

Abatement incentives prior to the commencement of the Australian Emissions Trading Scheme: Comments

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Note

Before the November 2007 election, the Climate Change Group in the Department of Prime Minister and Cabinet invited comments on a discussion paper about the rules applying to abatement incentives before Australia's emissions trading scheme began. This submission was made in response to that paper.

The new government has confirmed that it will participate in the Garnaut Review, and presumably consideration of the proposed early abatement proposals will become part of that process. Separately, the Garnaut Review is inviting comments on a discussion paper on [Climate Change: Land use - Agriculture and forestry \(PDF, 137kb\)](#). The deadline for submissions is 18 January 2008.

Summary of recommendations

Emissions and uptake of CO₂ in living systems should not be treated as a side-issue in a system designed primarily to tackle fossil fuel emissions. Emissions from clearing native vegetation and native-forest logging are large, equivalent to 15--20% of Australia's total net emissions. Agricultural emissions are similar in scale. These sectors need attention in their own right to assess whether emissions trading will work. Failure to do so poses risks for the integrity and effectiveness of the emissions trading scheme. It may also lead to perverse outcomes such as biodiversity loss, higher emissions in non-covered sectors, and over-commitment of water in a drying climate.

Recommendation 1. The scope and role of Australia's emissions trading system with respect to each sector should be reviewed, especially for land-based sectors, with an explicit statement of the appropriateness of emissions trading for each sector and the quantity of abatement to be achieved by the scheme.

Recommendation 2. The consultation process for emissions trading should be expanded to include a broad range of expertise on land-based sectors, including scientists from a range of disciplines, NGOs and economists. One or more discussion forums would be useful.

Recommendation 3. *Conservation* should be explicitly recognised as a sector in the emissions trading system, Australia's greenhouse gas accounts and other climate programs.

Recommendation 4. Australian estimates of carbon stocks should be upgraded and reported, together with estimates of the potential carbon carrying capacity of land under different types of vegetation and management.

Recommendation 5. Much greater transparency is essential and more resources are needed to improve the reliability of the National Carbon Accounting System, especially for native forests and other biodiverse ecosystems with high carbon stores.

Recommendation 6. For all purposes other than NCAS, fuel combustion emission factors for wood, wood waste and biomass should be directly comparable with those for fossil fuels. This means incorporating all direct and indirect CO₂ emissions.

Recommendation 7. In NCAS, the treatment of fuelwood needs to be upgraded and made more transparent, along with other parts of the AFOLU accounts.

Recommendation 8. Before any decision about allowing carbon offsets for any form of wood production, the net greenhouse gas outcomes should be modelled using real data for the carbon stocks in different types of native forests and plantations. The data and results should be published for comment and discussion before proceeding.

Recommendation 9. MIS plantations should not be eligible to be carbon offset projects.

Recommendation 10. Early abatement from fuel switching to wood (or other biofuels) should be accredited only to the extent that that the new fuel reduces emissions compared with that previously used, having measured and accounted for all emissions from the new fuel (e.g. from the combusted wood as well as logging-induced on-site emissions). Recapture time should be taken into account. Native forest wood should be excluded altogether.

Recommendation 11. The activity of *Conservation* under the emissions trading scheme should apply to the management of land permanently dedicated for biodiversity and/or cultural purposes and jointly managed for carbon sequestration.

Recommendation 12. The role of native vegetation conservation in the emissions trading system should be reviewed and compared with other ways of conserving biodiverse carbon .

Recommendation 13. If offset credits are to be recognised for green carbon, *Greenhouse Friendly* criteria should be upgraded to reflect UNFCCC full-carbon accounting and fuel combustion emission factors should be made fully equivalent to fossil fuels for wood, waste wood and biomass.

Recommendation 14. Sectors or activities should not be able to earn credits unless they pay debits for emissions. With the exception of offset credits generated for conservation activities, only early action credits should be accredited under the emissions trading scheme. These should apply to activities that will be covered by the scheme within one to two years and which have been rigorously and scientifically assessed.

Recommendation 15. There should be an urgent evaluation of green carbon stocks and fluxes to identify the best methods for eliminating greenhouse gas emissions, promoting biosequestration and protecting biodiversity, water and ecosystem services.

1. Introduction

Australia's greenhouse gas emissions have to be reduced dramatically and quickly. While the focus has been on energy-related fossil fuel emissions, other sectors also produce significant emissions and must play their role in the emission reduction task. There has been a tendency to treat the land-based sectors as somewhat peripheral, mainly as a source of offset credits to make the cost of reducing fossil fuel emissions cheaper. In fact, Agriculture (88 Mt CO₂) and Land Use, Land-Use Change and Forestry (94 Mt CO₂) are major emission sources, with large contributions from native vegetation clearing and native forest logging. The importance of LULUCF emissions has been masked because Australia's National Carbon Accounting System (NCAS) presents net results instead of disaggregating emissions and uptake.

Major emission reductions can be achieved simply by protecting mature forests and stopping clearing of native forests, woodlands and savannas.

The reliance on 'carbon sink' plantations as an offset is misplaced – they essentially achieve a one-off increase in CO₂ storage proportionate to the average age of the plantation -- a few decades at most. The reported –21 Mt CO₂ uptake by post-1990 plantations gives a wrong impression of their importance. It is due to rapid expansion, driven by favourable tax treatment, and the fact that they are not yet being logged. Pre-1990 plantations are net greenhouse emitters.

Against this background, the parameters for early abatement are crucial. They will set the terms for the emissions trading scheme and the very large investment decisions which will flow from it. It is imperative that they not lead to perverse outcomes for Australia's greenhouse gas emissions and that they do not create incentives for detrimental impacts on other environmental values such as biodiversity and water.

This submission focuses on green carbon, especially in the forestry and conservation sectors, but should prompt a re- evaluation of emissions and uptake in all land-based sectors. It discusses definitions, reviews Australia's carbon accounting system, and outlines boundary issues between covered and uncovered sectors.

2. Green carbon

Unlike fossil fuel emissions, the 'green carbon' associated with living systems has the important characteristic of being able to be sequestered as well as emitted.¹ However, this does not make living systems neutral with respect to the atmosphere because sequestration takes time; as long as the CO₂ remains resident in the atmosphere, it is acting as a greenhouse gas, the same as if it had come from burning coal or oil. For an old growth forest,

¹ I use the following terminology:

Green carbon: emissions from with living systems.

Brown carbon: fossil fuel emissions

Biodiverse carbon: green carbon in vegetation with high biodiversity value (which generally will be associated with high CO₂ stocks)

the recapture time for part of the emissions induced by logging or clearing will be centuries. For a pulplog plantation, the recapture time is around 15 years; for an annual crop, it is 12 months. Time and space are to some degree interchangeable so that recapture time can be speeded up by replanting or regrowing an area large enough to compensate. However, it is far more efficient, in carbon, land and water terms, to protect the most dense existing stocks of carbon in old forests and woodlands.

For reasons set out in the following sections, it is not at all clear that emissions trading is the best way to achieve the vital emission reductions available from protecting mature forests and stopping clearing. It may also be that green carbon is not equivalent to fossil fuel emissions (brown carbon) and the two cannot be successfully combined in one scheme.

It is proposed that the emissions trading system should initially exclude the land-based sectors of *Agriculture*, *Forestry* and *Conservation* (collectively Agriculture, Forestry and Other Land Use, AFOLU, in the terminology of the Intergovernmental Panel on Climate Change, IPCC). *Agriculture* and *Forestry* are major generators of greenhouse gas emissions and have large sequestration capacity. *Conservation* is not identified as a sector, because it has few or no emissions; however it has an important role to play because of its very large sequestration capacity.

The integrity and effectiveness of the trading scheme will be subject to the rules governing the interaction between covered and uncovered sectors. As discussed later, there are risks of at least four kinds:

- The quantity of available abatement for uncovered activities may be very large relative to the emissions trading market, which would distort the market as a whole.
- Allowing offset credits to be created for some products within an industry, but not others, will alter relative prices and may cause overall emissions to increase, or at least not be reduced to the level expected.
- Products, such as biofuels, from uncovered AFOLU activities that are inputs to covered activities or sectors will gain a demand advantage, again leading to the potential for higher rather than reduced emissions.
- Omitting to identify conservation and cultural management as specific activities means that important sequestration opportunities may be missed.

The emissions trading scheme has to be designed to deal with these risks and issues from the beginning. It must be clearly demonstrable that it has the integrity and robustness to meet greenhouse gas reduction targets and that it will not adversely affect biodiversity, water and other ecosystem services. For this, a wider discussion than is likely to be generated by the current modes of consultation is needed.

Recommendation 1. The scope and role of Australia's emissions trading system with respect to each sector should be reviewed, especially for land-based sectors, with an explicit statement of the appropriateness of emissions trading for each sector and the quantity of abatement to be achieved by the scheme.

Recommendation 2. The consultation process for emissions trading should be expanded to include a broad range of expertise on land-based sectors, including scientists from a range of disciplines, NGOs and economists. One or more discussion forums would be useful.

3. Key concepts and definitions

The IPCC methodology for greenhouse gas accounting, the emission trading system and the National Greenhouse and Energy Reporting (NGER) framework use intersecting concepts. Unless these are clarified and consistently defined there is a risk of duplication, double counting or non-counting of emissions, and general confusion, especially in the land-based sectors.

IPCC uses a primary categorisation based on land use: forest, cropland, grassland, wetlands, settlements, other. These can be further subdivided on the basis of ecological classification, and/or 'activities'. Emissions and uptake on land managed for conservation or cultural purposes are included as 'human-induced' by the IPCC, but not in the Australian greenhouse gas accounts.

NGER is based on 'facilities', defined as 'an activity or series of activities' that involve the production of greenhouse gases and that form a single undertaking or enterprise.

The emissions trading system refers interchangeably to 'sector' and 'activity' and has the additional concept of a 'project', none of which terms are defined. In this framework, sectors and activities generate emissions (which is why they are part of the emissions trading scheme). Projects provide abatement.

It would be useful to have explicit definitions of sectors and activities which harmonise with the IPCC accounting methodology and the NGER reporting framework. With such an approach, 'sectors' would be broadly defined: agriculture, forestry and conservation. Activities would be subsets of these that have similar characteristics with respect to land-use, industry and CO₂ behaviour. The whole system has to be spatially explicit to mesh with the carbon accounts.

Even though it does not generate emissions, 'conservation' should be regarded as a sector in its own right. It should be defined as land permanently set aside for biodiversity conservation or Indigenous cultural management where CO₂ sequestration is a joint management objective. In the Australian context 'avoided deforestation' or 'avoided logging' should not qualify as conservation management unless the land is legally dedicated to conservation for at least 100 years.

While conservation land does not generate emissions, except through unpredictable events such as fire, frost or disease, it has large uptake potential and is a major store of CO₂. It will interact with the emissions trading system or other measures to reduce emissions as a generator of carbon credits and needs proper standards and accountability.

Recommendation 3. *Conservation* should be explicitly recognised as a sector in the emissions trading system, Australia’s greenhouse gas accounts and other climate programs.

Definitions under the Mandatory Renewable Energy Target scheme also need to be harmonised with the related programs. Specifically, the inclusion and definition of so-called ‘wood waste’ should be reviewed: the MRET definition is based on product value, not emissions measurement; and, by qualifying as ‘renewable’, wood fuel is assumed to have zero emissions when this is not the case.

4. Carbon accounting

The design of the emissions trading system will be strongly influenced by the accounting system, which underpins it. Lack of rigour, reliability or transparency in the accounts is likely to translate into a less effective trading system or even to create perverse outcomes.

Australia’s National Carbon Accounting System (NCAS) generally follows IPCC methodologies, and publishes both Kyoto and UNFCCC accounts.² Since post-Kyoto arrangements will soon be in force, the full-carbon UNFCCC accounts will almost certainly be the basis for future international commitments. This means that emissions and uptake on land whose use does not change will come into account. Internationally, the treatment of forest ‘degradation’ – that is CO₂ loss through logging, grazing and other activities – is under active discussion. In Australian native forests, degradation is a significant but under-reported source of emissions and the same may apply to other biodiverse ecosystems such as savannahs and shrublands.

Both the UNFCCC and Kyoto accounts are estimates of annual CO₂-e fluxes or stock changes; they do not systematically estimate the stocks themselves. This submission refers to Australia’s 2005 UNFCCC accounts, unless otherwise stated.

4.1 Carbon stocks

Although not reported in Australia’s greenhouse gas accounts, CO₂-e stocks have been estimated for forests and wood products (table 1). These figures need to be verified, especially for wood products and landfill, which are estimated from modelling. Real measurements of the current and potential carbon carrying capacity of native forests are urgently needed, both to improve emissions data and assess their potential for additional sequestration. The history of degradation through logging, grazing and other activities suggests the sequestration potential is high. Soil carbon stocks on cropping and grazing land are potentially very large and the sequestration potential from carbon conserving forms of agriculture is correspondingly significant.

² The main difference is that the Kyoto accounts only report emissions and uptake from land-use change, e.g. forests to grassland, or vice versa. The UNFCCC accounts are full-carbon accounts, so that emissions and uptake not associated with land-use change are also measured and reported.

Recommendation 4. Australian estimates of carbon stocks should be upgraded and reported, together with estimates of the potential carbon carrying capacity of land under different types of vegetation and management.

Table 1. Stocks (Mt CO₂)

Item	CO ₂ stocks	Million Ha	Comment
Native forests	38 350	162	Includes all native forests and all CO ₂ pools (biomass, soil carbon). 'Managed' native forests as reported in the NCAS accounts are those available for logging; they occupy around 15 million ha.
Plantations	322	1.6	Includes all CO ₂ pools (biomass, soil)
Wood products	347		These are modeling results. It seems unlikely that the quantity of CO ₂ stored by wood products and landfill is equivalent to 2.2% of all the CO ₂ in 162 million ha of native forests.
Landfill	504		

Source: BRS State of the Forests report 2003, and AGO publications.

4.2 Emissions and uptake

Forests, plantations and wood production are a significant part of Australia's greenhouse profile. According to NCAS, the *Land Use, Land-Use Change and Forestry* sector as a whole is marginally greenhouse positive with net uptake of -3 Mt CO₂ in 2005. In reality, large emissions in this sector are masked by an assumed -57 Mt pa CO₂ uptake by managed native forests and the fact that the area of plantations has expanded rapidly since 1990 but most are not yet being logged. Table 2 summarises the data and shows:

- The uptake of CO₂ by up to 150 million ha of forests not used for wood production is omitted from the accounts. Uptake by the 15 M ha of 'managed native forests' has never been measured and is just assumed to be -57 Mt CO₂ per annum.
- On-site emissions from native forest logging are severely under-reported because soil carbon is omitted and biomass volumes are under-estimated.
- Apart from 5 Mt CO₂ in durable wood products (which includes imports), and possibly some log waste reported as fuelwood consumption, between 24 and 29 Mt CO₂ in logs is not accounted for in this section of the accounts.
- The bulk of native forest wood is exported as woodchips and its embodied CO₂ is excluded from the accounts.
- Pre-1990 plantations (mostly softwood) are net greenhouse negative (2 Mt CO₂ of emissions on-site plus emissions of up to 17 Mt CO₂ from the logs themselves). In other words, the current rate of logging exceeds the rate of CO₂ uptake for the plantation estate as a whole.
- Post-1990 plantations are currently greenhouse positive largely because they are not yet being logged (total uptake in 2005 was -21 Mt CO₂ from about 800 000 ha of plantations established since 1990). Whether the post-1990 plantation estate as a whole continues to be net greenhouse-positive depends on the logging rate and the rate of expansion.

The composition and presentation of the NCAS forestry accounts lacks transparency and for native forests lacks rigour.³ Other parts of the LULUCF accounting framework display similar issues. For example, in the Agriculture sector, changes in soil carbon are not measured, the assumption being that they remain constant under cropland or grassland.

Recommendation 5. Much greater transparency is essential and more resources are needed to improve the reliability of the National Carbon Accounting System, especially for native forests and other biodiverse ecosystems with high carbon stores.

4.3 Recapture time

Time is critically important but not represented at all in the accounts. Emissions that are effectively permanent are treated in the same way as emissions which will be rapidly recaptured. The concept of recapture time, the time taken to recapture all emitted carbon, may provide a means of weighting emissions from different sources according to how long they will be adding to greenhouse gas concentrations in the atmosphere.⁴

4.4 CO₂ storage efficiency

Plantations are not very efficient carbon stores. An average hardwood pulplog plantation with an MAI of 18 m³ pa would sequester 610 t CO₂ per hectare over a standard 15 year rotation.⁵ By comparison 300 year old *Eucalyptus regnans* forest sequesters an average 4400 t CO₂ per hectare. To store that quantity of CO₂ in log production plantations would require seven times the land area to be maintained at an average age of 15 years or 14 times the land area at an average age of 7.5 years. Because the plantations are constantly in an active growing phase, they consume large amounts of water. In effect water is being exchanged for carbon.

Wood products, also, are not efficient carbon stores. In round terms, for a given volume of logs (native forest and plantation combined), 20% of the CO₂ is quickly lost through burning and decay; 55% contributes to a net increase in landfill; and only 25% contributes to the durable wood products pool. If on-site emissions are included in the calculation, the durable wood products proportion for plantations is about 12% of total CO₂ emissions; and for native forests it is less than 5%.⁶

Another factor, which needs to be taken into account, is wood density. Native forest wood is significantly denser than softwoods or plantation hardwoods: 630+ kg/m³ compared with 440 kg/m³ for softwood plantations and 550 kg/m³ for hardwood plantations. Products, which use native forest wood when plantation wood can do the job, are more carbon intensive than they need to be

³ Blakers 2007, *Working Paper 1*, www.greeninstitute.com.au

⁴ Blakers 2007, *Working Paper 2*, www.greeninstitute.com.au

⁵ MAI 18 m³ per ha pa, rotation 15 years = 270 m³ per ha pulplogs. Using the IPCC default expansion factor of 0.9, total biomass is 513 m³ = 166 t C (611 Mt CO₂)

⁶ Blakers 2007, *Working Paper 2*, www.greeninstitute.com.au

4.5. Fuel combustion emission factors

The AGO publishes fuel combustion emission factors, which are used as a standard by *Greenhouse Friendly*⁷ and appear likely to be used by NGER. Under the IPCC accounting guidelines, CO₂ emissions for wood and wood waste are not included in the energy sector, because they are supposed to be accounted for in the land-use accounts. This accounting treatment has been carried over to the AGO fuel combustion emission factors.

This creates two issues. Firstly, there is a question as to whether the CO₂ emissions from fuelwood are fully accounted for in NCAS. Fuelwood is not included in the ABARE wood and wood product statistics, which are used to derive on-site, logging emissions, so upstream emissions from fuelwood logging are not specifically calculated (but may be partially dealt with to the extent that fuelwood is a by-product of wood production or clearing). The caveats about the reliability of emission factors for native forest logging apply.

Secondly, for projects or facilities using the AGO fuel combustion emission factors, emissions from wood and biomass combustion are not treated comparably with emissions from fossil fuels. Direct CO₂ emissions from combustion are excluded, as are indirect or upstream emissions. This is a major distortion, especially for native forest wood.

The use of fuelwood to produce industrial energy is a relatively minor activity at present, but there are major plans for it to grow.⁸ Higher MRET targets will drive this if wood remains classed as a 'renewable' energy source; and by emissions trading and *Greenhouse Friendly* if wood remains classed as a zero- CO₂ emissions fuel.

Recommendation 6. For all purposes other than NCAS, fuel combustion emission factors for wood, wood waste and biomass should be directly comparable with those for fossil fuels. This means incorporating all direct and indirect CO₂ emissions.

Recommendation 7. In NCAS, the treatment of fuelwood needs to be upgraded and made more transparent, along with other parts of the AFOLU accounts.

5. Boundary issues between covered and uncovered sectors in the emissions trading system

5.1 Quantity of abatement

The quantity and price of green carbon relative to the domestic emissions trading market are crucial to the effectiveness of the scheme. Emissions from the *Energy* and *Industrial Processes* sectors, which will be the backbone of the scheme, totalled 420 Mt CO₂ in 2005. For comparison, net emissions from excluded sectors were

- *LULUCF*: -3 Mt CO₂

⁷ *Greenhouse Friendly* guidelines, p.30

⁸ See for example NAFI's 10 point plan for *Promoting Growth in the Forest Industry*, October 2007

- *Agriculture*: 88 Mt CO₂
- *Waste*: 17 Mt CO₂

Green carbon abatement can come from avoiding emissions or increasing sequestration. To get an idea of the potential quantities, we know that in recent years:

- Deforestation resulted in avoidable emissions of at least 56 Mt CO₂ per annum;⁹
- Native forest logging resulted in avoidable emissions of around 38 Mt CO₂ per annum;¹⁰
- Avoidable emissions of soil carbon have not been estimated and are not included in the accounts but are likely to be large.
- Avoidable emissions from clearing and degradation in non-forest ecosystems are not measured and may also be large.
- The quantity of available biosequestration from native vegetation is likely to be large, taking into account that many native forests have previously been logged or otherwise degraded;¹¹
- There is significant abatement potential from improving agricultural practices and better waste management.

Much of this abatement will be cheap relative to the cost of reducing fossil fuel emissions so, if offset credits are allowed from these sources, it may reduce the imperative to deal with fossil fuel emissions (in much the same way that Australia has relied on reduced clearing rates to come within striking distance of its Kyoto target). It may also make it more difficult to deal comprehensively with green carbon emissions because the abatement price will have been set by the fossil fuel sector which can afford to pay higher prices.

5.2 Industry consistency

Similar products in the market should be treated equivalently by the emissions trading system or there is a risk of perverse outcomes. Wood products are largely substitutable between native forests and plantations, indeed plantations already supply the bulk of Australia's sawntimber, but they are proposed to be treated differently by the emissions trading scheme depending on their source. Three sources are recognised by the national carbon accounts:

- native forests;
- pre-1990 plantations;
- post-1990 plantations on land that was cleared before 1990.¹²

Current *Greenhouse Friendly* guidelines stipulate that 'forest sink' projects have to be post-1990 plantations (or revegetation) and must be 'beyond' business as usual, generally

⁹ Forests converted to pasture, net emissions of 56 Mt CO₂ (this includes an unknown quantity of uptake by regrowth on land that was cleared since 1990).

¹⁰ Blakers, 2007, *Working Paper 2*, greeninstitute.com.au

¹¹ Measurements in a forest in south-eastern NSW suggested that it was carrying only 60% of its potential carbon carrying capacity.

¹² Biodiverse plantings are also included here but currently comprise only a tiny fraction of plantings

associated with an investment or behaviour change that would not normally be undertaken. There are broadly two categories of project that would meet this definition:

- deferred logging: existing plantations grown beyond their previously planned rotation length;
- uneconomic sites: plantations established on land that would otherwise be uneconomic for wood production, such as low rainfall areas.

a) Deferred logging. If logging is deferred, offset credits could be generated for additional CO₂ sequestered beyond the normal pulplog rotation. The deferred wood production could be replaced in the market by native forest logs (this is precisely what is planned for Tasmania's public native forests¹³). For a given merchantable wood volume, native forest emissions are several times greater than those from plantations. This is for two reasons:

- Merchantable log volume is the basis for calculating logging-induced emissions. In native forests the log volume is generally a much smaller proportion of total above-ground biomass than in plantations (in one measured coupe in Tasmania, actual log volume was four times greater than the recorded volume of saleable logs, meaning greenhouse gas emissions would be proportionately under-estimated).
- Losses of soil carbon are not included in measures of logging-induced emissions but may be substantial.

The older and more productive the native forest, the more severe these effects. If native forest logs replace plantation logs, there is a real risk that total emissions from wood production would rise, not fall.

Recommendation 8. Before any decision about allowing carbon offsets for any form of wood production, the net greenhouse gas outcomes should be modelled using real data for the carbon stocks in different types of native forests and plantations. The data and results should be published for comment and discussion before proceeding.

b) Uneconomic sites. On uneconomic sites, such as in low rainfall zones, the choice for carbon offset projects is between plantations for wood production or revegetation into native woodland or forest. *Greenhouse Friendly* has advised that plantations established on such sites (or anywhere) under Managed Investment Schemes (MIS) can also be approved carbon sink projects. The 100% tax deduction for MIS schemes means that, financially, plantations will win overwhelmingly. It is also generally cheaper up-front to put in a plantation than to re-establish native vegetation, even though in the long term the native vegetation will be sustainable.

To the extent that the preferential treatment of plantations compared with native vegetation for carbon offsets encourages more land to be put under plantations, detrimental environmental impacts are likely. These include:

- Water use. Committing land to plantations on a pooled basis for wood production and carbon sequestration means that large volumes of scarce water have also been committed to maintain the trees continuously in a rapid-growing phase for 70+ years.

¹³ Forestry Tasmania, 2007, *Sustainable High Quality Eucalypt Sawlog Supply – Review 3*, www.forestrytas.com.au

- Biodiversity. Plantations are crops. Their contribution to biodiversity conservation is negligible compared with the opportunity to sequester carbon in natural vegetation.
- Sustainability. Plantations require continuous intensive management, including water, chemical and fertiliser use over the 70-100 year commitment period. Native vegetation, once established, will be largely self-sustaining, especially if it is part of a regional biolink or similar.

Recommendation 9. MIS plantations should not be eligible to be carbon offset projects.

5.3 Fuel switching

Products from an uncovered sector, which are inputs to a covered sector, will have an advantage because they have no emissions cost built in.

Sixteen power stations are already registered to generate electricity from so-called ‘wood waste’ under MRET. With the advent of emissions trading and increase in MRET targets, demand for renewable electricity will increase and fuel switching to lower emission fuels would appear to qualify as an early abatement measure.

Wood may under some circumstances be a lower emission fuel. But, to determine this, it would be necessary to measure all emissions: logging-induced on-site emissions in the forest or plantation as well as all emissions (including CO₂) from the combusted wood. For plantation fuelwood, on-site emissions are almost as great as those from the combusted wood itself. For native forest wood, logging-induced on-site emissions will be several times those from the combusted wood for the reasons in 5.2 above.

The net result of fuel switching for electricity generation may be increased greenhouse gas emissions, especially for wood sourced from native forests. A recent review concludes that growing and restoring forests is a better choice than switching to biofuels for carbon mitigation.¹⁴

Recommendation 10. Early abatement from fuel switching to wood (or other biofuels) should be accredited only to the extent that that the new fuel reduces emissions compared with that previously used, having measured and accounted for all emissions from the new fuel (e.g. from the combusted wood as well as logging-induced on-site emissions). Recapture time should be taken into account. Native forest wood should be excluded altogether.

5.4 Conservation abatement

Conservation should be defined as an activity where land is permanently dedicated for carbon storage as well as biodiversity and/or cultural protection. This in fact is the only genuine carbon offset because it comes from a sector which does not generate emissions and is additional, permanent, measurable and verifiable.

¹⁴ Righelato, R and Spracklen, D V, 2007, *Carbon mitigation by biofuels or by saving and restoring forests?* Science 317:902.

There is large abatement potential from allowing existing forests to grow to maturity, changing management practices (e.g. savannah burning), and to a lesser extent from restoring native vegetation. The availability of abatement from these sources as part of the emissions trading system presents risks of distorting the market. However, funding is needed to maintain and restore native vegetation for carbon storage and other ecosystem services. One option to consider is differentiating between restoration, which would attract full offset credits, and management, which might attract partial credits reflecting the lower costs of maintenance. A simpler option is to recognise the immense value of existing biodiverse carbon stores, protect them and pay to maintain them in good condition.

Recommendation 11. The activity of *Conservation* under the emissions trading scheme should apply to the management of land permanently dedicated for biodiversity and/or cultural purposes and jointly managed for carbon sequestration.

Recommendation 12. The role of native vegetation conservation in the emissions trading system should be reviewed and compared with other ways of conserving biodiverse carbon .

5.5 *Greenhouse Friendly*

Greenhouse Friendly's current criteria appear to be based on Kyoto accounting rules. Thus, subject to other criteria, they allow offset credits to be generated by:

- avoided deforestation;
- new plantations on land cleared before 1990;
- growing post-1990 plantations longer.

They do not recognise non-Kyoto activities such as avoided logging, biosequestration and conservation of soil carbon despite the fact that these are real opportunities for reducing emissions.

Recommendation 13. If offset credits are to be recognised for green carbon, *Greenhouse Friendly* criteria should be upgraded to reflect UNFCCC full-carbon accounting and fuel combustion emission factors should be made fully equivalent to fossil fuels for wood, waste wood and biomass.

6. Offset credits

The boundary issues between covered and uncovered sectors mean offset credits run a high risk of distorting the effectiveness of the entire emissions trading scheme. The simplest and safest approach is to restrict offset credits to what are essentially early abatement projects – that is, to permit abatement only from sectors or activities that have a defined timetable for entry into the emissions trading scheme. In other words, no credits without debits. Before entering the scheme, sectors or activities should be subject to rigorous scientific assessment, measurement issues should be resolved, and there should be a reliable assessment of the quantity of emissions and available abatement.

Even with this approach, there will be major questions to address about the equivalence of green carbon with fossil fuel emissions. These relate to the quantity of green carbon, the time dimension of emissions and uptake, and the abatement costs compared with those for fossil fuel emissions. If green and brown carbon are not truly equivalent, the scheme will not deliver its expected outcomes.

It is essential to reduce green carbon emissions and increase sequestration as part of an overall climate crisis strategy. However, it may be that emissions trading is not the best solution. Living systems are complex and inter-dependent. Splitting them into separate markets for carbon and water, and potentially other values, risks perverse outcomes. It completely misses the critical role of biodiversity in mediating ecosystem services at all scales from local to global.

Recommendation 14. Sectors or activities should not be able to earn credits unless they pay debits for emissions. With the exception of offset credits generated for conservation activities, only early action credits should be accredited under the emissions trading scheme. These should apply to activities that will be covered by the scheme within one to two years and which have been rigorously and scientifically assessed.

Recommendation 15. There should be an urgent evaluation of green carbon stocks and fluxes to identify the best methods for eliminating greenhouse gas emissions, promoting biosequestration and protecting biodiversity, water and ecosystem services.

Table 2. Land use, land-use change and forestry (LULUCF)
UNFCCC accounts 2005 (www.greenhouse.gov.au): LULUCF net emissions –3 Mt CO₂

Item	Net Mt CO ₂	Uptake Mt CO ₂	Emissions Mt CO ₂	Under- estimate	Omitted	Notes
Conservation forests (147 M ha approx)					Omitted	Uptake by forests in conservation reserves is not included in the accounts although the IPCC defines 'conservation' as a human activity (which therefore results in 'human-induced' emissions and uptake)
Soil carbon					Omitted	This is a significant omission for native forests; soil carbon can be as much as 50% of the total
Managed native forest (15 M ha)						'Managed native forests' are those available for logging
• On-site	-43	-57	14	Yes		The uptake of -57 Mt CO ₂ per annum is an estimate which has remained unchanged since 1990. Emissions of 14 Mt CO ₂ are a gross underestimate for native forests because they don't include soil carbon or the large quantities of wood waste on-site.
• Logs					12	The bulk of native forest wood is exported as woodchips and completely excluded from the accounts.
Plantations pre-1990						
• On-site (net)	2		2			Pre 1990 plantations are mostly softwood for sawntimber. On-site logging emissions exceed growth.
• Logs					17	Some of this log volume is accounted for in the 'wood products' item below and possibly in the fuelwood consumption component. The remainder is short term products or waste.
Plantations, 1990 +						Post 1990 plantations are mostly short rotation hardwood pulp plantations.
• On-site (net)	-21	-21				With a rotation of about 15 years, very little logging is included in this figure. Unless the area of plantations continues to expand, the uptake from these plantations will eventually be more than offset by the rate of logging, as for the pre-1990 plantations.
• Logs						Assumed to be virtually none as yet.

Item (continued)	Net Mt CO2	Uptake Mt CO2	Emissions Mt CO2	Under- estimate	Omitted	Notes
Burning (wildfire, prescribed burning)	1		1			This figures has varied up to about 5 Mt CO2; it is not large relative to on-site emissions from logging
Fuelwood consumption	10		10			From ABARE data, presumably historic fuel consumption (energy statistics, table G, although the figures do not match properly). Fuelwood is not reported as a 'wood product' by ABARE so on-site emissions are not counted. The fuelwood consumption measured here presumably includes a combination of waste from log processing and wood harvested specifically for energy production.
Clearing (on-site, net)	53		53			Clearing native forest and woodlands for pasture and crops. This is a net figure offsetting regrowth on previously cleared land against new clearing. Reduced rates of clearing are the primary reason why Australia will come close to reaching its Kyoto target
Wood products (incl. Imports)	-5	-5				This is the estimated increase in carbon stored in durable wood products from both domestically produced and imported wood products
Burning and decay					Omitted	About 20% of CO2 in the logs is released through burning or decay of processing waste
Landfill					Omitted	About 55% of CO2 in the logs goes to landfill. Much effort is being expended to show that landfill 'stores' carbon rather than releasing it through burning and decay.
Exports					Omitted	Native forest and plantation woodchips and logs which are exported are excluded from the accounts
TOTAL	-3	-83	80	??	29++	

Notes

1. The dark grey-shaded column presents net emissions as reported in Australia's National Greenhouse Gas Accounts on-line (www.greenhouse.gov.au). The pale grey columns break down the net figures into emissions and uptake where possible.
2. Negative numbers are uptake; positive numbers are emissions.