

A framework for carbon accounting and emissions reductions

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Australia's greenhouse gas accounts follow the international format. They can be re-arranged to provide a clearer basis for designing emission reduction policies and make them easier to understand and more transparent, especially in relation to non-fossil fuel emissions. This is essential to raise awareness, improve understanding and engage public support. The re-arrangement also highlights gaps in the data needed for full carbon accounting.

Annual accounts (flows)

1. Separate fossil carbon from biocarbon

Fossil carbon is the carbon locked in fossil fuels, such as coal, oil and gas. Biocarbon is the carbon associated with living systems. The two are functionally different, especially because biocarbon is stored in the living landscape and stocks and flows are relevant, as well as emissions and uptake. For fossil carbon, for all practical purposes, only emissions need be accounted for.

2. Separate 'green' carbon from 'production' carbon

Biodiverse green carbon is the carbon held in natural ecosystems (including biomass, dead wood litter, and soil). It is the jewel of terrestrial carbon stores, ecologically permanent because it is resilient, self-reproducing and adaptive. Production carbon is the carbon held in agricultural and other production systems (including plantations and waste) where the primary purpose of management is not protection but there may be opportunities to improve carbon storage without compromising production.

3. Separate emissions from uptake (removal of CO₂ from the atmosphere)

Fossil carbon only generates emissions. Biocarbon generates both emissions and uptake – for clarity, these must be disaggregated, not reported as net figures.

4. Account fully for all emissions and uptake (full carbon accounting)

The UNFCCC accounts are moving towards full carbon accounting and should be used to underpin policy and action. Major gaps that remain include CO₂ emissions and uptake by soils in production systems, and emissions and uptake by non-forest vegetation and by forests in protected areas (parks and reserves).

Biocarbon stocks

5. Develop accounts for biocarbon stocks

Deforestation and degradation have caused up to 35% of the increase in atmospheric CO₂ concentrations since the industrial revolution. This carbon debt should be reflected in a biocarbon stocks account, together with current stocks and potential for recapture. Issues such as the treatment of transient events (climatic events, fire etc) need to be worked out, as has been done for corporate financial accounting systems.

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Emission reduction targets

6. Set separate targets and trajectories for fossil carbon emissions, biocarbon emissions and biocarbon uptake

This gives clarity, allows different policies to be applied for each target appropriate to its characteristics, reduces uncertainties (e.g. the impact of biocarbon offsets on a fossil carbon market), and reduces the potential for perverse outcomes. It focuses on reducing emissions as the primary goal and narrows the space for argument (e.g. whether regrowth of protected forests should be defined as 'anthropogenic').

Emission reduction policies

7. Emissions trading

Emissions trading should be applied to fossil carbon emissions only, with no 'offsets' from uncovered sectors. This confines the scheme to sectors with relatively uniform characteristics: only CO₂ emissions (not uptake) are caught; measurement is reasonably reliable; a small number of players are involved; and the CO₂ can be regarded as a commodity (unlike biocarbon where the CO₂ ought to be valued according to its source – emissions from clearing a rainforest are not equivalent to emissions from logging a plantation).

8. *REDD Plus*

The primary aim for green carbon is to protect the stores in perpetuity, first by eliminating avoidable emissions (native forest clearing and logging are both largely avoidable) and then by enhancing uptake.

- o *REDD* -- reducing emissions from deforestation and degradation -- should be applied to green carbon, both forest and non-forest, in line with international moves. Regulation, together with transitional funding for affected industries and workers, is the simplest and most effective mechanism.
- o *Plus* – managing biocarbon stores in perpetuity – should apply to green carbon stores and to opportunities for improving carbon storage in production systems. The sequestration potential as native vegetation recovers to full carbon carrying capacity and from soil conservation is large.
- o *REDD Plus Fund* – expenditure on reducing biocarbon emissions and enhancing uptake should be proportionate to the benefits (in 2006, it accounted for 32% of emissions, 22% of net emissions). Income should be accumulated from a variety of sources including restructuring existing government expenditures for these areas, a tranche from the emissions trading scheme, voluntary contributions, and industry investments. The Fund would provide a new income stream for land managers to look after native vegetation carbon stores for the long-term, give incentives to conserve soil carbon in production systems, and invest in major new R&D programs. It should be managed by an expert body (similar to the Future Fund or Building Australia Fund).

9. Sectoral policies and boundary issues

Sectoral policies are likely to be needed to complement market based policies. Emissions trading should be augmented with energy efficiency standards and renewable energy feed-in laws. The agriculture and waste sectors are diverse, include multiple small players, and need specifically designed policies. Boundary issues for emissions trading need to address the treatment of fuelwood, bioenergy and biomass feedstocks, with policies in place before the scheme begins.

Australia 2006 greenhouse gas accounts (UNFCCC accounting). Mt CO₂-e

Activity	Fossil carbon	Biocarbon			
		Green carbon		Production carbon	
		Emission	Uptake	Emission	Uptake
Energy	401				
Stationary energy	287				
Transport	79				
Fugitive emissions	34				
Industrial processes	28				
Waste				17	
Agriculture				90	
Animal husbandry				63	
Soils				15	Unknown
Burning (non CO ₂)				12	
Forests and plantations		94	-57	2	-23
Native forest		31*	-57		
Pre 1990 plantation				2**	
Post 1990 plantation					-23**
Deforestation		63**			
Other (wood products, etc)				2	-4
Non-forest native vegetation (grassland remaining grassland)		Unknown	Unknown		
TOTAL 2006: 550 net Emissions only 634	429	94	-57	111	-27
Total 1990: 516 net Emissions only 590	310	172	-57	108	-13
Policy	ETS + sectoral	REDD	Plus	Sectoral	Plus

* Logging 21, fuelwood 7, biomass burning 3 (likely to be significantly underestimated)

** Net figures – not disaggregated into emissions and uptake

Kyoto sectors