

Kyoto
Supplementary
Submission No. 112:2



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Ms Susan Redman
Inquiry Secretary
Joint Standing Committee on Treaties
Parliament House
CANBERRA ACT 2600

Dear Ms Redman

Inquiry into the Kyoto Protocol

Thank you for your letter of 12 October 2000 regarding the Australian Greenhouse Office (AGO) appearance on 27 September before a public hearing of the Joint Standing Committee on Treaties, to give evidence to the Committee's Inquiry into the Kyoto Protocol.

As you have indicated, during the hearing the AGO undertook to clarify a number of issues for the Committee relating to the treatment of Greenhouse sinks under the Kyoto Protocol (p124 & p132, Hansard Proof). I have enclosed responses on these matters for the Committee's consideration. We had not previously been aware of the request emanating from the discussions with APPEA, but we will respond on this as quickly as possible.

The AGO has broadly reviewed the Hansard transcript, and does not wish to propose any amendments to it.

Please let us know if we can be of further assistance to the Committee, by contacting me (Ph: 6274 1405, email: ian.carruthers@greenhouse.gov.au) or Ms Bettina Soderbaum (Ph: 6274 1887, email: bettina.soderbaum@greenhouse.gov.au).

Yours sincerely

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26 October 2000

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Australian Greenhouse Office Response to Questions from Joint Standing Committee on Treaties

Definitions of Forest, Afforestation, Reforestation and Deforestation under Article 3.3 of the Kyoto Protocol

i) Background

Under Article 3.3 of the Kyoto Protocol, developed countries are required to count the net changes in greenhouse gas emissions by sources and removals from sinks resulting from direct human-induced land-use change and forestry activities, limited to afforestation, reforestation and deforestation since 1990.

On 1 August 2000, countries were invited to make submissions to the UNFCCC Secretariat on how the greenhouse sinks provisions of the Kyoto Protocol, including Article 3.3, should be implemented (Attachment A).

These proposals are now consolidated into a single document, known as the 'Co-Chairmen's text'. The section of the text pertaining to definitions of forest, afforestation, reforestation and deforestation appears in Attachment B. Countries have also had an opportunity to comment on the Co-Chairmen's text. The relevant Australian comments, submitted on 16 September, appear in Attachment C.

Decisions to implement the sinks provisions of the Kyoto Protocol are expected at the Sixth Conference of the Parties (COP6) to the UN Framework Convention on Climate Change in The Hague in November.

ii) Definition of a 'forest'

The definition of a forest is central to the operation of Article 3.3, as it will determine the scope of activities which can be counted as afforestation, reforestation and deforestation.

In the Australian 1 August 2000 submission, elements of a definition of a forest were incorporated into the definitions of afforestation, reforestation and deforestation. These definitions were designed to provide coverage of the full range of our native forests, plantations and woodlands.

Subsequent developments in the international negotiations have seen apparent convergence around a different approach based on a 'stand alone' definition of a forest with built-in flexibility. This also meets Australia's national interests and allows Australia to join other countries in supporting a definition of a forest for the purposes of implementing Article 3.3.

This approach (option 1c of the Co-Chairmen's text) has the greatest support in the negotiations. It is based on the Food and Agriculture Organisation (FAO) definition of a forest and allows flexibility as countries can choose their own ranges (thresholds) for canopy cover, land area and tree height. This means that Australia will be able to use existing forestry data in reporting on the Kyoto Protocol, and will ensure that the diversity of our forest estate can be included in the Kyoto Protocol accounting.

This definition, in conjunction with a reporting requirement on paragraph 53 of the Co-Chairmen's text, provides a degree of certainty for reporting and accounting because developed countries will each elect a definition of a forest before the beginning of the commitment period. The selected definition would then remain fixed for the duration of that commitment period, minimising scope for under-reporting.

The other options presented in the Co-Chairmen's text are less likely to receive support. In particular, Parties are unlikely to support a universal definition of a forest that does not allow for different country circumstances to be covered.

It is possible that there will be further technical work and negotiations on definitions of 'forest' after COP6 for possible implementation in subsequent commitment periods.

iii) Definitions of 'Afforestation,' 'Reforestation' and 'Deforestation'

There are two main options before the negotiations on definitions for afforestation, reforestation and deforestation. These relate to definitions which are in line either with the Intergovernmental Panel on Climate Change (IPCC) in their 1996 Inventory Guidelines, or the Food and Agriculture Organisation (FAO) definitions.

IPCC Definitional Approach

There is a high degree of convergence among most developed countries that the definitions of afforestation, reforestation and deforestation should be based on the IPCC definitions. Australia's proposed definitions as per our 16 September submission, which are also in line with the IPCC definitions, are set out below:

Afforestation is defined as the conversion of non-forest to forest on land that has not supported a forest for a period of at least 50 years. This means that afforestation is accompanied by a change in land use.

Reforestation is also accompanied by a change in land use and is defined as the conversion of non-forest to forest on land that was forested, but that has been converted to non-forest for a period of at least five years. Reforestation does not include regeneration that occurs as part of the commercial forest management cycle.

Deforestation is the conversion of forest to non-forest. Deforestation does not include harvesting or other practices that occur as part of the commercial management cycle.

FAO Definitional Approach

Under the FAO approach, the following definitions apply:

Afforestation: artificial establishment of forest on lands that previously did not carry forest within living memory.

Reforestation; artificial establishment of forest on lands that carried forest before. (This means reforestation includes regeneration of trees following harvest under normal forestry practice).

Deforestation: change of land cover with depletion of tree crown cover to less than 10%. (This means harvesting as part of normal commercial forestry is not counted as deforestation).

Depending on how the definitions are applied, FAO definitions for reforestation and deforestation can result in situations where countries either receive significant debits as a result of emissions from harvesting or significant credits by counting only the sequestration from regeneration and ignoring harvesting emissions. In neither case do credits or debits reflect actual exchange of carbon with the atmosphere.

While a few countries with large commercial forestry estates - including Canada and Japan - continue to advocate the FAO definitions rather than the IPCC definitions for reforestation and deforestation, the FAO approach is unlikely to be endorsed in the negotiations.

Definitions in the Co-Chairmens' Text

The Co-Chairmens' text currently contains the following definitions for afforestation, reforestation and deforestation. For these definitions, the options of inclusion or non-inclusion of bracketed text allows for either the IPCC or the FAO definitional approach to be used for reforestation. (The use of brackets signals that these are key options before the negotiators).

Afforestation

"Afforestation" is the conversion of non-forest to forest on land that has not historically¹ been forested.

Reforestation

"Reforestation" is the conversion of non-forest to forest on land that historically was forested, but that has been converted to non-forest. Re-establishment of the forest through planting, seeding and natural regeneration following harvesting will [not] be considered reforestation.

Deforestation

"Deforestation" is the conversion of forest to non-forest, which is not immediately followed by the establishment of the same forest type on the same site.

¹ The Co-Chairmens' text defines historic as meaning since 1990 which is the year carbon accounting begins for the Kyoto Protocol.

Australian submission to the UNFCCC on Land Use, Land Use Change and Forestry - 1 August 2000

Implementation of Articles 3.3 and 3.4 of the Kyoto Protocol

Summary

- The principles and relevant provisions of the UNFCCC and the Kyoto Protocol recognise the need to enhance and preserve sinks (land use, land use change and forestry activities (LULUCF)).
- Inclusion of sinks gives individual Parties greater flexibility to take action in a way that reflects their national circumstances, and improves the environmental effectiveness of the Kyoto Protocol.
- Sinks can contribute to reducing atmospheric greenhouse gas concentrations while also providing other environmental benefits by addressing soil degradation (eg. salinity), maintaining biodiversity and enhancing sustainable land management.
- Emissions from LULUCF constitute a significant proportion of Australia's emissions profile.
- COP decision 16/CP.5 established decisions on Article 3.3 and 3.4 as an integral part of the Buenos Aires Plan of Action package of decisions required at the Sixth Conference of the Parties (COP6).
- The IPCC Special Report on LULUCF has furnished Parties with the scientific and technical advice needed for effective and informed decision making on LULUCF at COP6.
- Articles 3.3, 3.4 and 3.7 provide a framework for the implementation of a restricted set of land use, land use change and forestry activities by Annex B Parties to the Kyoto Protocol.
 - Under Article 3.3, LULUCF activities are confined to direct human induced afforestation, reforestation and deforestation since 1990.
 - Article 3.4 establishes a process for Parties to include additional human induced activities in the agricultural soils, land use change and forestry categories. Decisions on Article 3.4 activities since 1990 may apply for the first Kyoto Protocol commitment period and must be applied in subsequent commitment periods.
 - Article 3.7 states that countries with a net source from land use change and forestry in 1990, such as Australia, can include emissions from land use change in the baseline used for calculating their assigned amounts.
- Parties should agree definitions and accounting approaches that will facilitate environmentally robust and cost effective implementation of LULUCF activities already specified in Article 3.3 (afforestation, reforestation and deforestation).
- For the first commitment period, Parties should move towards a more comprehensive treatment of greenhouse sinks by agreeing to definitions and accounting approaches for a further defined set of specific human induced additional LULUCF activities under Article 3.4.

- The key to implementing the LULUCF provisions of Article 3 lies in the development of robust approaches to accounting for changes in greenhouse gas emissions and carbon stocks associated with eligible LULUCF activities.
- When taken together, these accounting approaches and definitions should function as a means to integrate Articles 3.3, 3.4 and 3.7 in a coherent carbon accounting system which will allow key requirements of the Kyoto Protocol to be implemented.
- Such key requirements for LULUCF activities in the first commitment period include:
 - That the activity is directly human induced or human induced;
 - That the activity took place since 1990;
 - That measurement of changes in carbon stock or greenhouse gas emissions as a result of the activity is verifiable and transparent; and
 - That measurement uncertainties are taken into account.

I. OVERALL ACCOUNTING APPROACHES IN RELATION TO THE REQUIREMENTS OF ARTICLES 3.3, 3.4 AND 3.7, REVERSIBILITY, NATURAL EFFECTS AND ACCOUNTING INTERLINKAGES

Explanatory material

- An overarching carbon accounting system will need to provide consistent and robust estimates for LULUCF activities.
- To the extent possible, given the different requirements of Articles 3.3, 3.4 and 3.7 there should be measurement and accounting consistency across the carbon accounting system.
- The Protocol states that only certain human induced LULUCF activities in Articles 3.3 and 3.4 can be credited or debited against Parties' assigned amounts.
- This means that full carbon accounting of all terrestrial sinks within a Party's borders is not required for the purposes of implementing Article 3.
- In line with key requirements in Article 3.3 and 3.4, to gain credit or debit for LULUCF activities in the first commitment period, Parties will need to show that changes in greenhouse gas emissions and carbon stocks during the commitment period resulted from a human induced activity which took place since 1990.
- Measurement of changes in emissions and/or carbon stocks will need to be transparent, facilitate verification and take uncertainties into account.
- An accounting approach based on the concept of Article 3.3 and Article 3.4 lands offers the best way to reflect key Article 3.3 and 3.4 requirements.
- The Article 3.3/3.4 lands accounting approach essentially refers to land based accounting which is directly linked to specific, eligible LULUCF activities.

Article 3.3/3.4 lands accounting approach

- Under the Article 3.3/3.4 lands accounting approach, Parties will be required to identify eligible LULUCF activities which will draw a given area of land into the Article 3.3/3.4 accounting system.
- This will require specification of activities that are eligible under Articles 3.3 and 3.4; and

- Identification (for the purposes of measurement and reporting) of land units on which these activities occur.
- Accounting for Article 3.3/3.4 lands will commence on those areas of land at the start of the activity.
- As a general approach, once an area of land moves in to the Article 3.3/3.4 accounting system, then all greenhouse gas emissions or carbon stocks will need to be accounted for.
- This would include both human induced and natural processes such as fire, pest invasion, harvesting and replanting cycles in commercial forestry, as well as indirect human effects like CO₂ fertilisation.
- The effects of multiple eligible LULUCF activities on greenhouse gas emissions occurring on an individual area of Article 3.3/3.4 land will therefore be accounted for under this approach.
- Once an area of land becomes subject to the Article 3.3/3.4 accounting system, full carbon accounting of relevant carbon pools and measurement of changes of non-CO₂ greenhouse gases (methane and nitrous oxide) on that land will be required.
- Relevant carbon pools would include above ground biomass, litter and woody debris, below ground biomass, soil carbon and harvested materials.
- Accounting for Article 3.3 and 3.4 lands will be required across contiguous commitment periods under the Kyoto Protocol.
- This will address incentives to concentrate LULUCF activities that may result in net emissions in time periods not covered by the accounting system.

Measurement methodologies and uncertainty

- Article 5.2 of the Kyoto Protocol establishes the 1996 IPCC Revised Inventory Guidelines as the methodologies for measuring and reporting of greenhouse gases under the Protocol for the first commitment period.
- In some cases, these Guidelines will require elaboration to deal with the specific requirements of the Kyoto Protocol including for LULUCF activities in Articles 3.3 and 3.4.
- The IPCC work on good practice guidance should be extended to cover LULUCF activities under the Protocol including dealing with uncertainties. This would require development of a set of procedures that would allow Parties to address:
 - The choice of estimation methods appropriate to countries' national circumstances;
 - Quality assurance and quality control at a national level;
 - Quantification of uncertainties; and
 - Requirements for data archiving and reporting to promote transparency and facilitate verification.
- The IPCC Special Report shows that the technical capacity to measure changes in carbon stock and greenhouse gas emissions currently exists among Annex B Parties.
- Australia is developing a specialised National Carbon Accounting System that will provide robust accounting for all changes in greenhouse gas emissions and/or carbon stocks associated with eligible LULUCF activities.

Reversibility

- The Article 3.3/3.4 lands accounting approach which encompasses ongoing full carbon accounting/measurement of emissions on identified Article 3.3/3.4 land areas across the first and subsequent contiguous commitment periods means that possible reversibility (and variability) of those LULUCF activities at some future time would be identified and accounted for:
- Possible reversibility of LULUCF activities may arise from human action (eg harvesting under commercial forestry) or natural processes (eg. fire, pest invasion or El Nino cycles).

Natural effects

- Under the Article 3.3/3.4 lands accounting approach, changes in carbon stocks and greenhouse gas emissions resulting from natural effects such as fire, pest invasion and natural climate variability (eg the El Nino cycle) will be accounted for.
- Changes in carbon stocks resulting from increased CO₂ and nitrogen fertilisation will also be captured under the Article 3.3/3.4 lands accounting approach.
- These changes in carbon stocks and emissions will result in credits or debits under Parties' assigned amounts.

Linkage with Article 3.7

- Article 3.7 was an important part of the Kyoto Protocol outcome on LULUCF activities.
- Many Annex B countries have mature forests that are declining in sequestration capacity.
- These Parties would have suffered a detriment if they were required to include the land use change and forestry sector in the calculation of their 1990 baselines and then account for emissions and sequestration from this sector during the commitment period.
- To address this issue, emissions and sequestration from land use change and forestry (LUCF) are excluded from the calculation of most Annex B Parties' assigned amounts - i.e. emissions from LUCF are generally not factored into the calculation of Annex B Parties 1990 emissions baseline.
- However all Annex B Parties can count net sequestration from certain eligible LULUCF activities towards their target commitments under Article 3.3.
- This approach created significant problems for Australia as, unlike most Annex B countries, it had a net source of emissions from LUCF in 1990.
- This means that emissions from LUCF (which includes emissions from land clearing) would not have been factored into the 1990 baseline yet Australia would be debited for these emissions under Article 3.3 during the commitment period.
- Article 3.7 was developed to address only this problem and was not designed to capture emissions from other sectors such as agricultural soils.
- It allows countries with a net source from land use change and forestry in 1990, such as Australia, to include emissions from land use change in the baseline used for calculating their assigned amounts.

Including emissions from land use change in Parties' 1990 baseline

- Under Article 3.7, countries can only include emissions from land use change in their 1990 baselines if they can demonstrate that they have a net source of

emissions from the land use change and forestry inventory category in 1990, as laid out in the Revised 1996 IPCC Inventory Guidelines.

- In order to implement Article 3.7, elaboration of the term "land use change" in the second sentence of Article 3.7 is required.
- The meaning of the term land use change in Article 3.7 derives from the Revised 1996 IPCC Inventory Guidelines category *Land Use Change and Forestry* of which two sub-categories are *Forest and Grassland Conversion*, and *Abandonment of Managed Lands*.¹
- The Guidelines identify these two sub-categories as “categories of land use change” and says land use change has occurred where there is a change in land cover.
- Parties seeking to utilise Article 3.7 are therefore required to show that they had a net source of emissions from LUCF in 1990. Such Parties are then required to include emissions from relevant carbon pools associated with the forest and grassland conversion and abandonment of managed lands sub-categories in the calculation of their 1990 baseline.
- On this basis, emissions occurring in the remaining subsectors *Changes in Forests and Other Woody Biomass Stocks*, *CO₂ Emissions and Removals from Soils* and *Other* are not included under the term land use change in the calculation of the 1990 baselines via Article 3.7.
- This approach establishes a direct linkage between the terms *deforestation* in Article 3.3 and *land use change* in Article 3.7.
- Article 3.7 cannot be used to include in the calculation of Parties' 1990 baselines greenhouse gas emissions from non-forest land use change such as conversion of pasture to crop lands.
- This means there is no need to address potential double counting that may arise between Article 3.7 and additional activities in the agriculture soils and land use change categories that may be agreed under Article 3.4.

Textual Proposal

Overall accounting approaches for Article 3.3 and 3.4

Parties are required to account for changes in greenhouse gas emissions that occur during the first commitment period on areas of land where eligible land use, land use change and forestry activities have taken place, commencing either in 1990 or in a year subsequent to 1990 but before the end of the commitment period.

For Article 3.3, eligible activities are direct human induced afforestation, reforestation and deforestation that have taken place in 1990 or in a year subsequent to 1990 but before the end of the commitment period. (Definitions for afforestation, reforestation and deforestation shall be as provided in this submission (see section below)). To be directly human induced, afforestation, reforestation and deforestation must result from a deliberate human action or intervention.

¹ Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, Greenhouse Gas Inventory Reference Manual Vol 3, Section 5.2.

For Article 3.4, for the first commitment period, eligible activities are specific, human induced activities in the agricultural soils, land use change and forestry categories, that have taken place in 1990 or in a year subsequent to 1990 but before the end of the commitment period. (Definitions for additional activities shall be as provided in this submission (see section below)). To be human induced, an additional activity must result from a process that includes a deliberate human action or intervention.

For eligible Article 3.3 and 3.4 activities in the first commitment period, since 1990 means on or since 1 January 1990 and the end of the commitment period means up to and including 31 December 2012.

An area of land shall be subject to accounting for changes in emissions and/or carbon stocks if it is subject to an eligible activity under Article 3.3 or 3.4. Any changes in carbon stocks and/or greenhouse gas emissions resulting from subsequent eligible LULUCF activities introduced on that specific area of land during the commitment period shall also be accounted for.

Changes in greenhouse gas emissions and/or carbon stocks on areas of land where direct human induced afforestation, reforestation and deforestation and agreed human induced specific additional activities in the agricultural soils, land use change and forestry categories occurred since 1990 must be accounted for over contiguous commitment periods.

For Article 3.3 carbon dioxide emissions are to be measured as changes in carbon stocks by comparing the carbon stocks in 2012 with the carbon stocks in 2008. In the event that an activity commences during the commitment period, the changes in carbon stocks are to be measured by reference to the carbon stocks at the start year. Changes in emissions for non-carbon dioxide gases (methane and nitrous oxide) shall also be accounted for.²

To measure carbon dioxide, relevant carbon pools shall include above ground biomass, litter and woody debris, below ground biomass, soil carbon and harvested materials. The methodologies for accounting for harvested wood shall be those given in the 1996 IPCC Revised Inventory Guidelines as required by Article 5.2.

For forestry activities under Article 3.3, the following accounting sub-rules shall be applied:³

Credits (for sequestration) calculated at the stand level from reforestation following deforestation will be awarded only to the extent that carbon stocks have increased above levels present before the deforestation event took place.

Debits (emissions) calculated at the stand level from harvesting and other natural and human induced effects following afforestation and reforestation will not be greater than credits earned from sequestration.

² The SBSTA should invite the IPCC to develop such accounting methodologies as part of the IPCC work on methodologies on LULUCF as requested in the SBSTA 10 conclusions.

³ Explanatory text on the accounting sub rules for Article 3.3 activities can be found in Section II.

For some additional activities in the agricultural soils, land use change and forestry categories under Article 3.4, accounting methodologies will need to be elaborated. This elaboration of methodologies shall ensure that changes in emissions for non-carbon dioxide gases (methane and nitrous oxide) are accounted for.⁴

Methodologies shall also be elaborated to ensure that changes in emissions from additional activities in the agricultural soils, land use change and forestry categories are not also credited or debited in accounting for Parties' assigned amounts under Article 3.1⁵

Changes in carbon stocks and greenhouse gas emissions as a result of human induced and natural processes (including inter alia commercial forestry, fire, pest invasion, El Nino cycles, CO₂ and nitrogen fertilisation) during the commitment period shall be accounted for on each area of land where an eligible activity has taken place.

Reversibility

Changes in greenhouse gas emissions and carbon stocks on areas of land where human induced afforestation, reforestation and deforestation since 1990 or additional activities agreed under Article 3.4 have taken place must be accounted for over contiguous commitment periods. This means Parties shall account for any reversibility of sequestration or emissions reductions from eligible LULUCF activities under Articles 3.3 and 3.4 during commitment periods and over contiguous commitment periods.

Natural effects

Parties are required to account for all changes in greenhouse gas emissions and/or carbon stocks, including those that result from natural effects, that occur during the commitment period on areas of land where eligible land use, land use change and forestry activities have taken place.

Accounting interlinkages - Article 3.7

Parties with a net source of emissions from land use change and forestry in 1990 shall include in the calculation of their 1990 baseline emissions from land use change. Emissions from land use change are defined only as net emissions from the forest and grassland conversion and abandonment of managed lands sub-categories as laid out in the 1996 Revised IPCC Inventory Guidelines⁶.

II. PROPOSED DEFINITIONS AND ACCOUNTING APPROACHES RELATED TO AFFORESTATION, REFORESTATION AND DEFORESTATION UNDER ARTICLE 3.3

Explanatory material

- Credits and debits that can be counted as a result of Article 3.3 activities towards

⁴ The SBSTA should invite the IPCC to develop such accounting methodologies as part of the IPCC work on methodologies on LULUCF as requested in the SBSTA 10 conclusions.

⁵ *ibid*

⁶ IPCC Guidelines for National Greenhouse Gas Inventories, Greenhouse Gas Inventory Reference Manual Vol 3, Section 5.2.

Parties' assigned amounts will be determined on the basis of:

- Definitions for afforestation, reforestation and deforestation; and
- The accounting system used for Article 3.3.
- Definitions for afforestation, reforestation and deforestation activities under Article 3.3 should be chosen to support the operation of the overarching carbon accounting system.
- Under the definitional approach outlined below for afforestation, reforestation and deforestation, harvesting which occurs as part of the commercial forestry cycle would not be defined as deforestation. Similarly regeneration following harvesting would not be defined as reforestation.
- Commercial forestry cycles would not therefore function to draw areas of land into the Article 3.3 accounting framework.
- Under Australia's approach to afforestation, reforestation and deforestation, there is no need for a stand-alone definition of a forest.
- Elements of a definition of a forest needed to operationalise afforestation, reforestation and deforestation have been incorporated into the definitions for afforestation, reforestation and deforestation.
- The advantage of this approach is that it simplifies determination of whether an activity qualifies under Article 3.3 since the activity needs only to meet the requirements of afforestation, reforestation or deforestation without needing to meet an additional set of requirements posed by the definition of a forest.

Afforestation and reforestation

- For afforestation and reforestation, definitions that require a change of land use and the establishment of new forests on previously unforested land will facilitate identification and reporting of areas of land subject to eligible forestation activities under Article 3.3.
- Article 5.2 requires that the IPCC Revised 1996 Inventory Guidelines are used as methodologies for the first commitment period.
- The IPCC Revised 1996 Inventory Guidelines contain definitions for afforestation and reforestation which require a change in land use.

Deforestation

- A definition of deforestation needs to provide a basis for accounting for significant removal of trees or woody vegetation.
- If a definition of deforestation were to be tied solely to a change in land use significant changes in carbon stock where there is no change in land use will not trigger lands being drawn into the Article 3.3 accounting framework.
- Under Australia's approach to defining deforestation for Article 3.3, Parties will be required to determine canopy cover per area of land at the hectare level for their entire forest estate in 1990.
- This can be done with remote sensing techniques.
- Deforestation will be accounted when the proportion of canopy cover per hectare on a given area of forested land is reduced by 30% or more through forest conversion (eg if forest canopy cover drops from 60% to 42%) as a result of direct human induced removal of trees.

- The area of land subject to deforestation then enters into the Article 3.3 accounting system.
- The advantage of this approach is that it provides flexibility in relation to the forest type that is captured by deforestation.
- This will reduce the potential for Parties to selectively report forested land so as to minimise accounting for deforestation.
- Under Australia's approach, significant deforestation and degradation events will both be captured for the purposes of accounting for deforestation under Article 3.3.

Carbon accounting on Article 3.3 lands

- Under the Article 3.3 lands accounting approach, Parties are required to identify afforestation, reforestation or deforestation activities. These activities will function to draw a given area of land into the Article 3.3 accounting system.
 - Identification of eligible activities would be done on the basis of the definitions for afforestation, reforestation and deforestation given below.
 - Land units on which these activities occur would then be identified.
- Under the definitional approach outlined above for afforestation, reforestation and deforestation, harvesting which occurs as part of the commercial forestry cycle would not be defined as deforestation. Similarly regeneration following harvesting would not be defined as reforestation.
- Commercial forestry cycles would not therefore function to draw areas of land into the Article 3.3 accounting framework.
 - However under the Article 3.3 lands approach, once an area of land enters the Article 3.3 accounting system as a result of afforestation, reforestation and deforestation, Parties would be required to account for all changes in carbon stocks occurring on that area of land.
 - This would include changes in carbon stocks and emissions that are the result of harvesting and replanting on areas of Article 3.3 lands subject to commercial forestry as well as other changes in emissions that are the result of human and non-human induced effects.

Accounting sub-rules for Article 3.3

- In relation to accounting for Article 3.3 activities, the IPCC Special Report notes that some important discrepancies could occur between actual and reported changes in carbon stocks. The IPCC has proposed two accounting sub-rules to deal with these discrepancies.

Accounting Sub-rule 1

- A discrepancy could occur where land is deforested, used for agriculture before 2008 and then direct human induced reforestation occurs. Credits could be gained even though carbon stocks in the commitment period are likely to be less than in 1990.
- This discrepancy could be addressed if carbon credits for reforestation are awarded only for increases in carbon stock above the level of carbon stock present at the forest stand level prior to the deforestation event taking place.

Accounting Sub-rule 2

- Another discrepancy could occur where afforestation or reforestation since 1990 has brought land into the accounting system but, as a result of harvesting, thinning or natural events (eg fire, pests or storms), carbon stocks decrease over the commitment period.
- Under these circumstances, debits could be assigned during the commitment period even if the afforestation or reforestation activity reduces atmospheric CO₂ in the long run and carbon stocks increase overall.
- This discrepancy could be overcome if carbon debits for afforestation and reforestation are limited to the amount of net credits (credits minus debits) received from carbon accumulating at the stand level.
- For textual proposals on accounting for non-CO₂ gases (methane and nitrous oxide) for Article 3.3 activities, see Overall Accounting Approaches (Section I above).

Textual proposal**Definition of a forest**

There is no requirement for a definition of a forest for the purpose of implementing Article 3.3.

Afforestation, reforestation and deforestation

Afforestation is defined as the direct human induced establishment of new forests (trees and woody vegetation) on lands which historically have not contained forests. New forests established by afforestation must cover a minimum area of 1 hectare with a minimum stand width of 10 metres. Potential canopy cover at maturity under current management practices is not less than 20%.

Reforestation is defined as the direct human induced establishment of forests (trees and woody vegetation) on lands which historically have previously contained forests but which have been converted to some other use. Prior to reforestation, the land must have been under some non-forest use for a period of not less than 5 years. New forests established by reforestation must cover a minimum area of 1 hectare with a minimum stand width of 10 metres. Potential canopy cover at maturity under current management practices is not less than 20%.

To be directly human induced, afforestation and reforestation must result from a deliberate human action or intervention.

Establishment includes all deliberate human induced activities to establish trees including: direct planting, artificial seeding, site preparation (fire or mechanical) and protective fencing.

Deforestation will be accounted when the proportion of canopy cover per hectare on a given area of forested land (land with trees and woody vegetation) is reduced by 30% or more through forest conversion as a result of direct human induced removal of trees.

Deforestation is defined as direct human induced forest conversion which is frequently accompanied by burning. This does not include harvesting or other practices which occur as part of ongoing commercial forestry.

Forest conversion means the transition of forested land to non-forested land as a result of direct human induced removal of trees.

For the purposes of accounting for deforestation under Article 3.3, Parties shall determine canopy cover for each forested area within their borders to be accounted for on the basis of a minimum area of 1 hectare with a minimum stand width of 10 metres.

To be directly human induced, deforestation must result from a deliberate human action or intervention.

Carbon Accounting for Article 3.3 activities

Parties are required to account for changes in greenhouse gas emissions that occur during the commitment period on areas of land where afforestation, reforestation and deforestation have taken place, commencing either in 1990 or in a year subsequent to 1990 but before the end of the commitment period.

Changes in greenhouse gas emissions and carbon stocks as a result of human induced and natural effects (including inter alia commercial forestry, fire, pest invasion, CO₂ and nitrogen fertilisation) during the commitment period shall be accounted for on those areas of land where human induced afforestation, reforestation and deforestation since 1990 have taken place.

To measure changes in carbon stocks, relevant carbon pools shall include above ground biomass, litter and woody debris, below ground biomass, soil carbon and harvested materials. The methodologies for accounting for harvested wood shall be those given in the 1996 IPCC Revised Inventory Guidelines as required by Article 5.2.

Accounting methodologies shall be developed and agreed by the COP to ensure that changes in emissions for non-carbon dioxide gases (methane and nitrous oxide) are accounted for.⁷

Changes in greenhouse gas emissions and carbon stocks on areas of land where human induced afforestation, reforestation and deforestation since 1990 have taken place must be accounted for over contiguous commitment periods.

Carbon accounting baselines for Article 3.3 activities

The adjustment to a Party's assigned amount shall be equal to verifiable changes in carbon stocks and greenhouse gas emissions during the period 2008 to 2012 resulting from direct human induced activities of afforestation, reforestation and deforestation since 1 January 1990. Where the result of this calculation is a net sink, this value shall be added to the Party's assigned amount. Where the result of this calculation is

⁷ The SBSTA should invite the IPCC to develop such accounting methodologies as part of the IPCC work on methodologies on LULUCF as requested in the SBSTA 10 conclusions.

*a net emission, this value shall be subtracted from the Party's assigned amount.*⁸

This means Parties shall calculate changes in carbon stocks by comparing the carbon stocks in 2012 with the carbon stocks in 2008.

Accounting sub-rules for Article 3.3 activities

Sub-rule 1

Credits (for sequestration) calculated at the stand level from reforestation following deforestation will be awarded only to the extent that carbon stocks have increased above levels present before the deforestation event took place.

Sub-rule 2

Debits (emissions) calculated at the stand level from harvesting and other natural and human induced effects following afforestation and reforestation will not be greater than credits earned from sequestration.

III. HOW AND WHICH ADDITIONAL HUMAN INDUCED ACTIVITIES MIGHT BE INCLUDED UNDER ARTICLE 3.4 INCLUDING MODALITIES, RULES AND GUIDELINES RELATED TO THESE ACTIVITIES AND THEIR ACCOUNTING

Explanatory material

- Article 3.4 requires that additional LULUCF activities be in the agricultural soils, land use change and forestry categories.
- In line with the requirements of Article 3.4, the selection of activities and the accounting approach adopted for additional activities must provide the means to determine whether the activity occurred since 1990 for the first commitment period and whether the activity is human induced.
- Article 3.4 requires that the activity rather than the resulting emissions are human induced ("as to how and which *additional human induced activities...*").
 - This is similar to the construction of Article 3.3 which links the requirement of direct human induced to the activities of afforestation, reforestation and deforestation rather than to the change in emissions.
- The IPCC Special Report shows that under the broad approach to the selection of additional activities, where activities are defined as broad systems of land use, both human induced and non-human induced activities alike will be eligible for crediting under Article 3.4.
- The narrow approach to the selection of additional activities will facilitate the implementation of additional activities that are specifically defined with reference to the key criterion of human induced.

⁸ As per COP decision 9/CP.4

Selection of additional activities

- Under the narrow approach, only certain specified activities such as fertilisation in the agricultural soils category or reduced impact logging in the category of forest management would be included under Article 3.4.
- Australia supports the narrow approach to the inclusion of additional activities in conjunction with the land based accounting approach (see below).
- Within the narrow approach to the selection of additional activities, Australia supports the inclusion of additional activities to the extent that changes in emissions and/or carbon stocks can be accurately measured and verified.
- Australia supports the inclusion of revegetation as an additional activity under Article 3.4 as it demonstrably meets the criteria of human induced, measurability and verifiability.
 - In addition, revegetation can deliver improvements to biodiversity and land management and can address problems of land degradation such as salinisation of soils.
 - Revegetation is therefore in line with Australia's sustainable management objectives.
- Australia is working on methodologies to account for additional activities in the agricultural soils and forest management categories (including wood products) and will bring forward a further proposal on additional activities to address these issues.
- Australia is likely to support decision making at COP6 on specific additional activities in these categories for inclusion during the first commitment period if it can be demonstrated such activities also meet key tests of human induced, and are transparent, measurable and verifiable.
- For inclusion under Article 3.4, additional activities will also need to be in line with Australia's sustainable development objectives.

Accounting for Article 3.4

- Under the land based accounting approach, an area of land would be drawn into the Article 3.4 accounting system by the application of an eligible additional activity.
- A Party would then be required to account for all changes in greenhouse gas emissions on the area of land irrespective of whether changes in emissions result from a natural process (such as fire or pest invasion) or human activity.
- The narrow inclusion/land based accounting approach will simplify verification procedures and potentially reduce measurement and monitoring costs.
- It is also in line with the requirement that only eligible human induced additional activities since 1990 are counted towards Parties' assigned amounts for the first commitment period.
- Further work is needed to develop accounting methodologies to deal with additional activities under Article 3.4 including for the non-CO₂ gases. Australia may submit an additional proposal on these matters.
- Methane and nitrous oxide emissions from a range of land-use activities such as rice cultivation, agricultural soils, prescribed burning of savannas and field burning of agricultural residues are included in Annex A of the Kyoto Protocol and will therefore be captured in Parties' national inventories under Articles 5

and 7.

- As methane and nitrous oxide emissions from a range of land-use activities are included in Annex A, there is potential for double counting to occur if these emissions are also accounted for as a result of lands brought into the Article 3.4 accounting system.
- The IPCC should be invited to develop an accounting methodology as part of its methodological work on LULUCF to ensure that emissions reductions associated with Article 3.4 activities are not also credited in the accounting of Parties' assigned amounts under Article 3.1.

Textual Proposal

Selection of additional activities

Changes in greenhouse gas emissions from agreed specific additional activities in the agricultural soils, land use change and forestry categories may be added to or subtracted from a Party's assigned amount if that Party can demonstrate in its reporting under Article 3.4 that the specific activity is human induced, can be measured in a transparent fashion, is verifiable, is in line with that Party's sustainable management objectives and, for the first commitment period, that the specific activity has occurred since 1990.

Revegetation shall be included as an additional activity in the forest category for the first and subsequent commitment periods.

Revegetation is defined as the human induced establishment of woody vegetation that covers a minimum area of 0.5 hectare with a minimum width in any direction of 10 metres and does not meet the definitions of afforestation or reforestation under Article 3. Eligible revegetation activities include:

- *the establishment of woody vegetation to address sustainable land management;*
- *windbreaks and shelterbelts;*
- *environmental plantings or fencing off areas of native vegetation;*
- *agroforestry planting of trees or the development of new tree crop products such as tea tree oil to encourage a more diversified and sustainable production system that leads to social, economic and environmental benefits for land users; and*
- *changes in stock management practices to encourage regeneration of vegetation.*

If agreed by the COP, further specific additional activities in the agricultural soils, land use change and forestry categories may be included under Article 3.4 for the first commitment period

Accounting for Article 3.4 activities

Parties may account for changes in greenhouse gas emissions to be added to or subtracted from their assigned amounts on areas of land where agreed specific human induced additional activities in the agricultural soils, land use change and forestry categories have taken place, either in 1990 or in a year subsequent to 1990 but before the end of the commitment period.

Changes in carbon stocks and/or emissions as a result of human induced and natural effects (including inter alia commercial forestry, fire, pest invasion, CO₂ and nitrogen fertilisation) shall be accounted for on areas of land where agreed specific human induced additional activities in the agricultural soils, land use change and forestry categories have taken place, either in 1990 or in a year subsequent to 1990 but before the end of the commitment period.

For some additional activities in the agricultural soils land use change and forestry categories under Article 3.4, accounting methodologies will need to be elaborated. This elaboration of methodologies shall ensure that changes in greenhouse gas emissions for non-carbon dioxide gases (methane and nitrous oxide) are accounted for.⁹

Methodologies shall also be elaborated to ensure that changes in greenhouse gas emissions from additional activities in the agricultural soils, land use change and forestry categories are not also credited or debited in accounting for Parties assigned amounts under Article 3.1.

Changes in greenhouse gas emissions and carbon stocks on areas of land where eligible additional activities have taken place on or since 1990 must be accounted for over contiguous commitment periods.

IV. METHODOLOGIES FOR ACCOUNTING AND REPORTING IN RELATION TO ARTICLE 3.3 AND 3.4

Explanatory material

- Article 5.2 of the Kyoto Protocol establishes the 1996 IPCC Revised Inventory Guidelines as the methodologies for measurement and reporting of greenhouse gases under the Protocol for the first commitment period.
- In some cases, these Guidelines will require elaboration to deal with the specific requirements of the Kyoto Protocol including for LULUCF activities in Articles 3.3 and 3.4.
- The IPCC work on good practice guidance should be extended to cover LULUCF activities under the Protocol including dealing with uncertainties. This would require development of a set of procedures that would allow Parties to address:
 - The choice of estimation methods appropriate to countries' national circumstances;
 - Quality assurance and quality control at a national level;
 - Quantification of uncertainties; and
 - Requirements for data archiving and reporting to promote transparency and facilitate verification.

Textual Proposal

Methodologies

Methodologies for measuring and reporting on changes in emissions and/or carbon stocks for eligible LULUCF activities under Articles 3.3 and 3.4 shall be in line with

⁹ The SBSTA should invite the IPCC to develop such accounting methodologies as part of the IPCC work on methodologies on LULUCF as requested in the SBSTA 10 conclusions.

requirements of Articles 5, 7 and 8 of the Kyoto Protocol.

Elaboration of methodologies for the implementation of Articles 3.3 and 3.4 shall take into account the methodological work of the IPCC¹⁰, and should extend good practice guidance to land use, land use change and forestry activities including methodologies to ensure that measurement uncertainty is taken into account.

¹⁰ As requested by the Subsidiary Body for Scientific and Technological Advice at its 10th session.

Article 3.3 Definitions from Co-Chairmen's Text

Forest

Option 1: Definition determined on country level

Option 1a: One definition of a forest selected by each Party itself.

1. Parties shall elect one definition of a forest in accordance with their national circumstances. The definition must be used consistently in the first [and subsequent] commitment period[s]. [The formulation of the definition is irrevocable.]

Option 1b: Forest definitions for each forest type or biome occurring within the Party's boundaries.

2. Parties may choose to use several definitions of forest to account for different forest types in their country in accordance with their national circumstances. The definition(s) must be used consistently in the first [and subsequent] commitment period[s]. [The formulation of the definition(s) is irrevocable.]

Option 1c: Use of the FAO definition as in the IPCC Special Report, with Party-specific thresholds for forest cover, tree height and minimum area.

3. For the purpose of applying Article 3 of the Kyoto Protocol, the definition of a forest is: land with tree crown cover (or equivalent stocking level) of more than [Party to select a threshold of between 10 and 25] per cent and area of more than [Party to select a threshold of between 0.5 and 1] hectares (ha). The trees should be able to reach a minimum height of [Party to select a threshold between 0.25 and 5] metres (m) at maturity in situ. [A forest] may consist either of closed forest formations where trees of various storeys and undergrowth cover a high proportion of the ground; or open forest formations with a continuous vegetation cover in which tree crown cover exceeds [Party to select a threshold between 10 and 25] per cent [, extending over an area of more than [Party to select a threshold between 0.5 and 1 ha]]. Young natural stands and all plantations established for forestry purposes which have yet to reach a crown density of [Party to select a threshold between 10 and 25] per cent or tree height of [Party to select a threshold between 0.25 and 5 metres] m are included under forest, as are areas normally forming part of the forest area which are temporarily unstocked as a result of human intervention or natural causes but which are expected to revert to forest.

Option 2: Definitions and thresholds determined by COP

Option 2a: FAO definition with universal thresholds for forest cover, tree height, and minimum area.

4. For the purpose of applying Article 3 of the Kyoto Protocol, the definition of a forest is: land with tree crown cover (or equivalent stocking level) of more than [COP to select a threshold of between 10 and 25 to be applied by all Parties] per cent and area of more than [COP to select a threshold of between 0.5 and 1 to be applied by all Parties] hectares (ha). The trees should be able to reach a minimum height of [COP to select a threshold between 0.25 and 5 to be applied by all Parties] metres (m) at maturity in situ. [A forest] may consist either of closed forest formations where trees of various storeys and undergrowth cover a high proportion of the ground; or open forest formations with a continuous vegetation cover in which tree crown cover exceeds [COP to select a threshold between 10 and 25 to be applied by all Parties] per cent [, extending over an area of more than [COP to select a threshold between

0.5 and 1 ha to be applied by all Parties]]. Young natural stands and all plantations established for forestry purposes which have yet to reach a crown density of [*COP to select a threshold between 10 and 25 per cent to be applied by all Parties*] per cent or tree height of [*COP to select a threshold between 0.25 and 5 metres to be applied by all Parties*] m are included under forest, as are areas normally forming part of the forest area which are temporarily unstocked as a result of human intervention or natural causes but which are expected to revert to forest.

Option 2b: Forest definition for each biome (international level)

The COP/MOP requests the IPCC to develop definitions of a forest appropriate to each forest biome. Annex I Parties shall designate biomes to the lands within its boundaries and apply the associated forest definition as developed by the IPCC to each biome in order to determine eligible activities under Article 3.3 and 3.4 of the Kyoto Protocol. Such designation shall be applied consistently during the first and subsequent commitment periods. The designation of biomes to the land is irrevocable, unless a change in vegetation or biome warrants a new designation. In cases where a Party alters the designation of biomes to the land, such changes shall be reported in accordance with Article 7 and reviewed in accordance with Article 8 of the Kyoto Protocol.

Afforestation

5. “Afforestation” is the conversion of non-forest to forest on land that has not historically¹ been forested.

Reforestation

6. “Reforestation” is the conversion of non-forest to forest on land that historically was forested, but that has been converted to non-forest. Re-establishment of the forest through planting, seeding and natural regeneration following harvesting will [not] be considered reforestation.

Meaning of “historic” - Distinction between afforestation and reforestation

7. For purposes of defining afforestation and reforestation for the first commitment period, “historic” is considered to mean since 1 January 1990 [the last ... years].

Deforestation

8. “Deforestation” is the conversion of forest to non-forest, which is not immediately followed by the establishment of the same forest type on the same site.

Is forest harvesting considered deforestation?

9. Reductions in forest cover as a result of harvesting or other practices which occur as part of ongoing forestry practice are not considered deforestation under Article 3.3 of the Kyoto Protocol.

10. In cases where re-establishment of forest following harvesting takes place in the next commitment period, Parties shall provide information in accordance with Article 7 of the Kyoto Protocol, to distinguish acts of harvesting from acts of deforestation. Such information will be reviewed in accordance with Article 8 of the Kyoto Protocol.

¹ For the definition of “historic”, see paragraph 7.

**Australian Submission on the Co-Chairmen's text
16 September 2000**

Forest

1 (a) Forest is land with tree crown cover (or equivalent stocking level) of a minimum level of between 10% and 30% and minimum area of between 0.3 and 1.0 ha. The trees should be able to reach a minimum height of between 2m and 5m at maturity in situ. Forest may consist either of closed forest formations where trees of various storeys and undergrowth cover a high proportion of the ground; or of open forest formations with a continuous vegetation cover. Young natural stands and all plantations established for forestry purposes which have yet to reach the minimum tree crown cover or the minimum tree height are included under forest, as are areas which are temporarily unstocked as a result of human intervention or natural causes.

1 (b) To reflect its national circumstances, each Party in Annex I shall, for purposes of applying the definition of "forest" (as provided in para 1(a) above) to its own lands, elect a single minimum tree crown cover, a single minimum land area and a single minimum tree height and shall specify this election in its pre-commitment period report submitted under Article 7.4. Upon election, each Annex I Party's forest definition will be fixed for that commitment period.

5. "Afforestation" is the conversion of non-forest to forest on land that has not supported a forest for a period of at least 50 years. .

6. "Reforestation" is the conversion of non-forest to forest on land that was forested, but that has been converted to non-forest for a period of at least 5 years. Reforestation does not include regeneration that occurs as part of the commercial forest management cycle.

Deforestation

8 "Deforestation" is the conversion of forest to non-forest. Deforestation does not include harvesting or other practices that occur as part of the commercial forest management cycle.

Is forest harvesting considered deforestation?

9. Reductions in forest cover as a result of harvesting or other practices which occur as part of ongoing forestry practice are not considered deforestation under Article 3.3 of the Kyoto Protocol.

10. In cases where re-establishment of forest following harvesting takes place in the next commitment period, Parties shall provide information in accordance with Article 7 of the Kyoto Protocol, to distinguish acts of harvesting from acts of deforestation. Such information will be reviewed in accordance with Article 8 of the Kyoto Protocol.

Eligibility

17. For Article 3.3, eligible activities are those that are directly human induced and that have taken place on or since 1 January 1990 or in a year subsequent to 1990, but before the end of December of the last year of the commitment period and that meet other requirements set forth in this decision.