

## FOREST MANAGEMENT FOR CARBON

*Carbon sequestration policies remain at a higher level of abstraction, stating merely strategic objectives, possibly because these markets are only emerging and remain political and highly uncertain. <sup>1</sup>*

### SUMMARY

This section discusses the nature of carbon and its influence in the southern region's State Forests in creating a healthy climate. It outlines global strategies designed to mitigate carbon emissions as a defence against climate change.

It explores employment opportunities in managing forests for carbon, forest restoration and wildlife. It discusses the concept of funding new forest management in the Great Southern Forest from carbon credits as providing a practical opportunity for emissions reduction in State forests of the southern forest region.

It links carbon emissions with threats to human health and emphasizes the mitigation solution involving stopping logging of native forests.

### Carbon credits to protect natural forest habitats for jobs and climate action

Carbon: chemical symbol C is a nonmetal that has two main forms, diamond and graphite. It is also found in its impure form in charcoal, coal and soot.

Carbon dioxide: chemical symbol CO<sub>2</sub> is a colourless odourless gas produced by burning carbon and organic compounds and by respiration. It is naturally present in air, about 3%, and is absorbed by plants during photosynthesis.

The Great Southern Forest (GSF) supports regional jobs, wildlife and climate action within the southern region's coastal forests from Jervis Bay to the Victorian border. GSF is the southern region's community vision for beyond 1990s Regional Forest Agreements (RFAs), which are still in place yet which did not take into account current science regarding carbon benefits as outlined in the Autumn 2015 edition of *Nature NSW* <sup>2</sup>.

Carbon accounting for forests is mandatory under the Kyoto Protocol<sup>3</sup>. As a signatory, the Commonwealth is internationally bound to meet emission reduction targets. This requires that all signatories shall implement protection and enhancement of sinks and reservoirs. The establishment of the Great Southern Forest takes full advantage of the carbon carrying capacity of our southern region's forests and potential global market forest carbon credits programs.

The mechanics of carbon: Leaves are the 'solar panels' which created the oxygen-rich atmosphere essential for life on Earth. It is estimated that temperate forests absorb between 10 and 20 tons of carbon dioxide per hectare each year, through photosynthetic conversion into starch, cellulose, lignin, and wooden biomass. Photosynthesis captures the sun's energy and converts CO<sub>2</sub> into green carbon in plants which release oxygen. With brown and blue carbon, green carbon in trees is a perfect carbon capture and storage device.



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Our carbon's history: Eucalypts evolved as this island continent dried and fossil fuels were buried after ancient forests collapsed. Digging up coal, oil and gas and burning these fuels releases greenhouse gases. The natural hardwood forests in southeast Australia are among the most carbon-dense forests in the world; typically twice the carbon density of tropical forests.<sup>4</sup>

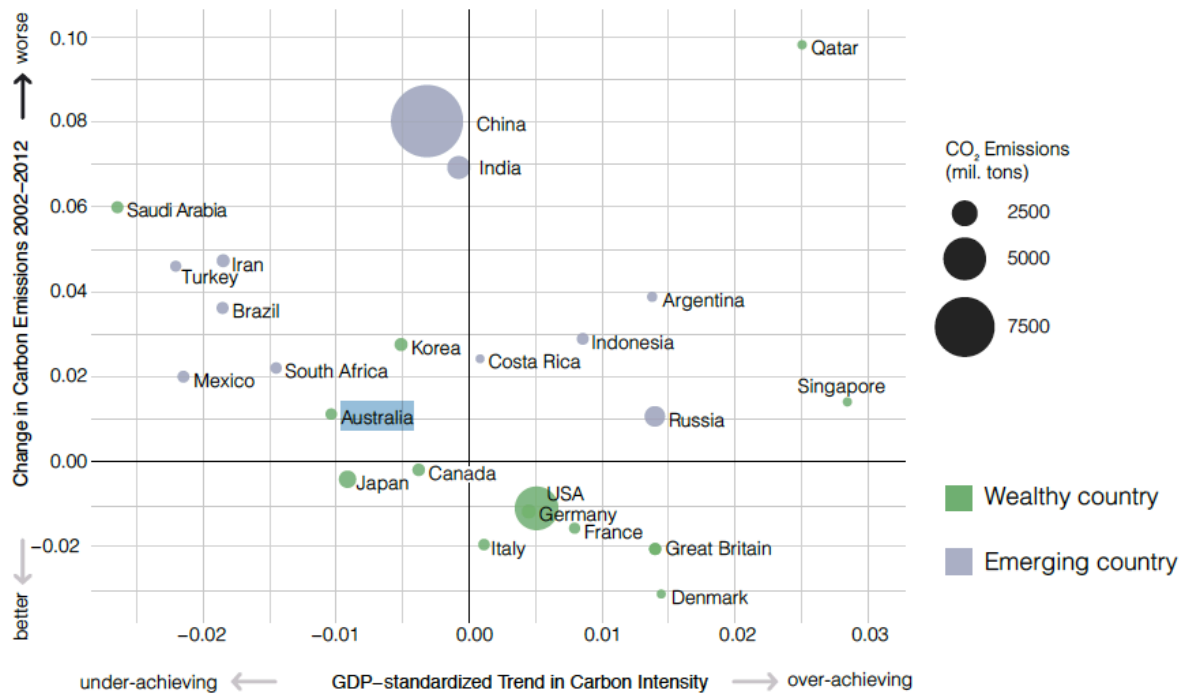
Modern times: Australia entered the Anthropocene period as 19th century colonial expansion saw relentless clearing of forests for farmland, firewood and building. During the 20<sup>th</sup> century, logging was accelerated and climate change became partly attributed to clearing and degradation of native forests because carbon storage systems were being destroyed. State Forests were set-up to protect against clear-felling for farms. Planting trees is restorative but young trees capture negligible carbon in the first decade according to Emissions Reduction Fund (ERF) graphs<sup>5</sup>.

The Australian Government has an ERF option for Avoided Deforestation for native forests<sup>6</sup>. The ERF has three elements: crediting emissions reductions, purchasing emissions reductions, and safeguarding emissions reductions. If one were to wade through the methodological determinations and satisfy the requirements, projects to reduce emissions by protecting native vegetation from being cleared should provide an opportunity for generating carbon credits under this, the Government's own plan.

As a long-anticipated counter measure, 21<sup>st</sup> century Federal Environment Minister, The Hon. Greg Hunt, announced that the ERF could stop logging in a Victorian State Forest and spoke of a next wave of environmental innovation. Australia established targets for 2030 and started stretching commitments to action against climate change. Forest carbon measurement methods such as RET<sup>7</sup>, FullCA<sup>8</sup>, NGRS<sup>9</sup>, NCAS<sup>10</sup> and ERF<sup>11</sup> will be tested by markets and the United Nations (UN).

Whether we like it or not, according to Yale's Environmental Performance Index 2016 Report<sup>12</sup>, Australia is still keeping company with Mexico, South Africa and Korea in terms of climate change performance. Graph 1 shows our performance is ranked as under-achieving and getting worse according to the GDP-standardised trends in carbon intensity and trend in carbon emissions.

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### The southeast native forests of NSW are a natural treasure chest of carbon

Logging native forests causes immediate emissions (around 60% of forest carbon in these forests is lost in logging) which cannot be recovered except over decades to centuries (an estimated 53 years to recover 75%, 152 years to recover 90%)<sup>13</sup>.

The Australian Greenhouse Office and the Intergovernmental Panel on Climate Change have underestimated the amount of carbon held in native eucalyptus forests and soils by up to 400%. According to Australian National University (ANU)<sup>14</sup> researchers, native eucalypt forests across southeast Australia store far more carbon than previously thought, and that has far-ranging implications for climate change policy. 'There is much more carbon in our natural forests than we thought', said Professor Brendan Mackey who led the research group. 'This means the potential amount of avoided emissions is much larger, and therefore there's much more to be gained from protecting them from logging. It means the risks of logging are bigger than we thought'<sup>15</sup>. Another ANU study showed that unlogged forests contain three times more carbon than a logged forest.<sup>16</sup>

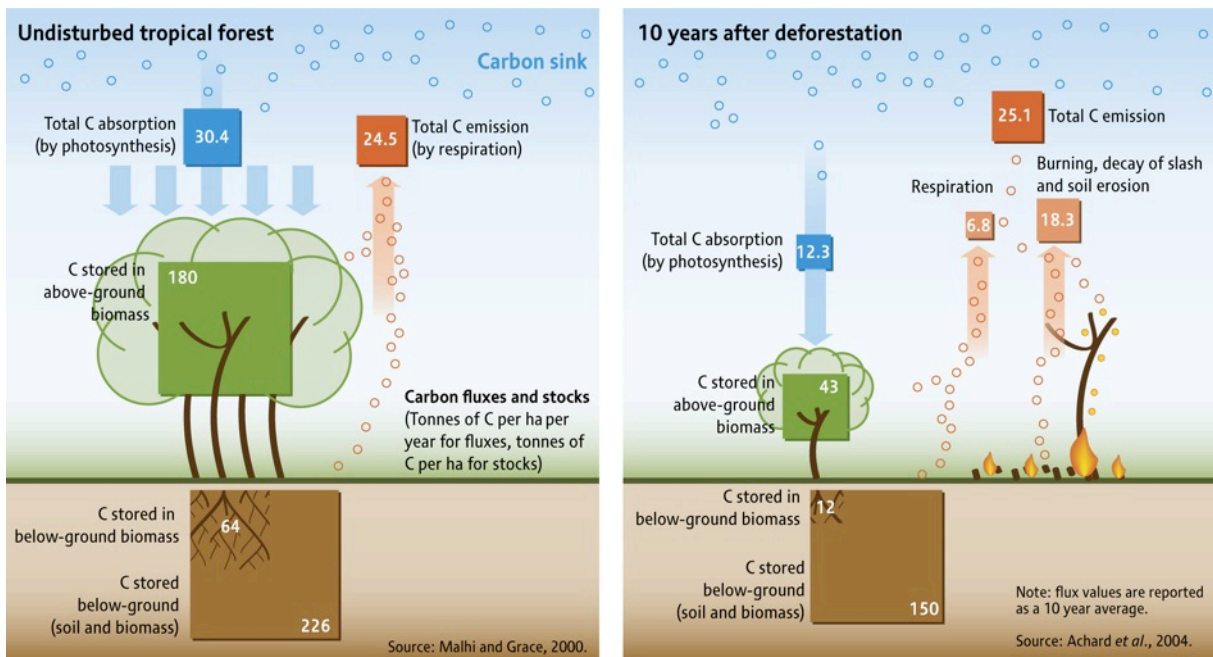
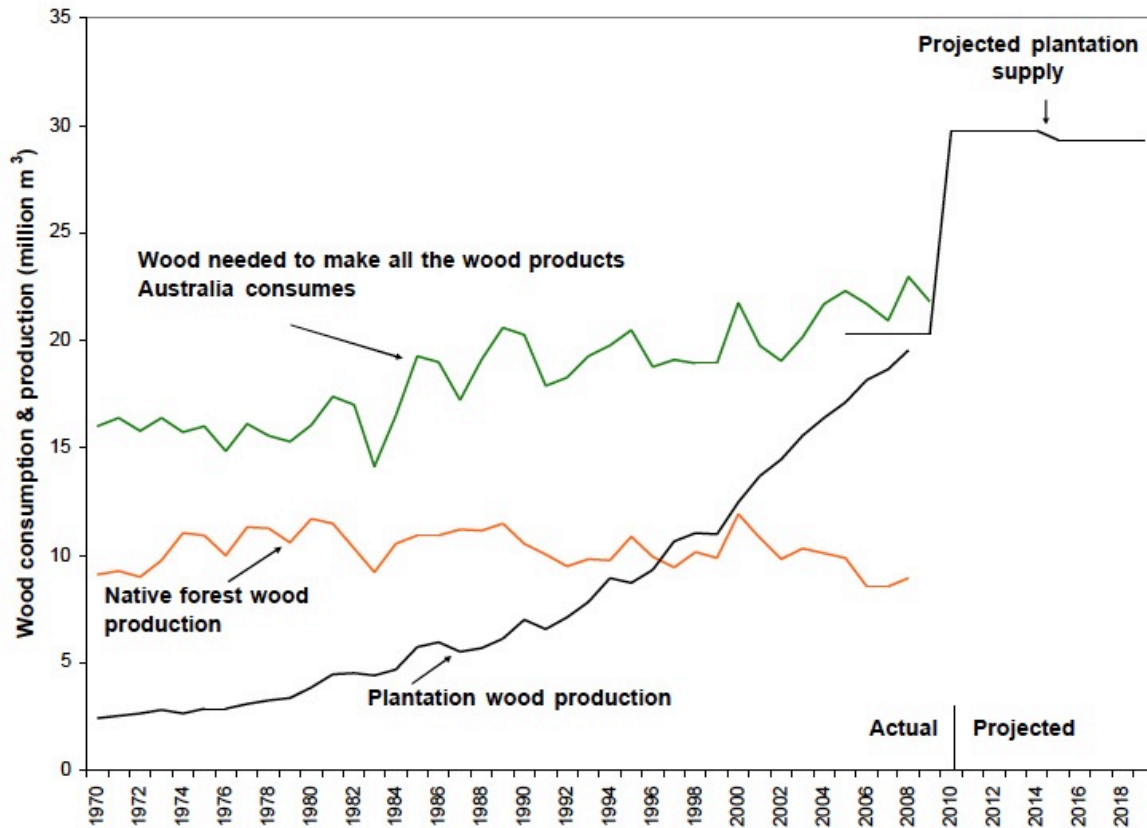


Figure 1: Carbon storage in an unlogged and a logged forest

## CO<sub>2</sub> emissions in the southern region of NSW

ANU researchers estimate that the eucalypt forests of southeast Australia could remove about 136 Mt (mega tonnes) CO<sub>2</sub>-e (carbon dioxide emissions) per year (on average) for the next 100 years (Mackey, 2011). This estimate is based on several key assumptions, including both the cessation of logging and controlled burning over the 14.5 million hectare study area<sup>17</sup>.

Today, Forestry Corp. trucks 80%-90% of the native forest it logs to the Eden Woodchip Mill from the southern forest region of NSW. The traditional loss-making logging contracts still applicable to native forests in State Forests of the southern region, could be converted into profit from carbon credits. This opportunity can be realized by stopping the massive avoidable up-front pulse of carbon pollution/emissions caused by logging and post-logging burning of the region's native forests. In support of this initiative, logging our native forests is unnecessary as Australia can meet nearly all its domestic timber needs from plantations as Graph 2 shows.



Graph 2: Australia's existing plantations can meet our wood needs—an opportunity for major native forest protection with forestry growth<sup>18</sup>

In the study *Under What Circumstances Do Wood Products from Native Forests Benefit Climate Change Mitigation?*<sup>19</sup> Keith and her colleagues demonstrate that changing native forest management from commercial harvesting to conservation can make an important contribution to climate change mitigation. The findings of their study were derived from mixed-eucalypt forest in New South Wales (and Mountain Ash in Victoria) scenarios, so are particularly relevant to the intention and ambit of the Great Southern Forest. They found that conservation of native forests results in an immediate and substantial reduction in net emissions relative to a reference case of commercial harvesting. They also found that, over the 100-year simulation period, total carbon stocks were lower in harvested forests than in conservation forests. This fact has been overlooked in forest management decision-making. International forest-related policies, including negotiations under the UNFCCC, have failed to recognize fully the mitigation value of native forest conservation.

Perverse practices: Table 4 at the end of this section shows CO<sub>2</sub> emissions from logging native forest on the South Coast of NSW for the 2006/07 year. These statistics incorporate sub totals from actual logging, machinery use, roading and vehicle use, chipmill operations and Forest Corp (formerly FNSW) operations. Hollows-dependent wildlife such as the endangered Swift Parrot require trees older than 100–150 years. Leaving trees to grow maximizes carbon sequestration as re-growth approaches its full carbon carrying capacity beyond 100 years. Will the Australian Federal and State Governments measure State Forest carbon emissions to enable authentic evidence-based decisions?

## Influence of global strategies for economic opportunities of State Forests

Australia needs to cut its CO<sub>2</sub> emissions by 236 million tonnes to meet its current 2020 mitigation target of -5% below 2000 levels. The 2015 Global Goals agreed to by the UN include taking more 'urgent action to combat climate change'.

Via the UN, the 2015 Paris Agreement, signed by 196 nations, allocated a separate Article<sup>20</sup> to forests in recognition of the role they play as critical global carbon sinks. As the country with the most carbon-dense forests in the world<sup>21</sup>, Australia should set a global example and lead the way in forest management for carbon by ending native forest logging. We should apply more intense periodic scrutiny and the stronger safeguards which were initially designed for developing countries to Reduce Emissions from Deforestation and Forest Degradation (REDD+). These safeguard amendments and new forest measurement methods should improve the capacity of the Australian Emissions Reduction Fund (ERF) and open it to compatible global market forest carbon credits programs.

In early November 2015, the ERF Auction set an average price on carbon in State Forests of \$12.25 per tonne of abatement: 129 contracts were awarded committing to purchase 45,451,010 tonnes of abatement; contracts were awarded to 77 contractors covering 131 projects; the total value of contracts awarded was \$556,875,549. The largest single contract was for 2.5 million tonnes of abatement and the smallest for 15,333 tonnes.<sup>22</sup>

Despite this, Australia's 2020 climate targets are still out of reach after second emissions auction<sup>23</sup>. We have spent almost half of the A\$2.55 billion allocated to the ERF and some 92.8 million tonnes of emissions reduction have been 'bought' at an average rate of almost A\$13.12 per tonne of CO<sub>2</sub>.

The impact of the creation of the Great Southern Forest's whole of landscape protected area would automatically reduce emissions and thus improve Australia's chances of meeting its carbon reduction targets which are currently under threat. By continuing to log the sub-regions of the southern forest region of NSW's 428,008 ha of State Forests, carbon reduction benefits are being wasted. Thus, using carbon benefits from these forests to help meet climate targets seems logical. Given the industries' subsidies, not using them is like throwing taxpayers' money into the wind. In addition, using such benefits as a viable income for jobs in wildlife and forest restoration and tourism are valid alternatives to destroying the natural environment and all it contains.

## Job opportunities

The GSF will expand employment and incomes in sustainable sectors and jobs on the Far South Coast of NSW. In 2014, the entire southern forest region logging sector employed only about 300 people including contractors, and this number is shrinking. On the other hand, Tourism currently employs 58 500 people in the southern region. The price of carbon at the April 2015 Federal Government auction fell from \$23 to \$13.95 per tonne and to \$12.25 per tonne at the November 2015 auction. However, even at this lower figure, the, say, 1.2 to 1.5 million tonnes of carbon emissions, Perkins and Macintosh<sup>24</sup> estimate could be saved by ceasing logging the southern region could earn between \$14,700,000 to \$18,750,000 per year at this lower carbon price. At the current median wage in the southern regions' shires, of \$70,000, this carbon credit income could be used to generate up to 267 FTE<sup>1</sup> sustainable jobs. Innovation driven by new opportunities would enable the creation of a broader base of jobs in small to medium sized businesses away from the mindset which connects places like Eden to the sole business of woodchipping.

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<sup>1</sup> Full Time Equivalent



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What may not be recognised is that the sense of urgency is not just hype. Scientific evidence supports that emissions in the near future are potentially more damaging than deferred emissions and future sequestration does not compensate for emissions now. It is therefore a priority to protect the stores of carbon in existing native vegetation, especially old growth and mature forests, because it takes decades or centuries for all the emitted carbon to be recaptured.<sup>25</sup>

While softwood plantation timber employment increases, only about 30 jobs remain in the native forest woodchip mill at Eden. With the creation of the GSF, the potential \$18,750,000 of carbon credits per annum could fund investment and jobs in forest restoration, multispecies tree nurseries, bird breeding boxes in forests, and weed, pest, feral animal, and disease eradication. Based on actual and projected tourism employment the preserved forests also could be expected to create additional jobs in eco and mainstream tourism, and protect the jobs already in this sector in the (currently existing) Bega and Eurobodalla Shires.

These opportunities will breathe new life into the way we traditionally have used our forests, transitioning from short term extraction to best practices forest management compatible with other Great Eastern Ranges conservation initiatives: The Great Northern Koala Park, NSW, and The Great Forest National Park, Victoria.

Employment outcomes under the carbon capture scenario also are superior to the projected current logging scenario after 2020 as shown in Table 3<sup>26</sup>. While employment in the native forest logging and processing sector is declining, and likely to fall further in future due to the sector's poor financial outlook, employment from the carbon capture scenario already almost matches its 2012 level and could be expected to grow in future years, as carbon prices recover internationally.

Table 1: Employment generated in Southern Forestry Region from harvesting\* and carbon capture activities (Full Time Equivalent)

| From this:   |                                   |                                    |                             |      |      |
|--|-----------------------------------|------------------------------------|-----------------------------|------|------|
| Harvesting scenarios   | H1: Chipping and saw logs 2011-12 | H2: Chipping and saw logs end 2012 | H3: Saw logs only est. 2013 |      |      |
| Processing – chip and saw milling  | 188                               | 159                                | 139                         |      |      |
| Logging and haulage  | 139                               | 91                                 | 25                          |      |      |
| Total industry   | 327                               | 250                                | 164                         |      |      |
| FNSW personnel   | 79                                | 75                                 | 30                          |      |      |
| Total including FCNSW  | 406                               | 325                                | 194                         |      |      |
| To this:   |                                   |                                    |                             |      |      |
| Scenario CC 1: Carbon capture, potential employment funded by Australian Carbon Credit Unit income | 2014                              | 2015                               | 2021                        | 2025 | 2032 |
| Carbon assessment, forest management, weed and feral animal control, wildlife preservation         | 205                               | 205                                | 205                         | 205  | 205  |
| Fire and walking trails, tourist roads, other infrastructure                                       | 51                                | 51                                 | 120                         | 120  | 120  |
| Health & educational personnel   | -                                 | -                                  | 75                          | 75   | 75   |
| Total  | 256                               | 256                                | 400                         | 400  | 400  |



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\*Despite rhetoric referring to harvesting, the logging of native forests is not sustainable, as true harvests follow annual plantings.

This table shows that employment generated from ACCU income from not logging the State Forests of the southern forest region would level off at about 400 full time equivalent jobs in forest management, and health and educational personnel alone. This does not include the boost to tourism which would result from a focus on using the regenerating forests for attracting visitors and the consequent return of wildlife as has been experienced in other countries which have ceased logging native forests. The Great Southern Forest holds great potential for the future of forests and the planet.

*Mike Thompson, Frances Perkins, Bronte Somerset*



## Calculations of actual loss of CO<sub>2</sub> and soil from logging activities

Table 2: CO<sub>2</sub> emissions of native forest logging on the South Coast, NSW, 2006/07 <sup>2</sup>

| Item                                    | Area/Amount                                   | Volume                | Time Period      | Tonnes CO <sub>2</sub> e           |
|---|---|-----------------------|------------------|------------------------------------|
| native forest loss                      | 14 388 ha                                     | 611 594m <sup>3</sup> | 2006/07          | 1 730 623                          |
| slash                                   | 14 388  | 611 594m <sup>3</sup> | 2006/07          | 235 710                            |
| Contractors' cars                       | 23 compartments                               | 69 vehicles           | 276 days         | 780 327                            |
| <b>sub total logging</b>                |   |                       |                  | <b>2 746 660 tCO<sub>2</sub>e</b>  |
| machines                                | 3 per compartment                             | 69                    | 276 days         | 10 529 843                         |
| chainsaws                               |   | 23                    | 138 hrs/276 days | 87 900                             |
| mechanical harvesters                   |   | 19                    | 276 days         | 2 899 522                          |
| <b>Total logging tCO<sub>2</sub>e</b>   |   |                       |                  | <b>16 263 925 tCO<sub>2</sub>e</b> |
| roading for compartments                | 1770 kms                                      | 2 machines/ comp      | 7080hrs@23L/hr   | 434 965                            |
| jinkers x 75                            | 1.5 million L /2.7kgCO <sub>2</sub>           | 61 159 400t-km        | 0.024l/t-km      | 40 50 000                          |
| sawmills scope 2                        | 20 700m <sup>3</sup> at 1.96GJ/m <sup>3</sup> | 4                     | 207 days         | 40 153                             |
| sawmill vehicles                        |   | 44                    | 207 days         | 56 097                             |
| SEFE chipmill                           | 6 500 000kWhrs                                | 49 weeks              | 7056 hrs         | 5 785                              |
| chipmill vehicles                       | 35 km ea way                                  | 20                    | 253 days         | 72 718                             |
| bus                                     | 6 trips per day                               | 1                     |                  | 13 246                             |
| ships                                   |   | 26                    |                  | 610 324                            |
| FNSW - electricity                      |   | 10 069Gj              |                  | 2 500                              |
| Petrol vehicles                         | 9038L   | 77                    |                  | 20 858                             |
| Diesel vehicles                         | 71 973L                                       | 555                   |                  | 192 248                            |
| Gippsland CO <sub>2</sub> estimates     |   |                       |                  | 4 620 420                          |
| <b>sub total (vehicles &amp; mills)</b> |   |                       |                  | <b>10 119 314 tCO<sub>2</sub>e</b> |
| <b>TOTAL</b>                            |   |                       |                  | <b>26 383 239 tCO<sub>2</sub>e</b> |

<sup>2</sup> Data from FNSW Implementation Report 2004/05 and 2006/07 on this data it seems one vehicle uses 110L per year; data for logging is from ESRI, harvest plans and Digwood FOI info 2009; 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4: Agriculture, Forestry and Other Land Use, Chapter 2: Generic Methodologies Applicable to Multiple Land-Use Categories- Table 2.5 and 2.6; Chapter 4; Annex 2 Summary of equations: part B equation 2.12, part C; part E; table 4.5 and 4.6; the formulas used for logging are CO<sub>2</sub>e = HxBEFx Dx(1+R)x44/12 (or 3.667) where H= m<sup>3</sup> BEF =1.9 D=0.325tCm<sup>3</sup> R= 0.25; for prescribed burning equation 2.27 CO<sub>2</sub>e = A x MB x Cf x Gef x 10-3; the liquid fuel formula is CO<sub>2</sub>e = (QExEF)/1000 where Quantity consumed or burnt x Energy x Emiss Factor divided by 1000; slash estimates FNSW 50-150t/ha or Ximines figure of 50% pers com to Paul et al below n4; the electricity consumption formula is Y= Q x (EF/1000); Harvesters and log loaders consume 23-38 litres/hr, graders when roading 0.276 L/km, jinkers 1.8L/km, cars -petrol 4WD 4cyl 9L/100km, 6cyl 16L/100km, diesel 4cyl10L/100km, 6cyl 14L/100km, Toyota 4WD 4.12L engine diesel - 12.1L/100km; FNSW state contractors used 10.9M L 2009/2010; BEF means biomass expansion factor, D is density of carbon in hardwood, R is ratio of below ground weight to above ground weight.

| Item        | Area/Amount | Volume    | Time Period | Tonnes     |
|-------------|-------------|-----------|-------------|------------|
| soil C loss | 14 388ha    | 611 594m3 | 2006/07     | 14 773 023 |

The NSW government's lack of progress on cutting CO<sub>2</sub> emissions from native forest logging is the reasoning for calculations confined to CO<sub>2</sub>.<sup>27</sup> Ideally all six Kyoto GHGs should be calculated.<sup>28</sup> The following assumptions were made (a) native forests on the south coast are logged primarily for pulp; (b) 50% of the biomass of trees remain on site as slash.<sup>29</sup> The South Coast is defined as a temperate system. Flows of GHGs to or from the atmosphere are equal to changes in carbon stocks in the biomass and soils.

While searching for relevant equations, it became apparent that the generic methods used are not all encompassing. The conversion of native forest to dirt does not seem to be a category. Carbon density is  $.325 \times \text{cubic metre} \times 3.66 = \text{CO}_2$ .

The stock of carbon for intact natural forests in our study area is about 640 t C ha<sup>-1</sup> and the average NPP of natural forests is 12 t C ha<sup>-1</sup> yr<sup>-1</sup> (with a standard deviation of 1.8). In terms of global biomes, Australian forests are classified as temperate forests. The IPCC default values for temperate forests are a carbon stock of 217 t C ha<sup>-1</sup> and an NPP of 7 t C ha<sup>-1</sup> yr<sup>-1</sup> (Mackey et al 2007).

National Transport Commission base B-Double tax on the assumption that trucks travel 210 000kms/year on 2 12 hr shifts. To keep it simple we will assume 611 594 m<sup>3</sup> is the equivalent number of tones. The assumption that the average haul distance is 100km, although in many instances this is a lot more. As a result the freight task (t X avg haul distance) is 61 159 400 t-km. The fuel use for the b-double types in that area would be about 0.019 l/t-km or worst case 0.024 l/t-km for jinkers. This gives a fuel use of just under 1.5 million L and every litre of diesel burned produces 2.7 kg of CO<sub>2</sub> or just under 4 million tones of CO<sub>2</sub> worst case.

With harvesting equipment the actual fuel use per hour varies dramatically depending on the machine, as does the amount of wood they handle in an hour. As an example a harvester will consume between 10 and 25 L per hour (depending on design, size, etc.) and will process between 8 and 28 m<sup>3</sup>/hr in the conditions you are looking at. Similarly a felling machine will consume 30-40 L/hr and fell between 10 and 80 m<sup>3</sup>/hr.

Calculations were made using the Stock-Difference Method except for East Gippsland.

NSW native forest volume logged= 1 196 999 m<sup>3</sup>, FNSW figures under FOI 2006/07 south coast Volume logged = 20 408+59056+10856+324 960+60 053+115 808+11 836+8617 = 611 594 m<sup>3</sup>, Sth Coast hectares logged = 14 388 Gain-Loss Method (2006-07) = 14 388 hectares logged x 256 x 3.667 = 13 506 764 tCO<sub>2</sub>e.

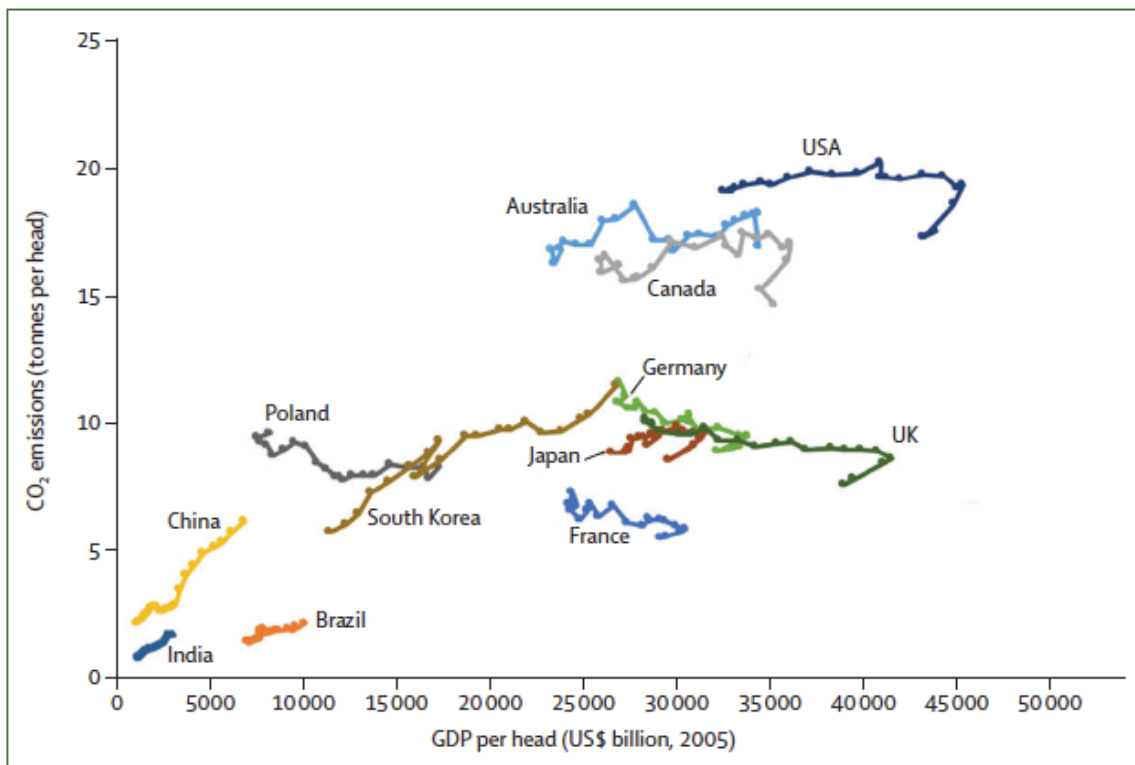
For East Gippsland 4 500ha x 280 x 3.667 = 4,620,420 tonnes of CO<sub>2</sub> (40% of 640 = 256, 40% of 700 = 280) as it is assumed that logged forest is, on average, 40 per cent below carbon carrying capacity (Roxburgh et al. 2006).

*South East Forest Rescue*

## Climate Change: Native Forests Benefit Human Health

This section balances the findings of the multidisciplinary and international Lancet Commission on Health and Climate Change<sup>30</sup> with the occurrence of native forest logging in the southern region of NSW.

The Commission declares that “the effects of climate change are being felt today, and future projections represent an unacceptably high and potentially catastrophic risk to human health”. The Commission’s graph shows that, based on purchasing power parity, Australia has the second highest level of emissions among the countries which they represented. Based on a study of emissions from native forest logging and infrastructure in the southern region of NSW, 26 383 239t CO<sub>2</sub>e occur in one year alone. (See Table 4 and explanation below). Stopping logging of native forests would mean that these emissions would not be counted in Australia’s carbon emission tabulations.



Graph 3: Per head CO<sub>2</sub> emission trends in relation to income for a selection of countries (1990–2008)  
\*Based on purchasing power parity.

Universal health benefits from carbon sequestration must not be underestimated. Even though the multiple, strong scientific, commonsense, empirically and economically based claims made in this Great Southern Forest initiative justify that stopping native forest logging will contribute to a healthy environment and a healthy planet, the Lancet Commission on Health and Climate Change states that, “achieving a decarbonised global economy and securing the public health benefits it offers is no longer primarily a technical or economic question—it is **now a political one** [emphasis added]”. Thus, the outcomes and recommendations identified and elaborated on in this GSF initiative can only be realized by a strong commitment by the Federal and State Governments to end the multiple environmentally destructive influences of native forest logging.

The Lancet Commission affirms that many mitigation and adaptation responses to climate change are “no-regret” options, such as have eventuated in countries such as Brazil, New Zealand and Mozambique post stopping logging of native forests, which led to direct multiple economic and environmental benefits. Stopping logging of native forests in southern region of NSW would guarantee a “no-regret” option. This outcome needs to be tested by a positive policy response by the Federal and State Governments for it to be realised.

The Commission’s list of high impact technologies for climate mitigation includes afforestation and reforestation. It maintains that afforestation and reforestation have a globally potential mitigation effect of 183 Gt of carbon by 2060<sup>3</sup>. This approach concurs with Kieth et al’s (2015) conclusion that: “...we found that the greatest mitigation benefit from native forest management, over the critical decades within the next 50 years, is achieved by protecting existing native forests”. Much more carbon can be sequestered by afforestation and reforestation initiatives. For these initiatives to become a reality in countering the impact of an increasingly carbon laden atmosphere, depends upon the ability and will of our political leaders to recognise the critical role which carbon plays in securing healthy forests and a healthy planet.

### Biomass Burning: a Perverse Way to Meet Renewable Energy Targets

There is an immediate and critical need to reconsider legislative and policy settings around wood fired power. Security of the native forests is threatened by conversations relating to the concept of burning native forests for electricity generation. Carbon accounts prove that considering burning woodchips as renewable energy is a perverse argument as this practice would emit more CO<sub>2</sub> than coal-fired power stations.

Native forest biomass burning would involve major depletion of forest carbon stocks. Thus, this practice should not be considered to be an eligible renewable energy fuel for electricity generation as it is dirty energy and not genuinely renewable as are wind, solar, tide and geothermal. The purpose of the Renewable Energy Targets (RETs) is to encourage the reduction of greenhouse gas emissions. Burning native forest biomass for electricity generation is contrary to this purpose as both the logging and the burning result in large CO<sub>2</sub> emissions.

The Department of Primary Industries has admitted that no Australian studies have been conducted on the cost or the financial viability of burning native forest trees for electricity generation. The findings from American studies<sup>31</sup>, that burning native forest biomass for electricity produces more emissions than coal (estimates vary from 1.5 times to 6 times more), are likely to be compounded by specific factors relative to the Australian context. Burning timber from southeast native and old growth forests of NSW, with world renown high carbon storage, would encounter an even larger carbon debt. This makes it less likely that emissions reductions from burning wood would be creditable in any meaningful timeframe.

It has been advocated that Australia should follow European bioenergy practices. Yet, most European forests are plantations, not natural forests. Other fundamental differences are: different geographies, climates, water supplies, and industry economics. Promoting such pro-biomass burning arguments based on European practices are refuted in research findings from Sweden.<sup>32</sup> These researchers recommend that management should consider the carbon displacement effect of using forest biomass for bioenergy and other purposes. They state:

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<sup>3</sup> The Commission obtained these values of CO<sub>2</sub> emission mitigation for renewable energy from the Intergovernmental Panel on Climate Change (IPCC) special report on renewable sources and climate change mitigation. The ranges represented the minimum and maximum values from four future energy scenarios.

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The public and private sectors are advised to consider information from comprehensive analyses that provide insights about energy and forest systems in the context of evolving forest product markets ...

They promote 'sustainable forest management, considering other ecosystem services of the forest such as air quality improvement, water purification, soil stabilization and biodiversity conservation, and social services such as employment and recreation'. These considerations are discussed in relevant sections of this document.

Biomass burning for electricity generation is definitely not a 'one size fits all' situation. In the specific Australian context, renewable energy credits from biomass burning would only give perverse incentives on top of the large subsidies already required for native forest logging. It would be like getting into more debt to pay an existing one—the debt would double and the immediate carbon deficit from forest loss would exacerbate the problem.

Forest management decisions should follow a global trend away from bioenergy production from a source which, managed for carbon, water, soil and wildlife, would generate optimal revenue. The principles of the Great Southern Forest would guarantee such optimal revenue.

*Bronte Somerset*



Image 1: Post-logging burn. Judith Deland

## CONCLUSION

The evidence given in this section supports an ending to native forest logging as substantiated by establishment of the GSF. Not at any time in our history has the public had such a great awareness of, and better understood, the science and impact of carbon emissions.

Communities of the southern region of NSW have seen the damage to our forests from logging for woodchips, destroying their capability to sequester carbon. Global research on the impact of carbon loss from forests is trustworthy because what has been proven scientifically with theory and logic, equates to our own local empirical evidence. Given this wealth of knowledge and understanding, it is therefore imperative that the ideals of the Great Southern Forest be initiated: the future health of the planet depends upon it.

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- <sup>1</sup> Makkonen, M., Huttunen, S., Primmera, E., Repog, A., Hildéna, M. (2015) *Policy coherence in climate change mitigation: An ecosystem service approach to forests as carbon sinks and bioenergy sources*. Science Direct. doi:10.1016/j.forpol.2014.09.003
  - <sup>2</sup> Thompson, M. (2015). Great Southern Koala Forest. *Nature NPA*. Autumn 2015
  - <sup>3</sup> Kyoto Protocol, Art 2(1)(a)(ii) [unfccc.int/kyoto\\_protocol/items/2830.php](http://unfccc.int/kyoto_protocol/items/2830.php)
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