National Association of Forest Industries

Forest industries and climate change

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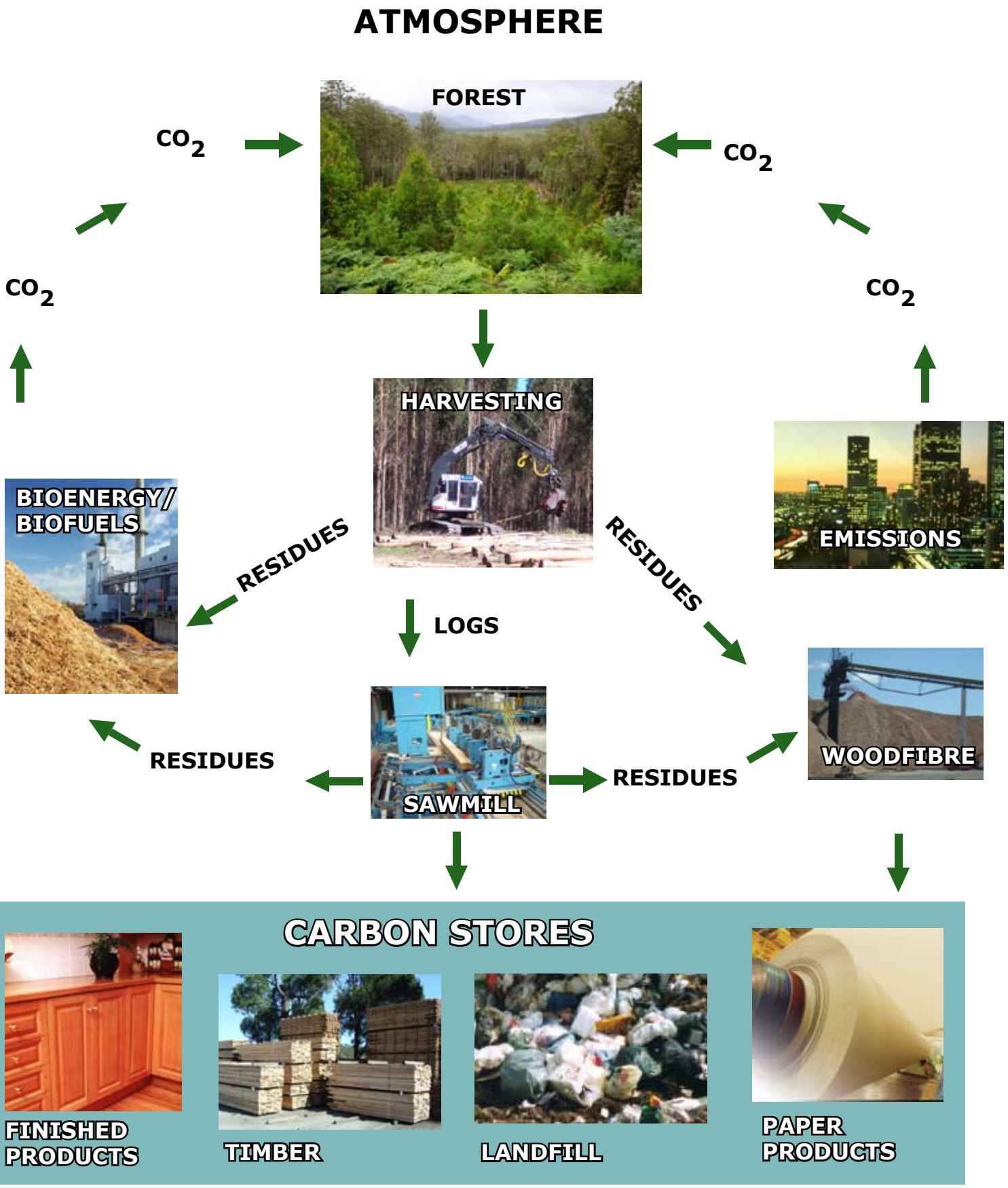
The carbon life-cycle



The Australian community has become aware of the significant need to remove and reduce emissions of CO_2 from the atmosphere.

As major carbon stores, forests, trees and wood products have a major role in addressing the impacts of climate change.

It is widely acknowledged that trees are natural carbon stores which actively sequester carbon from the atmosphere. Australia has the capacity to further utilise the carbon benefits that forests and wood products can offer.

The accumulated storage in Australia's forest plantations and wood products is about 323 million tonnes of carbon, of which wood products store some 230 million tonnes of carbon.[1]

Forest values

Australia's forest industry is a large economic contributor. The industry is worth around 18 billion dollars per year to the nation's economy, which is around 3% of Australia's GDP. However, there is an ongoing annual trade deficit of around 2 billion dollars each year, which highlights the importance of utilising Australian grown timber resources and supporting the value-adding of these products.

The industry employs around 137,000 people (about 1% of Australia's employment base). The industry is mostly located in regional areas where it is able to offset the economic impacts of drought and rural decline which is affecting employment levels.

Given an understanding of the significant role of forests in the climate change debate, it is time that decision makers focus on the positive role that wood and paper products can have on addressing climate change.

Forest products have a major role in our lives; they are ubiquitous products which can assume many forms. The versatility of wood is reflected in the numerous ways it can be utilised in addressing climate change.

This document helps analyse the sustainable and renewable use of forests as carbon sinks, wood for energy efficient buildings, the need to manage forests to reduce bushfire emissions, renewable energy from wood waste, and the current state of play and future opportunities for the forest industry in carbon trading.

Forests as carbon sinks

Australia's economy has been growing rapidly, placing increasing pressure on the nation to stay on track in meeting the Kyoto target of 108% of 1990 emissions levels. In order to meet this target, Australia will need to embrace a number of approaches in offsetting emissions, with forest carbon sinks at the core of this solution.

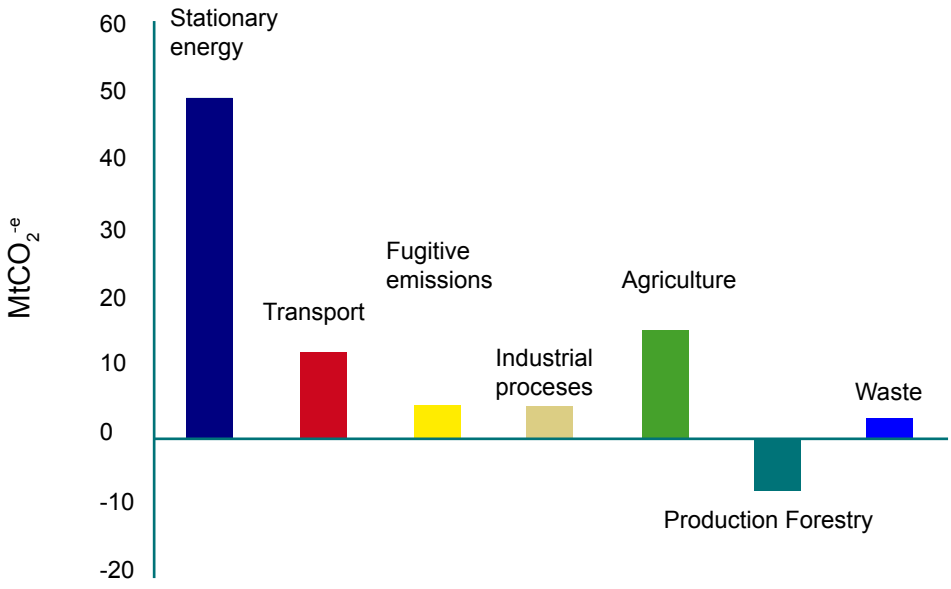
Actively growing trees are natural carbon stores. In 2004, Australia's production forests and tree plantations are estimated to have absorbed around 44 million tonnes of CO_2 from the atmosphere. This is equivalent to taking nearly 9 million cars off the road for one year.[1]

This is a significant amount considering that Australia's emissions for 2006 were already at 109% of 1990 emissions. That is, Australia must continue to address emission reduction and the establishment of tree plantations, and continue to actively manage native forests, which can contribute to maintaining its Kyoto target.[3]

Australia's forests are growing in size. The total forest area is around 166 million hectares, with a tree plantation estate of over 1.8 million hectares. As part of the Australian Government's 2020 Vision, it is planned that the plantation estate will expand to 3 million hectares by the year 2020.

The following diagram shows how the forest industry is helping to offset emissions from other industries.

Australia's greenhouse gas emissions by sector[3]



Carbon storage in wood

Despite not being recognised under the Kyoto Protocol, forests continue to be carbon stores even after they have been harvested. As new trees are established the rate of carbon sequestration increases. After trees are harvested, they provide wood products which continue to store carbon in materials we use in our everyday lives.

Items such as paper and packaging, building materials, furniture and musical instruments have a complete lifecycle which retains the carbon sequestered from the atmosphere by the trees they are derived from.

Recent research conducted by the CRC for Greenhouse Accounting has found that carbon remains stored in wood products for much longer periods than previously estimated, even after they have been disposed of in landfill.

For example, wood and paper products dating back 46 years have been found in landfill in pristine condition by CRC researchers.[5]

But it doesn't end there – residues from wood production can be used for energy production where some of the carbon stored in the products is converted in to CO_2, creating renewable and carbon neutral energy.

Wood Products after 46 years, buried at Sydney Park landfill (left)

Researchers weighing a tree crown on a trailer (below left) and dry blackbutt boards weighed on a trailer (below right) to determine the carbon content of the wood

Wood and paper products dating back 46 years have been found in Sydney landfill in pristine condition by CRC researchers. [4]

Political support

"Right here, right now, we have the means to make a massive and material impact on greenhouse gas emissions by sustainable forestry"

The Hon. Malcolm Turnbull, Minister for the Environment and Water Resources, May 2007

"By 2010, it is estimated that plantations established since 1990 will offset some 21 million tonnes of Australia's total carbon dioxide emissions per year. This is without taking into account carbon dioxide sequestered in timber and timber products currently in circulation"

Senator Eric Abetz, Minister for Fisheries Forestry and Conservation, March 2007

"In the future both farming and forestry have the potential to play a vital role in carbon sequestration in Australia. The combined potential of carbon sequestration from farming and forestry may allow Australia to gain a significant advantage, when compared to other advanced economies, in achieving future emission targets"

Senator Kerry O'Brien, Shadow Minister for Primary Industries, Fisheries & Forestry, May 2007

Forestry has an important role to play in the agricultural landscape

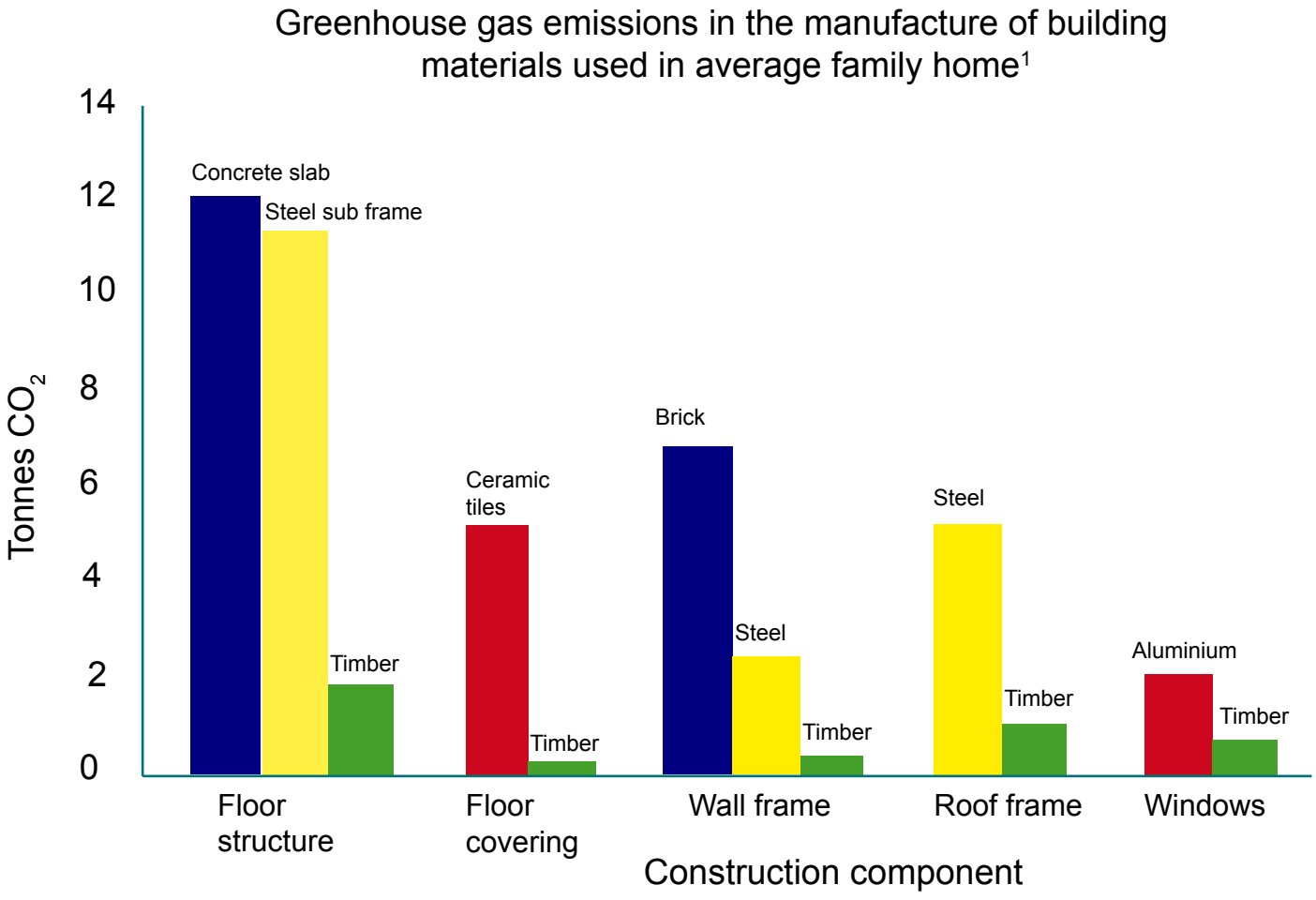
Low embodied-energy

If half of Australia's new homes were built using predominantly wood products, over 1.3 million tonnes of CO_2 emissions could be saved

Some products used in buildings require large amounts of energy in their production. For example, in the construction of a family home, an extra 15 tonnes of CO_2 is emitted in the production of a concrete slab when compared to a timber floor.[5] The Australian Greenhouse Office estimates that it would take 64 years to recover this carbon debt in energy savings.

As discussed earlier in this document, wood is a natural carbon store which requires very little energy in its production. By using wood as an alternative to products with high embodied energy in their manufacture, consumers, builders and designers have the opportunity to dramatically reduce CO_2 emissions.

Recent research compared the difference in greenhouse gas emissions generated in the construction of a single-storey house when predominantly wood products are used in favour of alternative materials with high greenhouse gas emissions in their production. More than 25 tonnes of CO_2 equivalents would be saved if the 'wood products' were used.[5]



Wood waste for bioenergy

Renewable energy from wood waste reduces CO_2 emissions by 95-99% for each megawatt hour (MWH) of electricity generated when compared to coal-fired electricity generation

In Australia most stationary energy is produced by coal fired power stations which produce large emissions of CO_2. Stationary energy accounts for around 50 per cent of Australia's annual emissions.

In order to reduce greenhouse gas emissions which may be contributing to climate change, Australia is exploring alternative sources of energy and ways in which greenhouse gas emissions can be reduced in electricity generation.

Bioenergy is a renewable, greenhouse neutral energy derived from a diverse range of non-fossil organic resources, including forest residues and thinnings, sawmill residues, demolition and recycling wastes.

Wood waste is a prime example of a 'biofuel' which is a renewable resource that can be used to generate electrical power, steam, or liquid biofuels such as ethanol.

The term wood waste refers to low-grade timber material with no other identifiable market or environmental value. This includes material that is left in the forest after the higher-value timber resources have been harvested. It also includes the sawdust, shavings, off-cuts and other wastes associated with timber processing.

Wood waste also comes from a wide variety of other sources, including those trees which die and are replaced in our urban landscape as well as manufacturing, construction and demolition debris.

As discussed elsewhere in this document, wood is a natural carbon store. The carbon removed from the atmosphere by growing trees is stored in wood products. As not all wood derived from forests is of high enough quality to be used in useful products like furniture, flooring or framing, there is some unavoidable waste products. Bioenergy is a carbon neutral way of utilising this residue for energy production, removing some of the need to burn fossil fuels and the carbon emissions which accompany them.

Bioenergy is a source of energy used extensively throughout the world, contributing to some 14% of the world's total energy supplies. Sweden for example, is now generating around 20 percent of its energy needs from woody biomass and plans to increase this over time.

In Australia, the forest industry has the resources to produce 30% of the additional 9,500 GWh of electricity required to meet the Mandatory Renewable Energy Target (MRET) without harvesting one extra hectare of trees by using wood waste and residues.

The net benefit for the environment from using wood waste would be a permanent reduction in Australia's greenhouse gas emissions of 3 million tonnes of CO_2.

It is hoped that bioenergy from wood waste will continue to be embraced as part of a more balanced shift to renewable energy and a greenhouse-friendly alternative to using fossil fuels.

This *is* wood waste

This is *not* wood waste

Wildfire emissions

Where there's intense fires, there's excess carbon emissions
Active management of forests is essential

As intense bushfires burn, a large amount of carbon enters the atmosphere - adding to the levels of CO_2 which are contributing to global warming.

The 2002-03 bushfire season was responsible for the emissions of around 130 million tonnes of CO_2. This is equivalent to around a quarter of Australia's annual greenhouse emissions. Over the 2006/07 season in Victoria alone, around 40 million tonnes of CO_2 has been released into the atmosphere.

This is in stark contrast to carefully managed forestry operations, where only small areas are harvested each year, in varying locations across the landscape. Low intensity prescribed burning is routinely carried out to encourage regeneration of forests and to reduce the risk of damaging high intensity wildfires. This active management approach mimics the natural state of Australia's forests and ensures sustainable biodiversity outcomes through the creation of multiple-aged forests.

The current passive management approach to management of national parks often results in the excessive build up of fuel, which will potentially lead to larger more intense and destructive wildfires and greater carbon emissions.

Sustainable commercial forest management ensures that the carbon remains stored in wood products for long periods of time, even when the wood is manufactured into products such as flooring, furniture or paper products.

High intensity wildfires can have severe impacts on forest ecosystems

Opportunities in carbon trading

Australia requires an additional reduction of greenhouse gas emissions of 76 million tonnes CO_2 by 2020, over and above the 85 million tonne CO_2 reduction target for 2010 if it is to keep emissions at 108% of 1990 levels. The carbon stored in trees can be traded, creating a market mechanism to offset emissions from other sectors. This is considered by some as a better approach than a 'carbon tax'.

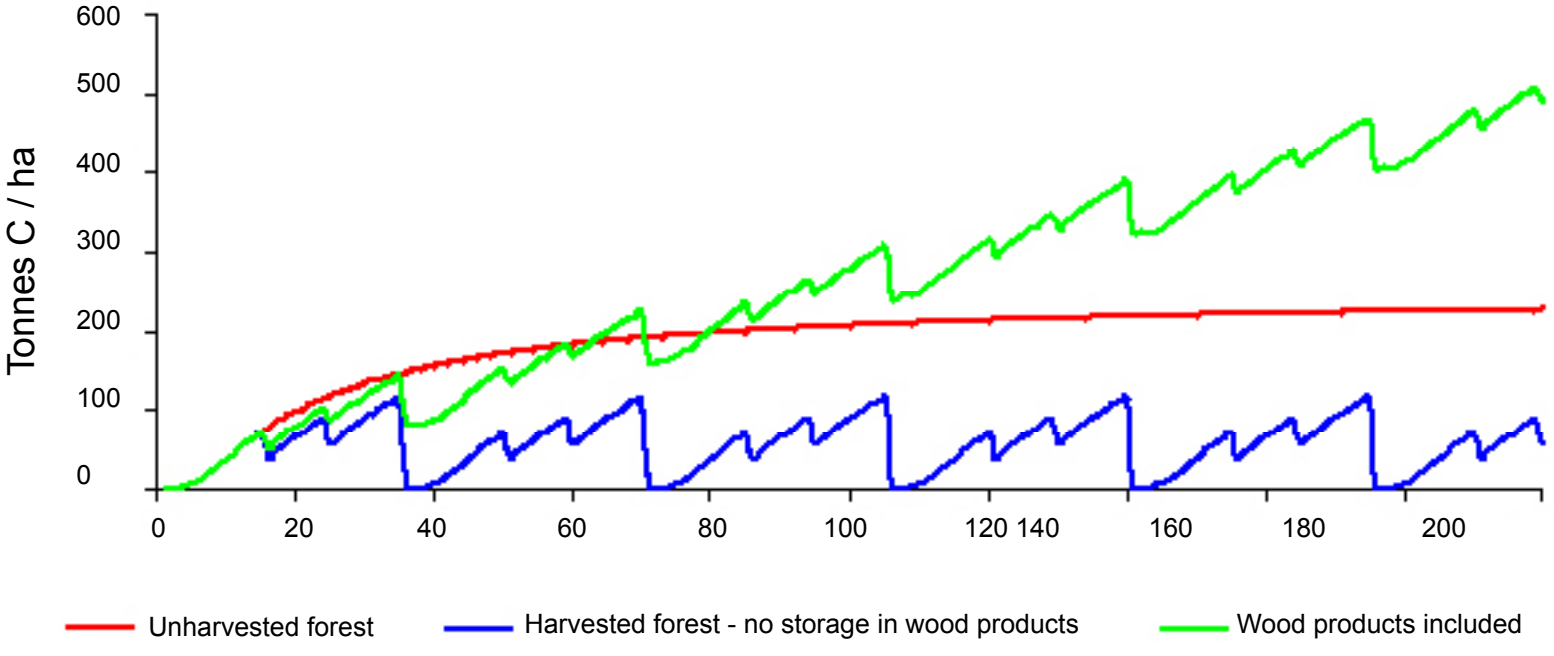
Domestically, State and Territory Governments are considering a range of policies to ensure a flexible way of achieving greenhouse gas abatement in the future. A national emissions trading scheme is being debated, with the possibility for this scheme to link Australia to international carbon markets.[6]

At the national level, a Prime Ministerial Task Group on Emissions Trading was formed in late 2006, and an Emissions Trading Issues Paper, which provides the context for the work to be undertaken by the Task Group, was issued in February 2007.[7]

At present, harvested wood products are not recognised as carbon stores by the Kyoto Protocol and other trading schemes. This approach leads to false accounting outcomes as it assumes that all CO_2 is emitted at harvest. With the consideration of the long-term carbon storage in wood products, a national emissions trading scheme has the potential to:

- Make carbon trading a more attractive proposition for the forest and wood products industries.
- Increase the value of carbon sequestration in forests, as the penalty currently paid due to the false assumption that all carbon is emitted at harvest would effectively be removed.
- Encourage the establishment of more plantations for carbon sequestration, providing greater incentives for smaller growers to participate.
- Increase the use of carbon storing wood products, as a substitute for less desirable and high carbon emitting materials.
- Encourage the utilisation of wood waste residues for energy generation and biofuels, thereby displacing the use of fossil fuels and permanently eliminating atmospheric emissions that would have otherwise resulted.
- Provide a benefit in terms of storing carbon in landfills in the form of unrecoverable waste timber.

Carbon storage in harvested and unharvested forests[1]



Current examples of forestry carbon offsets

Victorian DSE

CO2 Group Limited announced in early 2007 that it's 100% owned subsidiary, CO2 Australia was selected as a major Carbon Offset provider to the Victorian Government's Department of Sustainability and Environment.

The carbon sequestration generated by tree plantations established through the CO2 Australia™ Carbon Sequestration Program will be used by the Victorian Government to offset greenhouse gas emissions from the Government's state fleet of passenger and light commercial vehicles.[8]

CO2 Australia's Big Day Out

In early 2007, the organisers of the Big Day Out music festival engaged CO2 Australia to offset the energy used in the festival with the establishment of a Eucalypt tree plantation to sequester carbon. The project is expected to cost about $30,000. [8]

Forests NSW offsets Tokyo Electric Power Company (TEPCO)

Examples of forests being used as emissions offsets date back as far as the year 2000. Forests NSW and Tokyo Electric Power Company (TEPCO) signed a contract to establish a planted forest estate in NSW for carbon sequestration and timber products over a ten year period.

TEPCO has been seeking an opportunity to invest in carbon sinks for greenhouse gas offsets as part of its overall package of measures to deliver internal emissions abatement solutions.

It was estimated that the forests will absorb 200,000 tonnes of carbon annually. This is equivalent to 100 days of CO_2 emissions by a 600,000-kilowatt thermal power station.[9]

References

[1] 'Forests, Wood and Australia's Carbon Balance', *FWPRDC and CRC for Greenhouse Accounting*, 2006

[2] 'Tracking the Kyoto Target', *Australian Greenhouse Office*, 2006

[3] *Australian Greenhouse Office, Department of the Environment and Heritage*

[4] 'Happy to have his theories rubbished', *Sydney Morning Herald*, 27 Jan 2007

[5] CRC for Greenhouse Accounting http://www.greenhouse.crc.org.au/counting_carbon/wood.cfm

[6] National Emissions Trading Taskforce http://www.emissionstrading.net.au/

[7] Prime Ministerial Task Group on Emissions Trading http://www.pmc.gov.au/emissionstrading/index.cfm

[8] CO2 Australia - http://co2australia.com.au/

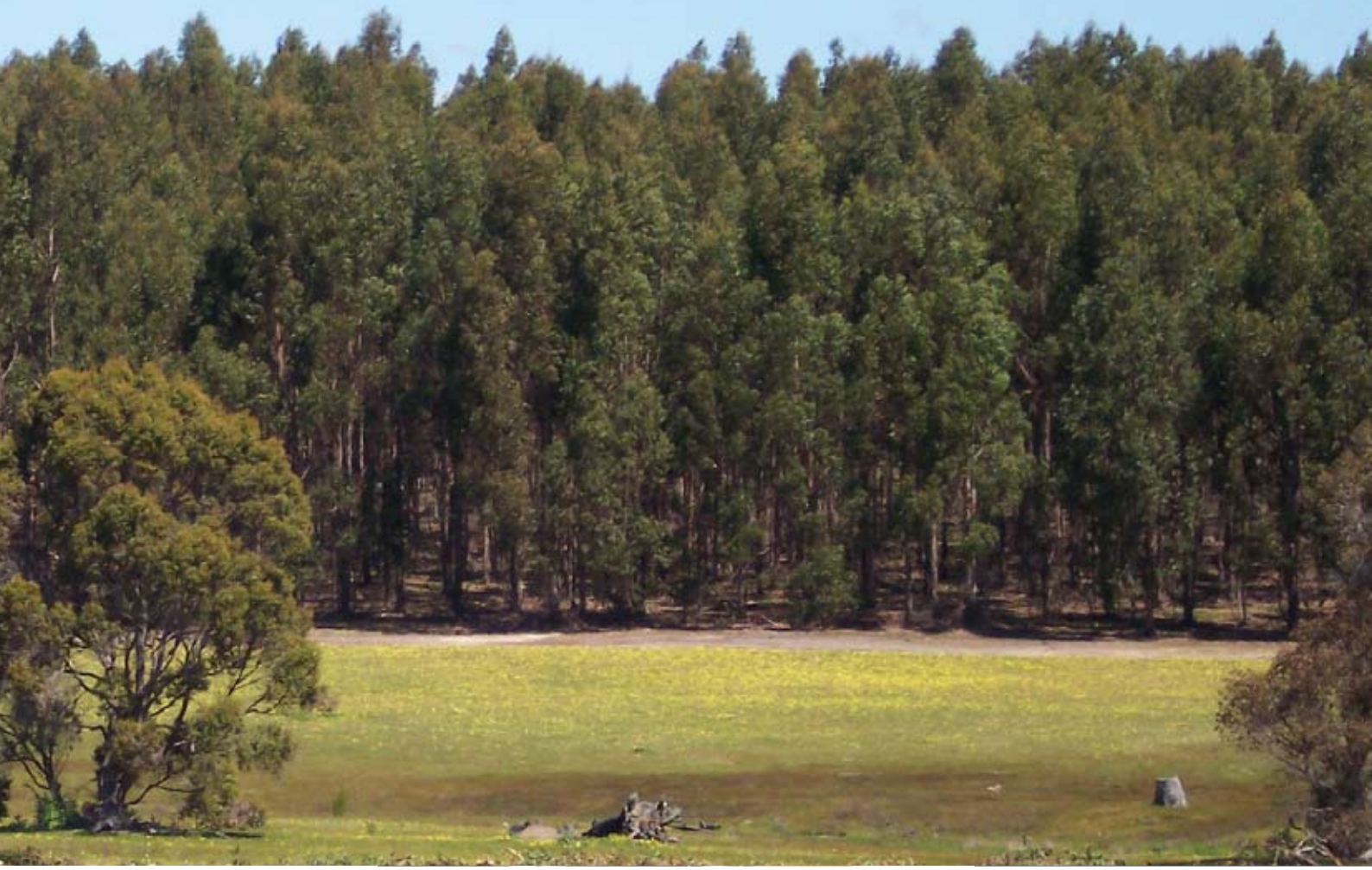
[9] The Greenhouse Gas Protocol Launch: Breakout Group Three - Sequestration: Forestry and Other Sinks http://www.smec.com.au/

The forest industries must play an active key role in Australia's efforts to mitigate climate change

Actively growing trees are natural carbon stores. In 2004, Australia's production forests and tree plantations are estimated to have absorbed around 43 million tonnes of CO_2 from the atmosphere.

This is a significant amount considering that Australia's emissions for 2006 were at 109% of 1990 emissions. That is, to assist in meeting its 108% Kyoto target, Australia must continue to look for low emission outcomes, establish tree plantations and continually actively manage native forests.

The industry is worth around $18 billion per year to the economy and employs around 137,000 people, mostly in rural and regional areas.



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