

Australian Forests and Climate Alliance

Submission to Australia's Review of Climate Change Policy, May 2017

Section 1: Australia's Paris Agreement Target

Question 1. What factors should be considered in the process of Australia's consideration of a commitment to long-term emissions reduction goal for Australia beyond 2030?

As GHG emission impact compounds exponentially with emission increase, Australia should factor into its long-term emissions reduction goal any mechanism by which emissions can be **immediately** halted, as well as **promote ongoing and increasing emissions reduction and sequestration benefit**. Ending any further logging or clearing of native forest ecosystems is a major factor that should be not only considered, but immediately adopted. We will address this again under LULUCF, making more points about the significance of this factor to our long-term emissions reduction goal.

Rationale: Global deforestation has resulted in about a third of total anthropogenic CO₂ emissions since 1850 (Bagley 2011).¹ Industrialised logging and/or clearing of native forest ecosystems emits large pulses of carbon dioxide to the atmosphere. Clearing instantly releases carbon formerly stored as tree and soil biomass as the cleared biomass is burned or decomposed. There's a double loss as the land area no longer sequesters carbon at the former rate. As with clearing, industrial logging, the cause of most forest degradation, involves post log burning and massive disruption of soil structure and therefore less long-term carbon retention. **In addition to this, forests are now being deliberately targeted for logging for burning - with and without fossil fuels – as a pseudo renewable energy source.**

The definition of 'forest degradation' by the Food and Agricultural Organisation is: A net annual decrease of carbon stock density in land remaining forested.² Forest degradation includes the impacts of any land-use activity that reduces the carbon stock and/or ecosystem services of a forest relative to its natural carbon carrying capacity. Deforestation is the extreme end of a continuum of degradation. One cannot refer to the impact of deforestation on carbon emissions without taking into account also the rapid rise in emissions from forest degradation. Emissions from forest degradation as opposed to deforestation have, in the last five years, roughly doubled from what they were in the previous decade.³ With the increase in the extent and intensity of industrial logging across this continent Australia is a major contributor to this recent rise in emissions from forest degradation as well as a significant contributor by means of being one of 11 'hotspots' of global deforestation.⁴

As Australia's land clearing rate is now amongst the highest in the world, and its native forests are being systematically clear felled and biological sterilised owing to the inadequacy of regulatory systems under regional forest agreements, it's critical that Australian Climate Change Policy acknowledges, and undertakes to immediately halt, Australia's contribution to the globally escalating emissions from LULUCF. As this is something that can be done immediately and is in the power of the federal government to effect, by simple measures (explained in LULUCF section) ending native forest logging and clearing needs adoption as a top priority factor, a core strategy. It should not be relegated as it so often seems to be, as a less significant or less urgent action, as if an afterthought and/or part of programmes developed to placate a sea of voices calling for 'compensation' or 'grants' when it is finally taken into consideration. It should be at the forefront of any review into climate change policy. Australian scientists are of this opinion: From their joint statement June 2016:

¹ Bagley, J.E. (2011) Impacts of land cover change: energy regulation, breadbasket production, and precipitation. Phd., Atmospheric and Oceanic Sciences, University of Wisconsin-Madison.

² <http://www.fao.org/docrep/009/j9345e/j9345e07.htm>

³ From an average of 0.4 Gt CO₂ yr⁻¹ in the period 1991–2000 to an average of 1.0 Gt CO₂ yr⁻¹ for 2011–2015 Ibid, <http://www.fao.org/docrep/009/j9345e/j9345e07.htm>

⁴ World Wildlife Fund Living Forests Report, Chapter 5: Where deforestation most likely http://awsassets.panda.org/downloads/lfr_chapter_5_executive_summary_final.pdf

*'Forest and woodland destruction is the fastest-growing contributor to Australia's carbon emissions' and 'Australia's increasing forest and woodland destruction threatens its ability to meet its commitments under four major international treaties: the Convention on Biological Diversity, the World Heritage Convention, the Convention to Combat Desertification, and the Framework Convention on Climate Change.'*⁵

The first of the urgent solutions proposed is: *'Develop and implement a strategy to end net loss of native vegetation, and restore over-cleared landscapes.'*⁶

Factors driving emissions from deforestation and forest degradation:

The international wood biomass energy trade: Internationally industrial logging is on the increase driven by demand for supply of the international wood biomass energy/fuel trade, a factor acknowledged to be on a comparable scale with global population increase. The relatively recent perversion of 'psuedo' climate change science that is now widespread policy, is the fallacious regard of wood biomass combustion as a 'carbon neutral' activity. Though increasingly discredited, and with consensus of the world's most respected scientists that it is dangerous policy,⁷ it has been adopted by many national governments (including the Australian Coalition government) as a means by which proportionate growth of the 'renewable' energy sector can be claimed. This is despite the fact that it merely replaces fossil fuel combustion with an even more dangerous fuel.

It is dangerous in that:

- it emits an immediate pulse of CO₂ to the atmosphere along with multiple other toxic gases and particulates.
- it extenuates the fossil fuel industry through the subsidization of the wood component of operations as 'carbon neutral' and it accelerates destruction of terrestrial carbon sink/storage capacity (forest ecosystems, carbon storage in trees, root systems, soils and soil microbial processes).
- powerful commercial interests influencing global and thus national climate change policies are involved in propaganda to keep pressure on governments to continue logging and clearing to ensure supply to the international biomass trade involved in carbon subsidy rorting and fossil fuel extension.
- 'psuedo' science purveyed re the 'carbon neutrality' of burning wood biomass confuses the public which understandably becomes sceptical of anything proposed by governments. To see burning forests subsidised as a climate impact mitigation tool can only increase public disengagement and/or cynicism and result in a justifiable reluctance to take personal responsibility for the issue and/or to make personal sacrifices that otherwise would assist

Among innumerable scientific articles/reports providing evidence that the wood biomass energy/fuel trade presents a major climate change threat through the twin mechanisms of immediate release of carbon into the atmosphere from combustion and destruction of extant native forests (Appendix 1) is the recent report by respected independent think tank Chatham House, the Royal Institute of International Affairs,⁸ which states:

- The assumption that forest biomass should be considered carbon neutral is wrong

⁵ Scientists' Declaration: Accelerating Forest, Woodland and Grassland Destruction in Australia.'

<http://scoceania.org/policystatements/landclearing/>

⁶ Ibid.

⁷ Refer to Appendix 1 and also attached letters from concerned scientists in relation to the RET (2012) and the review into the Australian RET (2015)

⁸ <https://www.chathamhouse.org/publication/woody-biomass-power-and-heat-impacts-global-climate>

- The carbon released into the atmosphere from logging and combustion of forest biomass for energy can be three times higher than using fossil fuels and take centuries for new tree growth to absorb .
- It is not valid to claim that because trees absorb carbon as they grow, emissions from burning them can be ignored
- Urgent changes are needed to address serious gaps in emissions accounting for land use at the international level, and failing that the full emissions generated by burning wood in power stations should be taken into account in the energy sector, as with other forms of energy

Please refer to Appendix 1 for a comprehensive list of peer reviewed science modelling or monitoring of wood biomass impact published by the US based 'Biomass Monitor' and to the Australian scientists' letters to governments and politicians (attached).

Despite science unequivocally refuting the carbon neutrality of wood biomass combustion, governments have embraced the false emissions reduction accounting of wood biomass by which the claim is made that to increase percentage of energy produced by wood combustion (with or without coal) and calling it renewable is to imply a proportional decrease in emissions generated from fossil fuel. This is not a reality but an argument fabricated from the fact that trees regrow whatever one does with them is therefore 'renewable' and thus 'carbon neutral'. That massive emissions ensue from the combustion process is ignored. Meanwhile, globally just as much, if not more, CO₂ is entering the atmosphere with the fossil fuel, native forest logging and heavy machinery industries benefiting from ongoing subsidies directed to the wood/coal mix (and other such dangerous innovations), perpetuating the destruction of the world's best land-based carbon sink - its forests.

The 'wood biomass as a renewable' fallacy is as damaging to climate change action as was the decades long pseudo-scientific debate that current catastrophic global warming isn't of anthropologic origin. It can't be over-stated that this is an international ecological crime, not just against humanity but against all living things, the very survival of which it is threatening.

Emissions impact from land clearing and forest degradation is further compounded by the subsequent total loss of, or reduction in, the potential carbon carrying capacity of forests with forests having been either 'annihilated' or 'degraded', by clearing and logging. Not until such forests re-grow to maturity is their original sequestration and storage potential restored, a process which can take up to hundreds of years. Each logging and clearing event wipes out decades, even centuries, of otherwise effective sequestration and storage. Some Australian eucalypt forest systems don't reach their maximum carbon storage capacity until the trees within them are 400 – 600 hundred years old, and some of these Australian forest ecosystems can store more carbon per hectare for a lot longer than equatorial rainforests.⁹ Though it is possible to enhance recovery via forest restoration it is obviously best not to log or clear or permit degradation of the carbon carrying capacity of forest ecosystems in the first instance. This includes not indulging in such vandalising activities as 'mechanical fuel load reduction' in forests for bushfire mitigation, a scientifically unsound practice currently being promoted by the native forest logging industry as a 'thin end of wedge' means of getting access (for logging) into areas of Australia at present 'out of bounds'. National trials and workshops are now being conducted on this with \$1.5 million of federal funds having been directed for this pursuit.

With every year that the Australian native forests are permitted to recover from logging they grow toward re-attainment of their maximum carbon carrying capacity, with exponential increase in the quantity of carbon they can absorb and store. Logically therefore, Australia can reduce both immediate and long-term emissions by an immediate cessation of industrial logging and broad-scale clearing of the nation's native forest carbon sequestration/storage ecosystems. This, followed by the long-term ongoing restoration of

⁹ <http://www.theaustralian.com.au/archive/news/mountain-ash-tops-for-carbon-storage/news-story/be98b95c7ffb92adcc8de1789de8d7e1>

Australian native forest ecosystems, should be one of cornerstones of Australian Climate Policy and a strategy by which Australia can achieve any long-term emissions reduction goal.

Question 3: What are the issues in the transition to a lower emissions economy with respect to jobs, investment, trade competitiveness, households (including low income and vulnerable households) and regional Australia?

The economic benefits of ceasing land clearing and industrialised logging as part of the transition to a lower emissions economy are enormous. Multiple factors contribute to this argument but **the most easily quantified** is the extent to which the native forest logging industry is heavily subsidised without concomitant benefit in any sphere. Jobs are few as the industry is heavily mechanized. **State forest agency losses in all states are subsidised with absolutely no proportional comparative benefit to local, state or national economic accounts.** The industry runs at a loss. The story across Australia is the same. The nation's inherently valuable public asset, its native forests, are being destroyed for profit to (frequently overseas) companies at a loss to the taxpayer.

Direct economic loss from industrial logging of native forests:

State forest agencies report losses of millions of dollars annually from the native forest logging sector.¹⁰ When added to other direct monetary subsidies, one could argue a minimum direct cost (loss) to taxpayers of at least \$100 million dollars annually.

Indirect costs (economic loss) of industrial logging of native forests

- Loss to taxpayers/ratepayers from the damage of heavy industrial logging machinery and trucking of native forest wood product along local, state and national roads
- One-off 'bail out' federal grants (which occur frequently) and which in the case of Tasmania have been as much as \$100 million dollars at a time
- Taxpayer dollars squandered on pay-outs to multinationals for 'failure to supply' contracted quantities of the dwindling native forest resource, e.g. multimillions to BORAL in relation to a timber supply agreement in NSW developed under the current NSW Regional Forest Agreements.
- Subsidies that flow to the native forest logging sector routinely from industry programmes (formerly via federal DAFF and other agency funding for 'upgrades') now also include funds via multiple federal climate change fund programmes available to the logging industry from roting the

¹⁰ Economic estimates of forest losses in native forests managed by state forest agencies across Australia with sources **NSW:** 2009-2002, Forests NSW's (now the Forests Corporation of NSW) total net loss before tax (excluding net fair value adjustment, asset revaluation and impairment of assets) was AU\$85 million (AU\$21 million per annum). The Australia Institute, Technical Brief No.21, The Australian native forest sector: causes of the decline and prospects for the future, April 2013, Andrew Macintosh

WA: Losses over 4 years 2012-6 \$34 million: The Australia Institute, *Barking up the wrong trees, WA's Forest Products Commission (FPC) and the performance of its native forestry*, Discussion Paper, Tom Swann and Bill Browne, October 2016

Victoria: In a submission to the Victorian Cabinet it was admitted that \$5.5M per annum was lost by the native forest logging industry (after the distribution of corporate overheads) ([VicForests 2013](#)). As of 2012 VicForests had posted losses totalling \$10.9M for two consecutive years.

Tasmania: Forestry Tasmania (the agency responsible for public native forests in Tasmania) recorded a net loss before tax and other items of AU\$64 million over the period 2009-2012 (or AU\$16 million per annum).

Also, as at 2012 Forestry Tasmania's financial performance was summarised with four facts:

In the previous six years it received \$100 million in subsidies from the federal government

In the previous four years it had lost an average of \$100 million per year

It had an unfunded superannuation liability of well over \$100 million

The Tasmanian government recently promised to prop it up with an additional \$100 million subsidy.

<https://www.crikey.com.au/2012/08/21/tasmanias-forestry-sector-akin-to-work-for-the-dole/>

Most recent informed statistic of average Tasmanian native forest logging sector loss is \$16 p.a. (pers comm, CEO Markets for Change Australia Monday 4th May 2017)

'renewable' energy sector in the wake of government legislation deeming burning native forest biomass to be 'carbon neutral' .

Other as yet unquantified costs of logging and clearing native forest ecosystems

Massive environmental (and economic) costs are incurred through damage to biodiversity, water resources, micro and macro climate regulation, soils, and weed proliferation, all known and studied impacts of clearing and logging native forest ecosystem. To continue these practices guarantees not only a continuation but an increase in the massive national environmental and economic loss that is being incurred because the impacts are cumulative.

Money saved by no longer subsidizing native forest logging can be immediately invested into genuine renewable energy technologies and/or rural regional renewal strategies. The latter might include 'transitioning' former 'supposedly' logging income-reliant communities into communities employed in profit generating industries e.g. industrial hemp (IH) for the production of fibre, green building materials, raw material for hemp/nano-technological production of new substances now employed in manufacturing. Domestic demand for Australian industrial hemp currently outstrips supply. International demand is sufficiently strong that countries which only fairly recently unblocked regulatory barriers to production are exporting increasingly large quantities. It would seem to make sense to re-direct subsidies (though this is not necessarily required) from the loss-making and job-poor native forest logging sector into the development of agricultural centres growing raw materials in high demand by industry, the production of which is environmentally benign. IH, for example, can be grown in many areas of all states, isn't herbicide or pesticide reliant, requires far less water than comparable crops, achieves up to four growing cycles per annum dependent on location and transforms under-utilised cleared land into a highly effective carbon sink. As a component of 'green' building materials IH (unlike wood) continues to sequester atmospheric carbon in a long-term 'curing' phase (post construction). Transitioning to crops that increase the profitability of sometimes marginal (and already cleared) land and which are 'inherently environmentally benign, is economically more rational than pursuing a subsidy tradition to an increasingly mechanized native forest logging sector that can only guarantee maximum environmental destruction, ongoing resource depletion, minimal jobs and no profit. Renewal of regional economies by desisting from native forest logging and encouraging transition to this more worthwhile agricultural pursuit is one example of the means by which Australia can 'transition' to a low emission economy. There are plenty of others.

The 'direct' cost to Australia from the loss-making native forest sector has been outlined. The huge opportunity cost (loss) to regional Australia from logging and native vegetation clearing has been mentioned but has never been modelled. Catchment damage to agriculture from logging and clearing has been so well understood that since the institution of programmes such as soil conservation services in 1938, (following a 1936 commonwealth government request to all states to form soil conservation committees), multi millions was poured into ameliorating or 'educating' the public to prevent exacerbating the impact of rampant clearing and logging. From the mid 1990's more multiple millions have been spent annually on federal and state catchment protection/remediation programmes rolled out to address vegetation loss, soil erosion from logging and clearing and river and creek bank restoration due to deforestation induced hydrological impact. Even the Australian Landcare movement arose from the acknowledged impact on agriculture and environment of the catchment damage caused by logging and clearing. This has been and continues to be millions if not billions of Australian dollars spent to minimal effect as the causes underpinning the damage, industrialised logging and clearing, continue unabated, and in fact, in recent years, have been 'refreshed' owing to federal and state environmental legislative irresponsibility. Yet the government does not acknowledge the fact that its own agencies and policies are responsible for the ongoing clearing/logging through governance failure.

Discontinuing logging and clearing native forest ecosystems is an easy to implement mechanism for immediately cutting costs while helping the nation achieve a long term emission reduction goal. It's also the critical action to promote landscape resilience from climate change impact. It's also the means by which the root cause of damage to Australian catchments can be stopped. Australia will then be able to stop throwing around hundreds of millions of dollars annually for decades on ineffectual programmes for

catchment repair which fail to 'cure catchments' because government policy refuses to address the root cause of the nation's major environmental destruction, i.e. logging and clearing of native forest ecosystems. Below is further detail of the nature of the damage done, providing evidence of the urgent need to proceed down the vegetation protection path as a critical factor for a sound climate change policy.

Soil and soil carbon: Soil loss through erosion; damage to soil structure. Both are directly attributable to the loss of vegetation and to the compaction impact of heavy industrialised machinery. In the case of forestry,

The passage of forestry machines causes soil compaction, leading to significant changes in the soil structure and moisture conditions. When soil is compacted, soil bulk density increases, porosity and water infiltration decrease, erosion speeds up, and all of these processes lead to changes in plant physiology. Photosynthesis, transpiration, nutrient uptake, mycorrhizas and plant hormones are all possible avenues for these changes.¹¹

A factor outside the parameters of study referenced above, but relevant to climate change policy, is the massive increase in emissions from soil structure disruption, as soil is a major means of sequestering carbon.

Water: Both logging and clearing damage fresh and estuarine water quality, impacting aquatic agriculture. In addition the short- and long-term threat to water availability is now proved with impact on rainfall directly attributable to loss of native forest canopy cover.¹² It is now known that forests seed rain yet since 2009 Australia has allowed the loss of another third of its remnant forest.¹³ The impact of deforestation and forest degradation on water supply across the continent has apparently been avoided or ignored in economic modelling on climate change policy. Otherwise it would be a 'no brainer' that climate change policy, when considered from an economic point of view alone, would embrace cessation of logging and land clearing for its impact on water resources.

Other economic repercussions relevant to transmission to low emissions economy in relation to ongoing logging and clearing:

Tourism and extinction: Industrial logging and clearing are severely impacting medium- and long-term tourism potential. These practices are one of 6 primary factors influencing global extinction which is at its zenith in Australia. Extinction of Australian wildlife will drive tourists away from, not to, this country.

Tourism and heat: Destruction and degradation of the cooling canopy of forests are making Australia an increasingly hot place, particularly for inhabitants of regional Australia – often outdoors - and such microclimatic impacts will increasingly be experienced by tourists (or not experienced should they find Australia becoming simply 'too hot' and decide not to come).¹⁴ Many people flock to cool forests on hot summer days, and as we know these heatwaves are set to increase. The tall cool canopies of intact native forests can be at least 2.5 degrees cooler than a baking 'logged/clear felled' exposed 'ex' forest

¹¹ This paragraph forms the conclusion of the following article:

Soil Compaction – Impact of Harvesters' and Forwarders' Passages on Plant Growth, Roman Gebauer, Jindřich Neruda, Radomír Ulrich and Milena Martinková, *Mendel University in Brno, Brno, Czech Republic, May 23, 2012*

<http://cdn.intechopen.com/pdfs-wm/36974.pdf>

¹² "Clearing our Rainfall Away", Dailan Pugh, http://www.nefa.org.au/clearing_our_rainfall_away

¹³ Scientists' Declaration: Accelerating Forest, Woodland and Grassland Destruction in Australia.'

<http://scboceania.org/policystatements/landclearing/>

¹⁴ By reducing evapotranspiration, deforestation tends to cause an increase in sensible heat and surface temperatures (Shukla *et al.* 1990, Pielke 2001, Foley *et al.* 2003b, von Randow *et al.* 2004, Findell *et al.* 2007, Findell *et al.* 2009, Lawrence and Chase 2010, Davin and de Noblet-Ducoudré 2010, Kovářová *et al.* 2011, Deo 2011, Lee *et al.* 2011, Bagley 2011, Ban-Weiss *et al.* 2011, Pitman *et al.* 2012, Eiseltová *et al.* 2012). Kovářová *et al.* (2011) found "The air temperature increases at areas where a decline of available water occurs and latent heat of evapotranspiration shifts to sensible heat". Pielke 2001 consider "Once the surface energy budget is altered, fluxes of heat, moisture, and momentum within the planetary boundary layer are directly affected". Extract from "Clearing our Rainfall Away", Dailan Pugh, http://www.nefa.org.au/clearing_our_rainfall_away

landscape.¹⁵ This is the case with Old Growth Douglas Fir forests in North America. Even more recent studies, May 2017, demonstrate temperature micro-climate moderation effects due to canopy cover.¹⁶ But it doesn't require a scientific study to tell you that forests should be celebrated for their regulation of temperature. Just go and stand in one, where they still exist, and experience the coolness, or the protection from cold wind. Forests are critical shelter for organisms reliant on them and great for human visitors.

The review panel would do well to take into account a recent Australian publication, *Clearing Our Rainfall Away*, which has analysed multiple historic and recent scientific articles and documents and arrived at the following (science based) conclusions:

It has been estimated that since European settlement, land-clearing in eastern Australia has directly resulted in an average summer rainfall decrease of 4-12% and a warming of around 0.4-2oC.

Introduction: *Clearing our Rainfall Away*

Far from being passive, vegetation plays an active role in its partnership with climate (Zeng and Neelin 2000). Across the semi-arid Sahel in central Africa, the forests and woodlands of southern Australia, and the mighty Amazon rainforests, clearing, logging and burning of natural vegetation is causing a considerable increase in temperatures, decrease in evapotranspiration and decrease in rainfalls. As observed by Fu (2003):

Both the observational and theoretical studies have proved that the destruction of natural vegetation cover, such as destructive lumbering of forests and over cultivation and overgrazing of grassland has been one of the major causes for the deterioration of regional climate and environment.

At the site level, compared to cleared areas, it is apparent that forests can create their own microclimate, with more stable temperatures (warmer on cold winter nights and cooler on hot days), and with moister soils and higher humidity in dry times (Meher-Homji 1991). Vegetation, and particularly forests, can affect regional climates by:

- transpiring moisture from the ground into the atmosphere to form clouds and generate rainfall
- providing a large area of leaves and other surfaces for evaporation of moisture back into the atmosphere
- creating areas of low pressure by evapotranspiration that generate winds and draw in moisture from afar
- having an 'evaporative cooling' effect by absorbing solar energy and converting it into latent heat held in water vapour through evapotranspiration
- emission of organic aerosols, and volatile organic compounds that oxidise to form aerosols, that act as cloud condensation nuclei around which water drops form
- increasing air turbulence, causing drag on the air and reducing wind speed, increasing transfer of moisture into the air, causing updrafts and rain

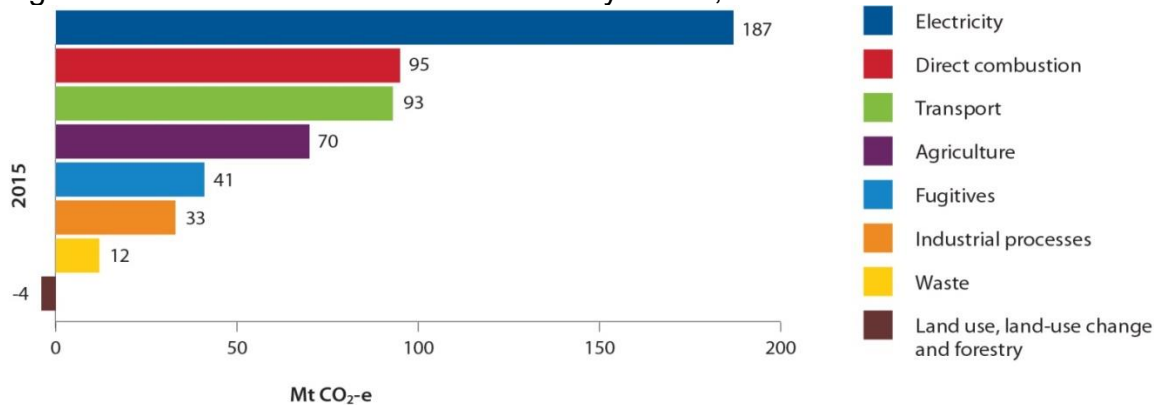
When all these factors are considered it should be obvious that to cease the activities that are damaging the nation's forests can only have a positive economic impact in terms of transition to a lower emissions economy.

¹⁵ <http://www.takepart.com/article/2016/04/22/old-growth-climate-change-forest-cooling/>

¹⁶ <http://www.sciencedirect.com/science/article/pii/S0168192317300436>

Section 2: Challenging premises on Sectoral Analysis of Emissions

Figure 1: Australia's estimated emissions by sector, 2015



Source: Australia's emissions projections 2016, Commonwealth of Australia 2016

AFCA challenges the accuracy of the graph above (from the Discussion Paper) on which decisions will be made about Australian climate change policy.

This graph differs markedly from other emissions projections by the Australian government, which forecast a dramatic increase in LULUCF emissions. We refer you to Table 5 of the Federal Government Report Australia's Emissions Projections 2014-5 prepared by the Department of Environment, (<https://www.environment.gov.au/system/files/resources/f4bdfc0e-9a05-4c0b-bb04-e628ba4b12fd/files/australias-emissions-projections-2014-15.pdf>) Here LULUCF emissions are approximately 300% higher in 2019-20 from 2013-14 levels, a result partly of Qld land clearing and possibly burning. Bear in mind also that when these (higher) projections were made, NSW had not as yet repealed its Native Vegetation Act which afforded some protection from clearing. It would not surprise us if emissions from this sector were on an emission trajectory even higher than that estimated by the Department of Environment Report.

The review committee needs to address the fact that a fundamental premise of the discussion paper is possibly flawed, that the emissions from Land use, Land-use Change and Forestry is the Discussion Paper are not correct. Australia's emissions from LULUCF are more likely positive and rising, sharply, driven by industrial logging and the removal of native vegetation land clearing controls.

Critical to a review of Climate Change policy is correction of reporting standards. We agree with other organisations that the Australian Government needs to correct reporting anomalies regarding LULUCF emission accounting. Below are key points.

- Deforestation should be reported against the activities and industry responsible, not as net LULUCF reporting by UNFCCC convention
- Carbon monoxide, black carbon, NMVOCs and sulphur dioxide emissions should be reported against relevant activities and the responsible industry. For example, savanna burning for pasture maintenance, though an emission source of extreme significance, is not included in national inventory reporting for agriculture
- Up-to-date global warming potential should consider all emissions. For example, methane's global warming potency in its role in the creation of other greenhouse gases, particularly ozone, and interacts with aerosols
- Decadal greenhouse gas accounting should occur as well as accounting as per UNFCCC convention

Section 3: Responses to questions by emissions sector

The Electricity Sector

What are the opportunities and challenges of reducing emissions from the electricity sector?

The big challenge to the electricity sector is to reduce emissions without the use of combustion-based electricity generation technologies, generally speaking. This sector must strive to leave behind such highly emissive power generating systems asap. In particular it should not seek continuation or expansion by resorting to the false emissions accounting practices possible under current policy, i.e. the deeming of wood-based combustion processes to be carbon neutral/ renewable, therefore eligible for subsidies. This applies in particular to the use of native forest wood-based biomass for power generation. The sector urgently needs to rule out the use of native vegetation-derived biomass as a raw product for combustion or for processing into any form as a fossil fuel substitute e.g. wood pellets, wood char etc.

Also it needs to rule out refinement of native forest biomass into biomass derived oils/fuels to substitute for traditional fossil fuel-based power generation e.g. diesel substitute. For example, the Facilities Method of the Emissions Reduction Fund allows electricity generators to earn carbon credits by reducing emissions per unit of output by means of a low-emissions fuel. Under this programme the use of lignose derived from native forest/vegetation biomass in conjunction with lignose from brown coal as a so-called renewable fuel can be subsidised as a renewable energy irrespective of the fact that this will only encourage further destruction of remnant native forest/vegetation cover and prolong the viability of the fossil fuel industry.

Electricity Sector Challenge: The sector needs to be alert to the abuse of subsidy programmes which encourage use of materials derived from clearing and logging native vegetation whether or not direct combustion of these materials takes place. The sector needs to resist this use even if such materials have formerly been deemed 'carbon neutral' or 'renewable'.

Are there any implications for policy?

The deeming of native wood biomass as a 'carbon neutral' component of any energy generation technology must be reversed. Policy should stipulate that its use/inclusion in any form renders void any claim for subsidy in respect of technologies seeking subsidization through emission reduction promotion programmes. This would include subsidisation for units of energy produced utilizing the ERF and/or the RET. Technologies involving biomass derived from native forest clearing or logging should not be eligible for any research and development grants from the Clean Energy Finance Corporation and/or the Australian Renewable Energy Agency.

In regard to state and territory policies the federal government should make it quite clear that it will not provide funds for the pursuit of activities that would fund or otherwise reward as 'renewable' any energy technologies that involve the use of native forest derived wood biomass. The federal government should re-institute the ban on the use of native forest derived biomass for energy or fuel production and instruct states that they will not receive renewable energy funds for R & D or any other project until their state policies also include this ban in order to avoid the inadvertent acceptance or funding of technologies that can promote further native forest clearing and logging, acknowledging that the threat these activities pose to reducing carbon emissions is far too great to ignore.

Resource, Manufacturing and Waster Sector

There are two critical points to make in regard to this sector. The first falls within the context of native forest biomass/'residue' being considered renewable when burnt or otherwise processed to provide energy or fuel. The so-called 'residue' or 'waste' from native forest operations is not necessarily 'waste' and the legislation defining subsidy eligible residue is critically flawed. There are no adequate safeguards in the legislation to ensure that operational practices are not altered by industry in order to be able to define any amount of native forest biomass as waste. Currently any native forest logging product obtained under the aegis of a regional forest agreement is vulnerable to being treated as waste. Highest value tests are meaningless in relation to the definition of high value product for the reason mentioned above. So determining what is waste is critical for this sector regardless of any substance in terms of subsidising product by means of a definition of waste that renders it eligible for subsidy as an emissions reduction strategy.

Secondly, there is a mounting lobby by the manufacturing sector to regard wood 'waste' and in particular native forest wood 'waste' or biomass to be eligible for subsidy when burnt to provide thermal heating for industrial processes. This is utterly counter-productive to the goal of emissions reduction for all reasons stated in this submission and should not be countenanced.

The Land and Agricultural Sector

Opportunities and challenges: There is a significant global gap between the NDC's of signatories to the Paris Agreement and the scale of global emissions reduction needed to have a reasonable chance of keeping global temperature rise to below 1.5 - 2 degrees C1.. Action in the land and forest sector is being strongly promoted as a means of bridging this gap. This action includes protecting intact and restoring degraded, natural forests; planting new forests; and improving the productivity (and carbon storage) in agricultural soils.

To be successful, actions that would result in immediate emissions reductions must be prioritised.

Achieving Immediate Emissions Reduction in the Land and Forest Sector

There are two obvious pathways to achieve immediate substantial emissions reductions in Australia.

1. End broad-scale tree clearing

The urgent challenge is to reduce emissions from broad-scale tree clearing on agricultural land (primarily in Queensland and likely also in NSW and WA). There is no functional method under the Emissions Reduction Fund (ERF) that provides a carbon incentive to stop clearing native forests and woodlands. State-wide analysis of the only ERF method currently applicable to clearing re-growth forests in Queensland reveals that few individual properties could achieve viable carbon income under current ERF rules and pricing. To all intents and purposes the 'Avoided Clearing of Re-growth' ERF method is ineffective in reducing emissions. Note, it can only be applied to areas of land for which it can be demonstrated that they have had two past clearing events (a significant barrier in itself).

The failure of the Queensland parliament to re-introduce controls on broad -cale tree clearing means that other mechanisms must be considered to prevent even greater spikes in emissions. In the absence of a national carbon pricing mechanism or mechanism to cap emissions, it must be a priority for the ERF to develop an offset method that at least provides some level of incentive for landholders to avoid clearing.

2. Cease Logging and Restore Former Production Areas of Native Forests

Arguably the least cost path Australia-wide to quick emissions reduction would be to cease logging our public native forests and foster long-term recovery of their carbon stocks. This is in part because most of our wood supply comes from plantations. Indicative analysis suggests that very substantial reductions in emissions could be achieved if wood production from native forests ceased. Swapping carbon storage for logging is currently hampered by lack of a relevant ERF forestry method.

Carbon options have been raised in a number of states as an alternative to logging. In Victoria, carbon has been considered as part of its consultative process on the future of state forests (which arose as a result of past failure to protect the state's faunal emblem, the Leadbeaters possum). Victoria has the most productive native forests in Australia. They are located in the Central Highlands (home of the Leadbeaters possum). These forests are some of the most carbon dense in the world and have huge potential to store more carbon if allowed to recover from logging. The wetter forests in Tasmania, NSW, Queensland and WA would also have significant potential to store more carbon.

Given that production native forests store between 40-70% less carbon than unlogged forests, the long-term potential for carbon storage in Australia's native forests were they allowed to recover is very substantial..

Fostering Restoration of Natural Forests and Ecosystems

1. Forests and Current ERF methods: The current price being paid by the CER for ACCUs means that many of the existing ERF forest restoration methods either are uneconomic or cannot compete with other agricultural uses, resulting in little take-up by landholders.

Nevertheless there is potential to use some of the existing restoration methods to improve forest carbon stocks on private and public land including for the first time due to method changes last year in Protected Areas. There are significant areas of Australia, especially in the wetter areas, where carbon dense forests (including rainforests) would recover if weeds were suppressed. Mapping of areas currently infested with Lantana suggests that the benefit would be significant..

On public conservation land, NSW is the only conservation land manager to have acted on the change to the HIR method that makes conservation land eligible to generate ACCUs with a successful bid in an ERF Auction last year for projects that involve restoration in national parks using both the HIR method in wet forests and tree planting in dry forests. If successful many more projects could be developed to help restore forests in degraded areas of forested NSW National Parks.

2. Implications of the Paris Agreement: Thanks to article 5 in the Paris Agreement it is now appropriate that signatories to the agreement look at the quality of carbon stocks in the landscape and how to better protect and improve them.

Science makes it clear that biodiversity confers resilience on forest carbon stocks yet few climate policy makers recognise that the resilience which biodiversity confers on carbon stocks makes them less susceptible to loss from pests, disease and fire. Protecting and restoring bio-diverse natural forests is the least-risk climate action in the forest sector.

An appropriate 'qualitative' policy prioritisation would be to protect least disturbed forests first; restore degraded natural forests second; and lastly encourage restoration plantings and recovery in areas of non forest that buffer and connect areas of existing natural forest (thereby improving overall ecosystem resilience).

It is time to think of biodiversity as a 'core benefit' and not just a 'co-benefit'.

An obvious gap in Direct Action is the failure to adequately consider and promote additional public and private land conservation and management actions that improve ecosystem resilience and thus also improve carbon storage in natural ecosystems.

Developing an ERF method that allows for a range of actions known to improve carbon storage in the landscape (above and below ground) should be prioritised. Activities known to improve carbon storage in the landscape include: restoring riparian systems and natural water flows across the landscape; removing suppression factors such as invasive weeds and grazing pressure; and restoring ecologically appropriate fire regimes. An ecological restoration method that encourages any or all of these activities to be undertaken on private and public land (including conservation land) would be consistent with Article 5 of the Paris Agreement and should be a high priority, not least because of the potential scale of additional abatement.

Increasing funding for Indigenous Protected Areas and public and private land conservation acquisition and management would result in substantial climate mitigation and adaptation benefits.

Recognising the relationship between carbon storage and biodiversity would have the added benefit of reducing the risk of loss associated with climate action in the land and forest sector.

Improving the long-term resilience of natural ecosystems would not only benefit carbon storage and sequestration in the landscape, it would increase the probability of wildlife survival in the face of climate change and other known threatening processes.

3. Soils: There are clear links between improving the underlying biodiversity in soils with improving soil health and increasing soil capacity to store carbon resulting in overall increases in farm productivity. Thus increasing carbon storage in soils is likely to result in increased income from traditional farming activities and provide a new source of income from carbon – a double plus for landholders.

Interestingly, direct measurement reveals that where trees are allowed to recover on grazing properties there is an additional benefit for soil carbon and farm productivity. However, the current ERF soil carbon method does not allow the impact on soil carbon from restoration of trees to be taken into account.

An ecological restoration method would foster long-term improvements in above and below ground carbon storage.

4. Landscape Scale Restoration: International funds are increasingly available for projects in developing countries that link improved agricultural productivity with forest restoration and protection of natural forests and that link adaptation with mitigation benefits.

Few developed countries have as yet looked at the contribution to climate mitigation and adaptation that landscape-scale conservation and restoration programmes could make to mitigation and adaptation objectives.

Landscape-scale initiatives provide an opportunity to protect and buffer the remaining relatively large carbon stocks in older forests, build ecological connectivity to improve overall forest carbon stocks and resilience and to improve productivity and carbon storage in agricultural land.

Linking expansion of the conservation estate to forest protection, restoration and improved connectivity could deliver significant mitigation and adaptation benefits. Developing a landscape plan around 'Protected Area' expansion goals would be a sensible strategy.

An existing landscape-scale initiative that is reasonably well advanced is the Great Eastern Ranges (GER) protection and restoration initiative. The geographic range of this initiative runs from Cape York Peninsula to the Mornington peninsula in Victoria. A similar initiative in Western Australia, Gondwana Link, runs across a 1,000 km sweep across the south of the state. With the right policy settings, appropriate carbon methods and pricing, there would be great potential for these initiatives to increase the scale of their restoration activities.

Warning: It is critical that the logging industry does not get into further logging and clearing of native forest ecosystems under the guise of the need to thin them as a bushfire mitigation strategy. The science has clearly established that logged forests burn hotter, more frequently and more catastrophically than unlogged forests and the development of any policy in relation to this proposal needs to take the science into account.

It's a fact that wildfire in Australia poses a threat to the nation in terms of emissions generated by wildfire, and the impact that bushfire can have on the resilience of particular ecosystems. However a long-term scientific appraisal rather than a knee-jerk response needs to occur before any policy in relation to accepting 'thinning' of forests as a bushfire strategy is adopted. We submit scientific documents as well as a summary of some of the arguments in plain language which will attest to the fact that is counter-productive to move in and thin (log) forests under the guise of bushfire mitigation. All that thinning (logging) forests does is reduce the cooling potential of the canopy, its ability to allow the forest to self-regulate, allow

it to fulfil the function of keeping understoreys, ground cover cool and retain soil moisture. It is essential to become conversant with the science provided in the attached scientific studies on this matter.

There is very real pressure that Australia will lose its intact forests and its best carbon sink if lobbying by the native forest logging industry for its inclusion into climate change policy is given favourable treatment at the expense of science. The 'trials' of mechanical fuel load reduction are already being funded against the advice of scientists and this worrying development needs to be stopped. These are occurring in three states with \$1.5 million dollars of federal funds. The thrust for this development is based on US 'mechanical maceration' management of forests. This is another arm of the international biomass trade and it needs to be quashed immediately. Time does not permit us to elaborate further on this issue but on request we would be happy to refer you to the peer-reviewed science to state our case.