated cost estimate.	Included in 'Abatement Calculations' above as consolidated cost estimate.
7. FullCAM - project scenario (reporting period)	Potential cost might be up to \$1,000 for each FullCAM run.	NA	Potential cost might be up to \$1,000 for each FullCAM run.
8. FullCAM - long-term project scenario (100 years)	Included in 'Abatement Calculations' above as consolidated cost estimate.	Included in 'Abatement Calculations' above as consolidated cost estimate.	NA
9. Forest management plan	Potential cost to develop appropriate management regime and management plan might be \$2,500 per property.	NA	NA
10. Sampling plan	NA	Potential cost to develop the plan might range from \$10,000 to \$40,000 depending on complexity and scale of project.	NA
11. Carbon inventory	NA	Based on \$100 per inventory plot, total cost for a range of planting areas would be at minimum for each reporting period:	NA

		<ul style="list-style-type: none"> - \$3,000 for 30ha or less - \$5,000 for 30ha to 100ha - \$7,000 for 100ha to 1,000ha - \$10,000 for 1,000 to 10,000ha - \$20,000 for 10,000ha or more. 	
12. Carbon Inventory - Precision Standard	NA	Included in 'Abatement Calculations' above as consolidated cost estimate.	NA
13. Destructive sampling for developing allometric functions	NA	Depending on the size (i.e., age) and form of the trees this could vary from \$20,000 to \$40,000 per allometric function, about half that for updates to existing functions. The author estimates you might need to build and/or update allometric functions up to 4 times during the first 25 years.	NA
14. Significant reversal requirements to relinquish ACCUs or account for emissions (i.e., natural disturbance)	NA	NA	NA
15. Auditing your project	NA	NA	NA
16. Engaging an auditor	Potential cost from approved auditor might range from \$15,000 to \$30,000 per audit depending on complexity and scale of project.	Potential cost from approved auditor might range from \$15,000 to \$30,000 per audit depending on complexity and scale of project.	Potential cost from approved auditor might range from \$15,000 to \$30,000 per audit depending on complexity and scale of project.
17. Notification requirements	NA	NA	NA
18. Making changes to your project	NA	NA	NA
19. Monitoring requirements	<p>For on-ground photography, zero cost.</p> <p>For aerial imagery option, potential cost for annual monitoring might range from \$1,000 to \$5,000 per year depending on availability of current imagery and mapping support. Cost sources might include:</p> <ul style="list-style-type: none"> - Historic aerial imagery from state government might cost up to \$100 per image and another \$300 might be required to get a specialist to geo-reference it for use in GIS software - Satellite imagery cost is about \$1,000 per scene to acquire and geo-reference for use in GIS software - there would be additional labour costs for any interpretation/mapping of 	<p>Potential cost for 5-yearly monitoring might range from \$1,000 to \$5,000 depending on availability of current imagery and mapping support. Cost sources might include:</p> <ul style="list-style-type: none"> - Historic aerial imagery from state government might cost up to \$100 per image and another \$300 might be required to get a specialist to geo-reference it for use in GIS software - Satellite imagery cost is about \$1,000 per scene to acquire and geo-reference for use in GIS software - there would be additional labour costs for any interpretation/mapping of Strata is required if forest cover has changed or disturbance has occurred. 	<p>For on-ground photography, zero cost.</p> <p>For aerial imagery option, potential cost for annual monitoring might range from \$1,000 to \$5,000 per year depending on availability of current imagery and mapping support. Cost sources might include:</p> <ul style="list-style-type: none"> - Historic aerial imagery from state government might cost up to \$100 per image and another \$300 might be required to get a specialist to geo-reference it for use in GIS software - Satellite imagery cost is about \$1,000 per scene to acquire and geo-reference for use in GIS software - there would be additional labour costs for any interpretation/mapping of

	CEAs is required if forest cover has changed or disturbance has occurred.		CEAs is required if forest cover has changed or disturbance has occurred.
20. Record keeping requirements	NA	NA	NA

Barriers to Entry

The degree to which there will be barriers to entry partly relates to the level of expertise you have in-house within the business and the method you choose, as many of the possible barriers relate to how they affect cost in terms of need for third party support. The following section provides an overview of key areas for the methods that might present such barriers.

Consent from all eligible interest holders

The two ERF methods require that the proponent provide evidence that they have consent from all eligible interest-holders. Although the process is purely administrative, possibly backed up by legal support in more complex business financial arrangements, there is the possibility that an eligible interest holder may withhold consent.

For example, should an interest holder such as a mortgager be relying on the value of the land as security against a loan, any perceived risk imposed by a 25-year or 100-year permanence obligation to keep a piece of land forested might be seen to reduce land value. This could be either directly by way of a perceived opportunity cost of not being able to switch land-use should agricultural market conditions change in favour of another enterprise, or by the complexity that such an obligation on the title might cause for a land sale required to realise the value of the land. Choice of a 100-year permanence period over the 25-year option would likely increase the risk of consent being withheld.

CFI 'Water Rule'

The Plantation Forestry and Farm Forestry harvest project methods are both subject to the 'water rule' as set out in the CFI Rule. Specifically, within South Australia and Victoria, if the average annual rainfall is more than 600mm these harvest projects need to lie within the 'specified regions' as displayed in Figure 8 and Figure 9 otherwise the project will need to have suitable water access entitlement or prove that the project manages dryland salinity.

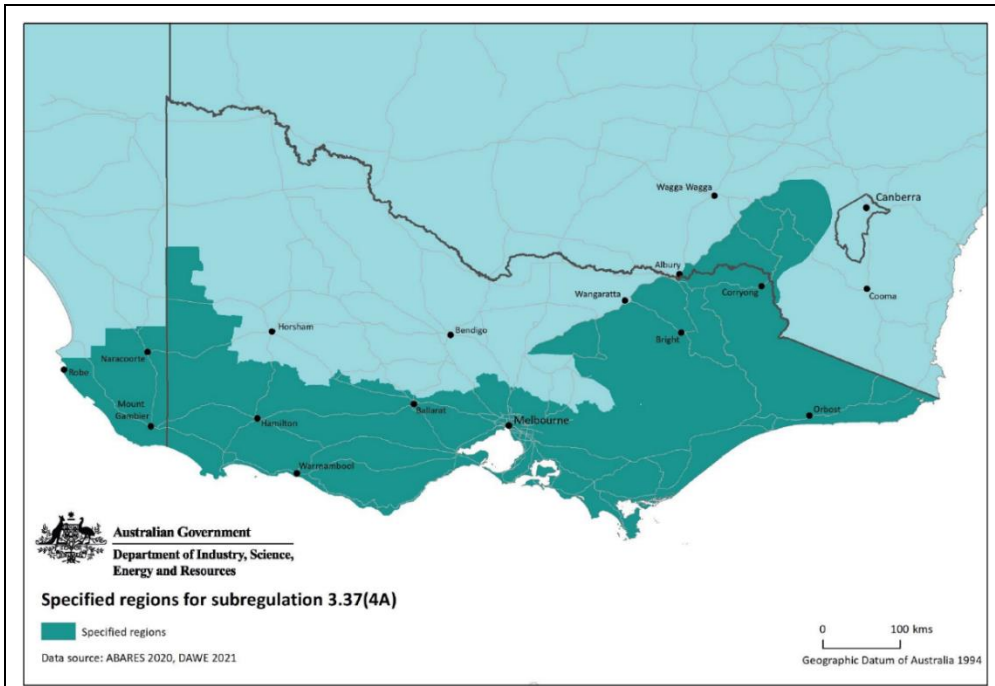


Figure 8: Specified rainfall zones for the plantation forestry method relevant to the Green Triangle NPI Region²³

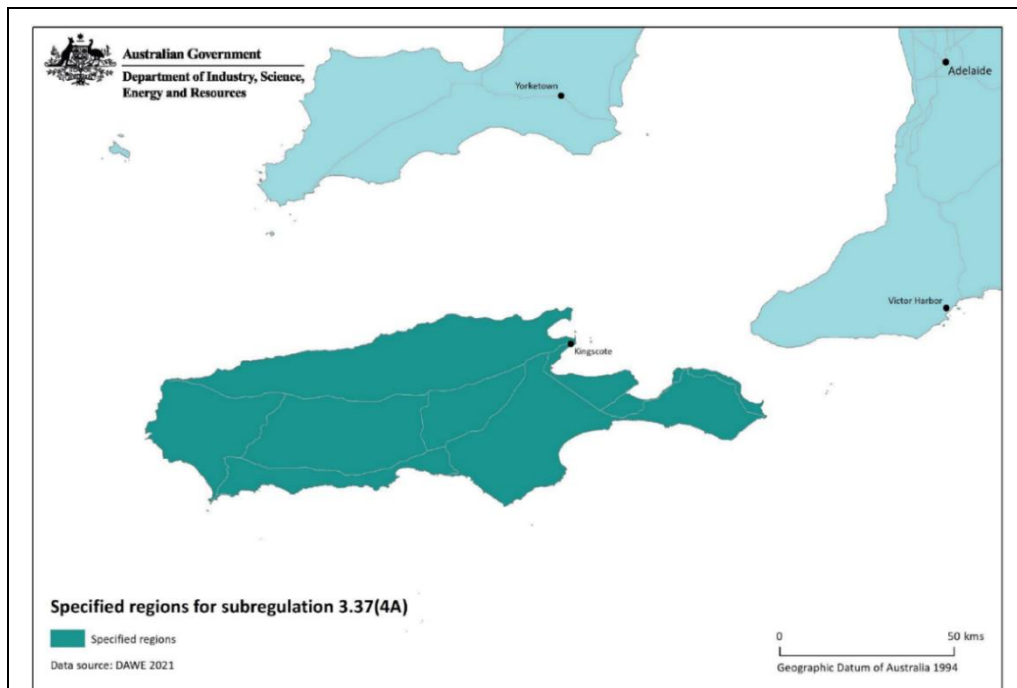


Figure 9: Specified rainfall zones for the plantation forestry method relevant to the Mount Lofty Ranges and Kangaroo Island NPI Region²⁴

²³ Source: Australian Government website

²⁴ Source: Australian Government website

These boundaries appear to be derived from a mix of Forestry Hub region boundaries, NPI region boundaries and average rainfall isohyets. As they are not provided in any digital format that can be referenced within mapping software to determine their location accurately, you may need some external support determining your eligibility if your property lies on or near the less obvious boundaries of these regions.

In late 2022 DCCEEW sought feedback on a proposal to repeal the relevant sections of the legislation. If successful, this would in effect remove the water rule. At the time of writing no outcome had been reached.

Technical Skill Requirements

Legal

As with any business enterprise, legal support is required when setting up new entities and agreements. Although there is no legal support requirement for the actual application or registration process under the ERF methods, there may be a requirement for legal support when either setting up an entity to act on behalf of multiple proponents, or in the due diligence process when signing up with a carbon provider who will act as the proponent. Under Climate Active certification you are signing a licence agreement which you may wish to have legal review of.

Under the ERF methods, the required process to achieve consent from all interested parties might extend to banks mortgaggers, joint-venture partners and any organisation with a caveat on the land. This might require significant legal support under complex business arrangements to determine all eligible interest-holders.

Legal support and advice are requirements for most businesses and so services to support entry into these methods are readily available.

Plantation Management Experience

Forest management expertise is required in any forest-based carbon sequestration project. The long-term nature of plantations requires a slightly different skill set to typical agricultural cropping enterprises, though often the underlying principles are the same. For example, they share the same need to select a species that will grow well on the available land, to clear and prepare the site for planting, to plant the crop at a spacing that will maximise site occupancy but allow an acceptable size at harvest, for thinning to adjust this as required, to control pests, to address loss from catastrophic events such as fire and flood, to understand

the market, etc. One of the main differences is that trees can become large as they approach maturity, which requires a different level of health and safety management when working in their vicinity, especially at harvest.

Setting up a permanent planting, say for the wider benefits of trees on farms including shelter for grazing, erosion control and habitat provision, is relatively simple from a forest management perspective, assuming the site is suitable for the species planted.

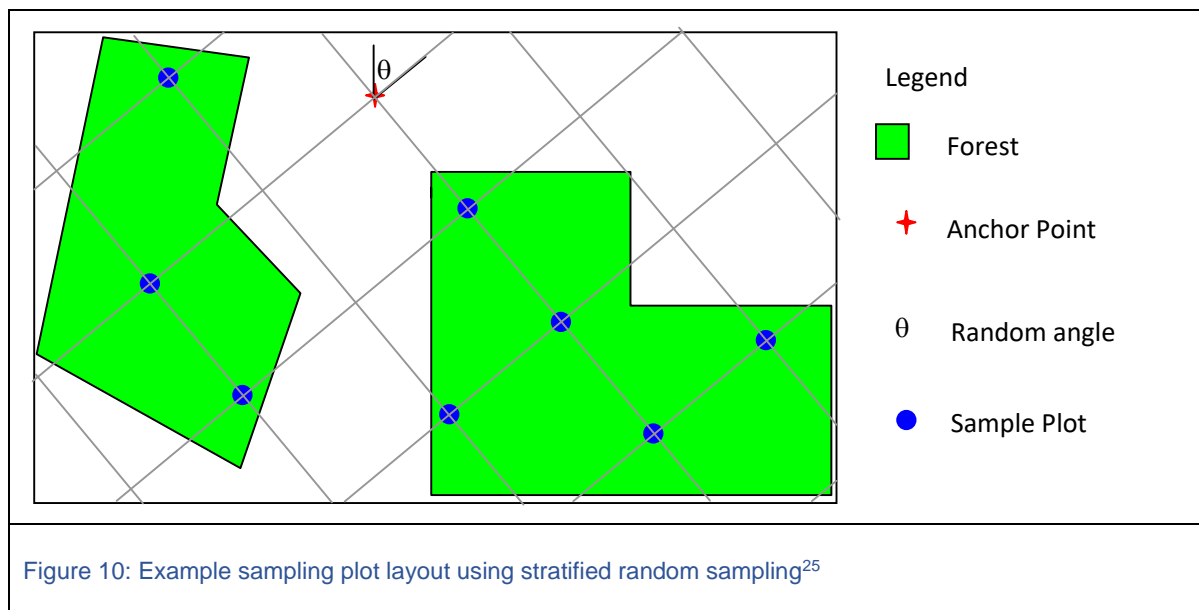
The required level of understanding of forest management increases when you step up from a permanent planting to a plantation established for harvest. And there's a similar jump again when management switches from a short-term rotation plantation (such as a 10-15 year Eucalyptus crop for a pulp market) to a long-term plantation (such as a 28-32 year Pine crop for multiple pulp and sawlog markets), the latter which then often requires one, two or three thinning events throughout the rotation to achieve required market quality in terms of final tree size and form.

These skill sets are relatively easily outsourced as the Green Triangle forestry industry supports a wide range of contract service providers in this area, and professional advice from such bodies as Forestry Australia and their Registered Forestry Professional (RFP) members are available.

Forest Measurement and Modelling

Of the three methodologies, the Farm Forestry method pushes the requirement for forest management understanding to another level again given the need to undertake carbon inventories for each reporting period, and likely destructive sampling and the building of allometric functions using regression analysis. Even within the forest management industry mensuration and forest modelling is a specialist role.

The carbon inventory requirements for the size of sample plots is 0.02ha per plot, which if trees are planted at a typical initial plantation stocking rate of around 1,100 stems per hectare (sph) in a commercial hardwood plantation, or up to 1,600 for a commercial softwood plantation, equates to a need to measure either 22 or 32 trees for each sample plot located in the forest, depending on which type of plantation is established. Sample plots are typically located across the forest using a stratified random sampling design as displayed in Figure 10 below.



The minimum number of plots required to be measured is 30 for areas of 30 hectares or less, which equates to 660 trees needing diameter and/or height measurements each reporting period for hardwood plantations, or 960 for softwood plantations. This increases up to a minimum of 50 plots for areas from 30 ha up to 100ha, meaning about 1,100 trees will need measurements in hardwood plantations or 1,600 in softwood plantations. Thinning is a standard practice in the longer rotation softwood plantations and if this occurs the plot size is likely to increase to maintain the minimum target of about 20 trees measured per plot, to ensure an acceptable statistical precision for the overall measurements. The plot establishment and tree measurement standards for such plots needs to be high to achieve a reliable. Within the forestry industry capture of the measurements is usually undertaken within specialist data capture software installed on hand-held devices (more recently including smart phones and tablets), but for small scale projects paper records could be acceptable and the results entered into an electronic spreadsheet for analysis.

To build allometric functions, destructive sampling of up to 20 trees is required for a given 'allometric domain', and about 10 is required to update a pre-existing allometric function. Typically, if you plant a single species and apply the same forest management activities to it over the full rotation then this would constitute a single allometric domain. The allometric function is used to predict total tree biomass based on more easily measured tree metrics such as diameter and/or height, as required in the previously described carbon inventory. As

²⁵ Source: Technical Reference Guide for the Carbon Credits (Carbon Farming Initiative) (Measurement Based Methods for New Farm Forestry Plantations) Methodology Determination 2014, Version 1

the trees grow older the allometric functions will likely need replacement or updating to ensure the relationship still holds, and it is expected you might need to undertake this process 2 to 4 times over a 25-year period. The 20 destructive sample trees are measured then cut down, and the above-ground material separated into biomass components, including:

- stem
- crown (branches and foliage); and
- dead material (dead branches, stem & foliage)

These must be weighed as soon as possible after falling to get the 'wet-weight' (i.e., green) of each. Either all or a subsample of each component is then taken, the wet-weight is recorded, and they must be oven-dried at 70 degrees Celsius to obtain dry-weight. Measurement of the weight of below-ground biomass is optional.

Once the tree measurements are captured, they then need to be analysed to ensure the statistical precision required by the method has been achieved, and then calculations involving allometric functions are employed to arrive at the final carbon stock change estimates needed for offset reporting.

For the actual collection of tree measurements, there are contract providers of such services supporting the forestry industry within the Green Triangle, though they can also employ such contractors from New Zealand who offer competitive pricing at larger scales.

The skills and experience required to design and run an effective destructive sampling program, and to build and apply the required allometric functions, might require more specialist forest modeling consultancy, again bodies such as Forestry Australia are a good source of contact for such services.

The Plantation Forestry and Climate Active methods remove this need for any field-based measurements by completely relying on the FullCAM software to model carbon stock changes between each reporting period. Interestingly, despite all the field measurement and model development required by the Farm Forestry harvest project to calculate carbon stock changes, report offsets and issue credits, the total amount of credits that can possibly be issued is still capped via the FullCAM model.

FullCAM & ACCU modelling

Except for the Farm Forestry permanent planting project, all the methods require use of FullCAM at some point. FullCAM itself isn't too difficult to use as far as software goes, and the technical guides provided by the CER for usage are well laid out and clear, though there are a lot of steps involved in setting up the input files, with some manual over-rides required for the 2016 desktop version of FullCAM, and so it is easy to miss a step when building the models. The latest release expected to be released in 2023 is likely to streamline some of the issues with the existing FullCAM, and will be available via a web interface, removing the need for local installation. If you are comfortable using software and methodical with instructions then running FullCAM yourself is possible, the difficulty might lie in having a good forest management background to set up the forest management regime that is input into FullCAM.

Converting the greenhouse gas emissions and carbon sequestration values output by FullCAM into tonnes of carbon dioxide equivalents (tCO_{2-e}) adds some complexity to the process for all methods, and for the ERF methods the equations are embedded in the method legislation, so can be complex to unravel at first. Once the ACCU calculations have been understood and set up in spreadsheet software, use of FullCAM for reporting offsets or carbon stock changes for an ongoing project is relatively easy. Initial support to either set up or validate the FullCAM model and the calculation process is recommended.

Calculation of the 100-year long term average or PPACS values which estimate the total cap for ACCU issuance add slightly more complexity to the Plantation Forestry and Farm Forestry harvest projects. However, once the initial calculation process has been set up and validated within spreadsheet software, it's not difficult to manage for ongoing reporting.

Auditing

All three methods require regular audits or verification, once in the first period, and then it varies by method to the regularity of ongoing audits. All require this to be undertaken by a registered and accredited third party and as such there is no real flexibility to control costs other than by comparing fees offered by the registered providers.

Monitoring Forest Cover

All three methods require the project area to be checked regularly to ensure that the forest cover is being achieved, typically for each reporting period. The Farm Forestry method requires evidence that the forest covers is being achieved in the form of date-stamped geo-

referenced remotely-sensed imagery, which can require reasonable cost and technical expertise to acquire and use for imagery interpretation or mapping purposes. The Climate Active method gives you the additional monitoring option of taking a photograph from a fixed location at each reporting period. The Plantation Forestry method provides both these options as forms of monitoring but also provides for monitoring by way of permanent sample plot, which are common practice in the industrial plantation management space.

For small scale projects, the use of ground-based photography from a fixed location is a cost-effective option but might not be so effective at larger scales.

Monitoring management and disturbance

The ERF methods also require monitoring of management actions and disturbance events. Use of date-stamped geo-referenced remotely sensed imagery is optional in this case. Such monitoring informs the FullCAM modelling as to changes in updates to the current management regime to be run for each reporting period.

Managing Returns

The three methods reviewed provide returns in either the form of ACCUs for the two ERF methods, or insets for the certification route, both of which have financial value. However, the time over which ACCUs or insets are generated is directly related to the growth of the trees, and in the first few years any yield from credits or insets will be minimal. The wait to achieve a full return on investment could be up to 25 years. This will likely pose some barriers to entry if any up-front costs occur near, or immediately on, project startup, for example the audit requirement in the first reporting period under the ERF methods. Under the ERF Methods, the reporting period is flexible but fixed on registration, and you can choose anywhere from 6-month to 5-yearly intervals.

By way of example, crediting/insetting profiles for the reviewed methods have been prepared in the sub-section below for four sites across the GTFIH boundary (refer Figure 11). For the two ERF methods a 25-permanence period was modelled, and appropriate risk of reversal and permanence discounts were applied when calculating total ACCU credits that could be issued.



Figure 11: Locations of example FullCAM modelling sites

Crediting profiles under Plantation Forestry

As an example of ACCU profiles generated under the Plantation Forestry method, four example locations were modelled with FullCAM under a short rotation and long rotation management regime. Table 12 shows the total ACCU/ha generation estimated over the 25-year crediting period. Note that there is not a direct relationship between rainfall and ACCU generation, as the FullCAM models take account of a range of climatic, environmental, and edaphic variables on a site that might affect growth.

Table 12: Example total ACCU credits generated for the four GTFIH sites under the Plantation Forestry method			
Location Name	Long Term Average Rainfall (mm)	Total Credits Issued for Short Rotation Regime (ACCU/ha)	Total Credits Issued for Long Rotation Regime (ACCU/ha)
Edenhope	601	109	172
Furner	708	159	337
Heathmere	799	139	275
Timboon	974	169	395

The two regimes applied were a standard long-term Radiata Pine plantation regime (refer Table 13) and the other a standard short-term Tasmanian Blue Gum plantation (refer Table 14), as recommended by the PIRSA and GTFIH Project 1 (Jenkin, et al., 2023).

Table 13: Example management regime for long-rotation Radiata Pine plantation in the Green Triangle		
Management activity	Activity date	Detail
Planting	1/07/2024	<i>Pinus radiata</i> , at a density of 1600 stems per hectare (SPH)
1st Thinning	1/07/2036	Remove 60% to retain 650sph (1/5 out-row + bay selection)
2nd Thinning	1/07/2041	Remove 34% to retain 430sph (bay selection)
3rd Thinning	1/07/2041	Remove 26% to retain 320sph (bay selection)
Harvest	1/07/2055	Remove 100% to produce sawlog and pulp-log products
Chopper roll	1/09/2055	Site preparation for next rotation planting
Repeat above regime	1/07/2056	Multiple rotations to cover 100 years

Table 14: Example management regime for short-rotation Tasmanian Blue Gum plantation in the Green Triangle²⁶

Management activity	Activity date	Detail
Planting	1/07/2024	<i>Eucalyptus globulus</i> , at a density of 1100 stems per hectare (SPH)
Harvest	1/07/2037	Remove 100% to produce pulp-log products
Chopper roll	1/09/2037	Site preparation for next rotation planting
Repeat above regime	1/07/2038	Multiple rotations to cover 100 years

The ACCU crediting profiles for the two regimes were generated by applying calculations to convert FullCAM modelling outputs into carbon dioxide equivalents and then to apply appropriate discount to estimate available credits. Figure 12 shows the crediting profile for each location under the long rotation management regime, Figure 13 under the short rotation management regime. Despite a reasonable range in the total amount of credits to be issued for each location, the proportion of credits issued each year are very similar for a particular management regime.

²⁶ Source: GTFIH Project 3 (Esk Spatial, 2023)

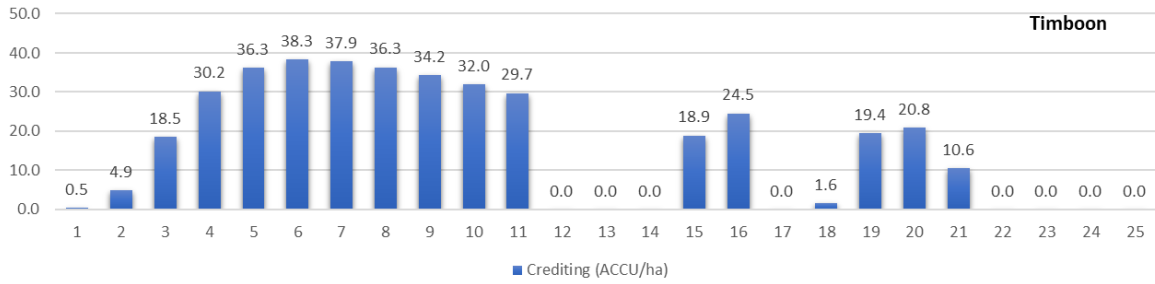
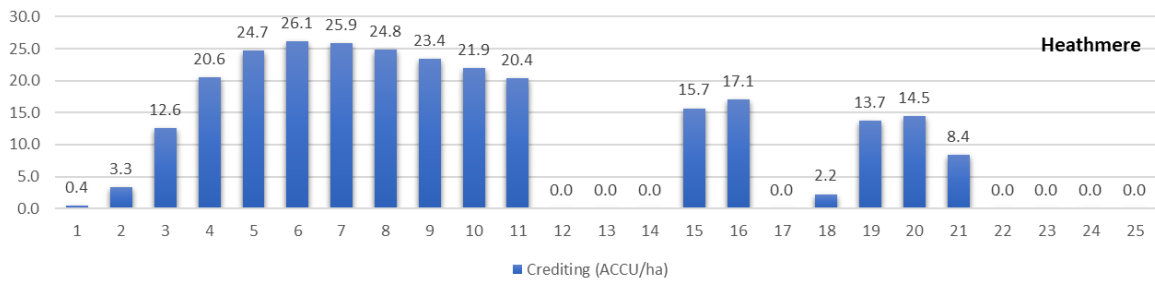
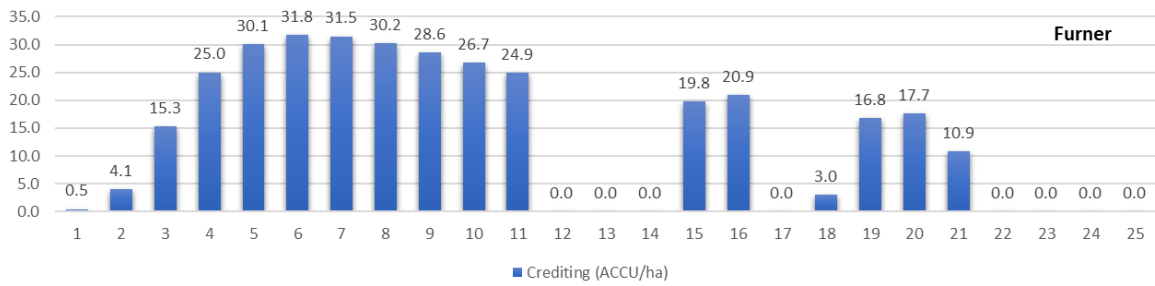
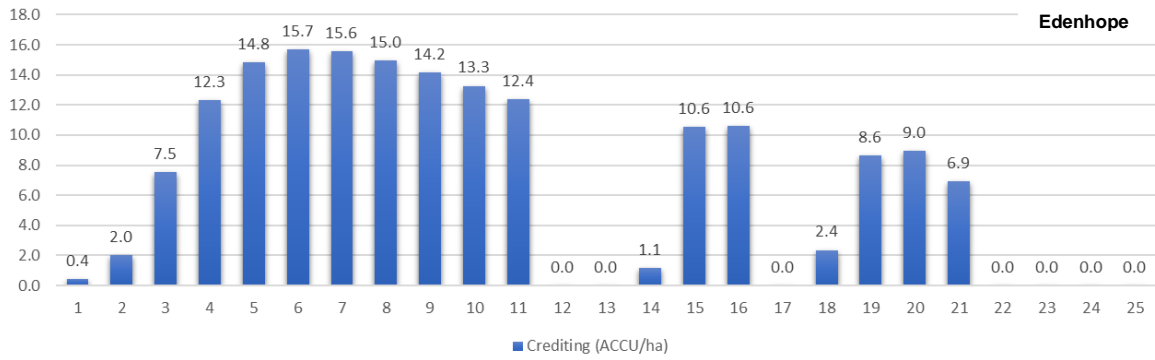


Figure 12: Example annual credit issuances for long-rotation Plantation Forestry projects²⁷

²⁷ Credit issuances cease after year 22 as credits issued equal long-term average carbon stock at this point. Note that the drop in issuances in years 12 and 17 correspond with thinning events in those years of the project scenario. Credit issuance does not commence again after such events until the net abatement returns to positive.

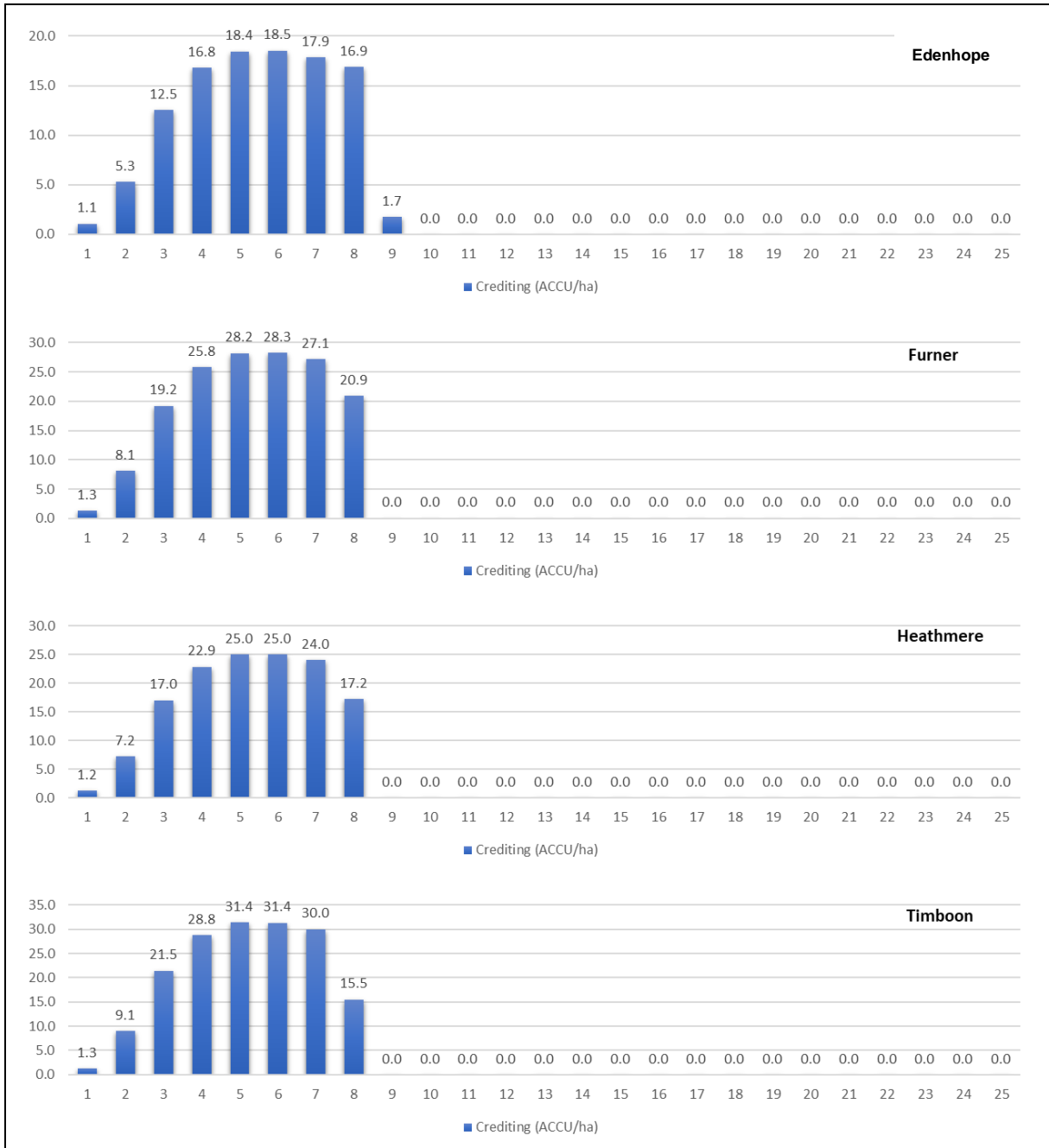


Figure 13: Example annual credit issuances for short-rotation Plantation Forestry projects²⁸

As an indication of total return likely over the 25-year crediting period the May 2023 ACCU spot price of \$37 was applied to the credits and the total value per hectare and a discounted present value per hectare were calculated as presented in Table 15.

²⁸ With the exception of Edenhope, credit issuances cease after year 8 as credits issued equal long-term average carbon stock at this point.

Table 15: Example discounted present value of revenue from ACCU credits generated for the four GTFIH sites under the Plantation Forestry method²⁹

Location Name	Short Rotation		Long Rotation	
	Total Value (\$/ha)	Discounted Present Value (\$/ha)	Total Value (\$/ha)	Discounted Present Value (\$/ha)
Edenhope	\$4,037	\$2,813	\$6,374	\$3,417
Furner	\$5,878	\$4,130	\$12,494	\$6,782
Heathmere	\$5,166	\$3,636	\$13,958	\$5,556
Timboon	\$6,251	\$4,427	\$14,598	\$8,023

Crediting profiles under the Farm Forestry Harvest Project method

For a Farm Forestry harvesting project, the total ACCUs generated will either match or be less than the amount generated under the Plantation Forestry method for an equivalent site and tree species. They will only match if all the following assumption hold:

- your trees grow as well as or better than the FullCAM growth model estimates; AND
- the statistical precision (i.e., variability) across all the measured carbon inventory plot results is within the required probable limits of error (10%); AND
- there is no significant negative bias in your allometric functions (i.e., it's not under-predicting how much carbon is in the trees)

However, the total ACCUs generated under a Farm Forestry harvest project will never exceed the Plantation Forestry method total ACCUs as the total credits issued can never exceed the predicted project average carbon stocks (PPACS) which is essentially the same as the long-term average net abatement cap placed on credits issued from Plantation Forestry methods. This is despite a carbon inventory possibly estimating a higher growth rate and carbon stock change than FullCAM if local growing conditions are favourable. Given the carbon inventory carbon stock estimates may not align with equivalent FullCAM model estimates for a given reporting period, the timing of credit issuance may differ slightly even if the same total crediting cap is achieved.

²⁹ Based on a ACCU spot price of \$37 and present value analysis of all revenue over the 25-year crediting period using a 7% rate of return which is standard for forestry valuation (Ferguson, 2018). Assumes all ACCUs traded.

Crediting profiles under Farm Forestry Permanent Planting Project method

For a Farm Forestry permanent planting project, the total ACCUs generated could exceed the total ACCUs shown for the Plantation Forestry methods, as there is no cap on credits issued for the 25-year crediting period. Under a Farm Forestry permanent planting project, ACCUs are solely issued on carbon stock estimates derived from the carbon inventory.

Using the Heathmere site described in the Plantation Forestry method ACCU profile example above, the potential credits available under the Farm Forestry permanent planting project might be around 377 ACCU/ha for Radiata Pine and 351 ACCU/ha for Tasmanian Blue Gum over the 25-year crediting period, equating to discounted present values³⁰ of \$6,798/ha and \$6,609/ha respectively if the ACCU's generated were actively traded over the full 25-year period under the May 2023 ACCU spot rate of \$37.

The relevant crediting profiles are displayed in Figure 14 and Figure 15 respectively. These figures are indicative only as they assume that the growth on the site and the results of the carbon inventory estimates match the FullCAM estimates, and these could easily be under or over depending on actual on-site conditions.

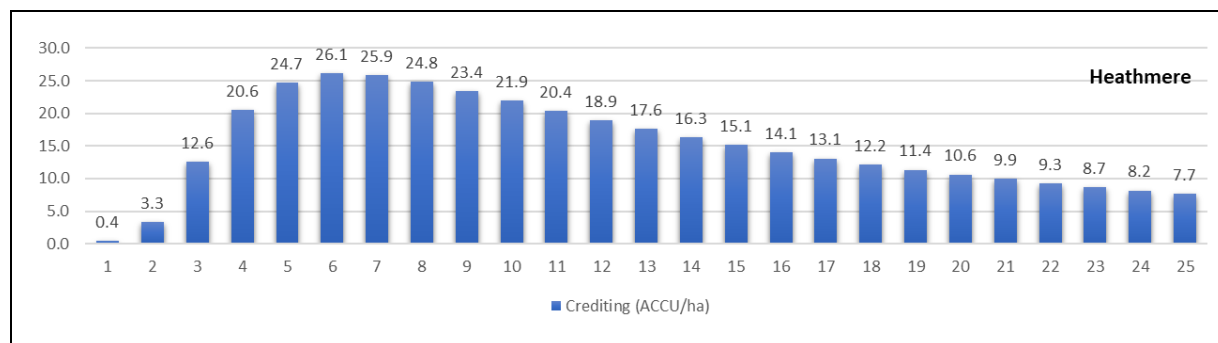


Figure 14: Example of crediting for a Radiata Pine plantation with no thinning or harvest events over 25 years for the Farm Forestry permanent planting method

³⁰ Based on present value analysis of all revenue over the 25-year crediting period using a 7% rate of return which is standard for forestry valuation (Ferguson, 2018). Assumes all ACCUs traded.

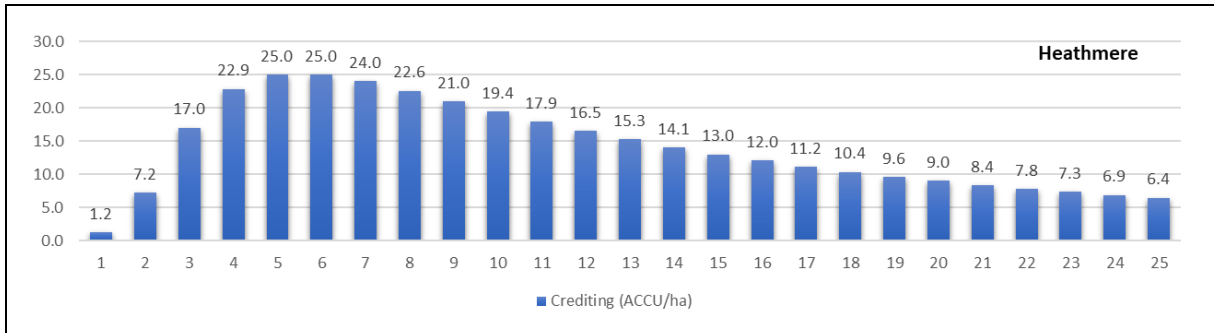


Figure 15: Example of crediting for a Tasmanian Blue Gum plantation with no thinning or harvest events over 25 years for the Farm Forestry permanent planting method

Carbon stock reporting profiles under the Climate Active method

Under the Climate Active method, assuming the same species and management regime, the generation of carbon insets on the same site would result in a similar profile as the Plantation Forestry method under an annual reporting option, given it also solely relies on the use of FullCAM modelling to estimate carbon stocks each year. However, there is no cap on total insets achievable, and the inseting would continue if total carbon stock changes remained positive for any given reporting period. If the change in carbon stock becomes negative for a reporting period due to a natural disturbance, then a zero result would be reported, but if they became negative due to harvesting or clearing an emission would be reported.

Using the Heathmere site described in the Plantation Forestry method ACCU profile example above, Figure 16 and Figure 17 provide the likely distribution of insets (i.e. positive values) or emissions (i.e. negative values) that would be reported for the long rotation Radiata Pine and short rotation Tasmanian Blue Gum regimes respectively over a nominal 31 year period (i.e. one complete Radiata Pine rotation) under the Climate Active method. Permanent planting equivalents under the Climate Active method were also developed for both these species and regimes as shown in Figure 18 and Figure 19.

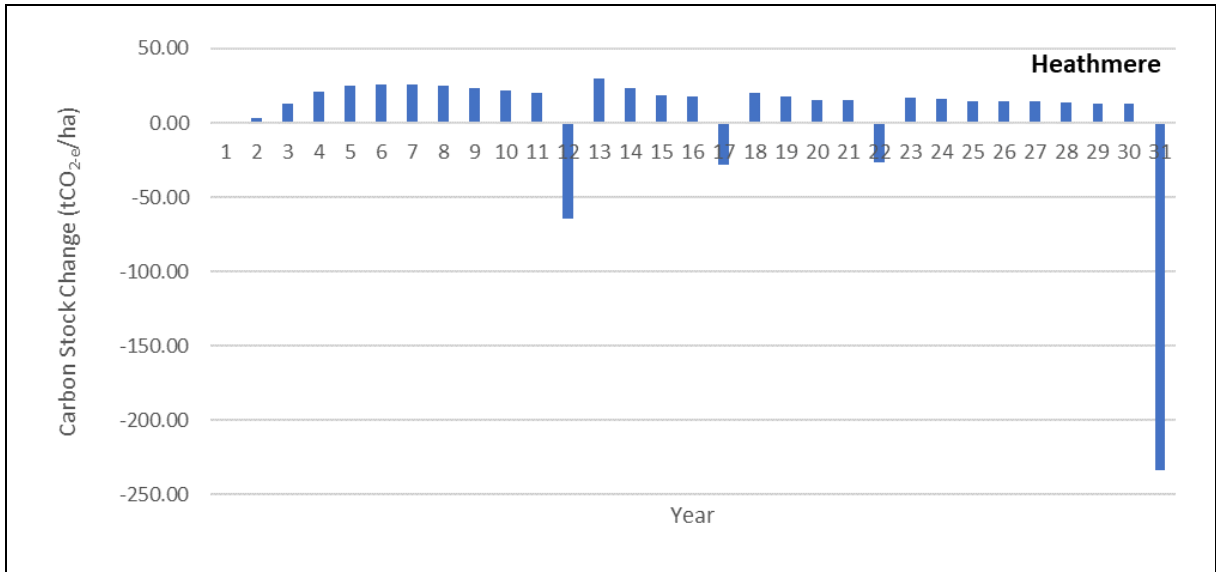


Figure 16: Example of reported carbon stock changes for a long rotation Radiata Pine plantation with three thinning events over 31 years for Climate Active GHG accounting

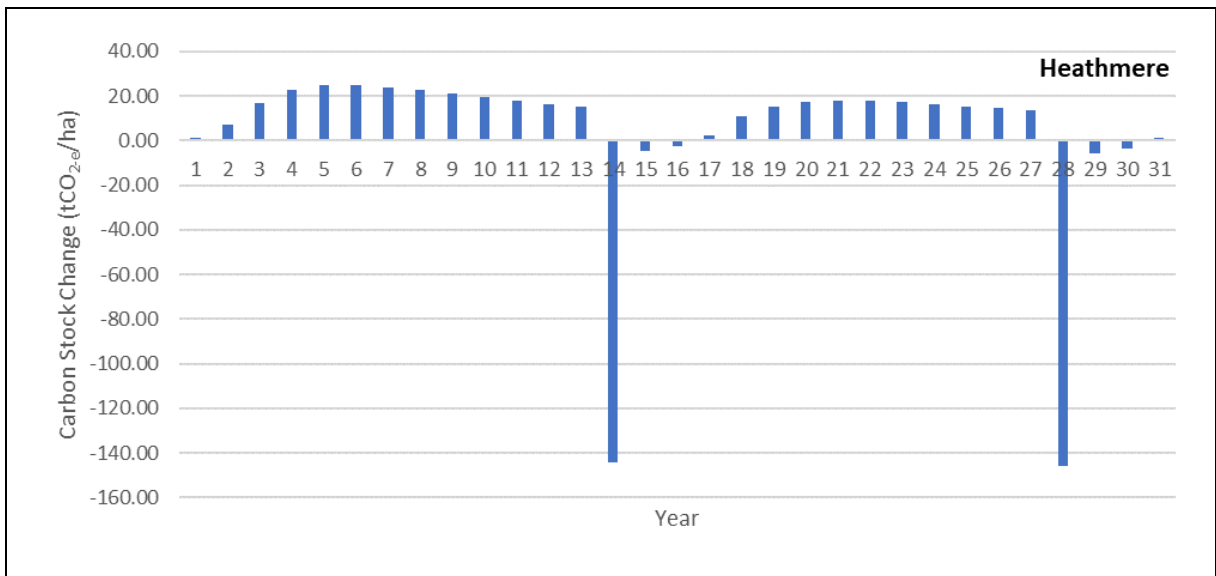


Figure 17: Example of reported carbon stock changes for a short rotation Tasmanian Blue Gum plantation over 31 years for Climate Active GHG accounting

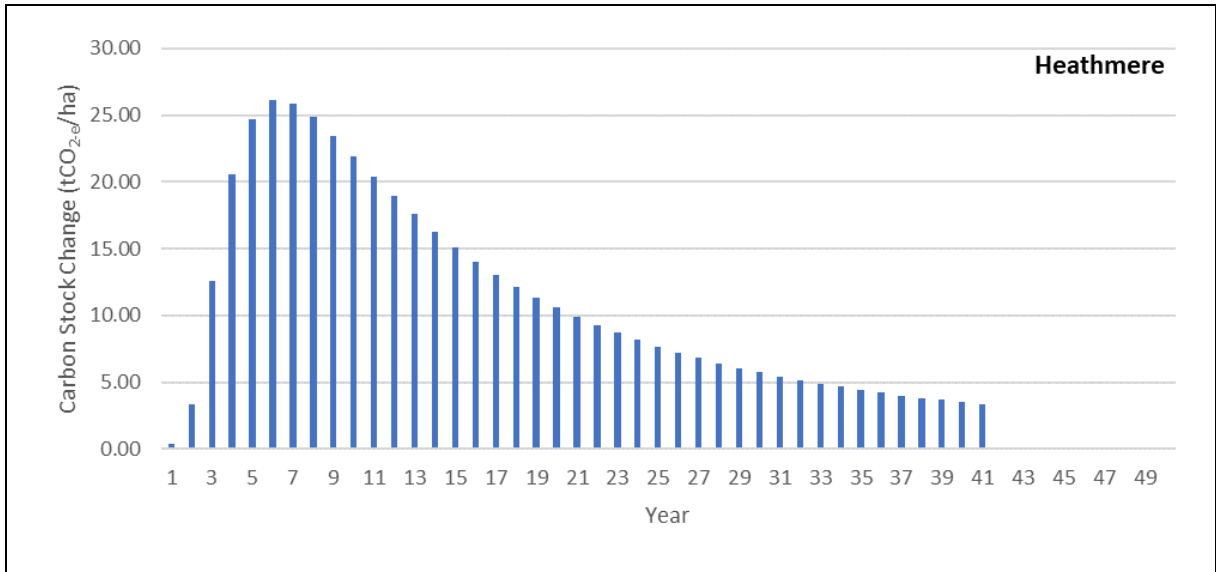


Figure 18: Example of reported carbon stock changes for a Radiata Pine permanent planting over 50 years for Climate Active GHG accounting

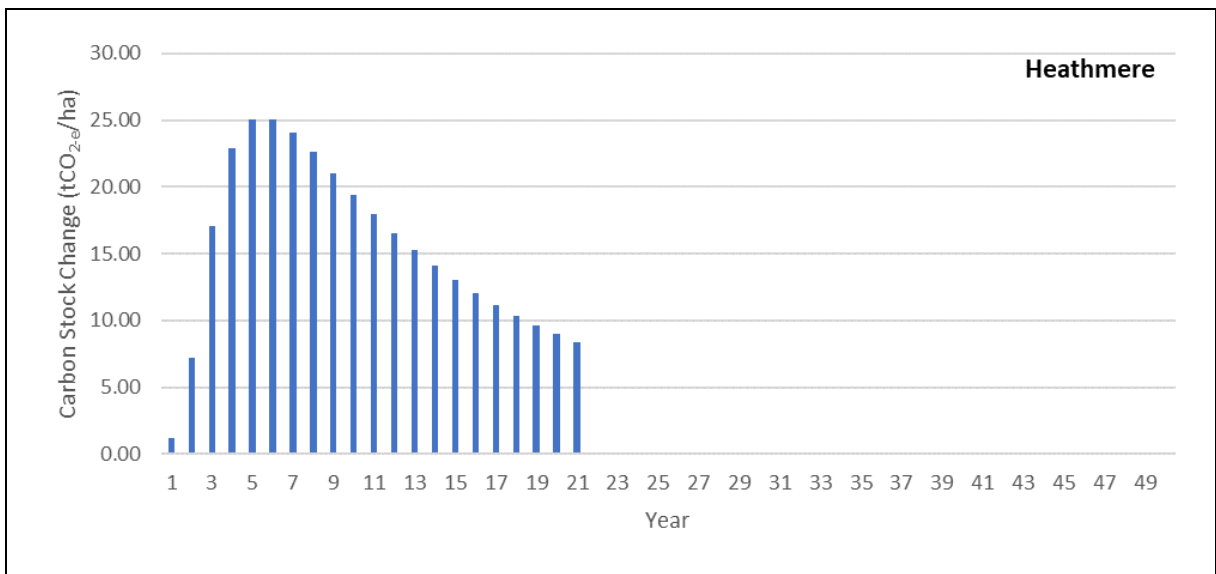


Figure 19: Example of reported carbon stock changes for a Tasmanian Blue Gum permanent planting over 50 years for Climate Active GHG accounting

Comparing the scenarios above under the Climate Active method, there is an obvious disadvantage to this method under a harvest regime scenario, as any insets generated along the rotation will eventually be reversed as reportable emissions, partially if thinning occurs and fully in a single period at final harvest, likely requiring the entity to trade for offsets to cover this. This might be compensated for financially given the harvested wood products would provide revenue, but the future price of carbon credits is unknown. If global demand for credits continues to increase as we approach 2050, they may be expensive to purchase as offsets.

Based on the FullCAM model, and the current age restrictions under the Climate Active method (refer Table 2), the permanent planting option continues to provide insets up to 41 years for Radiata Pine (refer Figure 18), some 456 tCO₂-e/ha in total, and up to 21 years for Tasmanian Blue Gum example (Figure 19), some 323 tCO₂-e/ha in total. These profiles and figures assume planting of a commercial plantation species at standard stocking for use as a permanent planting, and this might not be appropriate for the conditions on your site or the long-term health of the forest. Permanent plantings using locally native species would likely generate a lower overall inseting total than those reported for these commercial species. Permanent plantings under a Climate Active method would certainly provide a lower risk option for inseting than plantings for harvest.

Carbon Market

As described in the previous section, the ability to generate and trade carbon credits from one's own farming enterprise could provide financial motivation to enter the ERF, but it does rely on an active buying carbon market to ensure prices remain at a point that provide positive returns for the life of the project. Given ACCUs are generated over a 25-year period, not as a lump sum upon registration, entry into an ERF project is a long-term commitment from a financial return perspective, much like setting up a portfolio, or having a superannuation fund within the share market. As with most advice provided regarding investment in the share market, expectations of a quick return are possible but less likely, and generally assume a longer-term return on investment. However, the carbon market is still in transitioning phases so does not yet have the proven history of long-term performance that the share market does.

The regulation of emitters, such as under the ERF safeguard mechanism, is one approach to ensure an active buying market to bolster confidence in the market, and perhaps the expansion of such regulation might provide even more comfort around future carbon market performance. Global social pressure to purchase climate-linked products will likely drive the

need for carbon reduction or carbon neutral certification, in turn driving the need to purchase offsets and further supporting an active buying market. But such voluntary measures may not be sufficient to provide the certainty for a grower to enter the ERF, certainly not without some other mechanisms, whether government or market driven, to maintain social awareness and interest in climate change longer term.

Administrative Costs

Forestry enterprises are typically front-end loaded with costs (i.e., site preparation and establishment) and back-end loaded with returns (i.e., harvest for wood products), with a long wait in between, anywhere from 11 to 30 years depending on the chosen species and market, making the decision to establish new plantations one that requires considerable analysis and forethought, and is often a barrier to entry. The ability to receive revenue early in the rotation by way of carbon credit sales, or to reduce the need to purchase emissions offsets under certification, are obvious incentives to counter this. However, the administrative and third-party costs required to enter and run such arrangements may reduce the magnitude of such an incentive.

Under the Plantation Forestry and Farm Forestry methods you have some control over the timing of reporting periods, which drives the need for project administration activities such as running FullCAM, report preparation, auditing and monitoring. Both these ERF methods require an audit with the first offsets report. By extending out the reporting period, say to a maximum of 5 years, you can manage the cost profile once the project is running. Certainly, for the Farm Forestry method which also requires carbon inventory prior to each offset report a 5 year reporting period would likely be optimum from a cost management perspective, especially when credits are unlikely to be generated in the first few years of the project as the trees are still very small. However, the reporting period timing also drives ACCU issuance, so a 5-year reporting period will limit ability to generate revenue to directly counter the up-front establishment costs. Under both these methods you must continue to provide reports for the full 25-year crediting period, even if you are no longer being issued ACCUs.

Climate Active certification requires annual reporting so has no mechanism to fine tune project running costs and includes an annual licence fee for the wider carbon neutral certification. To utilise insets under the Climate Active method you also need to certify your business or product. A review of the cost associated with setting up this GHG account is outside the scope of this report but could be considerable for larger or more complex businesses so may attract a significant cost in addition to the annual licence fee for certification. For a small farm the associated cost to achieve certification might be

reasonable, as the actual GHG accounting might be quite simple to undertake. For example, under a beef enterprise you would need to account for enteric methane, manure emissions and electricity, fuel and fertiliser usage to calculate emissions, and the licence fee is scaled to the amount of emissions an entity generates and is significantly less for small operations.

Cost Profiles – 5ha and 100ha project areas

To provide some comparison of the likely cost profiles associated with each of the methods over a 30-year period, the external provider costs estimated in Table 4, Table 7 and Table 11 of the Detail Methodologies Comparison section for each relevant step of registration, measuring, modelling, reporting, auditing, and monitoring were applied to example projects under 5 hectare and 100 hectare scenarios .

The cost profiles provided are indicative and for comparative purposes only. They were generated under ‘worst-case’ scenarios assuming that you need to outsource all the third party support listed as ‘Moderate’, ‘High’ and ‘Very High’ within Table 3, Table 6 and Table 10. They should not be taken as an indication of the actual cost you will incur if you undertake any one of these methods. The actual cost you are likely to incur will vary greatly depending on how much of the administration you can manage internally, the reporting period you choose where this is flexible and the price competitive nature of the providers for those areas that need outsourcing. It is highly recommended you undertake your own due diligence in the likely costs you will incur over the project life before committing.

For comparison purposes it was assumed that all project scenarios were new plantings at the time of registration or certification and managed under a long rotation pine harvest regime. Other assumptions relevant to each method were:

- Plantation Forestry assumptions:
 - annual reporting period was chosen to maximise credit issuance. This has been observed to be current standard practice in the forestry industry.
 - full credits will have been issued by age 21 meaning that reporting requirements will drop a little therein (i.e., FullCAM modelling no longer needed)
- Farm Forestry assumptions:
 - 5-yearly reporting period to minimise total carbon inventory costs

- full credits will have been issued by age 19 meaning that reporting requirements will drop considerably therein (i.e., carbon inventory and FullCAM modelling no longer needed)
- destructive sampling and build of allometric functions were less complex for younger trees, so cost was lower at age 5 than later ages.
- the building of new allometric equations was required twice in the rotation, once in the first reporting period at age 5 and again at age 20 after the effects of the first two thinning events came fully into effect, likely changing the shape of the tree crown. The updating of existing equations was assumed to occur twice in the rotation at ages 10 and 15. The cost at each point in times was assumed to be identical for both the 5ha and 100ha scenarios, as the project was covered under a single allometric domain in each scenario.
- Climate Active assumptions:
 - annual reporting (mandatory under certification)
 - The total costs for the enterprise achieving certification are excluded from these tables and are unknown. As with all the costs provided to date, the cost will likely range widely with the complexity and scale of the business or product being certified.
 - The annual licence fees to retain certification are excluded from these tables. For reference, the licence cost for a small organisation would be \$840/annum and \$13,569/annum for a larger enterprise (annual emissions between 10,000 and 80,000t CO_{2-e}), which might be assumed to represent the size of enterprises undertaking plantings of 5ha and 100ha respectively. These would add \$25,200 and \$407,070 to total costs over the full 30 years to each scenario respectively. Per hectare these would equate to \$5,040/ha and \$2,714/ha for the 5ha and 100ha scenarios respectively, or \$2,085/ha and \$1,123/ha in net present value terms under a 7% rate of return.

Table 16 below provides a summary of the cost profile modelled for each method under a 5ha planting scenario.

Table 16: High level cost profile comparison under the three methods for a 5ha project			
Timing	Plantation Forestry	Farm Forestry	Climate Active (Draft)
Registration	\$15,800	\$18,000	\$8,000
Year 1	\$19,500	\$0	\$19,500
Year 2	\$2,000	\$0	\$2,000
Year 3	\$2,000	\$0	\$2,000
Year 4	\$2,000	\$0	\$2,000
Year 5	\$2,000	\$43,000	\$2,000
Year 6	\$2,000	\$0	\$2,000
Year 7	\$2,000	\$0	\$2,000
Year 8	\$2,000	\$0	\$2,000
Year 9	\$2,000	\$0	\$2,000
Year 10	\$17,000	\$18,000	\$2,000
Year 11	\$2,000	\$0	\$2,000
Year 12	\$2,000	\$15,000	\$2,000
Year 13	\$2,000	\$0	\$2,000
Year 14	\$2,000	\$0	\$2,000
Year 15	\$2,000	\$28,000	\$2,000
Year 16	\$2,000	\$0	\$2,000
Year 17	\$2,000	\$0	\$2,000
Year 18	\$17,000	\$15,000	\$2,000
Year 19	\$2,000	\$0	\$2,000
Year 20	\$2,000	\$42,000	\$2,000
Year 21	\$2,000	\$0	\$2,000
Year 22	\$500	\$0	\$2,000
Year 23	\$500	\$0	\$2,000
Year 24	\$500	\$0	\$2,000
Year 25	\$500	\$2,000	\$2,000
Year 26	\$0	\$0	\$2,000

Year 27	\$0	\$0	\$2,000
Year 28	\$0	\$0	\$2,000
Year 29	\$0	\$0	\$2,000
Year 30	\$0	\$0	\$2,000
Total Cost over 30 years	\$107,300	\$181,000	\$85,500
Total Cost/ha	\$21,460	\$36,200	\$17,100
Discounted Total Cost/ha³¹	\$13,260	\$18,055	\$9,835

Table 17 below provides a summary of the cost profile modelled for each method under a 100ha planting scenario.

Table 17: High level cost profile comparison under the three methods for a 100ha project			
Timing	Plantation Forestry	Farm Forestry	Climate Active (Draft)
Registration	\$50,500	\$48,500	\$8,000
Year 1	\$43,500	\$0	\$24,500
Year 2	\$11,000	\$0	\$7,000
Year 3	\$11,000	\$0	\$7,000
Year 4	\$11,000	\$0	\$7,000
Year 5	\$11,000	\$69,000	\$7,000
Year 6	\$11,000	\$0	\$7,000
Year 7	\$11,000	\$0	\$7,000
Year 8	\$11,000	\$0	\$7,000
Year 9	\$11,000	\$0	\$7,000
Year 10	\$41,000	\$29,000	\$7,000
Year 11	\$11,000	\$0	\$7,000
Year 12	\$11,000	\$15,000	\$7,000
Year 13	\$11,000	\$0	\$7,000
Year 14	\$11,000	\$0	\$7,000
Year 15	\$11,000	\$39,000	\$7,000

³¹ Based on present value analysis of all costs over the 30 year period using a 7% rate of return which is about standard for forestry valuation (Ferguson, 2018)

Year 16	\$11,000	\$0	\$7,000
Year 17	\$11,000	\$0	\$7,000
Year 18	\$41,000	\$15,000	\$7,000
Year 19	\$11,000	\$0	\$7,000
Year 20	\$11,000	\$47,000	\$7,000
Year 21	\$11,000	\$0	\$7,000
Year 22	\$6,000	\$0	\$7,000
Year 23	\$6,000	\$0	\$7,000
Year 24	\$6,000	\$0	\$7,000
Year 25	\$6,000	\$7,000	\$7,000
Year 26	\$0	\$0	\$7,000
Year 27	\$0	\$0	\$7,000
Year 28	\$0	\$0	\$7,000
Year 29	\$0	\$0	\$7,000
Year 30	\$0	\$0	\$7,000
Total Cost over 30 years	\$398,000	\$269,500	\$235,500
Total Cost/ha	\$3,980	\$2,695	\$2,355
Discounted Total Cost/ha³²	\$2,291	\$1,511	\$1,112

Based on the indicative cost profiles provided above, the cost to enter and administer a planting as an inset within the Climate Active Carbon Neutral Program appears to be significantly cheaper than the ERF methods. However, this must be balanced against the unknown costs of achieving certification for the wider business or product.

³² Based on present value analysis of all costs over the 30 year period using a 7% rate of return which is about standard for forestry valuation (Ferguson, 2018)

The assumption that the Farm Forestry method would be reported at 5-year intervals might seem an unfair comparison to reporting the Plantation Forestry method at annual intervals, but analysis of this reporting scenario showed an addition of about 50% to the total cost (refer Table 18) given the need for carbon inventory for each reporting period and would not be recommended.

Table 18: High level cost estimation for Farm Forestry method under annual and 5-year reporting scenarios				
	5ha Scenario		100ha Scenario	
	5-yearly reporting	Annual reporting	5-yearly reporting	Annual reporting
Total Cost over 30 years	\$181,000	\$259,000	\$269,500	\$437,500
Total Cost/ha	\$36,200	\$51,800	\$2,695	\$4,375
Discounted Total Cost/ha³³	\$18,055	\$27,101	\$1,511	\$2,441

As shown in the table above, the ability to achieve scale with the carbon project can have a dramatic impact on the cost per hectare for such administrative requirements. Under a larger area more revenue from credits could be generated to offset these costs, many of which are fixed. This is particularly evident in the Farm Forestry method such that if you cannot undertake carbon inventory yourself for a small-scale project, the cost to bring in external contractors to measure your trees might cancel out any revenue from credits. Farm Forestry harvest projects are limited to 100ha in size in areas of 400mm or more rainfall, which may impact the cost of entry for commercial plantations from an economies of scale perspective.

Cost Profile – 1,000ha project areas

By way of example of the economies of scale that can be achieved, the high level cost profile under a 1,000ha scenario was developed, an option which is not available for the Farm Forestry method due to limitations on maximum project area as defined within the Method. There are currently forest management companies within Australia who are aggregating multiple properties to achieve, 500ha, 1,000ha and even 2,000ha carbon projects, achieving very high economies of scale with respect to administrative, reporting and monitoring costs.

³³ Based on net present value per hectare of all costs over the 30 year period using 7% rate of return

Table 19 below provides a summary of the cost profile modelled for each method under a 1,000ha planting scenario.

Table 19: High level cost profile comparison under the three methods for a 1,000ha project			
Timing	Plantation Forestry	Farm Forestry	Climate Active (Draft)
Registration	\$91,500	NA	\$32,000
Year 1	\$63,000	NA	\$55,000
Year 2	\$23,000	NA	\$20,000
Year 3	\$23,000	NA	\$20,000
Year 4	\$23,000	NA	\$20,000
Year 5	\$33,000	NA	\$20,000
Year 6	\$23,000	NA	\$20,000
Year 7	\$23,000	NA	\$20,000
Year 8	\$23,000	NA	\$20,000
Year 9	\$23,000	NA	\$20,000
Year 10	\$63,000	NA	\$20,000
Year 11	\$23,000	NA	\$20,000
Year 12	\$23,000	NA	\$20,000
Year 13	\$23,000	NA	\$20,000
Year 14	\$23,000	NA	\$20,000
Year 15	\$33,000	NA	\$20,000
Year 16	\$23,000	NA	\$20,000
Year 17	\$23,000	NA	\$20,000
Year 18	\$53,000	NA	\$20,000
Year 19	\$23,000	NA	\$20,000
Year 20	\$33,000	NA	\$20,000
Year 21	\$23,000	NA	\$20,000
Year 22	\$15,000	NA	\$20,000
Year 23	\$15,000	NA	\$20,000
Year 24	\$15,000	NA	\$20,000
Year 25	\$15,000	NA	\$20,000
Year 26	\$0	NA	\$20,000

Year 27	\$0	NA	\$20,000
Year 28	\$0	NA	\$20,000
Year 29	\$0	NA	\$20,000
Year 30	\$0	NA	\$20,000
Total Cost over 30 years	\$774,500	NA	\$667,000
Total Cost/ha	\$775	NA	\$667
Discounted Total Cost/ha³⁴	\$433	NA	\$313

The additional assumptions applied to model the 1,000ha scenario over the 100ha scenario were:

- Plantation Forestry assumptions:
 - More complexity in achieving interest holder consent.
 - Mapping support would be increased in terms of CEA mapping, and support requirements to prove land was cleared of forest for previous 7 years.
 - Permanence plan was more complex to develop and maintain.
 - Annual reporting & FullCAM modelling was more complex.
 - Forest Management Plan was more complex to develop and maintain.
 - Ongoing monitoring of forest cover would require remote imagery.
- Farm Forestry assumptions:
 - Could not be modelled as 100ha is the area limit applied to Farm Forestry harvest projects in area of 400mm or more long-term average rainfall.
- Climate Active assumptions:
 - Mapping support would be increased in terms of CEA mapping, and support requirements to prove land was cleared of forest for previous 5 years.

³⁴ Based on present value analysis of all costs over the 30 year period using a 7% rate of return which is about standard for forestry valuation (Ferguson, 2018)

- Annual reporting & FullCAM modelling was more complex.
- Forest Management Plan was more complex to develop and maintain.
- Ongoing monitoring of forest cover would require remote imagery.
- The annual licence fees to retain certification are excluded from these tables. For reference, the licence cost for a large (annual emissions between 10,000 and 80,000t CO_{2-e}), and very large (> 80,000t CO_{2-e}), would be \$13,569/annum and \$19,384 respectively, the latter being the highest Climate Active certification licensing tier. These might represent the emissions from an enterprise interested in establishing large scale plantations for insets.

Pooling Resources

As clearly shown in the previous section, the ability to achieve scale for a single project is one pathway to reducing per hectare costs for that project. Rather than attempting a large project yourself, the alternative is to enter your project under a pooled project run by a cooperative or third party carbon service provider. This allows you to share the internal resources or third-party provider costs required to administer and undertake such activities to remove cost as a barrier to entry. Under the ERF methods an over-arching legal entity can act as the proponent for multiple entities. As such there are currently many carbon providers in the ERF project space who manage the whole process for landowners or organisations throughout the life of the project.

Although fee for service arrangements are available from some providers, a standard method of remuneration for such services is for the carbon provider to become the lead proponent of the project and take an agreed share of the credits as they are issued over the 25-year crediting period. This structure has the benefit of ensuring that any fees payable to the carbon provider over the crediting period are balanced directly against incoming revenue from credits, not forcing the landowner to pay significant up-front costs or be directly out of pocket at any stage. The carbon provider with the pooled resources should also be able to pass on overall efficiency gains to all proponents of the project given they can spread their costs amongst multiple carbon projects. Some such providers are not-for-profit and so their fees or percentage in both instances are generally lower.

Under Climate Active the whole supply chain for a product can be certified. Such an arrangement could provide an umbrella for all the constituent growers to contribute insets to the aggregated GHG account, thereby reducing overall certification costs of their product by

reducing the need to purchase offsets and possibly by sharing audit, reporting and monitoring costs. How a planting of trees within a cropping enterprise would be accounted for may be problematic given the cyclical growing of crops for a single piece of land (i.e., the multiple products grown may not have same supply chain) but for those producers with longer term land-use products such as dairy, cattle, wool production, vineyards, or orchards, this alternative might have some merit.

Grant and Loan Assistance

Government grants and loans are one mechanism to help overcome the barriers associated with the up-front cost in establishing forestry and forest-based carbon projects.

The Federal government recently announced the Support Plantation Establishment program and committed through the 2022-23 Budget \$73.8 million in grant funding over four years from 2023-24 to assist with establishment of new plantations to secure future domestic wood supply (DAFF, 2023). Details are:

- the grant will fund:
 - preparation of the plantation forest site
 - purchase and planting of seedlings
 - payment of labour and contract planting fees
- the grants are available to private, First Nations, and farm forestry businesses, as well as state and territory government forestry enterprises through the Support Plantation Establishment program.
- the grant program requires successful applicants to establish a new long-rotation plantation forest of at least 20 hectares.
- the minimum grant available is \$40,000, and applicants are required to provide a co-contribution equal to the grant amount.
- the Australian Government will provide \$2,000 (GST exclusive) per 1 hectare of new plantation forest established. Projects must be completed by 30 June 2027.
- the initial grant round opened on 21 June 2023 and closes on 24 January 2024.

The Regional Investment Corporation (RIC) is offering Plantation Development Concessional Loans ('Plantation Loan') to encourage new plantation developments and the replanting of bushfire-damaged plantations as a result of the 2019-20 Black Summer Bushfires (Australian Government, 2023). The Plantation Loan lends up to \$2.5 million. The loan term is 20 years with interest-only repayments for years 1-13 and principal and interest payable for years 14-20. A variable interest rate applies to the loans. The loan can be used to support a project under the ERF. The planting proposal must be greater than 30ha to be eligible.

Risk and Risk Management

Permanence Obligations

Under the ERF Methods, until the permanence period expires, either 25 or 100 years, if there is any significant (>5%) reversal of the carbon sequestration within the project, then there is the possibility that ACCUs may need to be relinquished by the proponent to match the reversal amount. The wording around this does suggest that if the proponent has undertaken sufficient steps to mitigate the risk of the disturbance, then the relinquishment might not be required, so the importance of a good solid permanence plan, and appropriate implementation for the full permanence period, cannot be understated. Within the forest environment the obvious candidate for disturbance is bushfire, the risk of which can be managed via a good fire management plan and emergency response arrangements, but insect attack and wind damage are also likely candidates, and these too can be managed to an extent with the right forest management experience and resources.

Over a 25-year period under an ERF project the management of such a risk is conceivable and achievable from a personal and business perspective as it aligns with standard rotation length for most pine plantations. But over a 100-year period this is a significant commitment, and most, if not all, of the people involved are unlikely to be alive, certainly not working, as the project nears that end point. There would need to be sound legal and risk management processes in place to ensure the understanding of the requirements are handed down to the next owner of the business, and it would add an extra level of complexity to land sales or purchases that involve a carbon sequestration right whereby a new landowner might not understand their obligations in the process. The CER does hold a public facing register of the location and land parcels involved with all registered carbon sequestration projects, and there is a provision in the act that the carbon project can be recorded against the title by the

relevant land title register. ACCUs can be voluntarily relinquished to cancel a project or terminate a carbon maintenance obligation.

Under the Climate Active method there is no permanence period, and any reversals, whether caused by clearing, natural disturbance or land sale would all simply be accounted for as an emissions line item in the carbon accounting and a requirement of the purchase of equivalent credits to offset any emissions to achieve net zero again.

As mentioned previously, the presence of a permanence obligation on a farm might also pose a risk to the value of the land during any sale process as the obligation to maintain forest cover during the permanence period is retained with the land right. The value to purchase sufficient ACCUs to cover a significant carbon sequestration reversal event might need to be accounted for in the price negotiation process to ensure a sale.

The only benefit of choosing a 100-year permanence obligation is that it provides more credit opportunities (up to 20-25% more in total) but if this advantage outweighs the risk of an increase in the likelihood of a disturbance event occurring, the inflexibility around future land use over the period and the possibility that such an encumbrance might lower the value of your land would need to be seriously considered prior to entry into such an arrangement.

Carbon Sequestration Insurance

Given the permanence obligations described above, the need for insurance cover is an obvious risk mitigation strategy from the proponent's perspective. Within the forestry industry, insurance cover for plantations and forest is standard practice, but from a review of publicly available policies, they only seem to cover the loss of the value of the timber (and/or cost of re-establishment), typically from loss from fire or windstorm, but they do not appear to directly cover loss of carbon sequestration. There is also the issue of the increasing lack of affordability of plantation insurance, particularly following the 2019/20 fires (ABC Rural, 2022).

An internet review of insurance cover available in Australia specific to the reversal of carbon sequestration, although not exhaustive, has found such cover to be limited. One provider which currently covers both agricultural crop and plantation loss alike, also provided carbon insurance (i.e., loss of ACCUs) by way of parametric insurance. Instead of indemnifying you for your precise loss as is the case under standard insurance covers, parametric insurance policies respond on the triggering of an external index at which point claims are settled according to a pre-agreed payout scale (Gallagher, 2023). Given claims are based on the triggering of an index, parametric policies also have basis risk that (Gallagher, 2023):

- The trigger is met but the policy response does not reflect the financial impact of the loss you have suffered; or
- The trigger is not met so there is no policy response, notwithstanding the fact that you have suffered a loss.

Globally, in September 2022, a carbon credit insurance was introduced by a provider to cover the actual purchase and sale of resultant credits within the market, providing protection against the invalidity of any credits subject to fraudulent or negligent claims by the producer of such credits (Carbon Credits, 2022).

From the perspective of the scheme and certification operators, there is in the methods reviewed here a form of insurance built into the various methods. The credits, or sequestration, held back by the operator when the risk of reversal buffer and the permanence discounts are applied to either issuing ACCUs or insets, act as a pooled source of cover for loss against individual projects. This explains why not all reversals of carbon sequestration within an individual project within the ERF might need to relinquish ACCUs to account for the loss. This more lenient outcome is likely to be only possible where an adequate permanence plan is in place and all the listed fire response and related risk mitigation requirements have effectively been put into practice, essentially that you have fulfilled your duty of care to reduce the chance of a significant risk of a reversal event occurring.

Carbon Market vs Certification

The generation of ACCUs from a tree planting project offers more flexibility than generation of insets for certification. ACCUs can be held and used to offset internal emissions within the Climate Active GHG accounting process or can be traded on the spot market for financial return. The alternative reviewed here, to include tree planting abatements within the Climate Active GHG accounting, is limited in that an abatement can only be used as insets against your own business and only in the reporting period they were generated.

Conclusions

The Farm Forestry harvest project has very complex field measurement requirements for estimating carbon stock change within each reporting period, and in the absence of any in-house forest management or inventory skills, this is likely to lead to increasing overall administration costs if regular credit issuing is desired. Despite this complexity, this method has no actual advantage over the Plantation Forestry method in terms of the total amount of credits that can be issued given the same long term average abatement cap is applied, as generated from the same FullCAM modelling process, and in fact might actually generate less. The Farm Forestry restriction of 100ha on harvest projects where rainfall is greater than 400mm rainfall further limits the total credits possible on a property which in turn could limit any scale of efficiencies that might have been achieved from a larger project in terms of cost management. The large plantation managers within the Green Triangle are investigating carbon projects anywhere from 500ha to 2,000ha in size, where more significant economies of scale can be attained to manage costs. Although the Plantation Forestry method has the same crediting cap as the Farm Forestry harvest project, these other limitations do not exist and so this would be the recommended option should you wish to establish a plantation for harvest and receive ACCUs.

The Farm Forestry permanent planting project has no such FullCAM-based crediting cap, nor area restrictions, which provides much more flexibility to maximise returns for a given site and is likely to produce higher credit issuance over the 25-year crediting period than the other two plantation harvest ERF options reviewed, assuming the same species are chosen for planting. The benefit of having a tree crop that can be harvested for revenue is of course absent, but the other on-farm benefits such as shelter and erosion mitigation can still contribute to the overall productivity of the farm enterprise. Given there is no need to run FullCAM for this method, the cost profile for the permanent planting project is likely to be slightly lower than that for a Farm Forestry harvest project. Provided you can overcome the technical expertise requirements either internally or via third party support for carbon stock measurement, this method could provide more ACCUs than the Farm Forestry harvest project and Plantation Forestry methods.

The overarching caveat on the above paragraphs being that all ERF methods have the same risk of reversal profile, so appropriate fire response and risk management strategies should be put in place, and where financially viable, appropriate carbon sequestration insurance should be sought. Similar effort should be put into mitigation of damage from insects, windstorms and other natural disturbances. These ERF methods also have the

same potential barriers to entry in the form of the possible withholding of consent by mortgagers and regular audit costs. Their permanence obligations also may pose issues for certain eligible interest holders when seeking consent to participate in the ERF.

All ERF methods do however have the potential for joint venture or management by third party carbon providers in the role of the lead proponent to assist with reducing the total cost of administrating the project, and if cost recovery is structured correctly, could for the most part be financed directly from credit revenue.

Putting aside the actual cost of setting up the initial enterprise or product certification, and associated licence fees, entering a project into the Climate Active carbon neutral certification scheme appears to have both lower cost and lower risk profiles. The upside being that your enterprise isn't forced to purchase as many offsets off the spot market while carbon stocks are being accumulated, and carbon neutral certification might attract better market penetration than without. In fact, the possibility that carbon neutral certification becomes a requirement for market entry or a part of a businesses' standard annual accounting as the Australian government's carbon emission reduction and net zero target dates of 2035 and 2050 approach is not inconceivable given the growing global support these mechanisms are receiving. The downside over inclusion of sequestration projects within the certification route being that any sequestration achieved can only be used in the moment, as no tradeable carbon credits are generated. Of more significance is the fact that under a Climate Active harvest regime scenario you will eventually have to report large emissions during thinning or final harvest events, which will leave you exposed to the cost of offsets from available carbon markets at those points in time. You do have some control over when such harvest events can occur, which might be used to mitigate the expense of purchasing offsets if you get the timing right but should not be relied upon given carbon credit pricing is variable and essentially unpredictable over time.

Assuming the potential additional cost of entering the project into the ERF over a certification project to receive credits doesn't outweigh the value of the ACCU credits received, and you can manage the greater risk profile, you could use these ACCUs to offset your internal business emissions and still achieve carbon neutral certification under Climate Active, retain a lot more flexibility as to when such credits are relinquished for such inseting, and avoid large emissions reports at harvest events. The added benefit under this combined scenario is that you could hold the ACCUs when spot prices are low or sell them on the open market when ACCU prices are high, providing an opportunity to improve overall financial profitability and still achieve carbon certification for marketing or carbon accounting purposes.

Your own conclusion as to which method is the best will depend on your specific financial situation and your related goals for plantation establishment and carbon sequestration but it is clear that:

- if you are planning on establishing a plantation for harvest of saleable wood products, the Plantation Forestry method is the recommended option, as it avoids the need for complex and costly field measurements, has no penalty associated with reversals resulting from thinning and harvest events and, provides tradeable ACCUs to retain control over current and future financial decisions. The risks associated with the Plantation Forestry permanence period can be mitigated with a solid permanence plan (and its implementation) and if available and financially viable, appropriate insurance to cover reversal from disturbance.
- if you are planning on establishing a permanent planting for on-farm benefits such as shelter and erosion control, the Climate Active method may yield more insets, has a lower risk profile and has a lower cost of entry than the Farm Forestry permanent planting method, but will not yield any tradeable ACCUs to gain financial planning flexibility. Although not reviewed in this report, the ERF's 'Reforestation by Environmental or Mallee Plantings' Method should also be considered as option to generate ACCUs from a permanent planting.
- entry under a 100-year permanence obligation for any of the ERF methods should not be undertaken without lengthy consideration of possible ramifications for yourself, the business and the future owners of the land.
- the ability to scale up the project area and/or pool resources and costs among multiple proponents is a key path to reducing any financial stress associated with the administrative costs required for entry and running a project under all methods reviewed.
- entering the ERF and receiving credits provides much more flexibility to manage return on investment against the costs associated with entering such projects and future emissions, and still provides good options to achieve carbon neutral status should such certification become a market standard, or should such requirements become more widely legislated or tax incentivised as Australia attempts to reach net zero by 2050. However, given the long-term commitment and returns for such an enterprise, an understanding of the carbon market space is key to make effective use of ACCUs generated.

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Appendices

Appendix 1 - Requirements for a Forest Management Plan under the Plantation Forestry Method

Forest Management Plan Instructions

The forest management plan (FMP) must be provided with each offset report containing:

- management records detailing all the management actions undertaken within the CEA for the current rotation, and planned management actions for the remainder of the current rotation and subsequent rotations.
- an explanation of how each management action has been or will be evidenced or documented (e.g., company records, invoices, etc.). These are required to be referenced but not attached to the FMP.
- an explanation of any changes to the management regime set out in the previous reporting period.
- where relevant, a description of any natural disturbances or growth interruptions that have occurred.
- for each management action and disturbance event listed in the management record or in a management regime:
 - the time of the action or event in relation to the starting date for the rotation; and
 - the appropriate FullCAM event type and FullCAM standard event as listed in the FullCAM guidelines; and
 - the parameter values entered, or expected to be entered, into FullCAM, where these are not the defaults.
- an explanation of how records of monitoring and evidence of management actions, natural disturbances and forest development are being made and kept.

- optionally, the forest management plan can include the permanence plan (refer Appendix 2).

The following example forest management plan is prepared under a scenario where a 100ha project was registered on the 15th of March 2024, and the plan is being submitted with the 19th annual offset report in 2043. A windstorm damaged 4ha in 2037 following the 1st thinning event, resulting in the need for a new carbon estimation area (CEA) to be split off the initial CEA to allow salvage harvest and replanting to occur.

Example Forest Management Plan

Project Name:	Green Farm Planting Project
Project ID:	ERFNNNNNNN (as supplied by CER on registration)
Project Registration Date:	15 th March 2024
Project Method:	Plantation Forestry 2022 - Schedule 1
Region:	Green Triangle
CEA IDs	CEA1 - NW Pivot Block
	CEA2 - NW Pivot Block - Windthrow 2037
CEA Start Date	Original planting completed 17 th August 2024
Date Plan Prepared:	10 th March 2043 (19 th reporting period)

Default Management Regime

(Original plan as input into FullCAM at registration to calculate forward abatement)

Management activity	Date	FullCAM Event [+ Adjustments]	Detail
Planting	1/07/2024	Plant trees: seedlings, normal stocking	<i>Pinus radiata</i> , 1600sph target stocking
1st Thinning	1/07/2036	Thin 1 (GmTri; SA/Vic; 1984-present) [Affected portion = 60.6%]	Thin to 650sph (1/5 outrow + bay selection)
2nd Thinning	1/07/2041	Thin 2 (GmTri; SA/Vic; 1984-present) [Affected portion = 33.85%]	Thin to retain 430sph (bay selection)
3rd Thinning	1/07/2044	Thin 3 (GmTri; SA/Vic; 1945-present) [Affected portion = 25.58%]	Thin to retain 320sph (bay selection)
Harvest	1/07/2055	Thin clearing (GmTri; SA/Vic; 1970-present)	100% clearfell harvest, sawlog produced
Chopper roll	1/08/2055	Chopper roller -> 80% (avg)	Slash and debris chopper rolled to prepare site for next planting
Repeat above regime	1/07/2056	As above	Multiple rotations to cover 100 years

Management Records

(Summary of activities or natural disturbance that have occurred since registration up to the current reporting period)

CEA	Activity	Status	Completion date	Evidence	Detail
1	Planting	Complete	17/08/2024	Invoice 09165 from GT Planters Pty Ltd	<i>Pinus radiata</i> , 1558sph achieved
1	1st Thinning	Complete	13/10/2037	Invoice 2367 from GT Loggers Pty Ltd	Thinned to 575sph
1	CEA1 Area adjustment	Complete	14/11/2037	Reported to CER	CEA1 reduced in area by 4ha
2	CEA2 created	Complete	14/11/2037	Reported to CER	CEA2 created, 4ha in size
2	Windthrow Disturbance	Complete	15/11/2037	Sentinel Satellite Imagery 18/11/2037 used to map area affected into CEA2	Heavy winds damaged 4ha of CEA1 which were removed from CEA1 and added to new CEA2
2	Salvage harvest	Complete	14/03/2038	Invoice 2408 from GT Loggers Pty Ltd	Windthrow trees salvage harvested, 50 t/ha pulplog and 100 t/ha firewood produced, remainder left as debris
2	Windrowed and burned	Complete	20/05/2038	Date-stamped photos of windrows; prescribed burn permit #45693	Remaining debris piled into windrows using neighbour excavator and burned with help from local fire brigade
2	Planting	Complete	17/08/2039	Invoice 12546 from GT Planters Pty Ltd	Eucalyptus globulus, 1,005sph achieved
1	2nd Thinning	Complete	1/02/2042	Invoice 2808 from GT Loggers Pty Ltd	Thinned to 407sph
1	Fertiliser	Complete	10/09/2042	Invoice 765 for Fertiliser	Later age N-fertiliser applied via tractor – treatment required following analysis of foliar analysis

Current Management Regime

(Default management regime updated with actual management records of management activities and disturbance events where they differ, for input into FullCAM)

Current Management Regime for CEA1 - NW Pivot Block

Activity	Date	FullCAM Event [+ Adjustments]	Detail
Planting	17/08/2024	Plant trees: seedlings, normal stocking	<i>Pinus radiata</i> , 1558sph achieved
1st Thinning	13/10/2037	Thin 1 (GrnTri; SA/Vic; 1984-present) [Affected portion = 63.1%]	Thinned to 575sph
Area adjustment	15/11/2037	NA	CEA 1 reduced in area by 4ha
2nd Thinning	1/02/2042	Thin 2 (GrnTri; SA/Vic; 1984-present) [Affected portion = 29.2%]	Thinned to 407sph
Fertiliser	10/09/2042	Fertilisation: Mid-rotation (Medium)	N-fertiliser applied via tractor
3rd Thinning	1/07/2044	Thin 3 (GrnTri; SA/Vic; 1945-present) [Affected portion = 21.4%]	Remove 26% to retain 320sph (bay selection)
Harvest	1/07/2055	Thin clearing (GrnTri; SA/Vic; 1970-present)	100% clearfell harvest, sawlog and pulplog to be produced
Chopper roll	1/08/2055	Chopper roller -> 80% (avg)	Slash and debris chopper rolled to prepare site for next planting (back to pine)
Repeat above regime	1/07/2056	As above	Multiple rotations to cover 100 years

Current Management Regime for CEA2 - NW Pivot Block - Windthrow 2037

Activity	Date	FullCAM Event [+ Adjustments]	Detail
Planting	17/08/2024	Plant trees: seedlings, normal stocking	<i>Pinus radiata</i> , 1558sph achieved
1st Thinning	13/10/2037	Thin 1 (GrnTri; SA/Vic; 1984-present) [Affected portion = 63.1%]	Thinned to 575sph
CEA Created	14/11/2037	NA	CEA 2 created, 4ha in size
Windstorm Disturbance	15/11/2037	NA	CEA 2 completely affected by windthrow event
Salvage harvest	14/03/2038	Thin clearing (GrnTri; SA/Vic; 1970-present)	100% salvage harvest. 50 t/ha pulplog and 100 t/ha firewood recovered
Windrow and burned	20/05/2038	Site prep: Windrow and burn	Remaining debris piled into windrows using neighbour excavator and burned with help from local fire brigade
Planting	17/08/2039	Plant trees: seedlings, normal stocking	<i>Eucalyptus globulus</i> , 1,005sph achieved
Harvest	1/07/2055	Thin clearing (GrnTri; SA/Vic; 1970-present)	100% clearfell harvest with CEA 1, pulplog to be produced
Chopper roll	1/08/2055	Chopper roller -> 80% (avg)	Slash and debris chopper rolled to prepare site for next planting (back to pine with main block)
Repeat above regime	1/07/2056	As above	Multiple rotations to cover 100 years

FullCAM modelling

The Current Management Regimes for CEA1 and CEA2 as outlined above were modelled in FullCAM for the purpose of this 19th reporting period.

Record Keeping Statement

Tax invoices and receipts of contractor hire, chemicals bought, etc. will be retained to record management activities, date-stamped photos will be retained to confirm timing of

disturbance events, and date-stamped aerial imagery will be purchased and retained to map the extent of such disturbance as soon as practical after the disturbance event has occurred.

Appendix 2 - Requirements for a Performance Plan under the Plantation Forestry and Farm Forestry Methods

Permanence Plan Instructions

The permanence plan describes the steps that have and will be undertaken to ensure carbon remains sequestered in the project area for the permanence period. The plan must include any management actions that have or will be undertaken to prevent the risk of fire starting and spreading on project areas, including the frequency and scale of these actions.

While the proponent remains responsible for protecting sequestered carbon, proponents who are not landholders should ensure this plan is developed and agreed with landholders and should provide a signed copy to the CER outlining the agreement. In some instances, a land-holder may be required to act under a local fire management plan, for example to maintain an access road. In such cases, these management actions should be included in the permanence plan for fire management for the relevant individual ERF project. A good permanence plan might also consider what actions would be taken in the case of a reversal due to fire, to ensure vegetation is restored as quickly as possible, and in accordance with method requirements.

Within the Green Triangle, the Green Triangle Fire Alliance³⁵ (GTFA) would be a useful first contact for understanding requirements for appropriate bushfire risk management from a plantation forestry perspective. Making contact with, or volunteering with, your local Country Fire Service (CFS) brigade in South Australia, or local Country Fire Authority (CFA) brigade in Victoria, would also provide good support and evidence that you are taking appropriate steps to avoid a risk of reversal.

The example permanence plan below is prepared under the scenario of a small plantation being established on a farm within Victoria in the Green Triangle.

Example Permanence Plan

The management activities outlined below were prepared in collaboration with both the GTFA and Hamilton Brigade of the country fire authority (CFA) and advice on fire management planning on farms as available from the CFA website. A separate Fire Plan

³⁵ <https://gtfih.com.au/gtfa/>

has been developed and is available upon request, but the key principles and required management actions are summarised below.

On Site Risk Management

- *Understorey vegetation will be sprayed off until the trees achieve reasonable height at which point, they will be controlled via agistment of cattle.*
- *Management of fire trails, with good connections to public roads, will be undertaken on an annual basis to allow onsite access by fire tankers. This includes spraying off of roadside vegetation and road surface repairs as required to ensure the trails are navigable.*
- *The vegetation around the nearby power line will be sprayed off on an annual basis to within 30m.*
- *Registered burning off of the nearby native forest back block will be completed on a 2-to-3-year cycle to reduce fuel loads.*
- *Vegetation on the property have been cleared and or managed as per the guidelines available in the 'Vegetation Clearing Exemptions – Bushfire Protection (August) Fact Sheet' as available on the CFA website, specifically:*
 - *All vegetation within 4m of the boundary fence lines adjoining bushfire prone areas will be actively sprayed and/or slashed each year.*
- *When thinning of the plantation occurs, any significant debris will be extracted, heaped and burned outside of the high fire danger period.*

Bushfire Response:

- *Contact has been made with the GTFA and it is understood the plantation is within visible range of the automated smoke detection system installed in the nearby fire tower.*
- *A fast-attack fire unit has been purchased and is maintained on the site for rapid first response. Farm-hands working on the property have been trained in its usage as volunteers with the Hamilton Brigade. On-site water storage in the form of a 10,000L tank has been established to ensure no impedance to quick response.*
- *A dozer will be maintained on the site during high fire danger periods.*

Disturbance Response

- *Should a part of the plantation be lost to natural disturbance, replanting will occur on that site within a year of the disturbance event where possible.*

Management Records

(Summary of activities undertaken to achieve the permanence plan)

CEA	Activity	Status	Completion date	Evidence	Detail
1	Understorey spraying	Complete	31/08/2025	Invoice 00055 from Weedkillers Pty Ltd	300L Roundup
1	Powerline & road easement spraying	Complete	31/08/2025	Invoice 00065 from Weedkillers Pty Ltd	100L Roundup
1	Understorey spraying	Complete	31/08/2026	Invoice 00155 from Weedkillers Pty Ltd	300L Roundup
1	Powerline & road easement spraying	Complete	31/08/2026	Invoice 00165 from Weedkillers Pty Ltd	100L Roundup
1	Understorey spraying	Complete	31/08/2027	Invoice 00255 from Weedkillers Pty Ltd	300L Roundup
1	Powerline & roadline easement spraying	Complete	31/08/2027	Invoice 00265 from Weedkillers Pty Ltd	100L Roundup
1	Prescribed burn on adjoining native forest	Complete	15/09/2027	Fire Permit Number: #45867	Good early spring burn
		etc		

Appendix 3 - References for Comparison Tables

Eligibility References

Table 20: Eligibility Criteria - References			
Scheme Criterion	Plantation Forestry	Farm Forestry	Climate Active Draft
1. Legal right	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 1 Section 5 [Definition] and Part 3 Sections 43 to 45	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 1 Section 5 [Definition] and Part 3 Sections 43 to 45	Guideline: Accounting For Carbon Sequestration From Tree Plantings (DRAFT), Climate Active 2022 - Page 2 and Climate Active Carbon Neutral Standard for Products and Services, Pages 9 & 45
2. Eligible interest-holder consent	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 3 Sections 43 to 45 Refer also 'Eligible interest holder consent' (Source: CER website) https://www.cleanenergyregulator.gov.au/ERF/Choosing-a-project-type/Opportunities-for-the-land-sector/eligible-interest-holder-consent	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 3 Sections 43 to 45 Refer also 'Eligible interest holder consent' (Source: CER website) https://www.cleanenergyregulator.gov.au/ERF/Choosing-a-project-type/Opportunities-for-the-land-sector/eligible-interest-holder-consent	NA
3. Establish the emissions boundary	NA	NA	Guideline: Accounting For Carbon Sequestration From Tree Plantings (DRAFT), Climate Active 2022 - Page 2
4. Regulatory approvals	For an overview of the state-based legislation relating to planning approvals, refer Greenwood Strategy 'PLANNING AND APPROVALS REQUIREMENTS FOR NEW PLANTATIONS IN AUSTRALIA' report prepared for Australian Forest Products Association, June 2021 (Source: Australian Forest Products Website) https://ausfpa.com.au/wp-content/uploads/2021/09/Planning-and-approvals-requirements-for-new-plantations-in-Australia.pdf	For an overview of the state-based legislation relating to planning approvals, refer Greenwood Strategy 'PLANNING AND APPROVALS REQUIREMENTS FOR NEW PLANTATIONS IN AUSTRALIA' report prepared for Australian Forest Products Association, June 2021 (Source: Australian Forest Products Website) https://ausfpa.com.au/wp-content/uploads/2021/09/Planning-and-approvals-requirements-for-new-plantations-in-Australia.pdf	For an overview of the state-based legislation relating to planning approvals, refer Greenwood Strategy 'PLANNING AND APPROVALS REQUIREMENTS FOR NEW PLANTATIONS IN AUSTRALIA' report prepared for Australian Forest Products Association, June 2021 (Source: Australian Forest Products Website) https://ausfpa.com.au/wp-content/uploads/2021/09/Planning-and-approvals-requirements-for-new-plantations-in-Australia.pdf
5. Fit and proper person assessment	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 2 Section 15 and Part 4	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 2 Section 15 and Part 4	NA
6. Area restrictions	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 1 Section 5 [Definitions of 'plantation forest' and 'forest cover']	Carbon Credits (Carbon Farming Initiative) (Measurement Based Methods for New Farm Forestry Plantations) Methodology Determination 2014 Part 1 Section 1.3 [definitions of	Guideline: Accounting For Carbon Sequestration From Tree Plantings (DRAFT), Climate Active 2022 - Appendix A Page 8

		'forest' and 'new farm forestry plantation']	
7. Species restrictions - achieve forest cover	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 1 Section 5 [Definitions of 'plantation forest' and 'forest cover']	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 1 Section 5 [Definitions of 'plantation forest' and 'forest cover']	Guideline: Accounting For Carbon Sequestration From Tree Plantings (DRAFT), Climate Active 2022 - Appendix A Page 7
8. Species restrictions - not a known weed	Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 3 - Section 20AA	Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 3 - Section 20AA	NA
9. No undesirable impact on agricultural production	Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 3 - Section 20B	Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 3 - Section 20B	NA
10. Not currently under a forestry managed investment scheme (MIS)	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 3 Section 11	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 3 Section 11	NA
11. Not previously cleared native forest	Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 3 - Section 20AA	Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 3 - Section 20AA	Guideline: Accounting For Carbon Sequestration From Tree Plantings (DRAFT), Climate Active 2022 - Appendix A Page 9
12. Not previously drained wetland	Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 3 - Section 20AA	Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 3 - Section 20AA	NA
13. ERF 'water rule'	Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 3 - Section 20AB [Previously Carbon Credits (Carbon Farming Initiative Regulations 2011 - Part 3 Section 3.37] Refer also 'Plantation forestry specified regions for sub regulation 3 37 4a' for map of 'specified regions' (Source: DISR website) https://www.industry.gov.au/sites/default/files/2020-07/plantation-forestry-specified-regions-for-subregulation-3-37-4a.pdf	Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 3 - Section 20AB [Previously Carbon Credits (Carbon Farming Initiative Regulations 2011 - Part 3 Section 3.37] Refer also 'Plantation forestry specified regions for sub regulation 3 37 4a' for map of 'specified regions' (Source: DISR website) https://www.industry.gov.au/sites/default/files/2020-07/plantation-forestry-specified-regions-for-subregulation-3-37-4a.pdf	NA
14. Within national plantation inventory (NPI) region	Carbon Credits (Carbon Farming Initiative—Plantation Forestry) Methodology Determination 2022 - Schedule 1 Part 1 Section 2	NA	NA
15. Additionality - starting dates (i.e., newness)	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 3 Section 27 and modified by Carbon Credits (Carbon Farming Initiative—Plantation Forestry) Methodology Determination 2022 - Part 3 Section 35	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 3 Section 27 and modified by Carbon Credits (Carbon Farming Initiative) (Measurement Based Methods for New Farm Forestry Plantations) Methodology Determination 2014 Part 1 Section 1.4 Refer also 'A guide to the	Guideline: Accounting For Carbon Sequestration From Tree Plantings (DRAFT), Climate Active 2022 - Appendix A Page 8

		Farm Forestry method' Page 4 [Source: CER Website] https://www.cleanenergyregulator.gov.au/DocumentAssets/Pages/A-guide-to-the-farm-forestry-method.aspx	
16. Additionality - 'business-as-usual' (BAU) land use prior to planting must not have been forest-based	Carbon Credits (Carbon Farming Initiative—Plantation Forestry) Methodology Determination 2022 - Schedule 1 Part 1 Section 2 Refer also 'Understanding your plantation forestry project - Simple method guide (Jan2022)' P.21 (Source: CER website) https://www.cleanenergyregulator.gov.au/DocumentAssets/Pages/Understanding-your-plantation-forestry-project---Simple-method-guide.aspx	Carbon Credits (Carbon Farming Initiative) (Measurement Based Methods for New Farm Forestry Plantations) Methodology Determination 2014 Part 2 Section 2.3	Guideline: Accounting For Carbon Sequestration From Tree Plantings (DRAFT), Climate Active 2022 - Appendix A Page 9
17. Additionality - baseline emissions or sequestrations	Carbon Credits (Carbon Farming Initiative—Plantation Forestry) Methodology Determination 2022 - Part 4 Section 43(1)	Carbon Credits (Carbon Farming Initiative) (Measurement Based Methods for New Farm Forestry Plantations) Methodology Determination 2014 - Part 6 Section 6.3	NA
18. Additionality - not already part of a carbon offsets scheme (i.e., no double counting)	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 2 Section 15A	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 2 Section 15A	Guideline: Accounting For Carbon Sequestration From Tree Plantings (DRAFT), Climate Active 2022 - Appendix A Page 8
19. Additionality - no regulatory requirement	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 3 Section 27	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 3 Section 27	NA
20. Additionality - not carried out under other government programs	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 3 Section 27 and Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 3 Section 21	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 3 Section 27 and Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 3 Section 21	NA
21. Estimating returns	Refer to Understanding your plantation forestry project - Simple method guide (Jan2022) P.11 (Source: CER website) https://www.cleanenergyregulator.gov.au/DocumentAssets/Pages/Understanding-your-plantation-forestry-project---Simple-method-guide.aspx	NA	NA
22. Estimating costs	Refer to Understanding your plantation forestry project - Simple method guide (Jan2022) P. 12 (Source: CER website) https://www.cleanenergyregulator.gov.au/DocumentAssets/Pages/Understanding-your-plantation-forestry-project---Simple-method-guide.aspx	NA	NA

Registration References

Scheme Criterion	Plantation Forestry	Farm Forestry	Climate Active (Draft)
1. Register your project or apply for certification	Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 3 Section 13 and Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 3 Section 10	Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 3 Section 13 and Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 3 Section 10	Climate Active Carbon Neutral Standard for Products and Services, Page 33
2. Choose project proponent	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 1 Section 5 [Definition] and Part 10 Sections 134 to 145 [Multiple project proponents] Refer also 'Being a Proponent fact sheet' (Source: CER website): https://www.cleanenergyregulator.gov.au/ERF/Want-to-participate-in-the-Emissions-Reduction-Fund/Planning-a-project/choosing-a-project-proponent-for-landholders and 'Planning a project' (Source: CER website) https://www.cleanenergyregulator.gov.au/ERF/Want-to-participate-in-the-Emissions-Reduction-Fund/Planning-a-project	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 1 Section 5 [Definition] and Part 10 Sections 134 to 145 [Multiple project proponents] Refer also 'Being a Proponent fact sheet' (Source: CER website): https://www.cleanenergyregulator.gov.au/ERF/Want-to-participate-in-the-Emissions-Reduction-Fund/Planning-a-project	NA
3. Submit plantation forestry notification	Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 3 - Section 20B Refer also 'Emissions Reduction Fund Plantation Notification' (Source: DAFF website) https://www.agriculture.gov.au/agriculture-land/farm-food-drought/climatechange/mitigation/cfi/plantation-forestry-notifications	Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 3 - Section 20B Refer also 'Emissions Reduction Fund Plantation Notification' (Source: DAFF website) https://www.agriculture.gov.au/agriculture-land/farm-food-drought/climatechange/mitigation/cfi/plantation-forestry-notifications	NA
4. Fit and proper person (FPP) test	Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 4 Sections 60 to 66	Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 4 Sections 60 to 66	NA
5. Provide map of project area	Carbon Credits (Carbon Farming Initiative—Plantation Forestry) Methodology Determination 2022 - Part 3 Sections 13 to 15 Refer also: - 'Mapping Requirements' [Source: CER website] https://www.cleanenergyregulator.gov.au/ERF/Want-to-participate-in-the-Emissions-Reduction-Fund/Planning-a-project	Carbon Credits (Carbon Farming Initiative—Plantation Forestry) Methodology Determination 2022 - Part 3 Sections 13 to 15 Refer also: - 'Mapping Requirements' [Source: CER website] https://www.cleanenergyregulator.gov.au/ERF/Want-to-participate-in-the-Emissions-Reduction-Fund/Planning-a-project	Guideline: Accounting For Carbon Sequestration From Tree Plantings (DRAFT), Climate Active 2022 - Appendix A Page 10

	<p>ulator.gov.au/ERF/Pages/Choosing%20a%20project%20type/Opportunities%20for%20the%20land%20sector/Mapping-requirements.aspx and</p> <p>- 'CFI Mapping Guidelines' (Source: DCEEW website) https://www.dceew.gov.au/climate-change/publications/carbon-farming-initiative-cfi-mapping-guidelines</p>	<p>ulator.gov.au/ERF/Pages/Choosing%20a%20project%20type/Opportunities%20for%20the%20land%20sector/Mapping-requirements.aspx and</p> <p>- 'CFI Mapping Guidelines' (Source: DCEEW website) https://www.dceew.gov.au/climate-change/publications/carbon-farming-initiative-cfi-mapping-guidelines</p>	
6. Calculate a forward abatement estimate (FullCAM)	<p>Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 3 Section 13(1)(m) and</p> <p>Carbon Credits (Carbon Farming Initiative—Plantation Forestry) Methodology Determination 2022 - Part 4 Sections 45 [Calculates long-term net carbon stock] and 53 [Calculates net abatement amount per period for ACCU issuance]</p>	<p>Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 3 Section 13(1)(m) and</p> <p>Carbon Credits (Carbon Farming Initiative) (Measurement Based Methods for New Farm Forestry Plantations) Methodology Determination 2014 Part 4 Sections 4.9 and 4.10</p>	NA
7. Provide evidence for starting date(s)	<p>Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 3 Section 27 and modified by</p> <p>Carbon Credits (Carbon Farming Initiative—Plantation Forestry) Methodology Determination 2022 - Part 3 Section 35</p>	<p>Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 3 Section 27 and modified by</p> <p>Carbon Credits (Carbon Farming Initiative) (Measurement Based Methods for New Farm Forestry Plantations) Methodology Determination 2014 Part 1 Section 1.4</p> <p>Refer also 'Carbon Credits (Carbon Farming Initiative) (Measurement Based Methods for New Farm Forestry Plantations) Methodology Determination 2014 - Explanatory Statement' [Source: Federal Register of Legislation] https://www.legislation.gov.au and</p> <p>'A guide to the Farm Forestry method' [Source: CER Website] https://www.cleanenergyregulator.gov.au/DocumentAssets/Pages/A-guide-to-the-farm-forestry-method.aspx</p>	Guideline: Accounting For Carbon Sequestration From Tree Plantings (DRAFT), Climate Active 2022 - Page 2
8. Provide evidence for business-as-usual (BAU) land use	<p>Carbon Credits (Carbon Farming Initiative—Plantation Forestry) Methodology Determination 2022 - Part 3 Section 10</p>	<p>Carbon Credits (Carbon Farming Initiative) (Measurement Based Methods for New Farm Forestry Plantations) Methodology Determination 2014 Part 7 Section 7.14</p>	Guideline: Accounting For Carbon Sequestration From Tree Plantings (DRAFT), Climate Active 2022 - Appendix A Page 8
9. Permanence period and discounts	<p>Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 2 Section 16 and Part 3 Section 23 and</p>	<p>Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 2 Section 16 and Part 3 Section 23</p>	Guideline: Accounting For Carbon Sequestration From Tree Plantings (DRAFT), Climate Active 2022 - Pages 5 and Appendix A Page 22

	Carbon Credits (Carbon Farming Initiative— Plantation Forestry) Methodology Determination 2022 - Part 4 Sections 46		
10. Management Regime	<p>Carbon Credits (Carbon Farming Initiative— Plantation Forestry) Methodology Determination 2022 - Part 3 Section 23</p> <p>Refer also 'Forest Management Plan Guidance' [Source: CER website] https://www.cleanenergyregulator.gov.au/DocumentAss ets/Pages/Forest-management-plan-guidance.aspx</p> <p>Refer Appendix 1 - Requirements for a Forest Management Plan under the for example Forest Management Plan</p>	Carbon Credits (Carbon Farming Initiative) (Measurement Based Methods for New Farm Forestry Plantations) Methodology Determination 2014 Part 2 Section 2.5(4) and Part 4 Section 4.5	NA
11. Permanence obligations	<p>Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 2 Section 16</p> <p>Refer also 'Permanence obligations' (Source: CER website) https://www.cleanenergyregulator.gov.au/ERF/Choosing-a-project-type/Opportunities-for-the-land-sector/Permanence-obligations</p>	<p>Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 8 Section 97</p> <p>Refer also 'Permanence obligations' (Source: CER website) https://www.cleanenergyregulator.gov.au/ERF/Choosing-a-project-type/Opportunities-for-the-land-sector/Permanence-obligations</p>	Guideline: Accounting For Carbon Sequestration From Tree Plantings (DRAFT), Climate Active 2022 - Appendix A Pages 6
12. Permanence plan	<p>Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 3 Section 13(1)(p)</p> <p>Refer also: - 'Permanence Obligations' (Source: CER website) https://www.cleanenergyregulator.gov.au/ERF/Choosing-a-project-type/Opportunities-for-the-land-sector/Permanence-obligations and - 'Reducing the risk of fire and preserving sequestered carbon in ERF vegetation projects' (Source: CER website) https://www.cleanenergyregulator.gov.au/DocumentAss ets/Pages/Reducing-the-risk-of-fire-and-preserving-sequestered-carbon-in-ERF-vegetation-projects.aspx</p> <p>Refer Appendix 1 - Requirements for a Forest Management Plan under the for example Permanence Plan</p>	<p>Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 3 Section 13(1)(p)</p> <p>Refer also: - 'Permanence Obligations' (Source: CER website) https://www.cleanenergyregulator.gov.au/ERF/Choosing-a-project-type/Opportunities-for-the-land-sector/Permanence-obligations and - 'Reducing the risk of fire and preserving sequestered carbon in ERF vegetation projects' (Source: CER website) https://www.cleanenergyregulator.gov.au/DocumentAss ets/Pages/Reducing-the-risk-of-fire-and-preserving-sequestered-carbon-in-ERF-vegetation-projects.aspx</p> <p>Refer Appendix 1 - Requirements for a Forest Management Plan under the for example Permanence Plan</p>	NA

13. Additional documentation and evidence	NA	NA	NA
14. ANREU account	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 2 Section 11(5)	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 2 Section 11(5)	NA
15. Register and land title registry	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 2 Section 16 and Part 3 Sections 167 and 168 and Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 2 Section 16 and Part 3 Sections 39 and 40 Refer also 'ERF project register' (Source: CER website) https://www.cleanenergyregulator.gov.au/ERF/project-and-contracts-registers/project-register	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 2 Section 16 and Part 3 Sections 167 and 168 and Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 2 Section 16 and Part 3 Sections 39 and 40 Refer also 'ERF project register' (Source: CER website) https://www.cleanenergyregulator.gov.au/ERF/project-and-contracts-registers/project-register	NA

Reporting and Monitoring References

Table 22: Reporting and Monitoring Criteria - References			
Scheme Criterion	Plantation Forestry	Farm Forestry	Climate Active (Draft)
1. Reporting requirements	Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 6 - Sections 69 to 71	Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 6 - Sections 69 to 71	Guideline: Accounting For Carbon Sequestration From Tree Plantings (DRAFT), Climate Active 2022 - Appendix A Page 17 and Guideline: Accounting For Carbon Sequestration From Tree Plantings (DRAFT), Climate Active 2022 - Appendix A Page 26
2. Reporting period	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 6 Section 76	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 6 Section 76	Climate Active Carbon Neutral Standard for Products and Services, Page 33
3. Crediting period	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 5 Section 69(2)	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 5 Section 69(2)	NA
4. Abatement calculations	Carbon Credits (Carbon Farming Initiative— Plantation Forestry) Methodology Determination 2022 - Part 4 Sections 43 to 54 and Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 2 Section 16	Carbon Credits (Carbon Farming Initiative) (Measurement Based Methods for New Farm Forestry Plantations) Methodology Determination 2014 Part 5	Climate Active Carbon Neutral Standard for Products and Services, Page 14
5. FullCAM - approved version	Source: CER website https://www.cleanenergyregulator.gov.au/DocumentAssets/P	Source: CER website https://www.cleanenergyregulator.gov.au/DocumentAssets/P	Guideline: Accounting For Carbon Sequestration From Tree

	ets/Pages/FullCAM-Guidelines-for-the-2022-plantation-forestry-method.aspx	ages/FullCAM-Guidelines-for-the-2022-plantation-forestry-method.aspx	Plantings (DRAFT), Climate Active 2022 - Appendix A Page 14
6. FullCAM - baseline scenario	Carbon Credits (Carbon Farming Initiative— Plantation Forestry) Methodology Determination 2022 - Part 4 Section 43(1)	Carbon Credits (Carbon Farming Initiative) (Measurement Based Methods for New Farm Forestry Plantations) Methodology Determination 2014 Part 6 Section 6.3	Guideline: Accounting For Carbon Sequestration From Tree Plantings (DRAFT), Climate Active 2022 - Appendix A Page 15
7. FullCAM - project scenario (reporting period)	Carbon Credits (Carbon Farming Initiative— Plantation Forestry) Methodology Determination 2022 - Part 4 Sections 39	NA	Guideline: Accounting For Carbon Sequestration From Tree Plantings (DRAFT), Climate Active 2022 - Appendix A Page 15
8. FullCAM - long-term project scenario (100 years)	Carbon Credits (Carbon Farming Initiative— Plantation Forestry) Methodology Determination 2022 - Part 4 Sections 40	Carbon Credits (Carbon Farming Initiative) (Measurement Based Methods for New Farm Forestry Plantations) Methodology Determination 2014 Part 4 Section 4.10	NA
9. Forest management plan	Carbon Credits (Carbon Farming Initiative— Plantation Forestry) Methodology Determination 2022 - Part 3 Section 23 Refer also 'Forest Management Plan Guidance' [Source: CER website] https://www.cleanenergyregulator.gov.au/DocumentAssets/Pages/Forest-management-plan-guidance.aspx Refer Appendix 1 - Requirements for a Forest Management Plan under the for example Forest Management Plan	Carbon Credits (Carbon Farming Initiative) (Measurement Based Methods for New Farm Forestry Plantations) Methodology Determination 2014 Part 2 Section 2.5(4) and Part 4 Section 4.5	NA
10. Sampling plan	NA	Carbon Credits (Carbon Farming Initiative) (Measurement Based Methods for New Farm Forestry Plantations) Methodology Determination 2014 Part 7 Section 7.25	NA
11. Carbon inventory	NA	Carbon Credits (Carbon Farming Initiative) (Measurement Based Methods for New Farm Forestry Plantations) Methodology Determination 2014 Part 5 Section 5.2 Refer also: Method 5 of the 'Technical Reference Guide' Method 5 (Source: CER website) https://www.dcceew.gov.au/sites/default/files/documents/technical-reference-guide-measurement-based-methods-	NA

		for-new-farm-forestry-plantations.pdf	
12. Carbon Inventory - Precision Standard	NA	Carbon Credits (Carbon Farming Initiative) (Measurement Based Methods for New Farm Forestry Plantations) Methodology Determination 2014 Part 5 Section 5.3	NA
13. Destructive sampling for developing allometric functions	NA	Carbon Credits (Carbon Farming Initiative) (Measurement Based Methods for New Farm Forestry Plantations) Methodology Determination 2014 Part 5 Sections 5.4, 6.11 & 5.23 Refer also Methods 10, 11 & 12 of the 'Technical Reference Guide' (Source: CER website) https://www.dcceew.gov.au/sites/default/files/documents/technical-reference-guide-measurement-based-methods-for-new-farm-forestry-plantations.pdf	NA
14. Significant reversal requirements to relinquish ACCUs or account for emissions (i.e., natural disturbance)	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 7 Section 91 and Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 6 Section 81 and Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 8 Section 97 [Carbon maintenance obligation] and Carbon Credits (Carbon Farming Initiative— Plantation Forestry) Methodology Determination 2022 - Part 3 Section 21 [Salvage harvesting]	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 7 Section 91 and Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 6 Section 81 and Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 8 Section 97 [Carbon maintenance obligation] and Carbon Credits (Carbon Farming Initiative) (Measurement Based Methods for New Farm Forestry Plantations) Methodology Determination 2014 Part 3 Section 3.6 [Growth disturbances]	Guideline: Accounting For Carbon Sequestration From Tree Plantings (DRAFT), Climate Active 2022 - Appendix A Pages 12, 13 and 22
15. Auditing your project	Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 6 Section 73 Refer also 'Auditing' (Source CER website) https://www.cleanenergyregulator.gov.au/ERF/Want-to-participate-in-the-Emissions-Reduction-Fund/Step-3-Reporting-and-auditing/Audit-Requirements	Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 6 Section 73 Refer also 'Auditing' (Source CER website) https://www.cleanenergyregulator.gov.au/ERF/Want-to-participate-in-the-Emissions-Reduction-Fund/Step-3-Reporting-and-auditing/Audit-Requirements	Guideline: Accounting For Carbon Sequestration From Tree Plantings (DRAFT), Climate Active 2022 - Appendix A Page 23 and Guideline: Accounting For Carbon Sequestration From Tree Plantings (DRAFT), Climate Active 2022 - Appendix A Page 27
16. Engaging an auditor	Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 6 Section 80 Refer also 'Register of Auditors' (Source: CER Website) https://www.cleanenergyregulator.gov.au/ERF/Want-to-participate-in-the-Emissions-Reduction-Fund/Step-3-Reporting-and-auditing/Audit-Requirements	Carbon Credits (Carbon Farming Initiative) Rule 2015 - Part 6 Section 80 Refer also 'Register of Auditors' (Source: CER Website) https://www.cleanenergyregulator.gov.au/ERF/Want-to-participate-in-the-Emissions-Reduction-Fund/Step-3-Reporting-and-auditing/Audit-Requirements	Guideline: Accounting For Carbon Sequestration From Tree Plantings (DRAFT), Climate Active 2022 - Appendix A Page 24 and Refer also the example 'Licence agreement terms and conditions for certification against the climate Active Carbon Neutral Standard'

	ulator.gov.au/Infohub/Audits/register-of-auditors	tor.gov.au/Infohub/Audits/register-of-auditors	Page 22 available on the Climate Active website: https://www.climateactive.org.au/b/e-climate-active/tools-and-resources/licence-agreement
17. Notification requirements	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 6 Sections 78 to 85	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 6 Sections 78 to 85	NA
18. Making changes to your project	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 3 Section 29 Refer also 'Making changes to your project' [Source: CER Website: https://www.cleanenergyregulator.gov.au/ERF/Want-to-participate-in-the-Emissions-Reduction-Fund/Making-changes-to-your-project]	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 3 Section 29 Refer also 'Making changes to your project' [Source: CER Website: https://www.cleanenergyregulator.gov.au/ERF/Want-to-participate-in-the-Emissions-Reduction-Fund/Making-changes-to-your-project]	NA
19. Monitoring requirements	Carbon Credits (Carbon Farming Initiative— Plantation Forestry) Methodology Determination 2022 - Part 5 Sections 61 to 64 and Carbon Credits (Carbon Farming Initiative— Plantation Forestry) Methodology Determination 2022 - Part 3 Sections 22 [Satisfying the forest development condition]	Carbon Credits (Carbon Farming Initiative) (Measurement Based Methods for New Farm Forestry Plantations) Methodology Determination 2014 Part 7 Section 7.2	Guideline: Accounting For Carbon Sequestration From Tree Plantings (DRAFT), Climate Active 2022 - Appendix A Page 8
20. Record keeping requirements	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 17 Section 191 and Carbon Credits (Carbon Farming Initiative— Plantation Forestry) Methodology Determination 2022 - Part 5 Sections 57 to 60	Carbon Credits (Carbon Farming Initiative) Act 2011 - Part 17 Section 191 and Carbon Credits (Carbon Farming Initiative) (Measurement Based Methods for New Farm Forestry Plantations) Methodology Determination 2014 Part 7 Section 7.3	Climate Active Carbon Neutral Standard for Products and Services, Pages 17