

GREENPEACE

Greenpeace Analysis of the Kyoto Protocol

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Analysis of the Kyoto Protocol

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Analysis of the Kyoto Protocol

Executive Summary

Loopholes in the Kyoto Protocol

An assessment of the loopholes in the Kyoto Protocol indicates that rather than the nominal 5.1% emissions reduction touted for the protocol a small increase above 1990 levels in both gross industrial emissions and emissions to the atmosphere can be expected. Loopholes include the change in the HFC baseline from 1990 to 1995, Clean Development Mechanism (CDM) Credits adding the emissions budgets of Parties, the exemption of international aviation and marine bunker fuels, the limited gross-net approach (sinks) and the problem of “hot air”.

Common Rules and Principles for the Flexibility Mechanisms

Because of the interactions between the flexibility mechanisms of the Kyoto Protocol (trading, joint implementation and the clean development mechanism) there need to some common rules and/or principles which apply to the operation of all of these instruments.

- Domestic action must be the priority in the overall implementation of the Protocol.
- Agreement to market rules for the exchange of emission units. The COP/MOP needs to ensure that if a market is to be permitted in all of the emission units that can be transferred under the Kyoto Protocol (assigned amounts, emission reduction units (ERUs) from Joint Implementation projects and certified emission reductions from the CDM) that this operates under rules which guarantee transparency, compliance with obligations, has buyer and seller liability, and reinforces the environmental objectives of the Protocol. There needs to be an agreed legal framework for the flexibility mechanisms *before* emission units from JI and CDM projects and assigned amounts are traded. The effectiveness of each of the flexibility provisions must be reviewed after the first commitment period, a report sent to the COP/MOP and problems rectified.
- Compliance with reporting obligations for emissions and transfers of assigned amounts is a pre-requisite for transfers of ERUs, CERs, or assigned amounts.
- A compliance regime including a ban on transfers of emission reduction units from any Party exceeding its emissions commitment (as laid out in Annex B) or in breach of reporting requirements, until that Party returns to compliance.
- National accounting systems for transfers of assigned amounts should be established that includes registration of acquisitions and transfers of assigned amounts with double entry bookkeeping. Details should include country of origin of the transfer or acquisition, the date the amounts were acquired or transferred, the price and so on should be required in order to trace acquisitions back to the individual projects or Parties from which they were generated or originated.

- Establishment of an in depth review process conducted by expert independent teams is essential.

Trading and Joint Implementation

The rules for trading should include:

- Prior agreement on trading rules before trading begins.
- Exclusion of sinks from the trading system.
- Application of trading rules to the transfer of ERUs from Joint Implementation projects.
- A selling limit on Parties to curtail the size of the “hot air” problem. A 3% limit on the sale or transfer of assigned amounts would limit the hot air problem to less than 1% of the 1990 Annex B emissions in the first commitment period.
- A buying limit to ensure that Parties do most their action at home. A buying limit of 10% of a Party’s assigned amount would ensure the domestic action has the major priority. A buying limit would apply to the total amount a Party could acquire during a commitment period via transfers under Article 6 and Article 17.
- A joint buyer and seller liability system, that operates during a commitment period and is based on annual inventories, to provide a signal as to whether or not a sellers assigned amounts or ERUs should be discounted.

Clean Development Mechanism

Rules covering the CDM should address the following issues:

- A quantitative limit must be placed on the use of the CDM to meet emission limits. CDM credits inflate emission budgets. The use of CDM credits should be limited to about 1% of a Party’s assigned amount.
- Project emissions reductions should be discounted by an agreed fraction to create the CERs available to add to assigned amounts. Discounting will help ensure that the global emissions are at least as low as they would have been in the absence of the CDM project.
- CDM projects should be limited to renewable energy systems or highly energy efficient projects that are unequivocally at the top end of efficiency practice in the world.
- Clean coal and nuclear power projects should not be eligible for CDM credits.
- No Land Use Change and Forestry projects should be allowed for credit.

Land Use Change and Forestry in the Kyoto Protocol

Implementation of the Land Use Change and Forestry provisions need to be guided by several general principles:

- The use of LUCF emission credits must not lead to adverse environmental effects on other values, such as biological diversity.

- Land Use Change and Forestry definitions, methodologies and policies must not create perverse incentives that would, for example, encourage clearing or harvesting of old growth forest for the purpose of claiming reforestation credits. Credit should be prohibited for any activity that has involved the harvesting of old growth forests.
- All Parties must be required to use common definitions and methodologies. The definitions and methodologies should be driven by an IPCC assessment of the treatment of Land Use Change and Forestry provisions in the Kyoto Protocol.
- A permanence requirement should be established for any changes in carbon stocks used to meet emission commitments. Reductions in the stocks of carbon, whose previous increments have been added to the assigned amount of a Party, should be deducted from the assigned amount.
- No use of LUCF activities beyond the categories defined in Article 3.3 should be permitted until a special assessment of the IPCC considers the entire issue of the Land Use Change and Forestry sector and the results of this considered by SBSTA and the COP/MOP. Specifically there should be no expansion under Article 3.4, Article 6 JI projects should be limited to the those categories under Article 3.3 and there should be no CDM sink projects.

There is a need for early clarification of the terms afforestation, reforestation, deforestation and “since 1990” used in Article 3.3. In common with other NGOs, Greenpeace believes that the following should be adopted:

- Reforestation credit can be claimed for activities that re-establish a forest by 2012 on lands which had, historically, previously contained forests but which had been converted to some other use as of 1990.
- Afforestation credit can be claimed for activities that establish a new forest by 2012 on lands that have, historically, not contained forests and did not in 1990.
- Deforestation emissions must be reported for activities that converted lands that in 1990 contained forests to some other use in 2012.

“Since 1990” should be defined as referring to activities begun on or after 1 January 1991.

The mandate of an IPCC Special Assessment of the Land Use Change and Forestry issue should include the scientific, environmental, technical, economic, social, institutional and policy issues relating to:

- The likely future role of the terrestrial biosphere in relation in the carbon cycle and the climate system over the next century.
- The implications of the LUCF activities if used to offset emissions from fossil sources of greenhouse gases, taking into account a range of possible stabilisation objectives for atmospheric concentrations of CO₂ and other greenhouse gases
- Potential for positive or negative synergies in relation to other environmental objectives such as biodiversity conservation, arising from the use (or not) of Land Use Change and Forestry activities to offset emissions from fossil fuels.
- Appropriate definitions of anthropogenically induced changes to biotic reservoirs of greenhouse gases that can be used on an equivalent and comparable basis by all Parties.

- The basis for quantifying and verifying changes in biotic reservoirs (stocks) of greenhouse gases, including an assessment of scientific uncertainties relevant to assessing the use of anthropogenic changes in relation to the attainment of assigned amounts by Parties to the Kyoto Protocol.
- An assessment of the potential short and long-term effects on biodiversity conservation and on ecosystem and agro-ecosystem stability, persistence, health and resilience of proposed and potential Land Use Change and Forestry intervention activities and credits, with particular attention to determining the potential for Land Use Change and Forestry incentives to lead to unintended adverse environmental impacts which degrade natural ecosystems, such as accelerated clearing or harvesting of old growth, primary or highly natural forests.

Analysis of the Kyoto Protocol

1. Key Elements of the Kyoto Protocol

Emission commitments and budgets

The Kyoto Protocol's emission commitments are structured around a number of key elements:

- Legally binding commitments are for fixed periods based on an emission budget (assigned amount).
- The emission commitments are in CO₂ equivalent terms, otherwise known as a basket of gases and sources.
- The basic emission budget is calculated with respect to the gross or aggregate sources of CO₂ equivalent emissions in the base year or period. For most Parties the gross emissions base are the sources defined in Annex A of the Protocol. The base year or period is usually 1990 but varies for some Economies in Transition (EITs).
- The legal emission budgets of Parties are capable of being transferred in a legally binding manner via three mechanisms: Joint fulfilment (bubble) agreements under Article 4, Emission reduction units from Joint Implementation projects under Article 6 and trading of assigned amounts (budgets) under Article 17. Transfers of emission budgets under these provisions do not modify the total assigned amount of the Annex I Parties but do change the budgets for individual Parties.
- A limited gross-net approach is taken by the Protocol. This adds to the assigned amount (emission budget) of the Annex I Parties as a whole, but not to the same extent as would occur if all LUCF activities were included. Gross emissions define the base period emissions and some Land Use Change and Forestry removals and sources (LUCFA) are to be used to meet the emission obligations during the budget (commitment) periods. The involvement of Land Use Change and Forestry activities in the definition of the base emissions for calculation of the emission budget and in the budget period itself is restricted to those permitted under Article 3.7 (base emissions) and Article 3.3 and 3.4 (budget period).
- The legal emission budgets of Annex 1 Parties as a whole can be added to from emission credits obtained from Non-Annex I Parties under the Clean Development Mechanism of Article 12.
- Unused portions of a Party's budget can be carried forward to the next budget period (banking) under Article 3.13. Emission borrowing is not mentioned and therefore not permitted under the Protocol.

Article 3 of the Kyoto Protocol establishes legally binding limits on the emissions of most of the Parties included in Annex I of the Climate Convention in the form of a budget for the period 2008-2012 (see Annex 1). This means that the Parties have to limit their total emissions during this period to the fraction of their 1990 emissions allotted to them multiplied by the number of years in the budget period (e.g. 5 for the first period).

The European Union and many of the East European Parties are required to reduce their emissions by 8%. Poland and Hungary have to make only a 6% reduction and Croatia 5%. The USA has to make a 7% reduction, whilst Japan and Canada are required to reduce by 6%. Several OECD countries have been allowed to stabilise or increase their emissions - New Zealand is to stabilise, Norway is to increase by 1%, Australia to increase by 8% and Iceland by 10%. These countries should have been required to reduce their emissions.

Of most concern in terms of global emissions is the fact that Russia and the Ukraine have been permitted to only stabilise rather than reduce their emissions. These two countries account for around 15% of Annex I emissions and the failure to require reductions opens up the potential for hot-air emission trading.

Article 3.3 of the Kyoto Protocol requires Annex I Parties to limit their emissions of the greenhouse gases specified in Annex A to the levels specified in Annex B “with a view to reducing their overall emissions of such gases by at least 5 per cent below 1990 levels in the commitment period 2008 to 2012.” For Annex I Parties as a whole¹ the most recent available information², suggests that a nominal 5.2% reduction in the aggregate gross industrial emissions and land use change (deforestation) emissions should be achieved under the Kyoto Protocol.

Table 1 tabulates the emissions to the atmosphere in 1990.

Table 1 1990 Baseline Annex I Emissions to Atmosphere

What the atmosphere saw in 1990?	GtC	% of 1990 gross emissions in Annex A
Total gross emissions in Annex A	4.85	100.0%
Bunker fuels	0.11	2.3%
Land Use Change (Article 3.7)	0.04	0.9%
Total gross emissions including land-use change	5.00	103.2%
Land Use Change and Forestry activities less Land Use Change under Article 3.7	- 0.36	-7.5%
Net emissions to atmosphere in 1990	4.64	95.7%

Note: Numbers may not add due to rounding errors

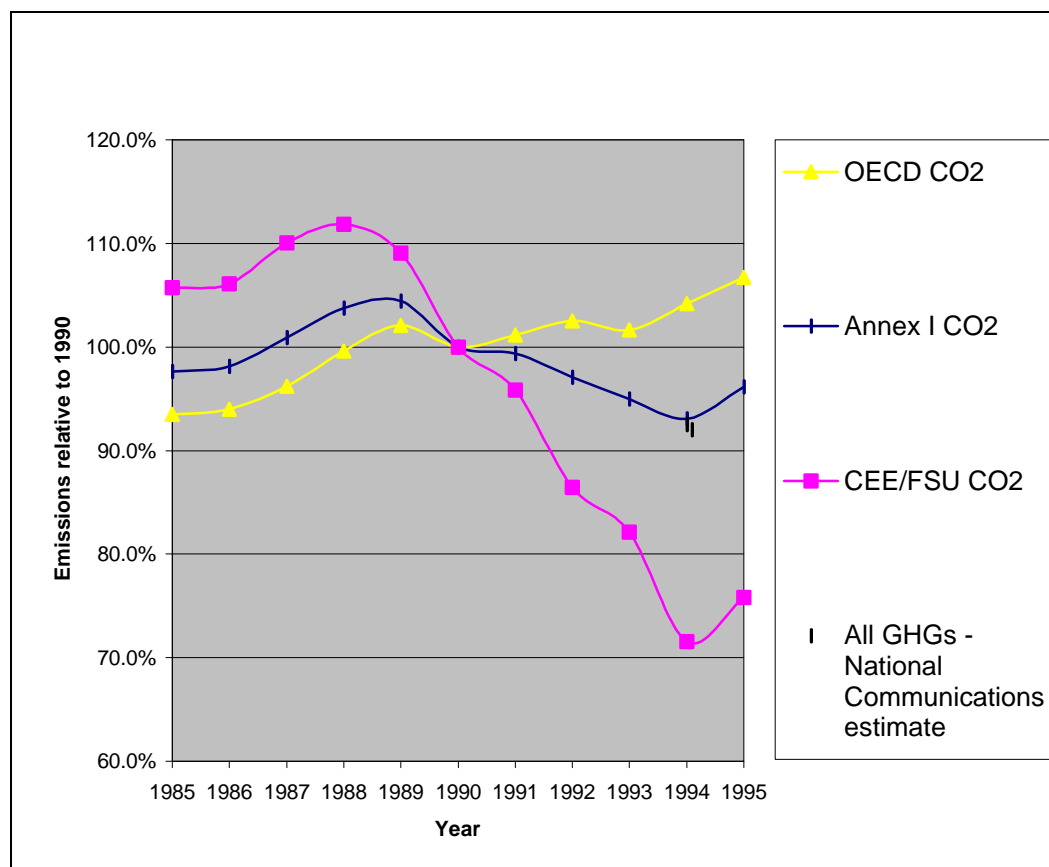
Gross industrial emissions in 1994 (the last year for reasonably comprehensive data covering 94% of Annex I 1990 emissions) were more than 7% below 1990 levels. Industrial CO₂ emissions were rising again by 1995 with Annex I emissions being 4% below 1990 levels in 1995³. Emissions from Central and Eastern Europe, Ukraine and the Russian Federation were, however, 24% below 1990 levels in 1995. OECD emissions are rising well above 1990 levels in spite of their obligations under Article 4.2(a) and (b) of the Convention.

¹ Turkey is not included in Annex B.

² Sources include: FCCC/SBI/1997/19/Add.1 9 October 1997 First compilation and synthesis of second national communications from Annex I Parties, INF 4, and the Ukraine National Communication, Updated HFC emissions and projections from Japan and the European Union.

³ Revised Regional CO₂ Emissions from Fossil-Fuel Burning, Cement Manufacture, and Gas Flaring: 1751-1995, January 15, 1998, Gregg Marland, Tom Boden, Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory.

Figure 1 Annex I CO₂ emissions to 1985-1995 relative to 1990 levels



Source: Revised Regional CO₂ Emissions from Fossil-Fuel Burning, Cement Manufacture, and Gas Flaring: 1751-1995, (1998) Gregg Marland, Tom Boden, Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, Bob Andres, Institute of Northern Engineering, School of Engineering, University of Alaska-Fairbanks, Cathy Johnston, Chemical Engineering, University of Tennessee, Knoxville, Tennessee 37996.

Gross-Net Emission Budget

The structure of the Kyoto emissions budgets is a form of the gross-net approach. Two different “net” approaches were proposed ahead of Kyoto:

- The net-net approach involved a net emissions baseline for the purposes of calculating the assigned amount and a net emissions budget. Net emissions are defined as the sum of gross industrial emissions, the net emissions (or removals) from Land Use Change and Forestry activities and net agricultural emissions (or removals).
- The gross-net approach involved a gross industrial emission baseline and a net emissions budget. This means that a Party with a net removal from its Land Use Change and Forestry sector in its budget year would be able to effectively increase its allowed emission budget by netting its gross emission with the Land Use Change and Forestry removals (sink). The full gross net approach would have effectively inflated the Annex I budget by about 6-8% relative to a gross emissions budget. This would have led to larger emissions to the atmosphere in the commitment period than would have been the case with a gross emission budget. As a

consequence of this concern the categories of Land Use Change and Forestry activities that can be used under the Kyoto Protocol to meet the emission commitments in Article 3 were restricted.

For most Parties the 1990 (or base year/period) emissions used to calculate their emissions allowances do not include the land use change and forestry emissions. Parties whose land-use change and forestry emissions were a net source of emissions in 1990 (Australia, the UK and one other Party) are allowed under Article 3.7 to incorporate their land use change emissions in their gross emissions baseline in order to calculate their allowed budget.

Net emissions in the budget period are restricted under Article 3.3 to only afforestation, reforestation and deforestation activities since 1990. Additional activities may be approved under Article 3.4 and if so may be used in the first commitment period.

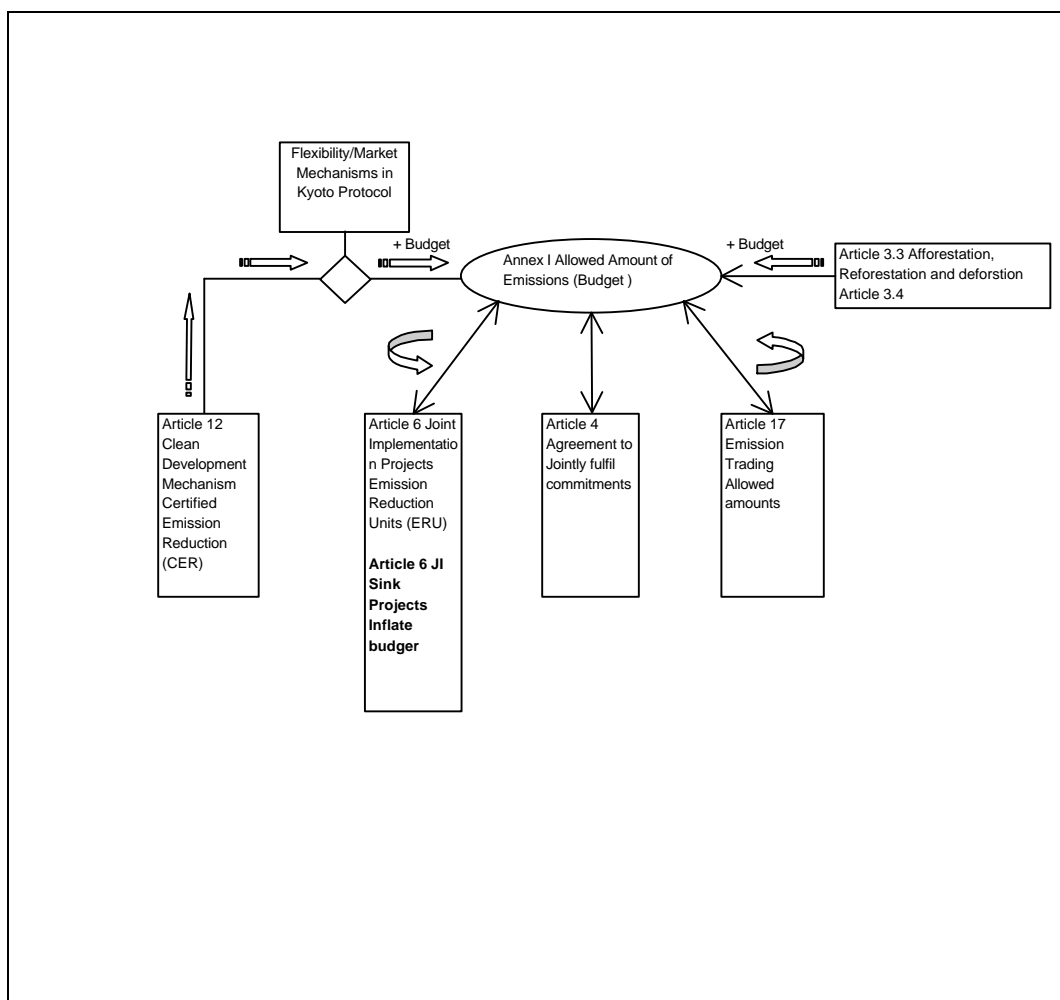
Flexibility Mechanisms

The Protocol permits the transfer of emission obligations between Parties having legally binding obligations via several pathways:

- Under Article 4, Annex I Parties are allowed to jointly fulfil their obligations and must notify the terms of their joint commitments when they ratify the Protocol. In other words, the Parties must declare the emissions reductions each is required to do under the terms of their joint agreement and this emission reduction (or limit) becomes its legally binding obligation under the Protocol. Parties are bound to this for the emission budget period (but may transfer or modify their emission budget in the other ways permitted by the protocol). This provision is most likely to apply only to the European Union, but other Parties may use it. If the EU fails to meet its target, then each member state is liable for the emission commitment declared above.

With this Article the European Union and each of its Member States would have to explicitly declare their burden sharing system at the time of their ratification of the Kyoto Protocol. This implies that the European Community ratification and that of its Member States can only occur after the burden sharing system is agreed. There is a chance that this could significantly slow the ratification of the treaty and even block its entry into force, if the EU process is delayed by the usual difficulty of getting agreement within the Union.

Figure 2 Structure of Flexibility Mechanisms in the Kyoto Protocol



Under an Article 4 agreement a Party's revised emissions commitments (assigned amount) would then form the base of any transfers of the assigned amount under Article 6 or Article 17 or additions from projects under Article 12.

- Under Article 6, Annex I Parties may transfer to or acquire from each other emissions reduction units (ERUs) on a project by project basis. Private sector entities are specifically allowed to engage in the processes leading to the transfer of emissions reduction units. Activities under this Article have to be "supplemental" to domestic actions, which carries an implied limit on how much Parties may engage in joint implementation to meet their commitments.
- Trading of assigned amounts (emission trading) between Annex B Parties to the Protocol is permitted under Article 17.

Transfers under these provisions should result in no net change in the total sum of the assigned amounts for the Annex I Parties as a whole. These transfers may however result in emissions to the atmosphere being higher than they would otherwise have been in the case where a Party has an assigned amount greater than its likely business-as-usual emissions in the commitment period. This has become known as the "hot-air" problem and specifically applies to the Russia Federation and the Ukraine. It may also apply to the case of Australia as a result of its rapidly declining deforestation emissions being added to its base year emissions (see Section 2 below).

The Kyoto Protocol creates a mechanism for emission credits to be obtained from actions undertaken in developing countries (Parties not included in Annex I). Article 12 establishes a Clean

Development Mechanism (CDM) which would allow Annex B Parties to obtain “credit” for actions undertaken between 2000 and the first budget period. These Certified Emission Reduction units (CERs) would be additional to the total Annex I assigned amount and hence would be a source of inflation for the emissions budget.

Exclusion of International Aviation and Marine Transport Fuels

International marine and aviation transport emissions have not been included in the Kyoto Protocol’s legally binding emission obligations. Weak reference is made in Article 2 on Policies and Measures to work towards limiting and reducing emissions from these areas. This is a small but rapidly growing source of emissions and represents a significant leakage from the emissions controls in the Kyoto Protocol.

Inclusion of HFCs, PFCs and SF₆

Emissions of HFCs, PFCs and SF₆ are to be controlled and are listed in Annex A of the Protocol. In response to the concerns of Japan, flexibility is provided for Parties to choose either 1990 or 1995 as the base year for these gases to be included in the baseline emissions against which the emissions budgets are to be calculated. This provision enables Parties to choose the highest year for HFC etc. emissions so that their emission budgets are proportionately higher. HFC emissions in 1990 were low but grew rapidly in the early 1990’s. The baseline flexibility may result in emissions being slightly higher than they would otherwise have been.

Reporting of greenhouse gas emissions and of assigned amounts

Article 5 and 7 of the Kyoto Protocol require annual reporting of Greenhouse gas emissions inventories and of assigned amounts, although this is not yet clear. Article 3.4 also requires Parties to produce inventories of their carbon stocks in the Land Use Change and Forestry and agricultural soils sector.

Review of emission commitments

The Kyoto Protocol does not include a provision for specific reviews of its emission commitments. Article 13 provides for general reviews and these are to be linked to the reviews specified in the Convention. The reason for this is that many developed countries want to include developing country emission commitments in the next review of emission obligations under the Protocol and the Convention.

Ratification and Entry into Force

To become binding international law the Protocol has to be ratified by 55 Parties to the Convention of which the Annex I Parties ratifying have to comprise 55% of 1990 Annex I carbon dioxide emissions.

The second table Annex 1 tabulates the official CO₂ emissions for the purposes of ratifying the Protocol. Article 25.2 defines “the total carbon dioxide emissions for 1990 of the Parties included in Annex I” to mean the amount communicated on or before the date of adoption of this Protocol by the Parties included in Annex I in their first national communications submitted in accordance with Article 12 of the Convention. Actual Annex I emissions in 1990 were higher than the official ratification base 13,728,306 GgCO₂ (3.74 GtC) with total reporting to date being 14,424,021 GgCO₂ (3.93 GtC).

Table 2 summarizes the ratification issue from the point of view of groups of Annex I countries. It shows that the USA, which has 36% of the 1990 Annex I CO₂ emissions, is just short of blocking entry into force of the Protocol.

Table 2 Groups of countries for ratification purposes

Group of Parties/Party	GtC	% of ratification base for Annex I
EU	0.90	24%
CEE Parties	0.31	8%
Russia	0.65	17%
Ukraine	0.18	5%
USA	1.35	36%
Japan	0.31	8%
Australia	0.07	2%
JUSCANZ	1.88	50%

2. Environmental Effectiveness: Potential Loopholes

Introduction

The environmental effectiveness of the Kyoto Protocol can be measured in several ways. From the point of the reductions required to achieve stabilization of atmospheric CO₂ levels the Kyoto Protocol does not approach the required targets. Another, narrower, perspective is whether or not the Protocol, if fully implemented, would achieve the emission reduction it explicitly calls for or requires from Annex I Parties. It is from this perspective that the following analysis has been undertaken.

From the point of view of the environmental effectiveness of the Kyoto Protocol, several points should be noted about its structure.

Baseline emissions differ from emissions to the atmosphere in 1990.

Baseline emissions are those used to calculate the assigned amount under Article 3.7. If the baseline emissions included all emissions to the atmosphere in 1990 then measuring the environmental effectiveness of the Kyoto Protocol would be a trivial task. However the baseline emissions do not include all sources and sinks and are necessarily emissions in 1990 for all Parties or all sources of greenhouse gases. The definition of the baseline emissions for the calculation of the allowed budget may vary according to:

- Whether Parties choose a base year of 1990 or 1995 for HFC, PFC and SF₆ emissions, which in practice means that Parties will choose the maximum year, so that their allowed emission budget is higher.
- Whether the base year or period varies from 1990, which it does for some economies in transition that have made a request under Article 4.6 of the Convention⁴.

Some classes of emissions to the atmosphere are not included in the baseline emissions. International aviation and marine transport emissions were not included in the baseline for emission controls.

In the Land Use Change and Forestry area whether or not Land Use Change emissions are included in the baseline depends on whether or not a Party was a net LUCF source in 1990. If it was not, then Land Use Change emissions are not included in the Party's baseline. Parties that do have a net land-use and forestry source in their base year are entitled to include their Land Use Change (but not Forestry) emissions in that year in their budget calculation.

⁴The Parties are Bulgaria, which is to use 1989 as a base year, Hungary, which is to use the average of the years 1985 to 1987, Poland, which is to use 1988, and Romania, which has 1989 as a base year (Decision 9/CP.2 paragraph 5).

Emissions budgets can be inflated

The assigned amount (or emission budget) of a Party is in effect the net of its own emissions during the budget period and the transfer of unused emissions budget from a previous budget period, emission reduction units from projects under Article 6, emission credits under Article 12, emission trading under Article 17.

Not all credits to assigned amounts provided for in the Protocol are balanced by debits to the budget of another Party within the system. In other words changes to assigned amounts are not necessarily a zero-sum game. This means that Parties may be able to add to their allowed budgets without reducing the allowed budget of other Annex I Parties.

The Clean Development Mechanism allows the creation of extra budgetary credits and hence inflates the allowed emissions. Whilst CDM credits created during a budget period may, at least in theory, result in global emissions being either the same or lower than they would otherwise have been, this is not guaranteed. In addition, emission credits that may be able to be generated under Article 12 between 2000 and 2007 would definitely be extra budgetary. Their effect would be to *add* to the allowed emissions budget of an Annex I Party during the first budget period by an amount that is not compensated for, even potentially, by a reduction in the (non-budget) emissions from non-Annex I Parties during the budget period.

The Land Use Change and Forestry (sink) activities that are allowed to be counted under Article 3.3 (and any allowed pursuant to Article 3.4) effectively *add* to the allowed emission budget in most cases.

Assigned amounts transferred under the trading provisions of Article 17 and joint fulfilment under Article 4 are closed in a budgetary sense - for every credit, there is a corresponding debit. Emission reduction units transferred under Article 6, being project based are not directly comparable to the direct transfer of assigned amounts as they are calculated in a different way; however, they should also result in closed transactions.

The Loopholes

Hot Air.

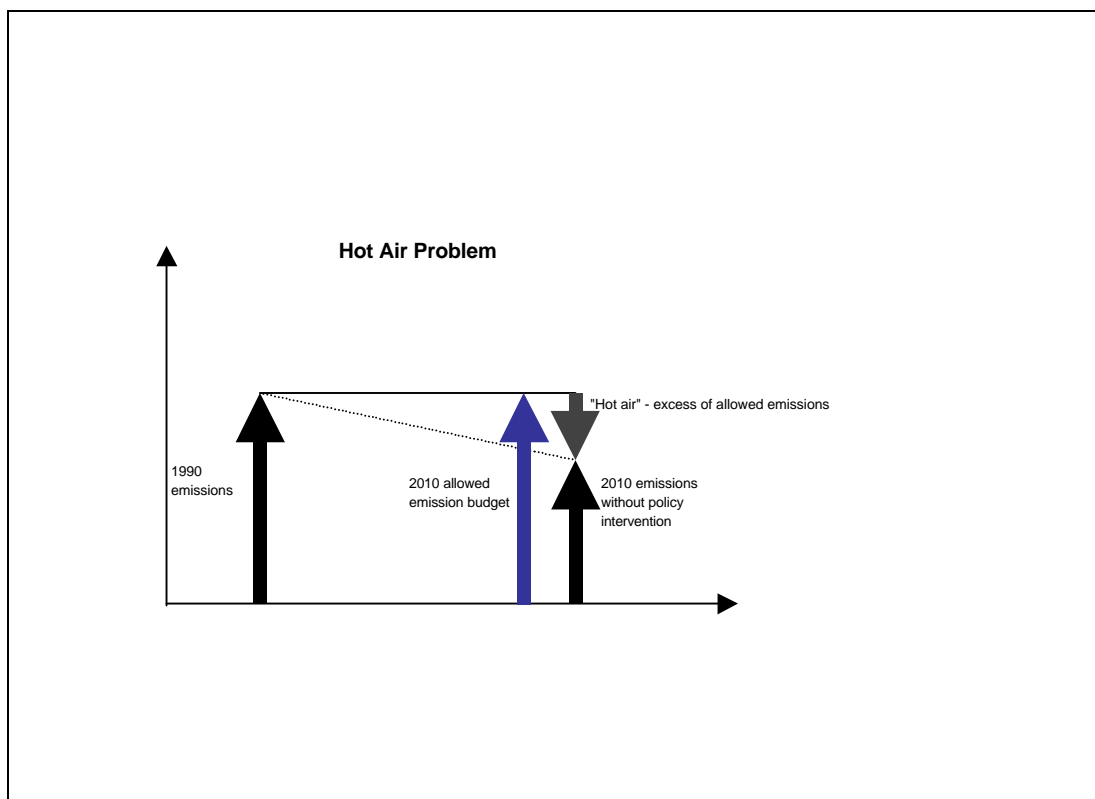
For Parties whose emissions can be reasonably anticipated to be well below their budget allocation in 2010, the issue of what happens to the excess emissions allocation is significant. This has become known as the “hot air” problem. In the absence of trading or JI projects, these excess emission allocations would not be emitted to the atmosphere. In all cases except the Russian Federation, the Ukraine and Australia, projected emissions in the absence of the Kyoto Protocol exceed the allowed emission budget.

The potential Australian hot air derives from its land use emission in 1990 and the fact that these emissions are reducing in the absence of the Kyoto Protocol. This issue is discussed separately from the Russian and Ukrainian situation.

Revised projections provided to the FCCC Secretariat during the In Depth Review of the Russian Federation's 1NC⁵ and the projections from Ukraine's recently submitted First National Communication indicate that these countries CO₂ emissions in 2010 are likely to be in range of 15% below 1990 levels. This is consistent with the International Energy Agency's 1996 World Energy Outlook scenarios having projections for emissions of CO₂ from the former Soviet Union (FSU) some 10-22% below 1990 levels in 2010. Additionally the US DOE/EIA International Energy Outlook 1996 reference case scenario projects FSU CO₂ emissions being some 12% below 1990 levels in 2010. Extrapolating projections for total CO₂ emissions to total greenhouse gases is not unwarranted given the fact that Russian methane emissions are very high and principally from the leakage of methane from the natural gas pipeline system. Improvements in this system, which has very high leakage rates appear almost inevitable by the time of the first commitment period, and would yield significant reductions, at least as great as those for CO₂ projections.

We have assumed that the Russian and Ukrainian emissions projections for 2010 are going to be around 15% below 1990 levels for the purposes of this analysis. This is equivalent to around 3.3% of Annex I emissions.

Figure 3 Schematic for Hot Air



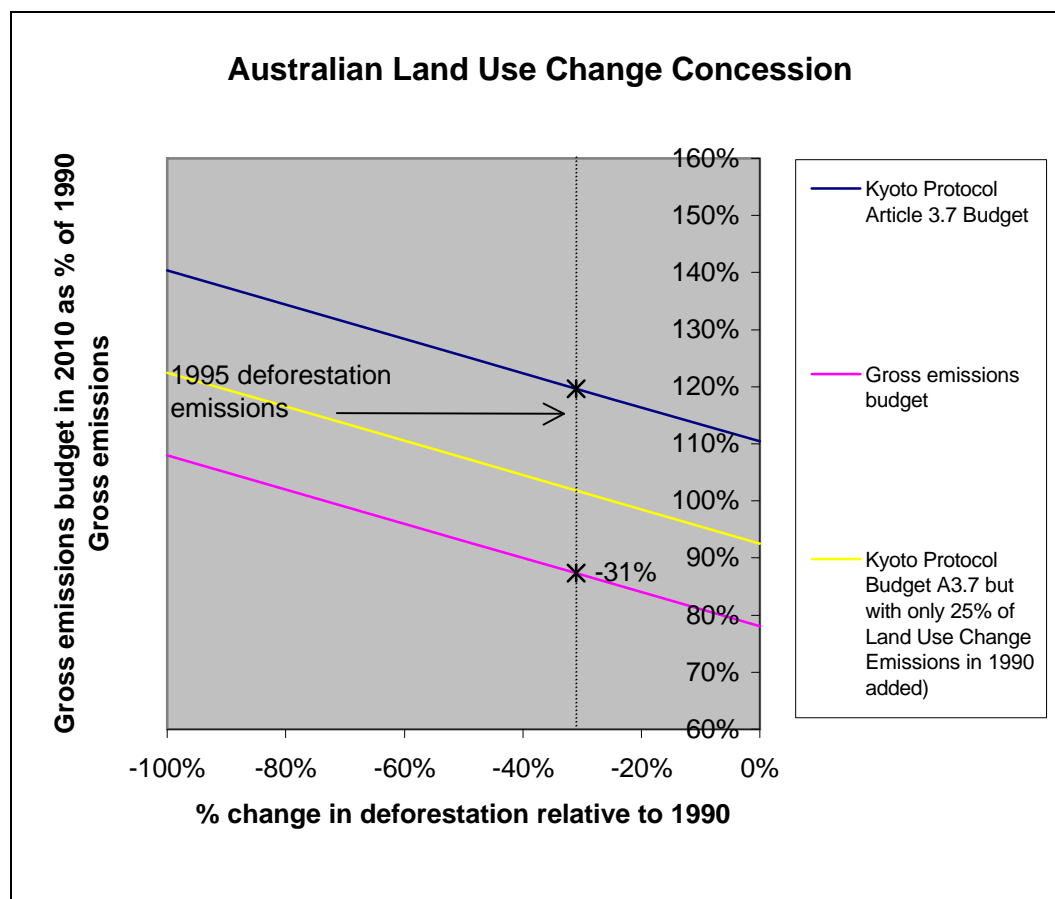
⁵ FCCC/IDR.1/RUS 21 February 1997, Report on the in-depth review of the national communication of the Russian Federation.

Australian Hot Air

As a consequence of Article 3.7, Australia is allowed to add its Land Use Change emissions in 1990, which derive principally from deforestation, to its baseline for calculating its allowed amount. As a consequence of this the allowed Annex I emissions are increased by 0.9%. What was not widely known in Kyoto is the Australia deforestation emissions are decreasing, and by 1994 were some 31% below 1990 levels. These emissions would have continued to decline in the absence of the Kyoto Protocol.

The consequence of the size of the Land Use Change emissions built into the Australian baseline are such that if deforestation emissions are reduced by 50-75% (relative to 1990 levels) by 2008, its gross emissions would be allowed to grow without restraint. Another way of looking at this is to note that if its land clearance emissions remained the same as they are now in 2008 Australia would be allowed to increase its gross emissions by much more than its apparent target of 108%. Figure 4 shows the relationship between allowed gross industrial emissions in 2010 and its deforestation emissions relative to 1990 levels.

Figure 4 Australian Hot Air issue



Baseline change for HFCs, PFCs, and SF₆.

The option of choosing a 1995 baseline for emissions of these gases leads to the inflation Annex I budget by around 0.6-0.7%⁶.

Exemption of emissions from international aviation and marine transport fuels.

If these emissions grow at around 3% per year from 1990 to 2010 then they would result in an increase in emissions relative to the 1990 Annex I gross industrial emissions of around 1.5-2%.

Sinks (Land Use Change and Forestry sinks)

To estimate the size of the potential effect on the emissions budget and in relation to emissions to the atmosphere, assumptions are necessary as to the magnitude of the additional activities undertaken and the extent to which they are additional to the projections that Parties have made for their LUCF sink in 2010. For indicative purposes here we have assumed that the additional afforestation and reforestation activities by 2010 would be equivalent to 25% of the 1990 LUCF sink in national communications and that 50% of this additional to the projections for 2010. This

⁶ This is estimated on the basis of updated HFC etc emission data from the EU member states, Japan for 1990 and 1995 so that the Parties reporting these emissions totalled over 70% of 1990 Annex I emissions.

translates into a 1.8% increase in the gross emissions budget in 2010 for the Annex I Parties (half of which is offset when considering the increase in emissions to the atmosphere resulting from this.)

Clean Development Mechanism Credits

For indicative purposes we have assumed that CDM credits add 2% to the Annex I emissions budget.

Conclusions

Table 3 summarises the results of this assessment of loopholes in the Kyoto Protocol (the effects of hot air are described in section 4 below). With the assumptions described above and if emission budgets are fully used then rather than the nominal 5.1% reduction touted for the Kyoto Protocol a small increase above 1990 levels in both gross emissions and emissions to the atmosphere can be expected.

Figure 5 shows the estimated implications for global emissions of the Kyoto Protocol compared to two IEA scenarios. The Protocol should produce a clear break in future global emissions, although for the low emissions scenario this is less clear-cut. Figure 6 shows the implications for Annex I emissions of the Protocol showing the effect of the loopholes and of hot air, if it were not to be transferred.

Table 3 What are emissions in 2010 likely to be if budgets are fully used?

	GtC	
Gross Annex A emissions budget	4.60	5.2% Nominal reduction from Annex A
Article 3.7 land use change addition to allowed budget	0.04	
Gross emissions budget including land-use change for Article 3.7 Parties	4.64	5.1% Nominal reduction from Annex A plus LUC for Australia and the UK
HFC 1990 or 1995 baseline flexibility	0.03	
Sub-total	4.67	4.5% reduction from Annex + LUC after including HCF baseline change
Bunker fuel emissions	0.20	
Sub-total	4.87	2.6% reduction below 1990
Article 12 CDM credits	0.09	
Sub-total	4.97	0.6% reduction below 1990 gross emissions
Article 3.3 afforestation and reforestation 25% of 1990 LUCF sink	0.09	
Total allowed budget	5.06	1.1% increase above 1990 gross emissions
LUCF Projections for 2010	-0.29	
Article 3.3 afforestation and reforestation that is additional to LUCF 2010 Projection	-0.05	
Land use change and forestry	-0.34	
Total emissions to atmosphere 2010	4.72	1.7% above 1990 net emissions to atmosphere

Figure 5 Kyoto Protocol and Global Fossil CO2 emissions

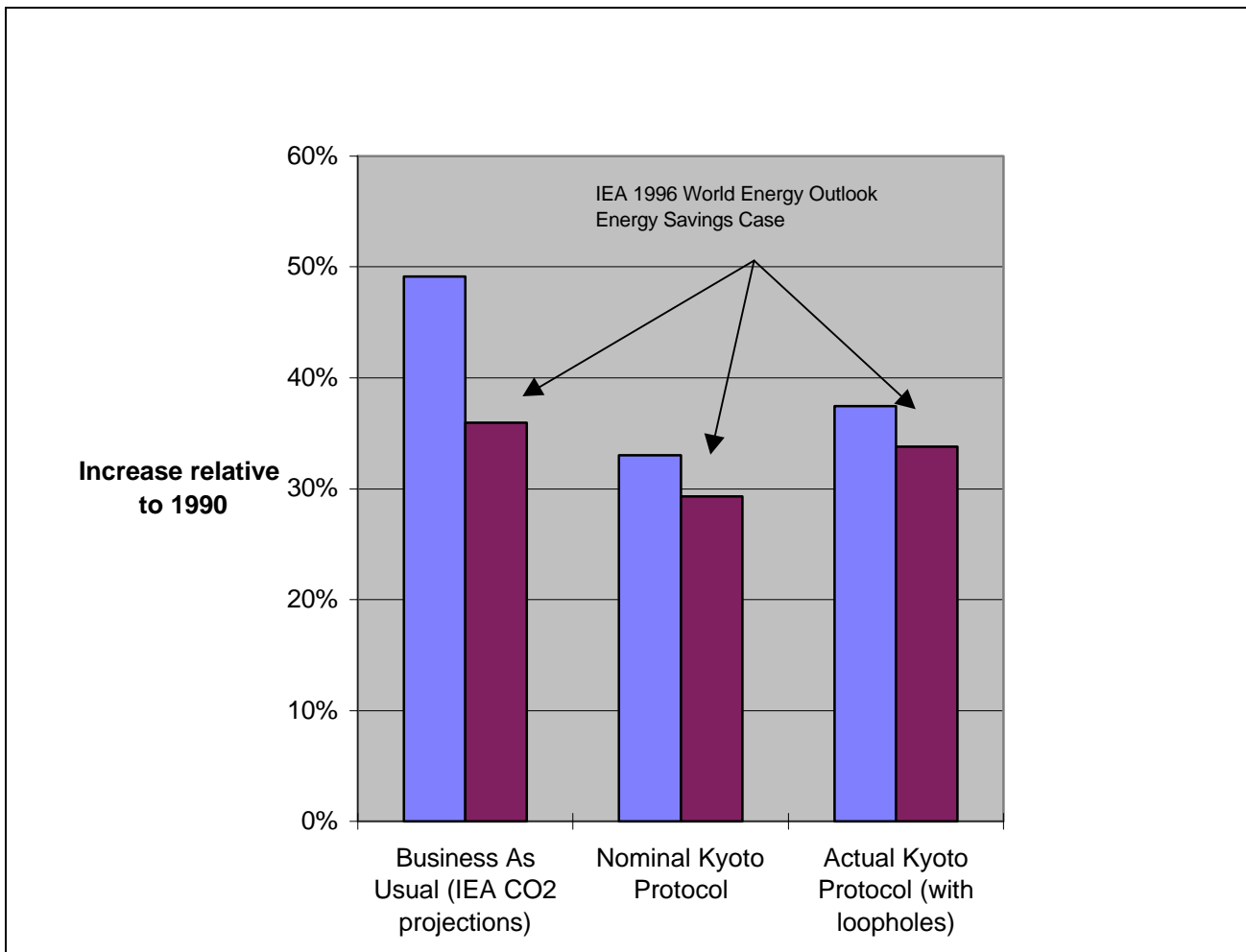
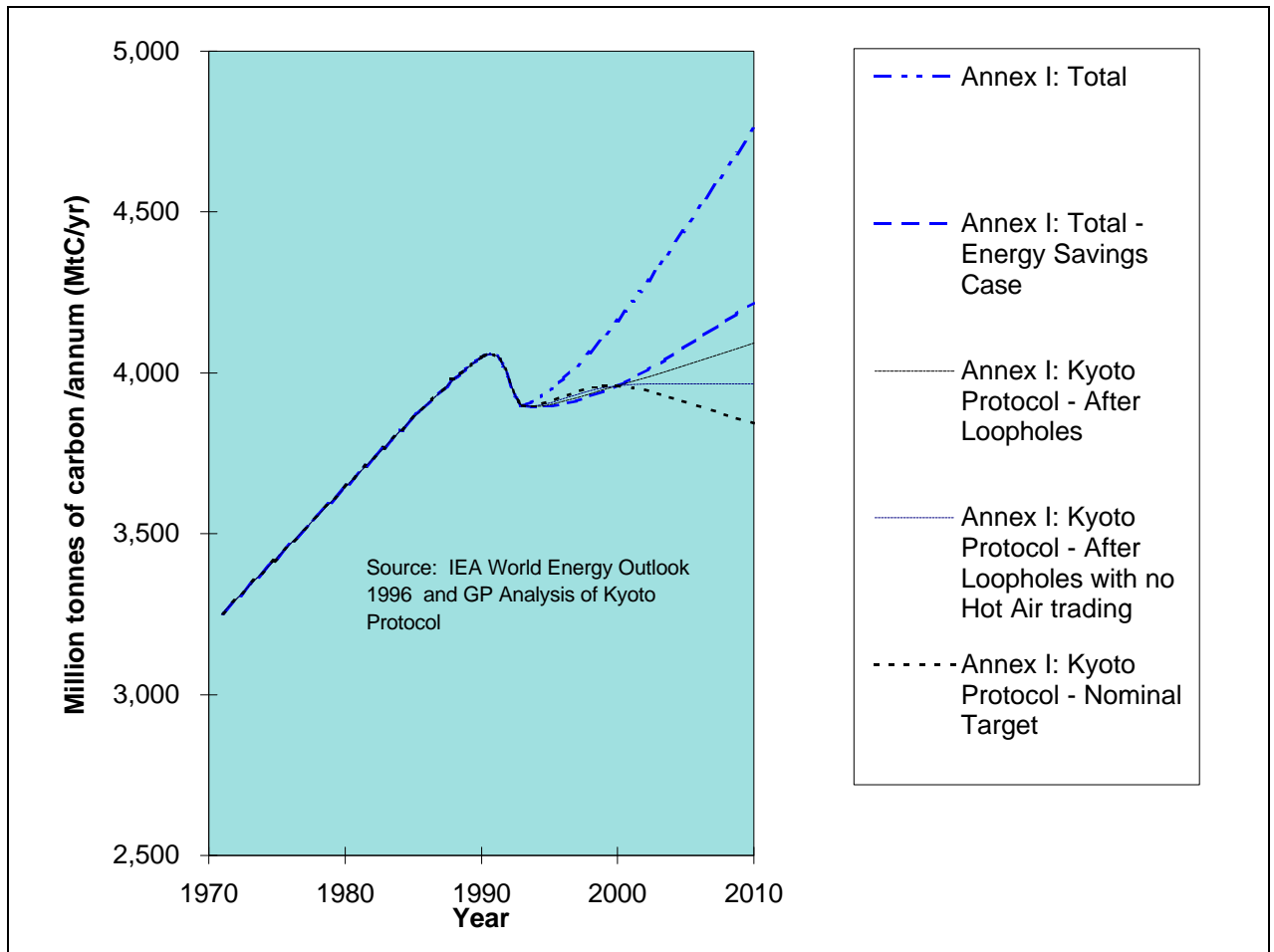


Figure 6 Kyoto Protocol and projections of Annex I Emissions.



3. Common Rules and Principles for the Flexibility Mechanisms

As a consequence of the interactions between the flexibility mechanisms of the Kyoto Protocol (trading, Joint Implementation, and the CDM), there need to some common rules and/or principles which apply to the operation of all of these instruments. In other words, before assigned amounts are traded, emission reduction units (ERUs) under Joint Implementation (JI) or certified emission reductions (CERs) under the CDM transferred, issues such as the priority given to domestic action, the fungibility of the emission units under Article 6, 12 and 17 and the legal framework under which exchanges would occur (e.g. carbon brokering), monitoring and verification of both emissions and changes to assigned amounts using these instruments, and incentives for compliance need to be resolved.

Other issues will be discussed in Sections 0 and 5.

Domestic action must be the priority

Only a limited part of Annex B Party commitments should be achieved through the flexibility mechanisms:

- Article 6.1(d) specifies those emission reductions or enhancement of removals must be “additional to any that would otherwise occur”. The term additional is undefined however it strongly implies that ERUs should be additional to those reductions that would have occurred as a consequence of the host Party meeting its obligations under Article 3.
- Article 12.3(b) specifies that Annex I Parties may only use the CERs to comply with part of their obligations. This part is to be determined by the COP/MOP⁷.
- Article 17 requires that any trading “shall be supplemental to domestic actions for the purpose of meeting” the emission obligations of an Annex B Party (our emphasis).

These limits must be defined by the COP before ERUs; CERs or assigned amounts can be transferred or traded. In addition the reporting rules to be developed under A7 of the Kyoto Protocol should require National Communications include projections for policies and measures which would enable a substantial majority of a Party's Annex B target to be achieved through domestic action.

Fungibility rules

A key question that arises from the Protocol is whether and to what extent the various emissions units generated under Articles 3 (as assigned amounts), 6 (as ERUs) and 12 (as CERs) are fungible. Are the emission reduction units, credits and transfers of assigned amounts arising through joint implementation, the CDM and trading to be treated equivalently as CO₂ equivalent emission credits? Or should there be explicit discounting of some of ERUs and CERs before they are used to modify a Party's assigned amount? Are all CERs equivalent even though they may be generated in different ways and be valid for different periods?

⁷ Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol.

One reading of the Protocol would seem to indicate that these units are fully fungible once they have been used to modify a Party's assigned amount, although the various quantities allowed to be used for credit or trading originate in quite different ways, may involve different sets of sources and sinks based on different emission methodologies or could conceivably involve double-counting. Article 3 treats transfers of CO₂ equivalent emission units under each of these mechanisms the same in the sense that they all modify the assigned amount of the Party where appropriate. Once ERUs and CERs become part of a Party's assigned amount then they can be traded.

In addition, the Protocol does allow for private sector involvement in all the steps in relation to ERUs and CERs under Article 6.3 and 12.9 respectively. In addition it would appear to be open to any Annex I Party to allow private sector entities to engage in all the relevant steps leading to trading of assigned amounts under Article 17.

At the least, it would seem prudent for the COP/MOP to examine the implications of a market that treated each of the emission units equivalently. The COP/MOP needs to ensure, if such a market is permitted, that it operates under rules which guarantee transparency of the system, has rigorous compliance requirements including buyer as well as seller liability, and that each emission credit that is transferred is traceable back to a specific project or country and that the integrity of the environmental objectives of the Protocol are protected.

Of particular concern are sink projects leading to transferable emission units. These are intrinsically much less reliable and verifiable than other kinds of emission units and indeed potentially much less permanent than avoided industrial emissions (see Section 6 below).

Legal framework

Guidelines, rules, modalities and methodologies must be agreed and in place *before* emission units from JI and CDM projects and assigned amounts are traded:

- Article 6 specifies only that the COP/MOP may develop “the implementation of this Article, including for verification and reporting”. However the existence of “hot air” in the assigned amount of some Parties, as well as uncertainties in relation to the use of Land Use Change and Forestry activities (see Section 6 below), places an additional burden on the need to verify project additionality. As a consequence the COP should clearly signal that Article 6 JI projects will require approved guidelines before crediting can be automatically assumed.
- Article 12 requires that the COP/MOP ⁷ agree the modalities and procedures for CDM projects and states the CDM shall operate under the guidance of the COP/MOP.
- Article 17 requires that the “Conference of the Parties shall define the relevant principles, modalities, rules and guidelines, in particular for verification, reporting and accountability for emissions trading”. Whilst some Parties (e.g. members of the JUSCANZ group) may claim that Article 17 does not specifically require this before trading begins, it is clearly implied in the text. It is in the interest of all Parties the rules for trading are agreed before transfers actually take place.

Carbon brokers regulated

The flexibility mechanisms in the Protocol provide opportunities for 'carbon brokers.' Accreditation procedures for these brokers must be agreed to avoid an unregulated free for all. These procedures must include penalties for fraudulent activities.

Review after first commitment period

The effectiveness of each of the flexibility provisions must be reviewed after the first commitment period and a report sent to the COP/MOP. The report should also cover issues and problems identified in relation to the operation of any general market in emission credits that emerges or is mandated under the Kyoto Protocol. Problems identified in the report must then be rectified.

Reporting and verification

Effective monitoring and verification of emissions and of transfers of assigned amounts must form the basis of the Kyoto Protocol. Without this there can be no guarantee that the Protocol is delivering real emissions reductions and environmental benefits, or a real basis on which assess Parties' compliance with their commitments. Monitoring and verification are thus central to an internationally credible Protocol as well as to its long-term success. The basic elements of the monitoring and verification regime for the Kyoto Protocol should be agreed first so that they can feed into the development of other elements of the Protocol (e.g. trading, JI and the CDM).

Information must reach a set standard to ensure it is relevant and of a high standard (this has not always been the experience of data reported under the FCCC). Funds should be provided to help with capacity building where necessary. Reporting and review guidelines must be updated at regular intervals as the uncertainties in measuring emissions from certain sources (e.g. land use change and forestry) decline as a result of evolving science and technology.

National accounting system for transfers of assigned amounts

National registration of acquisitions and transfers of assigned amounts and double entry bookkeeping, to include the country of origin of the transfer or acquisition, the date the amounts were acquired or transferred, the price and so on should be required. Of particular importance is the need for emission reduction units and credits transferred as a result of trading, JI and the CDM to be traceable back to the individual projects or Parties from which they were generated or originated.

In depth reviews

In depth reviews by expert independent teams must be carried out for all the flexibility provisions. As part of this, procedures must be developed to allow questioning and challenges by Parties and NGOs to the claimed results of projects carried out under the CDM and JI. For trading, in depth review teams must have the power to investigate national registration and accounting systems to ensure that fraudulent amounts are not assigned.

Verified national inventory systems

Parties must comply with Article 10 (emission inventories and national programmes to mitigate climate change) and Annex I Parties with Articles 5 and 7 and have in place verified national inventory systems before transfers of assigned amounts and/or certification of emission reductions can begin. This is necessary to ensure accurate tracking, measuring, monitoring and reporting of domestic emissions.

Information provided by countries, such as national communications and annual reports, should be easily accessible, transparent and widely available, including electronically.

Compliance Regime

Article 18 provides for the negotiation of a non-compliance regime to be approved by the first meeting of the COP/MOP. However, in addition to and separate from this, modalities, rules and guidelines agreed for the flexibility provisions should contain repercussions for Annex B Parties which are out of compliance with them. These should include the following:

- A ban on transfers of emission reduction units from any Party exceeding its emissions commitment (as laid out in Annex B) or in breach of reporting requirements until that Party returns to compliance.
- Annex 1 Parties out of compliance at the end of the commitment period have a short time (e.g. six months) to acquire enough emission reduction units or credits to bring themselves back into compliance.
- After the six month period, an Annex 1 Party still in non-compliance has the amount it is over its Annex B commitment plus a penalty (e.g. 50 per cent of the excess) subtracted from the next commitment period. If it is still out of compliance at the end of the next commitment period then more stringent penalties must be imposed. These penalties should not be simply a higher penalty than the 50 per cent suggested for the first commitment period, or it is possible that a persistent non-complier could continually roll forward the penalty to the following commitment period.

See Section 0 below, page35 “Joint buyer and seller liability system”, for an outline of a liability system which would complement a compliance regime by providing signals to buyers of assigned amounts and ERUs during a commitment period in relation to the anticipated compliance status of selling Parties.

Article 18

A strong and effective non-compliance regime is crucial to the Protocol's ability to ensure real and measurable environmental benefits and emissions reductions and to maintain international credibility and confidence. The non-compliance procedure to be

approved by the first meeting of the COP serving as the MOP must be strong, credible and effective. It should build on the procedures and elements already in the FCCC and the Protocol, such as in depth reviews, national communications and rules for JI, emissions trading and the CDM.

A decision must be agreed at COP 4 for an immediate start to the development of a non-compliance regime for the Protocol. This should be separate to the process agreed for Article 13 of the FCCC, but should work closely with existing institutions that already exist within the FCCC and the Protocol.

Strong and effective non-compliance regimes have been set up recently under the Montreal Protocol and the Second Sulphur Protocol to the Convention on Long Range Transboundary Air Pollution. The Article 18 process should review these regimes for useful elements. Of particular interest is the ad hoc group of legal experts set up under the Montreal Protocol. If created at COP 4, such a group could begin work elaborating the elements to be included in Article 18. These should include a list of binding indicative measures in cases of non-compliance.

Conclusions

As a consequence of the interactions between the flexibility mechanisms there need to some common rules and/or principles which apply to the operation of all of these instruments. These include:

- Domestic action must be the priority
- Market rules. The COP/MOP needs to ensure that if a market is to be permitted in all of the emission units that can be transferred under the Kyoto Protocol that it operates under rules which guarantee transparency, compliance, buyer and seller liability, and reinforce the environmental objectives of the Protocol. There needs to be an agreed legal framework for the flexibility mechanism *before* emission units from JI and CDM projects and assigned amounts are traded. The effectiveness of each of the flexibility provisions must be reviewed after the first commitment period, a report sent to the COP/MOP and problems rectified.
- Compliance with reporting obligations for emissions and transfers assigned amounts before transfers of ERUs, CERs or assigned amounts are permitted.
 - National accounting system for transfers of assigned amounts
 - National registration of acquisitions and transfers of assigned amounts with double entry bookkeeping. Details should include country of origin of the transfer or acquisition, the date the amounts were acquired or transferred, the price and so on should be required in order to trace acquisitions back to the individual projects or Parties from which they were generated or originated.
- In depth review by expert independent teams.
- Establishment of a compliance Regime including a ban on transfers of emission reduction units from any Party exceeding its emissions commitment (as laid out in Annex B) or in breach of reporting requirements until that Party returns to compliance.

4. Trading and Joint Implementation

Introduction

Transfers of assigned amounts within the Annex B group can occur via trading under Article 17 and the sale and acquisition of ERUs from Joint Implementation projects under Article 6. Whilst the commodities transferred are different, one being a part of a Party's assigned amount and the other being an emission reduction unit generated by a project their effects are symmetrical. Both add or subtract from a Party's assigned amount depending on the direction of the transfer and the net change in assigned amounts is zero. Rules affecting trading would directly and indirectly affect the transfer of ERUs. Achievement of policy objectives adopted in the form of rules for trading could be circumvented by a JI transaction unless the rules also apply, where appropriate, to both kinds of activities.

The Parties included in Annex B (i.e. having legally binding emission budgets) are allowed to trade their emission entitlements under Article 17. Such trading, however, is meant to be "supplemental" to domestic action and Article 17 of the Kyoto Protocol clearly specifies that the Conference of the Parties to the Climate Convention shall develop the rules for trading. Some Parties have raised a question mark, however, over whether these rules have to be developed before trading begins.

This issue, the prior agreement of trading rules is one of the key strategic issues in the implementation of the Kyoto Protocol. Unless rules are agreed in advance there is a significant probability that the trading system will lead to compliance and verification problems, disputes over what can be traded and by whom and of the transparency and fairness of the system and allegations of interference in domestic policy.

In addition to this question there are a set of issues that deal broadly with the following problems which are unresolved at present:

- Limiting the environmental consequences of "hot air" in some Parties emission allocations. This also an issue for JI projects.
- Defining what is meant by "supplemental" under the terms of Article 17. Any definition of supplemental adopted by the Parties could be rendered meaningless unless interpreted in a similar way under the additionality requirements of Article 6.
- Liability for traded allowances that are associated with a selling Party's failure to comply with its obligations. This is also an issue for JI project transfer.
- Reporting, compliance and verification at national and international levels. JI transfers raise similar issues.
- Involvement of the private sector in international trading of assigned amounts and JI projects.
- Issues involved with the co-existence of a variety of domestic policy instruments and an international emission trading system along with the transfer of project based ERUs.

Need for Prior Agreement on Trading rules.

The establishment of an international trading regime in greenhouse gases under the Kyoto Protocol is a new and untried experiment, involving not just Parties but, it is anticipated, the private sector as well. There are many reasons to expect that it could bring benefits to global efforts to reduce GHG emissions. It is also clear that there are many ways in which it could go badly wrong. Beyond the grand concept it will be the success in determining the details that will fundamentally influence the efficacy of the system in reducing GHG emissions, which is its ultimate purpose. It is essential, therefore, that a strong foundation for the system is developed before trading begins. This would involve regime to ensure transparency, effective monitoring and verification, a compliance and liability regime and elaboration of the key relationships with other elements of the Kyoto Protocol, such as Article 6 JI ERUs and the Land Use Change and Forestry sector. These elements need to take account of the complex issues inherent in involving the private sector in activities leading towards the transfer of assigned amounts between Parties and of the concerns over interactions between international trading and domestic policy.

The process of negotiating these elements should also help deal with some of the concerns that many developing countries have in relation to the trading system. If these Parties are to be involved in the future in an emission trading system, then procedural equity considerations demand that these Parties be also allowed to contribute to the formation of this regime. Their exclusion is likely to simply exaggerate the already strong concerns over the long term equity issues arising from the establishment of a trading system effectively begun by Grand-fathering the Annex I emissions.

In this context, it would seem unwise for the proponents of emission trading to support a regime that had no agreed rules from the beginning in the face of well known and complex problems. This is almost an invitation to disaster.

For these Parties, notably the USA, the desire to see developing countries take on, voluntarily, obligations and then engage in trading seems inconsistent with the position of being opposed to prior agreement on trading rules. Many developing countries are less than enthusiastic about trading. A transparent approach to the development of guidelines and rules for trading would help to generate confidence that such a mechanism can work effectively and fairly.

Whilst the USA and others are concerned that the COP⁸ may be unable to reach agreement on rules for trading immediately. Attempting to impose rules by default or unilateral action may in the long term be more damaging than delayed agreement to both the trading regime and the involvement of developing countries at a later stage. As the rules for trading may affect ratification the COP should, however, expedite consideration of this issue.

⁸ Article 17 specifies that is the COP of the FCCC that is to develop the rules for trading.

Emission trading and “hot-air”

One of the key environmental problems with emission trading under the Kyoto Protocol is “hot air”, which derives from the fact that Russia and the Ukraine have more rights to emit greenhouse gases than their emissions are likely to be. Estimates of this problem vary from around 2% of the entire Annex I emission budget to 7%. In other words, in the absence of emission trading, the Kyoto Protocol would produce a reduction of between 7 and 12% rather than the nominal⁹ 5.1% if all the emission budgets were consumed.

Figure 7 shows the magnitude of Russian and Ukrainian hot air as a function of a range of business-as-usual emissions in 2010 compared to three sets of gross 1990 emissions¹⁰ – total Annex B emissions, Annex B emissions not including Russia and the Ukraine, and combined US and Japanese emissions.

If it is assumed that the Russian and Ukrainian emissions in 2010 are likely to be around 85% of their 1990 value (see below for elaboration), and if this hot air were not allowed to be transferred, the Kyoto Protocol would produce a nominal reduction in Annex B emissions of 8.4% rather than 5.1%. Put another way, if the hot air under this scenario were transferred to other Annex B Parties, rather than the overall nominal reduction of 7.0% being achieved only a 2.2% nominal reduction would occur. If the USA and Japan took all of the hot air, their combined emissions would increase by 1.3% rather than the nominal reduction required of 6.8% for these Parties combined emissions.

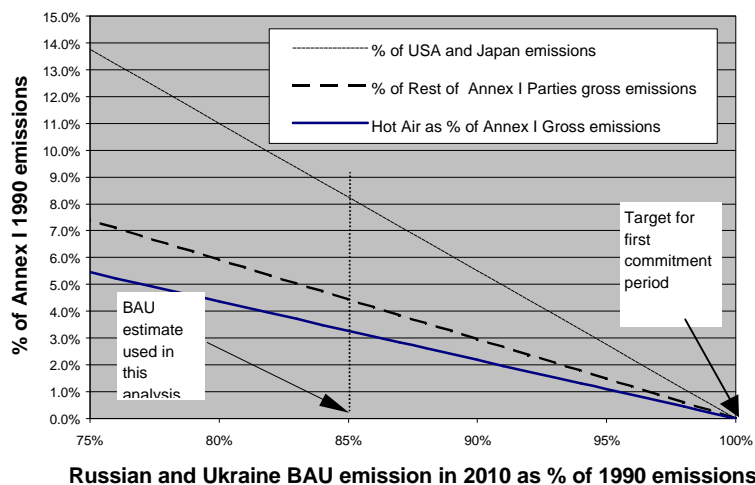
The analysis here shows that the size of the hot air problem may be quite significant relative to the domestic targets of the other Annex B Parties *if* the combined Russian and Ukrainian emissions are significantly below 1990 levels in the first commitment period. Even if the combined Russian and Ukrainian emissions are only 5% below 1990 levels in 2010 (rather than the 15% assumed above) this would still correspond to a 1% increase in Annex I emissions. If the corresponding hot air were bought by the USA and Japan alone this would allow these Parties to weaken their domestic reductions by about 3%.

Obviously a key issue here is the extent to which the Russian and Ukrainian emissions are likely to be below 1990 levels.

⁹ The term nominal is used here to refer to the computed reduction relative to the 1990 emissions in Annex A and the LUC emissions referred to the second paragraph of Article 7, without consideration of the HFC baseline change allowed under paragraph 8 of Article 3.

¹⁰ Gross emissions refer to the emissions from sources in Annex A and Land Use Change sources from Parties OUP7.

Figure 7 Hot Air and Annex I Emissions



In policy terms essentially six kinds of “solutions” to the “hot air” problem have been discussed:

- Renegotiate the Russian and Ukrainian targets. This is unlikely to be politically feasible.
- Buy up and retire the hot air. This also appears an unlikely option.
- Accept the hot air for the first commitment period, but reach an agreement with Russia and the Ukraine that their obligations in the second commitment period will be significantly lower than their projected emissions in that period. This would create an incentive not to sell of the hot air in the first period and carry any remaining forward to the second period. This solution, apart from being a “hostage to fortune”, is unlikely to be politically feasible or credible.
- Ignore the issue and treat it as a “transaction” cost for getting the Kyoto Protocol established. This is not a real solution and creates a very poor precedent for the future.
- Develop complex rules governing trading (and Article 6 JI projects) designed to prevent the transfer of assigned amounts arising from hot air. This is potentially a minefield of problems as it is quite difficult to conceive of rules that would eliminate hot air without leading to other problems.
- Impose a quantitative limit on sellers so that the volume of assigned amounts and ERUs that can be transferred is confined to a maximum amount. This limit would have to apply to the total of transfers under Article 6 and Article 17. This may be the most practical solution; however, it would reduce and not eliminate the “hot air” problem, depending on the size of the limit. A selling limit would only be needed as long as there were significant hot air in the emission allocation system.

In theory, Parties could circumvent a selling limit or a rule based system by using Article 4 and declaring, like the EU, that they will implement their obligations jointly. There is no restraint possible on this, apart from political embarrassment and the initiation of a formal complaint under the FCCC compliance provisions. However in

practical terms use of Article 4 simply to circumvent a selling limit is unlikely as Parties are likely to be unwilling to sacrifice the degrees of freedom surrendered as a consequence of an Article 4 joint fulfilment arrangement.

If a selling limit system were to be used to limit the size of the “hot air” problem to, for example, below 1% of the 1990 Annex B emissions (excluding Russia and the Ukraine), a limit of 3% would be needed on the sale of a Party’s assigned amount in the first commitment period. This would have the effect of:

- Disallowing transfers of more than 3% of from a Party’s assigned amount during the first commitment period.
- Ensuring that the nominal emission reduction achieved by the Kyoto Protocol would around 7.5% rather than 5.1% if all the hot air were traded in this case. Another way of looking at this is that a selling limit of this size would yield (with the BAU emissions assumptions above) a further 2.4% reduction. If the business as usual emissions of Russia and the Ukraine in 2010 were 90% of 1990 emissions in 2010 the corresponding reduction would be 6.6%, hence the selling limit would yield a further 1.5-% reduction, which is still significant. On the other hand if the BAU emissions from Russia and the Ukraine in 2010 were 90% of 1990 levels then the extra reduction would be around 0.3%, which may not be significant.

A Limit on Trading: Defining Supplemental

Article 17 specifies that emission trading “shall be supplemental to domestic actions” (our emphasis) for the purposes of meeting the emission obligations in Article 3. The Protocol, however, does not specify what this part means in quantitative terms. At least part of the motivation for including this term in the Kyoto Protocol was to limit the trade in “hot air”. A further motivation was to ensure that most action is done domestically in the belief that it is domestic policy that will drive technological innovation.

One way of ensuring that trading is indeed supplemental to domestic action would be to set an upper buying limit on how much a Party can buy to add to its assigned amount. This is distinct from the selling limit discussed above for the hot air problem. To be consistent such a limit would apply to the total amount a Party could acquire during a commitment period via transfers under Article 6 and Article 17, as Article 6 also requires that ERUs be supplemental to domestic actions.

This limit could also apply for similar policy reasons to the acquisition of CERs under the CDM. However Article 12 specifies only that part of a Party’s obligations may be met from the use of CERs. In addition the CDM creates the problem that the CERs credits inflate the entire Annex B budget, whereas Article 6 and Article 17 transfers do not do this.

Unlike the hot air problem (or a limit on CDM credits) there is not a clear quantitative basis for setting a buying limit as the objective. A buying limit of say 10% of the base year emissions (which would be slightly more proportionately compared to the assigned amount for most Parties) would mean that a Party could not obtain more than this amount via emission trading and joint implementation projects during a commitment period. In rough terms, for a Party whose BAU emission increase by

2010 would have been 25% and which under the Kyoto Protocol has a 7% reduction target (relative to 1990 levels) the emission reduction effort is about 32%. Allowing a 10% limit on Article 6 JI and Article 17 trading means that roughly two thirds of the emission effort would be done at home.

Joint buyer and seller liability system

Article 17 is silent on the question of who is liable in the event non-compliance with emission obligations under Article 3, arising from, or associated with, trading activities. Non-compliance occurs where a Party's assigned amount at the end of a commitment period is less than its emissions during that period. The issue of concern here is where the assigned amount has been reduced by the transfer of parts of the original assigned amount via trading for via Article 6 JI ERUs and the final assigned amount is below the total emissions for the commitment period.

There are a number of compelling reasons to have a system of both buyer and seller being liable in the event that emission trading (or Article 6 JI ERU transfers) leads to, or is associated with, an emission compliance failure:

- There are currently no specific compliance mechanisms that would provide a signal to those participating in an emission trading system that the system will have integrity. In the absence of such a signal sharp practices could become prevalent, as those wishing to cut corners could feel confident that penalties for non-compliance will be late, if at all.
- Not all Parties that could be involved in the trading system have robust legal systems capable of efficiently enforcing rights.
- The involvement of the private sector in trading creates additional compliance pressure.
- In the present situation, a buyer of emission reduction units would not be liable if the selling country is out of compliance with its Annex B target, even though it could reasonably have been foreseen that the selling Party would in this situation. In effect, a selling country could trade its entire emission budget while continuing to increase its own domestic emissions, while the buyer would increase its domestic emissions and still be in compliance.

To avoid these problems buyer countries must be also be made liable for the non-compliance of the seller country. Joint liability would mean that it would be in the buyer's interest to scrutinise rigorously the integrity of each transfer.

There appear to be two broad options for a (joint) liability system. One is where the system operates only after the end of a commitment period when the final inventories of assigned amount and emissions are in. The second is where the liability system operates on the basis of annual reports of emissions and assigned amounts and reacts during the commitment period to potential compliance problems.

The former system may, in effect, be no different from a non-compliance system and would suffer from the inherent defects of such a system: it takes place after the event, cannot easily influence emission obligations for the new commitment period and may

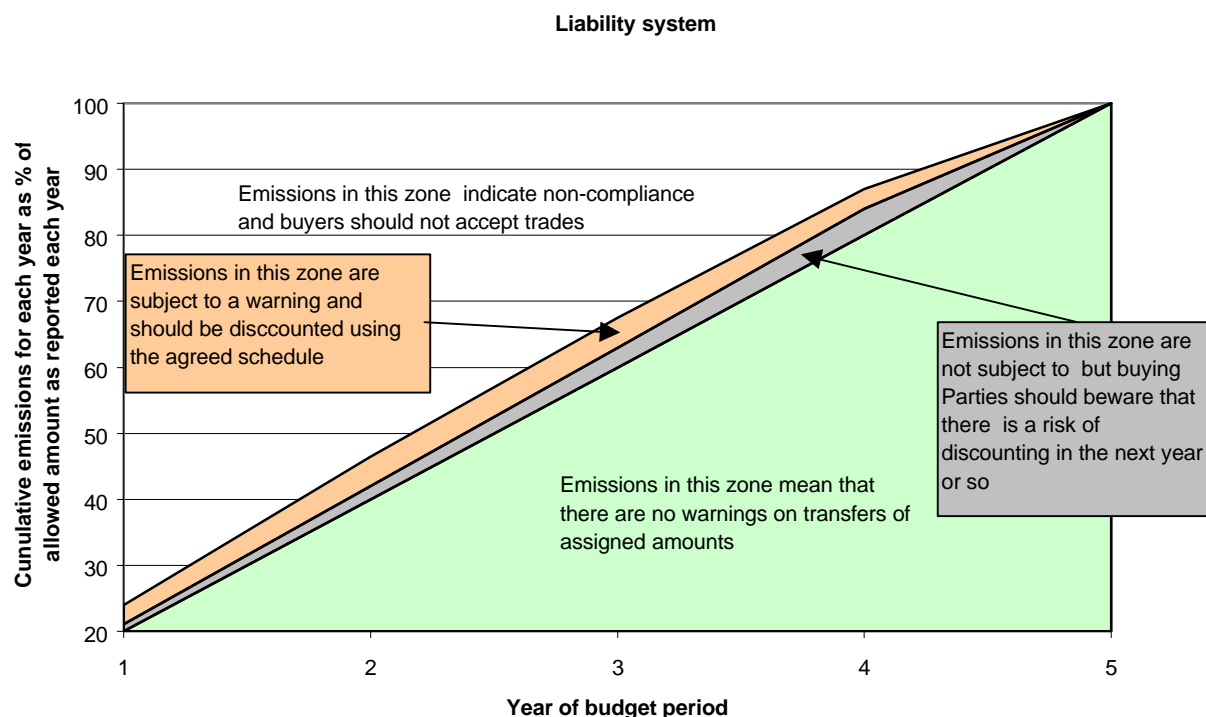
take a considerable period of time to resolve resulting in slow feedback to the market system and consequent degradation of environmental effectiveness.

The second system could work on the basis of the annual reporting of emissions and assigned amounts in such a way as to provide a signal to buying Parties. The signal system would operate so as to provide information as to whether a particular selling Party may or may not be entering a potential non-compliance situation and the level of the signal would determine whether discounting of any assigned amounts from this Party is advisable or required. Such a system could work in the following way (for Parties that are in compliance with their reporting obligations).

Based on a Party's reported emissions and assigned amounts and using an agreed schedule of ratios between cumulative emissions and assigned amounts for each year of a commitment period the Secretariat would assign one of four categories to the Party (see Figure 8):

- Category I (i.e. "Green Zone") means that the cumulative emissions are below the pro-rata assigned amount up to the last reporting year and there is no advisory on discounting assigned amounts from this Party.
- Category 2 (i.e. "Grey zone") is where the cumulative emissions are slightly above the pro-rata assigned amount up to the last reporting year but below the warning level (Category 3). The Secretariat would be required to notify all Parties that the Party is in the Grey zone and that buyers should be aware that the next annual report may result in a mandatory discounting of all acquired assigned amounts from this Party.

Figure 8 Joint Liability System



- Category 3 (i.e. “Orange zone”) is where the cumulative emissions are in the range above the pro-rata assigned amount up to the last reporting year which requires mandatory discounting of all assigned amounts transferred from this Party. The Secretariat would be required to notify all Parties of:
 - The discounting level required for the assigned amounts acquired from this Party and request that Party’s adjust there assigned amounts according. Parties would be allowed to continue to acquired assigned amounts from the Party in question but would discount new acquisitions as well as the previously acquired amounts.
 - The potential requirement for total discounting of any acquired assigned amount from this Party for banking purposes if after the end of the budget period the Party is found to be in non-compliance with Article 3. For the purposes of defining whether or not the acquired assigned amounts are used for Banking it would have to be deemed that the non-complying Party’s transferred assigned amounts are contained in any banking application.
- Category 4 (i.e. “Red zone”) is where the cumulative emissions are in excess of the agreed maximum pro-rata assigned amount up to the last reporting year which requires mandatory discounting of all assigned amounts transferred from this Party. Further transfers from this Party would not be recognised as valid (i.e. totally discounted). The Secretariat would be required to notify all Parties of the discounting level required for the assigned amounts already acquired from this Party and that banking of assigned amounts from this Party may not be allowed.

The agreed schedule of discounts would be constructed so that the liability is shared between the selling and buying Parties.

A joint liability system is not a substitute for a non-compliance system and associated penalties for non-compliance and there will need to be a close connection between a non-compliance system and a liability system (see below).

Pre-requisites for Trading

Compliance with reporting requirements for emissions and assigned amounts

Annual reporting of both emissions and assigned amounts has to be one of the basic building blocks for the integrity of the Kyoto Protocol and of its trading system. The annual reports provide the only basis for assessing during a commitment period whether or not a Party risks being out of compliance with its obligations under Article 3. This is vital information of relevance to the environmental effectiveness of the Kyoto Protocol and to the international market for greenhouse gases. If, for example, a Party is clearly heading for non-compliance as a result of excess transfer of assigned amounts or failure to curtail emissions, this is vital information for the market. Buyers will be aware that any assigned amounts acquired from this Party may subsequently be discounted (see below).

The requirement to report on assigned amounts is implied in Article 7 but is not explicit. Article 7.1 specifies that in addition to its annual inventory of GHG emissions and removals that a Party provide “supplementary information for the purposes of ensuring compliance with Article 3” be included. This information is to be decided by the COP/MOP under Article 7.4 and is to be in the context of modalities agreed for the accounting assigned amounts.

A requirement for annual report of transfer of assigned amounts and of the total resulting assigned amount of a Party should be established by the COP/MOP as a prerequisite for the transfer of assigned amounts by any mechanism.

The Kyoto Protocol is silent on whether or not buying or selling Parties have to be in compliance with the reporting obligations of the protocol in order to conduct transactions. This is in contrast to the obligations on Parties acquiring ERUs under Article 6 JI projects to be in compliance with Articles 5 and 7. Paragraph 1(c) of Article 6 means that acquiring Parties have to an emission inventory system in place, annual inventories submitted, and most importantly be including the information required in the guidelines adopted by the COP/MOP under paragraph 4 of Article 7. No similar obligations are mentioned for Parties transferring to other Parties ERUs.

This lack of symmetry of reporting requirements between acquiring and selling Parties and between Article 6 and Article 17 needs to be rectified if a trading system is to have integrity.

The rules of trading should require that Parties transferring assigned amounts (buying or selling) must be in compliance with the emission reporting obligations of the Kyoto Protocol and in particular with Article 7, and any specific modalities required under Article 7.4 for the accounting of assigned amounts.

The Secretariat should be tasked with the role of monitoring and verifying the transfers of assigned amounts and ERUs.

Non-Compliance Penalties

A non-compliance procedure with real teeth will be need to ensure that the trading system does not lead to cheating or to Parties exceeding their assigned amounts with impunity. Urgent efforts should be made to negotiate a procedure under Article 18. Options for non-compliance resulting from excess transfers of assigned amounts or ERUs include:

- Automatic suspension of capacity to transfer assigned amounts or ERUs until the Party is in compliance with its obligations.
- Total discounting of any banked assigned amounts from the non-complying Party (this has implications for the buyer).

The concept of subtraction of the amount the Party by which has exceeded its assigned amount in one commitment period from that Party’s assigned amount in the next commitment period, with a significant additional penalty, has been raised in the context of emission trading. This device has also been termed borrowing and has a number of

potentially negative consequences environmentally and in terms of the integrity of the commitment setting process. For example a Party that is aware that it is likely to be in non-compliance for the current commitment period and which is engaged in the negotiation of commitments for the next period, could bid up its assigned amount to offset any penalty under the “borrowing” concept. Nevertheless this concept should be seriously examined for its applicability.

Non-inclusion of sinks in the trading system

Article 3.3 does not specify that afforestation, reforestation and deforestation modify a Party’s assigned amount, and hence the inclusion of these activities in the trading system should not be permitted. Any additional Land Use Change and Forestry activities agreed under Article 3.4 would however modify a Party’s assigned amount. Because of the many problems identified in relation to sinks, the COP/MOP should not, permit any additional Land Use Change and Forestry activities to enter the trading system unless and until an IPCC Special Assessment on the Land Use Change and Forestry question, is complete, its results considered by SBSTA and decisions taken by the COP/MOP (see Section 6 below).

Enforceable national compliance systems where domestic trading is linked to international trading and transfers of assigned amounts

Each Annex B Party must enact legislation to establish enforceable national compliance procedures, with domestic penalties for non-compliance, for emission trading where private sector entities are to be involved in transactions leading to the transfer of assigned amounts between Parties. These should include a domestic regulatory programme and the designation and adequate funding of a specific agency to administer the programme. The establishment and effectiveness of such national compliance systems should be verified by the in depth review teams.

Joint Implementation

Most of the policy issues described in the preceding sections would need to be applied also in relation to the transfer of ERUs. To deal with the hot air problem and the issue of priority to domestic action the same limits would need to apply to sellers and buyers as for trading. Similarly the joint liability system would encompass transfer of ERUs as well as trading transfers. Additionally compliance with reporting requirements for emissions and assigned amounts, non-compliance penalties, and the need for enforceable national compliance systems where the private sector is involved in the creation and transfer of ERUs are essential for the JI system to work with integrity.

The involvement of sink projects in the generation of ERUs needs to be severely restricted as described in Section 6 below.

Joint Implementation projects and "Hot air"

The issue of "hot air" from the EIT countries, particularly Russia and the Ukraine, is an important factor for JI in these countries. Without hot air, donor countries would have

an incentive to invest in projects that would have major benefits to the host country in terms of improving efficiency and reducing emissions. Trading in hot air emission credits will bring about flows of cash into Russia and the Ukraine, but will not encourage the investment in projects which JI could bring about in the absence of hot air. Transfer of ERUs generated by effectively using a Party's "hot air" will also lead to emissions being higher than they would otherwise have been.

Many of the issues described below under the CDM, such as additionality, really only become a serious issue because of the existence of "hot air". Where a Party's assigned amount is lower than its business as usual emissions, the incentive is for JI project credits to be allowed where the host Party is sure that the project will help meet its legally binding emission limit. If there is doubt the host Party will be reluctant to part with any fraction its assigned amount and will only do so if it is sure that such a transaction would not jeopardise its capacity to comply with the obligations under Article 3.

Conclusions

The policy conclusions arising out of the above include:

- Need for prior agreement on trading rules before trading begins:
- Compliance with annual reporting requirements for emissions and assigned amounts or no trade allowed.
- Non-compliance penalties with real teeth to ensure that the trading system does not lead to cheating or to Parties exceeding their assigned amounts with impunity.
- Non-inclusion of sinks in the trading system
- Enforceable national compliance systems where domestic trading is linked to international trading and transfers of assigned amounts
- Trading rules will also need to apply to the transfer of ERUs from Joint Implementation projects
- A selling limit system can be used to limit the size of the "hot air" problem to, for example, below 1% of the 1990 Annex B emissions by disallowing transfers of more than 3% of from a Party's assigned amount during the first commitment period.
- Defining "supplemental" in relation to trading can be done by setting an upper buying limit of, for example, 10%, on how much a Party can buy to add to its assigned amount. To be consistent such a limit would apply to the total amount a Party could acquire during a commitment period via transfers under Article 6 and Article 17, as Article 6 also requires that ERUs be supplemental to domestic actions.
- There needs to be a joint buyer and seller liability system that operates during a commitment period.

5. Clean Development Mechanism

Introduction

Article 12 establishes a Clean Development Mechanism, which would allow Annex I Parties to obtain emissions credits from project activities done in participating non-Annex I Parties. This mechanism also allows Annex I Parties to gain credit for activities carried out before the first budget period in 2008. The CDM is to be subject to the authority of the COP and to operate through an Executive Board. Neither the institutional form nor structure of the Executive Board was defined in Kyoto. The CDM would operate through operational entities, which would certify project credits (CERs) and it would be subject to an independent audit and review procedure for project activities.

Activities under the CDM are meant to:

- Deliver real, measurable and long term greenhouse gas emission reductions and climate change mitigation benefits which would otherwise not have occurred;
- Avoid adverse impacts of projects in host countries, e.g. environmental, social and developmental and contributing to a host country's achievement of its national environmental and development goals; and
- Provide investment that is additional to a donor country's own overseas aid budget and to its contributions to the GEF.

On the surface the CDM is a beguiling instrument as its name implies that it will be used for “clean development”. However, it is clear that this is far from being a reality as most of the projects that are likely to come forward are marginal improvement in the technology that has largely lead to the problem of climate change.

A number of serious weaknesses in relation to the CDM have been identified which have the potential to undermine the effectiveness of the Protocol by creating considerable uncertainty over the actual reductions which will be achieved. These must be dealt with through the development of effective guidelines; rules, modalities, and methodologies that must be in place before emission reduction credits can be generated. Greenpeace has highlighted many of these problems in its past publications. There are also a number of issues in relation to the Land Use Change and Forestry sector and Article 12 which are described in the section on sinks in this paper (see Section 6 below).

The CDM and avoiding dangerous climate change

If one listens to a number of industries and Parties one talking about their ambitions for the CDM one could be excused for wanting to re-label the CDM as the Clean Coal Mechanism.

The difference in orientation about what the CDM should do stems from a fundamental divergence over what can and should be done about climate change in the mid to long term.

Those that believe that the CDM should provide credits for clean coal projects and for projects that marginally improve the efficiency of industrial plant, by and large often do not believe that avoiding dangerous climate change is possible, or even desirable. In other words for such proponents, avoiding, for example, a doubling of CO₂ in the atmosphere is not a legitimate policy objective. They are therefore unconcerned about limiting the growth of long-lived carbon-intensive capital stock that may last well past the middle of next century. The marginal effect of these kinds of projects is likely to be limited to advancing the adoption of cleaner combustion technology by a few years or so. Project proponents of course will seek to claim credit for “clean” coal projects for the full life of the power plant, claiming “additionality” for this period.

On the other hand those that believe that CO₂ doubling can and has to be avoided would wish to see the CDM used to catalyse the introduction of low or zero carbon technologies. These would be based on the highest efficiency available now in the advanced industrial economies and on renewable energy systems where they would not otherwise have been introduced. In other words, the CDM would be guided by the need to effect a rapid technological transition to low or zero carbon and environmentally sound energy technologies. The operation of the CDM, and hence the definitions of additionality adopted, would be predicated on the belief that the emission commitments in the Kyoto Protocol are only the beginning of deep reductions that will be required by the Annex I Parties. Hence “baseline” technology can be expected to change rapidly over coming decades. In other words, clean coal technologies, far from providing a solution may quickly become part of the problem.

What these issues point to is the need for the COP to develop guidelines as to the longer climate objectives that the CDM is to be capable of meeting. This needs to be an explicit discussion so that the Executive Board and the Operating entities clearly understand the terms of their mandate in climate protection terms.

Environmental effectiveness

The Kyoto Protocol specifies that emission credits obtained under the CDM would have to stem from “real, measurable, and long-term benefits related to the mitigation of climate change; and ...Reductions in emissions that are additional to any that would occur in the absence of the certified project activity.” However, the environmental benefit of the CDM is far from clear. Economic analysis indicates the existence of the CDM credits is likely to result in less emission reductions being achieved than would otherwise have been the case¹¹. In other words global emissions could be higher than they would otherwise have been if the Kyoto Protocol had not incorporated this instrument.

CDM adds to Annex I emissions

The CDM allows Annex I Parties to add CERs generated outside of the Annex I allowed emission budget system to their assigned amounts. In other words, like the sink credits allowed under Article 3.3 for reforestation and afforestation, the CDM emission credits are extra-budgetary. There is no guarantee that the CDM credits would result in reductions in emission growth so that the overall global emissions are at least as low as they would have been without this mechanism.

CDM allows pre-budget banking

In addition the CDM may allow credits to be generated ahead of the first budget period. Whilst proponents argue that this encourages “early” action, it also encourages less action at home by Annex I Parties, which by undertaking emission credit activities before 2008-2012, effectively add to their

¹¹ S. Parkinson*, K. Begg*, Protocol. Bailey[^] and T. Jackson* (1998), Accounting and Accreditation of “Activities Implemented Jointly” under the UN Framework Convention on Climate Change, Presented at the Second International Conference of the European Society for Ecological Economics, “Ecological Economics and Development”, Geneva, 4-7th March 1998. * Centre for Environmental Strategy, University of Surrey, UK, [^] Stockholm Environment Institute at York, University of York, UK.

allowed emissions in the budget period. Combined with credit for CDM projects during the budget period, this clearly generates an incentive for little or no action at home.

CDM and Land Use Change and Forestry activities could increase emissions from Annex I Parties

A small thought experiment illustrates the potential problem here in relation to one element that has been proposed for use by the CDM - that of forest conservation. This is the idea that Parties obtain credit for actions that prevent deforestation. Assume that deforestation in developing countries is 1 GtC/year and that CDM forest conservation, if allowed, could prevent 10% of this happening. The emission credits obtained for this would increase the allowed Annex I budget in 2008-2012 by about 5%. There is no guarantee that the actual deforestation would have been any lower than it would otherwise have been (deforestation activities may simply move to another location).

'Additionality' of emission reductions and project baseline setting

There is a real danger of a donor country gaining credits for emission reductions from projects that would have occurred anyway if the CDM did not exist. The fact that non-Annex 1 Parties do not have emission targets means there is no in-built safeguard to ensure that CDM projects generate real emission reductions.

In a situation where both Parties have legally binding emission limits (e.g. Article 6 JI projects) there is discipline on both Parties to ensure that JI projects really perform (unless there is "hot air" in the emission allocation – see below). If they do not then these Parties will breach their legal emission limits to the extent that they have relied on JI. Thus there is an incentive on both sides of the transaction (the host and the donor Parties) to ensure that actual emission reductions occur.

Under the CDM however, the host Party for a project does not have a legally binding emission limit. A potentially perverse incentive system operates in this situation as both the host and the acquiring Annex B Party has an interest in maximising the credit obtained for a project. Both Parties therefore have an in-built incentive to exaggerate the baseline emissions for a project.

A possible way of ensuring that donor countries do not gain over-inflated credits, thus reducing the real environmental benefits which accrue from CDM (and JI projects in the presence of hot air), would be to assign to the donor country only part of the emission reduction claimed for a project.

Specific Issues in the establishment and operation of the CDM

Executive Board

Priority should be given to the process for establishing a strong and independent CDM executive board, which would come into formal existence at the first MOP. The Executive board must be distinctly separate from other development entities (such as the World Bank, GEF, etc.) and must have a strong mandate that will enable it to effectively guide and implement the creation of the CDM. The executive board members should be balanced to reflect North-South equity.

Acceptable operational entities in place

Article 12 specifies that operating entities will be responsible for certifying CERs from project activities under the general requirement of this Article and the guidelines agreed by the COP. Certification cannot begin until the operational entities have been designated. Whilst there may be a number of entities Greenpeace opposes a major role for the international financial institutions and stock and commodity exchanges should have no role at all in certification.

Adaptation

In accordance with Protocol Article 12.8, a fair share of the proceeds from CDM projects should be set aside to assist developing countries that are particularly vulnerable to the adverse effects of climate change to meet the costs of adaptation. The Alliance of Small Island States (AOSIS), a major beneficiary of such funding, calculates that at least 10% of CDM project financing will be needed to cover reasonably anticipated adaptation costs. The assumption by Annex I countries of adaptation costs is fully consistent with the polluter pays principle, a well-established principle of international environmental law.

Credit sharing between host and donor Parties

Concern has been expressed by developing countries at giving up their 'low hanging fruit' (in emission terms) to donor countries. Developing countries are under pressure from particularly the USA to take on binding emission commitments in the future and the loss of the easier emission mitigation opportunities may make these targets more difficult to achieve. A solution might be some form of credit sharing between the host and donor countries. Research suggests that this may also encourage the uptake of projects by host countries.

Project credits only when achieved

Credits for projects should only be given once they are achieved and not based on feasibility studies. A project may not deliver the emission reductions estimated or fail completely. For these reasons it is important that the crediting mechanisms agreed for the CDM are *ex-ante*; in other words that credits are not assigned based on theoretical assumptions of the reductions which a project will achieve in the future, but on verified actual reductions achieved relative to the agreed baseline.

Effective tracking of emission units transferred

Emission credits transferred through the CDM must be able to be traced back to the individual projects or Parties from which they were generated in the first instance. This is necessary to ensure not only that real and additional reductions have been achieved but also to ensure confidence in the system and to maintain its integrity.

Independent auditing and verification

Priority should be given to establishing the procedures and mechanisms for independent auditing and verification of project activities including the CERs awarded by the operating entities. These procedures should begin from the moment that the CDM begins formal operation with the establishment of an Executive Board.

Conclusions

Placing a quantitative limit on the use of the CDM to meet emission limits

- The credits that Annex I Parties can obtain from the CDM towards meeting their obligations should be limited to a small percentage of their obligation. This would need to be around 1% if the damage to the environmental effectiveness of the Kyoto Protocol is to be almost negligible. Limiting could be done via a cap on the credits Parties can use towards their obligations.

Discounting of project credits

- Project emissions reductions should be discounted by an agreed fraction to create the CERs available to add to assigned amounts. Discounting will help ensure that the global emissions are at least as low as they would have been in the absence of the CDM project. A heavier discount should apply to pre-commitment period CERs.

Additionality Criteria

- CDM projects should be limited to renewable energy systems or highly energy efficient projects that are unequivocally at the top end of efficiency practice in the world.
- Clean coal projects should not be eligible for CDM credits as they lead to the locking in for long periods of time carbon-intensive capital stock.
- Nuclear power projects should not be eligible for CDM credits because of nuclear reactor safety, waste disposal and transport concerns, and the risk of nuclear weapons technology proliferation.

Exclusions of Land Use Change and Forestry sector

- No Land Use Change and Forestry projects should be allowed for credit (see section 6 below).

6. Land Use Change and Forestry in the Kyoto Protocol

To say the least, the Kyoto Protocol does not finally resolve the issue of the use of so-called sinks (LUCF sources and removals) to offset against the need for greenhouse gas reductions. The agreement on sinks is extremely complicated and opaque in terms of its full meaning. The driving force behind the sink agreement Kyoto was political and there was very little scientific rigour applied to this issue. The opportunity exists now to pause and get the science and policy right before rushing in to use the Land Use Change and Forestry activities to offset against fossil fuel emissions.

Most Parties are required to use a limited form of the “Gross-Net” approach for the first commitment period, with a “gross” industrial emissions baseline in 1990 or the base year or period (i.e. excluding land use change and forestry emissions). A limited form of “net” emissions are allowed to be used in the commitment period based on “direct human-induced land use change and forestry activities, limited to afforestation, reforestation, and deforestation since 1990” (Article 3.3).

The result of this construction is to have significantly reduced (but not eliminated) a large potential loophole which would have resulted from the full “gross-net” approach. However, it remains unclear as to what the meaning of Article 3.3 or 3.4 is in precise terms. A loose interpretation is likely to increase the size of the loophole.

To accommodate Australia, a provision was inserted in Article 3.7 which allows Parties whose Land Use Change and Forestry emissions were positive (i.e. a net source) in 1990 to add their Land Use Change emissions to the baseline in 1990 or base year or period. This is partly a necessary consequence of the limitation of the use of sinks to afforestation, reforestation, and deforestation since 1990 in Article 3.3. However, as explained below, it does give rise to the potential for hot air in the deforestation area.

Further complicating this area of the protocol is Article 3.4 which provides for an expansion of the categories of “net” activities, beyond afforestation, reforestation, and deforestation, which can be credited to the emissions budget. This article also provides that a Party *may* apply a future decisions about this to their emissions budget in the first commitment period. Such changes will apply to all Parties in the second and subsequent periods. An expansion of the “net” activities allowed to be included in meeting the first budget period would almost certainly represent a new loophole, which would allow emissions to the atmosphere to increase.

In this section, we examine some of the issues arising from the Land Use Change and Forestry provisions of the Kyoto Protocol, specifically Article 3.3 and 3.4, Article 6 and Article 12. At the end of the section, we draw policy conclusions from this analysis. First however we review some of the general concerns in relation to the use of sinks to offset against fossil fuel emissions.

General Concerns

The consequence of using sinks to meet Kyoto Protocol obligations is that more *fossil carbon* would be added to the climate system than would otherwise have been the case. This fossil carbon has been effectively isolated from the climate system, and in particular the fast moving components of the carbon cycle - the atmosphere and the terrestrial and marine biosphere and upper oceans - for millions of years. It is by no means clear that the amount of afforestation, reforestation or avoided deforestation would be any greater than would otherwise have been the case, as there is great potential for Parties to use existing activities and claim credit for these.

It is almost certain, in the long run over several centuries that a significant fraction (i.e. 25-50%) of the fossil carbon added to the climate system will end up in the atmosphere. The carbon cycle is known to be highly non-linear; however, the implications of what is known about the behaviour of this system for climate policy in relation to the net approach has *never been specifically assessed*.

At present, the push to use the net approach is effectively a short term, politically expedient device that is likely to create greater problems for future generations than would otherwise have been the case.

Greenpeace believes that this is a key strategic issue for the Convention that must be assessed for all its scientific implications *before* Parties allow it to be used.

Quantification and verification

Agreements on legally binding verifiable reduction targets for CO₂ emissions should not incorporate an approach which contains significant uncertainties both in calculation of removals and in long term safety of stored carbon. The net approach is inherently uncertain and the errors and uncertainties in defining and measuring land use sources and sinks would make emission targets unverifiable.

Canada and New Zealand exemplify the instability in the net approach. Canada's land-use emissions have switched from being a net sink to a source of emissions as a result of inventory and methodological reviews. New Zealand announced in Berlin at COP1 that it was projected to reduce its net emissions by 50% but as a consequence of inventory reviews is now projected to increase its net emissions by a similar amount.

Carbon time bomb effect

Widespread use of the net approach risks undermining efforts to protect the climate system, particularly as it is likely that climate change itself will lead to forest fires and droughts that would release carbon from the terrestrial biosphere back into the atmosphere.

To have the same effect as avoiding fossil fuel emissions, carbon stored by afforestation would have to remain locked out of the atmosphere on geological time-scales. There does not appear to be any scientific basis on which the integrity of forests as carbon stores can be guaranteed for centuries, let alone millennia.

It is a very high-risk strategy which, with the risks of positive feedbacks, could result in significant releases of additional carbon at some point in the future. There are signs already that some forests are becoming a source of carbon.

Scientific and methodological problems

There is no agreed methodological basis for adequately measuring emissions and sinks relating to land use sources at this stage. Parties have all used different approaches and different definitions of “anthropogenic”.

Parties are being selective about what they include as “anthropogenic” emissions and reservoirs, favouring those that help them policy-wise and ignoring those that do not.

Wrong policy signals

Significant use of the net approach will delay action in reducing fossil carbon emissions and hence slow the rate of introduction of technology and other measures required for rapidly reducing emissions globally. The net approach would allow the unnecessary build up of long-lived carbon intensive capital.

Unless appropriate accounting rules are adopted for reforestation under Article 3.3, there may be a perverse incentive for Parties to clear old growth forest and then “reforest” with fast growing plantations which will sequester carbon quickly. With a loose interpretation clearing old growth forest would not count as a deforestation emission, yet replanted trees would be counted as an additional anthropogenic activity and the carbon they take up, in effect added to a Party’s assigned amount.

Minding the Gap: Potential Leakage of emissions between 1990 and 2008

As a consequence of the gap between the base year (1990 for most Parties) and the start of the first commitment period there is the potential for “leakage” of emissions from the LUCF sector, including those activities covered by Article 3.3 that are used for meeting emission commitments. The existence of this “gap” is a significant policy problem which, if not addressed in the methods used to implement the Kyoto Protocol could degrade its environmental effectiveness.

Article 3.3 - Land Use Change and Forestry provisions

Deforestation and Land Use Change Emission Leakages and Hot Air

Article 3.7 allows Parties with a net Land Use Change and Forestry source in 1990 (or the base year or period) to add the Land Use Change component to their base year aggregate emissions for the purposes of calculating their assigned amount. Land Use Change sources are mainly, but not only, deforestation emissions and can also include, for example, drainage of peat lands for conversion to agriculture or some other use.

Article 3.3 requires that Parties, in effect, deduct their deforestation emissions arising from activities since 1990 from their assigned amount.

Several issues arise as a consequence of this construction under Article 3.7 and Article 3.3:

- **Other Land Use Changes due to human induced activities since 1990 emissions are not deducted from the assigned amount.** Other Land Use Change emissions due to human induced activities since 1990 are not permitted to be deducted from the assigned amount, although they must be reported as carbon stock changes under Article 3.4 and in the emission inventories under Article 5. In other words, non-deforestation Land Use Change emissions arising from human induced activities since 1990 may not be considered for compliance purposes under Article 3, although the entire amount of Land Use Change emissions is added to the base year emissions for the purposes of calculating the assigned amount. This may in effect give to a Party a small increment to the Land Use Change emissions baseline that does not have to be, in effect, deducted from its assigned amount during the commitment period.
- **Emissions leakage during commitment period from deforestation before 1990.** Because deforestation (and other LUC) emissions continue for some time after the original deforestation activity, there may be emissions arising from these activities prior to 1990 in the first commitment period which would not be deducted from the assigned amount (as they would not be arising from human induced activities since 1990). The magnitude of this leakage may not be large given the approximate 20-year period between 1990 and the first commitment period. However, given the large magnitude of soil carbon stocks and the fact their release takes place over a considerable period of time following deforestation, this needs to be investigated by SBSTA.¹²
- **Deforestation “hot air”.** To the extent that a Party’s deforestation activities were declining after 1990 irrespective of the FCCC or Kyoto Protocol, the addition to its assigned amount due to the inclusion of deforestation emissions in its baseline is, in effect “hot air”. This is clearly the case in relation to Australia.

Perverse Incentives

Under the IPCC Revised 1996 Reporting Guidelines, afforestation is the planting of new forests on lands which, historically, have not contained forests and reforestation is the planting of forests on lands which have, historically, previously contained forests but which have been converted to some other use¹³.

¹² The Australian second National Communication states: “Inventory data show [the LUC] share of total net emissions dropping from 20% to 13% between 1990 and 1995, reflecting a substantial decline in estimated emissions resulting largely from past clearing. Emissions are almost entirely in the form of CO₂. The release of CO₂ occurs in two zones: above ground when cleared vegetation is burnt or decays; and below ground when roots decay and soil carbon is released due to the disturbance. The below ground processes accounted for more than half of the 1990 emissions from land clearing, and a declining portion of subsequent emissions.”

¹³ IPCC Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, Reporting Instructions (Volume I), Glossary, pp. 1-18.

This definition of reforestation, in the context of the Kyoto Protocol and given the wide range of other interpretations in current use¹⁴, could lead to some problems unless a clearer definition of the term “historical” is adopted. The FAO definition of reforestation does not refer to a historical period and simply defines it as the establishment of a tree crop on forested land. If “historical” is not defined in relation to the IPCC definition as at least a number of decades then the kinds of problems that could emerge include:

- Clearing of old growth (or other forest types) and replanting with fast growing tree species leading to an emission leakage. The clearing of old growth would not appear as an emission under “deforestation” because the land was being reconverted to “forests”. The replanted forest may then produce a net removal. The change in stock caused by the replacement of old growth forest with the “new” forest would appear in the report required on stock changes under Article 3.4. However, it may not be relevant for the purposes of complying with Article 3, leading to a potential leakage of emissions from the system.
- Harvesting of wood from land defined as afforested or reforested since 1990 and for which credit had been obtained under Article 3 may not be classified as deforestation but the regrowth may be claimed as reforestation under Article 3.3.

Leakage from carbon stocks used for compliance purposes over several commitment periods

One of the issues involved with the use of Land Use Change and Forestry sinks to offset against emission budgets under Article 3 is the lack of permanence of the sinks compared to avoided fossil fuel emissions. Once fossil carbon enters the atmosphere this carbon is added irreversibly to the climate system. Carbon sequestered in sinks and used to offset the obligations in Article 3 will almost inevitably end up back in the atmosphere. The question is thus, for the second and subsequent commitment periods¹⁵, how negative stock changes are accounted for if the previous stock increments have been used to offset against the obligations of A3.

Article 3.3 is written somewhat ambiguously in relation to this issue. Consider, for example, a forest established by human induced activities since 1990, whose stock increase during a commitment period or periods were claimed for credit under the afforestation or reforestation terms of Article 3.3. If this were converted to some other use, or had its standing stock of carbon reduced by some activity or event, would this negative stock change be deducted from a Party’s assigned amount? It is not clear that this would be the case. If such a “Kyoto” forest were harvested and replanted it is by no means obvious that the accounting rules would require that the harvest emissions be deducted from the assigned amount. Similarly, if there were negative stock changes

¹⁴ For a discussion see Bernhard Schlamadinger and Gregg Marland (1998) “Some technical issues regarding land-use change and forestry in the Kyoto Protocol”, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN 37831-6335, USA for a discussion of this.

¹⁵ Article 3.1 of the Kyoto Protocol refers only the first commitment period however the Kyoto Protocol does envisage there being subsequent periods.

due to some change in management regime, such as prescribed burning or wildfire's (which happen periodically) it is not clear that these changes would be deducted from the assigned amount either.

Article 3.4, by requiring reporting of carbon stock changes as a whole for Parties, may provide a vehicle for resolving this issue, if the appropriate accounting rules are agreed. However, as a matter of principle, COP4 should make sure that the accounting rules for Article 3.3 afforestation and reforestation stocks ensure from the beginning Parties understand that negative stock changes will be deducted from the assigned amount. Agreed rules for counting stock changes will be needed to take account of a "permanence" requirement and these may be negotiated under Article 7.4, which requires that, the COP/MOP "decide upon modalities for the accounting of assigned amounts". Establishing a permanence requirement for stocks of carbon use to offset the Kyoto Protocol Article 3 obligations would:

- Establish symmetry between an addition to a Party's assigned amount for a stock increase and a subtraction for a stock decrease (where the stock has previously been counted as part of the assigned amount in an earlier budget period).
- Ensure that Parties sought to discount the credits obtained in any given commitment period for the possibility of wildfire's or other foreseeable events that would reduce carbon stocks.
- Provide a signal to the private sector that the use of sinks to offset fossil fuel obligations has to be seen as a permanent commitment.

Soil carbon stocks: in or out?

Soil carbon reservoirs often account for large proportions of the overall carbon stock of an ecosystem. An indication of the significance of this for policy is that deforestation emissions in Australia in 1990 were about half due to soil carbon losses. Afforestation and reforestation activities leading to increases in above ground carbon stocks do not *a priori* lead to an increase in soil carbon stocks. Some forest plantation activities can lead to long term loss of soil carbon.

Article 3.3 requires that Parties report "The greenhouse gas emissions by sources and removals by sinks associated with those activities" allowed under this Article. This clause does not imply a right to ignore or overlook sources of emissions such as loss of soil carbon associated with afforestation, reforestation and deforestation. Failing to ensure that Parties include the changes in the soil carbon stocks resulting from the human induced activities since 1990 under Article 3.3 could in effect result in net leakage of carbon to the atmosphere that would not otherwise have occurred. It would also be inconsistent if Land Use Change (deforestation) activities in 1990 that are allowed to be added to the base year emissions for the purpose of calculating the assigned amount included soil carbon losses, but there was no corresponding requirement to do so in the commitment period. This would amount to an accounting device that inflated Parties' assigned amount.

Changes in soil carbon stocks need to be included to avoid emission leakages and budgetary inflation as a consequence of the omission of sources of greenhouse gases.

Accounting Interpretations

The Secretariat has identified three methods for accounting for the stock changes under Article 3.3 (SBSTA/1998/INF.1). Only one of these, Method 1, appears to be fully consistent with the commonly understood provisions of the Kyoto Protocol.

The operative part of Article 3.3 for this discussion is the first sentence which states that:

“The net changes in greenhouse gas emissions from sources and removals by sinks resulting from direct human-induced land-use change and forestry activities, limited to afforestation, reforestation and deforestation since 1990, measured as verifiable changes in carbon stocks in each commitment period, shall be used to meet the commitments under this Article of each Party included in Annex I.”

Method 1 is based on the “gross-net” concept and an interpretation that the stock changes that can be counted are:

- Only those during the commitment period
- Only those that result from afforestation, reforestation, and deforestation due to direct human induced activities since 1990.

In this interpretation the meaning of the term “net changes in changes in greenhouse gas emissions from sources and removals by sinks” is defined by the subsequent phrase in the same sentence which specifies that these are to be “measured as verifiable changes in carbon stocks in each commitment period”.

Hence Method 1 specifies that only the changes in carbon stock *during* the commitment period due to the direct human induced activities since 1990 and specified in paragraph 3 of Article 3 can be used to meet the commitments in Article 3. In other words, the credit obtainable from afforestation, reforestation, and deforestation is the difference between the stock at the end of the commitment period and that at the beginning:

$$\text{Credit} = \text{Stock (31 December 2012)} - \text{Stock (1 January 2008)}$$

If *Credit* is negative, this is in effect deducted from the assigned amount, and if positive, it is added.

In policy terms this definition rewards Parties who establish new (and additional) sink activities since 1990 without consideration for Land Use Change and Forestry activities before or during 1990 (except as provided in Article 3.7). Parties operating under the last sentence of paragraph 7 of Article 3 are rewarded if they reduce deforestation activities by the first commitment period, as they have included in their base emissions the Land Use Change emissions occurring in 1990 (or their base year or period). This arrangement is consistent with the understanding reached in Kyoto in relation to the adoption of a limited form of the gross-net approach.

Method 2 is based on an interpretation of the terms “net changes” and “since 1990” that overlooks the ordinary meaning of the sub-clause which states that the “changes should be measured as verifiable changes in carbon stocks in each commitment period” and that the changes should be due only to the defined activities since 1990. The result is that Method 2¹⁶ defines the credit obtainable as the result of changes in the *rate change* in carbon stock during the commitment period compared to 1990:

$$\begin{aligned} \text{Credit} &= \text{Average Rate of Change of Stock During Commitment Period} - \text{Rate} \\ &\quad \text{of Change in Stock during 1990} \\ &= [5 * (\text{Stock (31 December 2012)} - \text{Stock (1 January 2008)})/5 - (\text{Stock} \\ &\quad \text{(31 December 1990)} - \text{Stock (1 January 1990)})] \end{aligned}$$

Note that if the stock change in 1990 is defined to be zero (by defining “since 1990” to be from 1 January 1991), then Method 2 is equivalent to Method 1. In any event, Method 2 is equivalent to Method 1 for the second and subsequent emission periods.

Method 2 is, in effect, a partial net-net approach. Although it does not modify the baseline for emission commitments, it implicitly introduces the net-net approach to the first commitment period. This enables the modification of the assigned amount in similar manner to a limited net-net approach.

There may be several adverse policy implications arising from Method 2¹⁷. This method does not take account of the total carbon stock but only the rate of change of the stock. This gives rise to at least three potential kinds of anomaly.

The first case is that of a Party that has deforestation emissions during 1990 due to activities in that year. This case may involve at least one, and possibly several of the seven Parties¹⁸ who have reported emissions from forest and grassland conversion in 1990, depending on the definition of deforestation adopted.

If the rate of deforestation emissions is reduced by the commitment period, then the Party obtains a credit for this reduction, even though the stock of carbon has been reduced. This would occur even if the Party were deforesting during the commitment period. If the Party takes no action then it is not rewarded or punished. By comparison, within the commitment period Method 1 would punish such a Party by requiring that the change in stock during the commitment period is, in effect, deducted from its assigned amount. Before the first commitment period Method 1 would act to provide a signal to Party’s to stop their deforestation activities well before 2008.

A further anomaly arises in relation to a Party with deforestation emissions in 1990 that is also a net source of emissions from the LUCF sector during 1990 that can lead to double counting of deforestation emissions due to activities in 1990.

¹⁶ Paragraph 43 of FCCC/SBSTA/1998/INF.1

¹⁷ For this discussion it is assumed that “since 1990” is defined to be from 1 January 1990 and that the stock changes considered are only those due to activities stemming from this date.

¹⁸ Australia, Estonia, France, Japan, New Zealand, Slovakia, and the United Kingdom.

A Party operating under the last sentence of paragraph 7 of Article 3 will be allowed to include the deforestation emissions due to activities in 1990 in the calculation of its assigned amount. It is likely that this will be a significant component of the land-use change emissions during 1990 (a significant fraction of 1990 deforestation and LUC emissions will also come from activities before 1990). If the Party reduces its deforestation emissions by the time of the first commitment period, it will be allowed to add the reduction in these emissions to its assigned amount. However, these emissions would have already been added to the assigned amount according to the formula defined in Article 3.7 in proportion to its obligation in Annex B. Such double counting would clearly be contrary to the intent of the Kyoto Protocol and would have to be rectified through decisions under Article 7.4.

The second case is that of a Party which has a significant afforestation and reforestation programme in 1990, but whose rate of sequestration in 2010 is likely to be lower than in 1990¹⁹. A Party in this situation would, under Method 2, have to deduct the reduction in its sequestration rate from its assigned amount, although it had added significantly to the stock of stored carbon both before and during the commitment period. By comparison, Method 1 would allow an addition to the assigned amount during the commitment period.

The third case involves a combination of these elements. It is relatively easily to construct a scenario in which a Party with both deforestation and afforestation/reforestation activities in 1990 can gain a substantial credit towards its assigned amount whilst its carbon stock remains unchanged or even declines from 1990 to 2012²⁰. Gaining credit in such a circumstance would result in emissions to the atmosphere being unequivocally higher than would have otherwise been the case. Whilst such a scenario is also possible under Method 1 the credits would be much smaller.

Method 3 defines the cumulative change in carbon stock to be the average stock in the 2008-2012 period less the carbon stock in 1990. The Secretariat does not define the carbon stock, but to be consistent it would have to be that deriving from afforestation, reforestation, and deforestation activities since 1990²¹. Whilst INF.1 does not define the *Credit* that a Party would get from Method 3 it does make clear that the change in cumulative change in carbon stock under this method cannot be used directly towards the commitments in Article 3 in the first commitment period. For subsequent commitment periods Method 3 would define *Credit* to be the difference between the average stock in the current and preceding period and is likely to produce approximately the same *Credit* as in Method 1.

¹⁹ This is a hypothetical case, which whilst possible may not be very likely. A forest planted in 1990 would probably not reach its peak sequestration rate until age 20 or so, hence the biology of forest growth would militate against this case occurring in practice.

²⁰ Consider a Party having 10 units of removals in 1990 and -50 units (i.e. emissions) from deforestation in that year. The afforestation sink grows to 50 units per year in 2010 and deforestation declines to -10 units. Under Method 1 the credit obtainable would be 40 units, under Method 2 it would be 80 units.

²¹ Paragraph 47 of FCCC/SBSTA/1998/INF.1

For the first commitment period, under Method 3, a decision would be required as to what fraction of the cumulative change would be used for *Credit* with the most logical being the ratio of the commitment period to the total period from 1990 to 2012 i.e. 5/22.

In other words, a Method 4 could be defined as:

$$\text{Credit} = 5/22 * (\text{Average stock in 2008-2012} - \text{Carbon stock in 1990})$$

This method would have the virtue of providing an incentive to avoid some of the leakage problems outlined at the beginning of this section. For example in the case described above, where a Party was able to claim credit under Methods 1 and 2 even though its stock change was zero from 1990 to 2010, Method 4 would offer no credit.

In summary, then Method 4 (modified Method 3) appears to offer the most advantageous outcome from the point of view of minimising emission to the atmosphere. It suffers, however, from not being clearly related to the requirement in Article 3.3 that the “changes should be measured as verifiable changes in carbon stocks in each commitment period”. Viewed from the point of view of emissions to the atmosphere, Method 2 appears to be the least beneficial of the methods owing to the adverse incentives described above. It is also not consistent with the wording of Article 3.3. Method 1 is the most consistent with the common understanding of Article 3.3 but does not provide as strong an incentive as Method 4 to minimise emission leakages.

Method 2 should be rejected. Further work needs to be done by both the IPCC and SBSTA in relation to Methods 1 and Method 4 (as described above) to explore the implication of these definitions for the effectiveness of the Kyoto Protocol.

In relation to the definition of “since 1990”, as 1990 is the base year for calculating assigned amounts (in most cases) the most appropriate interpretation of “since 1990” would be that it refers to activities undertaken from 1 January 1991.

Article 3.4 - Agricultural soils and Additional Land Use and Forestry Change Categories

Article 3.4 provides for the COP/MOP to decide upon what additional activities may be used in relation to compliance with the emission obligation in Article 3 and how they are to be counted, and the rules for addition or subtraction of changes in carbon stocks from Parties' assigned amounts. The potential list of such activities is large as the preliminary list identified by the Secretariat indicates: activities to avoid carbon emissions (e.g. reduce forest fires and insect infestation), build soil carbon, agrarian and pastoral practices, conservation tillage, forest management practices, (including low or reduced impact logging), forest conservation, harvesting, sequestration in wood products and activities that increase the lifetime of these products, land-clearing for agriculture, revegetation of degraded lands and soil conservation.

Additional activities under Article 3.4 will almost certainly add to the amount that Parties can add to their assigned amount and reduce the overall effectiveness of the Kyoto Protocol in reducing actual emissions to the atmosphere. This is especially true for the first commitment period where the assigned amounts were negotiated without a consideration of additional activities under Article 3.4.

The addition of further activities under Article 3.3 should not be contemplated until a full scientific, technical and economic assessment is done of the potential role of Land Use Change and Forestry emissions in meeting the ultimate goal of stabilizing greenhouse gas concentrations in the atmosphere at safe levels. The IPCC is the logical body to be tasked with this as a Special Report (See section “Rationale and Issues for IPCC Special Assessment of the Land Use Change and Forestry issue” on page 60).

Article 6 - Joint Implementation Projects and Sinks

Article 6 JI projects are not tied in principle to any of the Land Use Change and Forestry categories in Article 3.3 or those agreed under Article 3.4. In principle it appears that Article 6 JI projects could be based on any Land Use Change and Forestry activity provided it produced “a reduction in emissions by sources, or an enhancement of removals by sinks, that is additional to any that would otherwise occur”. In practice however, and in the absence of “hot air” in a Party’s emission allocation, there would be a negative incentive to conduct JI projects beyond the Land Use Change and Forestry sectors agreed under Article 3.3, or any additional activities agreed under Article 3.4 (see below for discussion). Under Article 3.11 any sink credit transferred to another Party has to be deducted from the assigned amount of the host Party. If the Land Use Change and Forestry activity does not itself earn a credit that is added to the host Party’s assigned amount, then the host Party is reducing its assigned amount without a countervailing emission benefit being obtained that assist it in meeting its obligations.

For this reason the “paradox” referred to in INF.1 wherein “country A could pursue a project (other than afforestation, reforestation, or deforestation) within country B and country B could pursue the same kind of project within country A, and both would receive more credits than if they pursued the same projects at home”²² will most likely not arise, excepting where a host Party has “hot air” in its emission allocation.

If a Party has significant “hot air” in its assigned amount, then there may be an incentive to undertake Land Use Change and Forestry activities that do not generate additions to its assigned amount in the first place. For this reason the COP should restrict Land Use Change and Forestry activities used for JI project credits to only those allowed under Article 3.3. Any decision in relation to additional categories pursuant to Article 3.4 and the involvement of these categories in ERU generation should be contingent on the outcome of an IPCC Special Assessment on the entire Land Use Change and Forestry sector as described below.

Article 12 - Clean Development Mechanism and Sinks

The CDM does not refer specifically to the use of the Land Use Change and Forestry sector in the generation of CERs. The absence of a reference to the Land Use Change and Forestry sector in the Kyoto Protocol, specifically in relation to removals of greenhouse gases, implies strongly that these activities are not meant to be included in CDM projects. Several other factors militate against allowing Land Use Change and Forestry activities to generate CERs:

- CDM project credits inflate the total Annex I assigned amount without guaranteeing a counterbalancing reduction in the growth of global emissions
- Article 12 requires that projects produce “real, measurable and long-term benefits” to the climate which sink projects are unable to do.

22 See Bernhard Schlamadinger and Gregg Marland (1998) op. cit.

- Leakage of emissions from CDM Land Use Change and Forestry projects is likely to be significant in two ways:
 - a) Temporal leakage. At the end of a Land Use Change and Forestry project's life there is no guarantee that the sequestered carbon will remain in the ground. If it is released via harvesting, clearing for agriculture or burning there is no requirement that the Annex I Party that used this stock of carbon to meet its commitments would debit its assigned amount with the negative stock change.
 - b) Spatial leakage. A carbon sequestration or emission avoidance project in one location may simply displace the activity that would have released the carbon another part of the country (or to another country all together).
- The additionality criteria are almost impossible to define rigorously and give rise to many gaming possibilities. This uncertainty reduces significantly the credibility of claims that these projects would produce "real, measurable, and long-term benefits related to the mitigation of climate change".
- Insecurity over actual long term benefit to forest conservation. The efficacy of Land Use Change and Forestry projects in terms of additional biodiversity conservation has not been demonstrated. In particular the effects of tying forested areas into an international greenhouse gas trading system may or may not bring long-term benefits. One of the stated objectives, for example, of the recent addition to the Noel Kempff Mercado National Park in Bolivia, is that three U.S. corporations, American Electric Power, BP America and PacifiCorp will receive carbon offset credits. The project proponents hope that these credits will have significant market value under an international emission trading system.

There seems to have been very little thinking, however, about the economic and land-use management and policy implications of the involvement of forest related emission credits such as these in a full-blown international carbon credit trading system. Whilst giving economic value to forest conservation is seen as a positive the entry of conserved forests areas in what is essentially a commodity trade in carbon may have far reaching implications, not all of which may be benign. The question of whether or not there are, for example, any perverse implications from the commoditization of the carbon sequestered in forests for other environmental objectives has not been seriously examined. What are the potential implications of private sector attempts to optimise both carbon and wood values over time for a forest conservation project when the value of the carbon is linked to several international markets?

If Land Use Change and Forestry activities are allowed in the CDM under the Kyoto Protocol there appears to be no quick fix to the accounting problems posed by their inclusion. Allowing only Article 3.3 activities for credit could contain a perverse incentive to allow deforestation. Although forest conservation was intentionally excluded from the list of allowable activities under Article 3.3, it is nonetheless encouraged within the Annex I group by virtue of the powerful incentive for industrialised country Parties to avoid the emissions associated with deforestation. These must be reported in their National Inventories and would be subtracted from their allowed emission budget. Under the CDM, however, accounting is based on specific projects rather than national totals. This means that land can be deforested without an emissions penalty being incurred and the land replanted with fast growing trees, which would attract emission credit units if it were defined as a CDM project. Because fast

growing trees may be a greater source of credits than a mature or old growth forest, there could be an incentive to do this, depending on how afforestation and reforestation are defined.

As a consequence of the great risk that sink credits from projects under the CDM could undermine the environmental effectiveness of the Kyoto Protocol, Greenpeace believes that these should not be allowed.

If further consideration is to be given to Land Use Change and Forestry projects under the CDM the COP/MOP should request that the IPCC complete a full-scale assessment of all aspects of the sinks issue in relation to all Parties. This assessment should include the extent to which forest/sink projects can meet the requirement to produce “real, measurable, and long-term benefits related to the mitigation of climate change” in the context of meeting Article 2 of the Climate Convention. The COP/MOP should consider this report before making any decisions on the future use of sink projects for emission credits.

Conclusions

Many of the Land Use Change and Forestry provisions of the Kyoto Protocol are ambiguous and key terms and accounting methodologies are ill defined.

General principles

The conclusions of this analyses are that the implementation of the Land Use Change and Forestry provisions need to be guided by several general principles:

1. All Parties should adopt and be required to use common definitions and methodologies. The absence of agreed common and scientifically robust definitions for activities and methodologies will mean that Parties will make their own interpretations. Such interpretations are likely to be advantageous to the Party concerned but could damage the environmental effectiveness of the Kyoto Protocol. The definitions and methodologies should be driven by an IPCC assessment of the treatment of Land Use Change and Forestry provisions in the Kyoto Protocol.
2. A permanent, symmetric and legally binding relationship should be established in relation to changes in the stocks of carbon used by a Party for the purposes of complying with Article 3 of the Kyoto Protocol (or its successors) and that Party’s assigned amount in any future commitment period. Reductions in the stocks of carbon, whose previous increments have been added to the assigned amount of a Party, should be deducted from the assigned amount. Methodologies, rules, and modalities for doing this could be agreed under paragraph 4 of Article 7.

Such a permanent provision applying to all carbon stocks used for compliance purposes would go some way towards recognising that sequestered carbon is not permanently withdrawn from the atmosphere. The effect of such a provision would be to ensure that Parties claimed credit-using sinks in the full knowledge that a future assigned amount might be debited if the sink is released to the atmosphere. This would encourage discounting of credits to take account of the probability of unplanned wildfire’s or other events that take place in forests that usually negatively affect the carbon stock. It would also provide an incentive to avoid the perverse effect outlined above.

3. LUCF credits must not lead to adverse environmental effects on other values, such as biological diversity. Land Use Change and Forestry definitions, methodologies and policies must not create perverse incentives that would, for example, encourage clearing or harvesting of old growth forest for the purpose of claiming reforestation credits. Credit should be prohibited for any activity that has involved the harvesting of old growth forests.

Beyond Article 3.3

Further consideration of the role of Land Use Change and Forestry activities, beyond those specifically agreed in Article 3.3, should be driven by a special assessment of the IPCC. This assessment should consider the entire issue of the Land Use Change and Forestry sector and its potential role on climate policy over the short, medium and long term from the point of view of stabilising atmospheric CO₂ concentrations. A more detailed outline of the rationale for this is outlined below.

Until such an assessment is completed and considered by SBSTA, with appropriate decisions taken by the COP/MOP, extension of the use of Land Use Change and Forestry activities for credit beyond those specified in Article 3.3 should not be permitted. Specifically:

- Article 6 JI projects should be limited to only those activities allowed under Article 3.3.
- Article 12 CDM projects should not involve the Land Use Change and Forestry sector at this stage.
- Expansion of activities under Article 3.4 should not be permitted.

Early clarification of Article 3.3

There is a need for early clarification of the terms afforestation, reforestation, deforestation and “since 1990” used in Article 3.3. In common with other NGOs, Greenpeace believes that the following should be adopted:

- Reforestation credit can be claimed for activities that re-establish a forest by 2012 on lands which had, historically, previously contained forests but which had been converted to some other use as of 1990.²³
- Afforestation credit can be claimed for activities that establish a new forest by 2012 on lands that have, historically, not contained forests and did not in 1990.
- Deforestation emissions must be reported for activities that converted lands that in 1990 contained forests to some other use in 2012.

These definitions avoid creating a perverse incentive to clear forest in order to claim a reforestation credit by restricting credits to land that did not have forest cover in 1990. This is

²³ For the purposes of this section, forests are defined as those types included in the category ‘Changes in Forest and Other Woody Biomass Stocks’ in the LUCF module of the IPCC Common Reporting Framework.

consistent with the definition of reforestation given in the glossary of the IPCC methodologies for national inventories.²⁴ This approach also provides symmetry in the treatment of reforestation and deforestation. For example, a forest being managed under a steady-state rotation would be excluded from the accounting system. Similarly, forest management practices that increase or reduce carbon stocks but maintain the land in forest would not be accounted for.

“Since 1990” should be defined as referring activities begun on or after 1 January 1991.

Further examination of Method 1 and a modified form of Method 3 (Method 4 as described above) as to which is the best method for calculating the changes in carbon stocks that can be used in meeting commitments in Article 3.3 is needed before a decision is made.

Rationale and Issues for IPCC Special Assessment of the Land Use Change and Forestry issue

As argued above, the further development of the Land Use Change and Forestry provisions of the Kyoto Protocol should be driven by an organised scientific and policy assessment that take account of the current and anticipated role of the Land Use Change and Forestry sector in the climate system.

The stakes could not be higher from an ill-advised use of (or failure to use) the Land Use Change and Forestry sector in climate policy. Our concern is that the global community make a fully informed decision on the basis of a state of the art assessment of this issue and not on the basis of 48 hour negotiations under extreme time and political duress. We do not believe that there has been to date a rounded assessment of the issues pertaining to the use of Land Use Change and Forestry credits under the Kyoto Protocol.

There is time enough for the IPCC to do this task separate from but parallel to the IPCC Third Assessment Report.

An IPCC Special Assessment would help resolve the scientific and policy questions surrounding the Land Use Change and Forestry issue and provide a basis recommendations on this issue to be developed by SBSTA and decisions made by a future COP/MOP in 2-3 years time (2000 or 2001).

Issues that an IPCC Special Assessment could examine include the scientific, environmental, technical, economic, social, institutional and policy issues relating to:

- The likely future role of the terrestrial biosphere in relation in the carbon cycle and the climate system over the next century with specific reference to scenarios for the influence of Agriculture and Land Use Change and Forestry activities one biotic reservoirs of carbon.

²⁴ “Planting of forests on lands which have, historically, previously contained forests but which have been converted to some other use. Replanted forests are included in the category ‘Changes in Forest and Other Woody Biomass Stocks’ in the Land Use Change and Forestry module of the emissions inventory calculations.”

- A possible role for anthropogenically induced changes to biotic reservoirs of greenhouse gases resulting from, for example, land use change, land management practices, and forestry activities in offsetting emissions from fossil sources of greenhouse gases. This would take account of the a range of possible stabilisation objectives for atmospheric concentrations of CO₂ and other greenhouse gases pursuant to Article 2 of the Climate Convention as well as projected changes to the terrestrial biosphere resulting from human induced climate change.
- The issues involved with, as well as the cost and benefits of, the potential use of Land Use Change and Forestry activities to achieve multiple objectives, specifically climate and biodiversity protection. These would include the economic, policy and legal implications of the involvement of the Land Use Change and Forestry sector in any international emission trading regime established under the Kyoto Protocol for all relevant objectives.
- Potential for positive or negative synergies in relation to other environmental objectives such as biodiversity conservation, arising from the use (or not) of Land Use Change and Forestry activities to offset emissions from fossil fuels.
- Appropriate definitions of anthropogenically induced changes to biotic reservoirs of greenhouse gases that can be used on an equivalent and comparable basis by all Parties.
- The basis for quantifying and verifying changes in biotic reservoirs (stocks) of greenhouse gases, including an assessment of scientific uncertainties relevant to assessing the use of anthropogenic changes in relation to the attainment of assigned amounts by Parties to the Kyoto Protocol.
- An assessment of the potential short and long-term effects on biodiversity conservation and on ecosystem and agro-ecosystem stability, persistence, health and resilience of proposed and potential Land Use Change and Forestry intervention activities and credits, with particular attention to determining the potential for Land Use Change and Forestry incentives to lead to unintended adverse environmental impacts which degrade natural ecosystems, such as accelerated clearing or harvesting of old growth, primary or highly natural forests.

Annex 1 Emission Commitments in Annex B of the Kyoto Protocol

Table 4 Emission Limits for Parties

Party	Quantified emission limitation or reduction commitment (percentage of base year or period)
Australia	108
Austria	92
Belgium	92
Bulgaria*	92
Canada	94
Croatia*	95
Czech Republic*	92
Denmark	92
Estonia*	92
European Community	92
Finland	92
France	92
Germany	92
Greece	92
Hungary*	94
Iceland	110
Ireland	92
Italy	92
Japan	94
Latvia*	92
Liechtenstein	92
Lithuania*	92
Luxembourg	92
Monaco	92
Netherlands	92
New Zealand	100
Norway	101
Poland*	94
Portugal	92
Romania*	92
Russian Federation*	100
Slovakia*	92
Slovenia*	92
Spain	92
Sweden	92
Switzerland	92
Ukraine*	100
United Kingdom of Great Britain and Northern Ireland	92
United States of America	93

* Countries that are undergoing the process of transition to a market economy.

Table 5 Total carbon dioxide emissions of Annex I Parties in 1990, for the purposes of Article 25 of the Kyoto Protocol [a]

Party	Emissions (Gg)	Percentage
Australia	288,965	2.1
Austria	59,200	0.4
Belgium	113,405	0.8
Bulgaria	82,990	0.6
Canada	457,441	3.3
Czech Republic	169,514	1.2
Denmark	52,100	0.4
Estonia	37,797	0.3
Finland	53,900	0.4
France	366,536	2.7
Germany	1,012,443	7.4
Greece	82,100	0.6
Hungary	71,673	0.5
Iceland	2,172	0.0
Ireland	30,719	0.2
Italy	428,941	3.1
Japan	1,173,360	8.5
Latvia	22,976	0.2
Liechtenstein	208	0.0
Luxembourg	11,343	0.1
Monaco	71	0.0
Netherlands	167,600	1.2
New Zealand	25,530	0.2
Norway	35,533	0.3
Poland	414,930	3.0
Portugal	42,148	0.3
Romania	171,103	1.2
Russian Federation	2,388,720	17.4
Slovakia	58,278	0.4
Spain	260,654	1.9
Sweden	61,256	0.4
Switzerland	43,600	0.3
United Kingdom of Great Britain and Northern Ireland	584,078	4.3
United States of America	4,957,022	36.1
Total	13,728,306	100.0

[a] Data based on the information from the 34 Annex I Parties that submitted their first national communications on or before 11 December 1997, as compiled by the secretariat in several documents (A/AC.237/81; FCCC/CP/1996/12/Add.2 and FCCC/SB/1997/6). Some of the communications included data on CO₂ emissions by sources and removals by sinks from land-use change and forestry, but since different ways of reporting were used these data are not included.

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Annex 2 Structure of emission obligations

The test of effectiveness used here is whether or not the Kyoto Protocol reduces Annex I greenhouse gas emissions to the atmosphere in 1990 by the maximum extent required under the specific terms of this agreement eg.

$$[1] \quad \text{Emissions to the Atmosphere in 2010} \leq x\% \text{ of Emissions to the Atmosphere in 1990}$$

Where $x\%$ is the amount of reduction implied by the Kyoto Protocol, taking into account all relevant factors.

Whilst the Kyoto Protocol emissions limits are based on the simple concept that the assigned amount (or budget) in the first budget period is a fixed percentage of emissions in the base year or period, a number of factors mean that the emission to the atmosphere in 1990 are not the same as the base emissions used for calculating the budget. This means that the mandated limit of 94.8% of the base emissions is not the same fraction of actual emissions to the atmosphere in 1990. These factors include:

- Some emissions to the atmosphere in 1990 are not included in the Kyoto Protocol (i.e. bunker fuels - international aviation and marine transport fuels) base year emissions or in the assigned amounts. For 2010 an estimate of the emissions from this source needs to be made.
- Land Use Change and Forestry sources and sinks that are not included in the 1990 emissions base for Annex I budgets for most Parties. Projections for these emissions for the year 2010 need to be made.
- A base year or period different from 1990 for the emission budget calculation for some Economies in Transition.
- The option of choosing either 1990 or 1995 as the base year for HFCs, PFCs and SF₆.

Emissions to the atmosphere in 2010 include the allowed emission budgets under the Kyoto Protocol, the net effect of afforestation, reforestation and deforestation activities since 1990 allowed under Article 3.3 (and any other activities agreed under Article 3.4), bunker fuels and other Land Use Change and Forestry emissions or removals:

$$[2] \quad \text{Emissions}_{2010} \equiv \text{Limit} * \text{Basket of Emissions in Base Year/Period} \frac{\text{Gases and sources listed in Annex A in base year}}{\text{Carbon equivalent}}$$

- + Clean Development Mechanism Certified Emission Reductions (Article 12 and Article 3.12)
- μ Additional LUCF removals/sources since 1990 defined under Article 3.4
- Article 3.3 Afforestation and reforestation activities since 1990
- + Article 3.3 deforestation activities since 1990
- + Bunker Fuel Emissions
- μ Other LUCF removals/sources

The budget (the assigned amount in Article 3) is a fraction of base year or period emissions. It can be modified in a legally binding manner via several transactions mandated under Article 4 and Paragraphs 10, 11 and 12 of Article 3 as described in Section 2 above. The budget for a Party can be described by the following equation:

$$\begin{aligned}
 [3] \quad \text{AssignedAmount} &\equiv \text{Limit} * 5 * \text{Emissions} \left[\frac{\text{Gases and sources listed in Annex A in base year} + \text{LUC sources if LUCF emissions} + \text{ve}}{\text{Base year or period/Carbon dioxide equivalent}} \right] \\
 &+ / - \sum_{2008}^{2012} \text{Budget transferred to/from Annex I Party (Article 4)} \frac{\text{Regional Economic Integration Organizations}}{\text{or other negotiated arrangement reported to the FCCC}} \\
 &+ / - \sum_{2008}^{2012} \text{Annex I Project Based Emission Reduction Units (Article 6 and Article 3.10 and 3.11)} \\
 &+ / - \sum_{2008}^{2012} \text{Trading of Emissions (Article 17 and Article 3.10 and 3.11)} \\
 &+ \sum_{2000}^{2012} \text{Clean Development Mechanism Certified Emission Reductions (Article 12 and Article 3.12)} \\
 &+ \sum_{2008}^{2012} \text{Additional LUCF activities since 1990 defined under Article 3.4}
 \end{aligned}$$

Where *Limit* is the limit specified for each Party Appearing in Annex B

For the Annex I group as a whole the transfers due to Article 4, 6 and 17 cancel out and do not affect the aggregate emissions budget. The CDM transfers however add to the allowed budget overall.

Two technicalities within the text of the Kyoto Protocol need to be noted here.

Firstly whilst a Party shall use the afforestation, reforestation deforestation removals and sources for the purpose of compliance with Article 3, this does not technically modify the Party's assigned amount. Instead these removals/sources are subtracted/added to the Party's aggregate emissions from the sources and gases defined in Annex A, for the purposes of assessing compliance with Article 3. Of course, in a mathematical sense this is the same as adding/subtracting the magnitude of the removal/source to the budget. This technicality is relevant to the question of whether or not sinks can enter the trading system defined under Article 17 and Article 3.10 and 3.11. Emission trading under these Articles is trading of an assigned amount, which would seem to exclude Article 3.3.

The second point is that any additional categories of land use change and forestry emissions defined under Article 3.4 would modify the assigned amount.

For the purposes of compliance with Article 3 of the Kyoto Protocol a Party's emissions are defined as the basket of the emissions from the sources listed in Annex A and deforestation emissions within the Party's borders, less the removal of greenhouse gases due to afforestation and deforestation activities since 1990 during the budget period. We have termed these the "compliance emissions":

$$\begin{aligned}
 [4] \text{ Compliance Emissions} &\equiv \sum_{2008}^{2012} \text{Basket of Emissions within Party's Borders} \frac{\text{Gases and Sources in Annex A}}{\text{Carbon equivalent}} \\
 &- \sum_{2008}^{2012} \text{Article 3.3 Afforestation and reforestation activities since 1990} \\
 &+ \sum_{2008}^{2012} \text{Article 3.3 deforestation activities since 1990}
 \end{aligned}$$

Compliance with the requirement of Article 3 of the Kyoto Protocol mean that the Compliance emissions defined in [4] above have to be less than or equal to the Assigned amount (budget) defined in equation [3].

The atmosphere however “sees” both the compliance emissions and the uncontrolled emissions. The actual emissions to the atmosphere will also include uncontrolled emissions (ie bunker fuels), emissions or removals for Land Use Change and Forestry activities not included under Article 3.3 or added under Article 3.4, as shown conceptually in equation [2] above.

Annex 3 Is pre-budget banking possible under the Kyoto Protocol?

Pre-budget banking of emission credits is a problem because it allows a Party to increase its emission budget during the first or subsequent commitment period by conducting activities *before* the first commitment period, *without a corresponding decrease* in another Party's assigned amount. In other words, pre-budget banking as defined here *inflates* the assigned amount for all Annex I Parties.

Activities which occur before the budget period, by agreement between Parties, and which lead to zero-sum adjustments of the assigned amounts for Annex I as a whole during the budget period are not defined here as pre-budget banking. Such activities are not inflationary.

Ahead of the Kyoto negotiations proposals were made by some Parties to allow pre-budget banking of emission credits in relation to the emission paths of some economies in transition. As EIT emissions are now below 1990 levels (or other base year/period), proposals were made to allow some portion of the amount that emissions are below the allowed level for the budget period for the period *before* the budget period to be added to the assigned amount. This was described as the "super-heated" hot air loophole and was not accepted as part of the Kyoto Protocol.

Since Kyoto, some Parties and some international organisations, such as the World Bank, continue to be at least informally of the view that the Kyoto Protocol allows the pre-banking of emission credits. Is this so?

Article 4 - Joint Fulfilment of Commitments

Article 4 provides for Parties to jointly fulfil their emission commitments by essentially modifying their assigned amounts under Article 3 in a legally binding manner. Because the assigned amounts relate to the budget period itself, there would appear to be little prospect that this article can be used for pre-banking of emission credits.

Article 17 - Emission Trading

Pre-budget period trading of assigned amounts is not specifically precluded or mandated under the Kyoto Protocol. Trading of assigned amounts is essentially a paper transaction and hence could occur at any time before, during or even shortly after a budget period ends, providing that the transaction relates to the Parties' assigned amounts and that the acquiring Party is in compliance with relevant obligations.

Trading after a budget period finishes could be used to bring a Party into compliance with its obligations. The selling Party would have the choice of either banking its unused assigned amount or selling them to a Party who needs them to comply.

In the case of trading of assigned amounts *before* a budget period, there would appear to be little environmental objection to this *per se* as the exercise is a zero-sum game - the total assigned amount for the Parties involved would not change. This issue is not

one of pre-banking of credits resulting in inflation of the budget, unless a Party's assigned amount is inflated by sink project credits.

However, emission trading itself would not be the source of budgetary inflation. This would stem from the treatment of sinks under Articles 3.3 and 3.4, Article 6 JI projects or Article 12 CDM credits.

Article 12 - CDM Credits

The CDM is by definition extra-budgetary and it increases the assigned amount of the Annex I Party obtaining the emission credit, hence inflating the assigned amount of the Annex I Parties. Extending the CDM credit generating period to before the first budget period magnifies the potential problem. CDM credits that are allowed to be generated from activities before the budget period are in effect pre-budget banked credits.

Under the CDM (paragraph 10 of Article 12), pre-banking *may* be permitted from the year 2000, with the caveat that rules have to be developed by the COP *before* this happens. Whilst Article 12.10 states that:

“Certified emission reductions obtained during the period from the year 2000 up to the beginning of the first commitment period can be used to assist in achieving compliance in the first commitment period.”,

Paragraph 3(b) of Article 12 states that:

“Parties included in Annex I **may** use the certified emission reductions accruing from such project activities to contribute to compliance with **part** of their quantified emission limitation and reduction commitments under Article 3, **as determined by the Conference of the Parties serving as the meeting of the Parties to this Protocol.**” (our emphasis)

Further, in relation to pre-banking, paragraph 5 (e) of Decision 1/CP.3 specifically requires that the COP examine the implications of pre-banking.

In essence these provisions appear to require an authorising decision by the COP *before* credit from pre-budget period activities can be used, but that the COP could not forbid such use. In taking a decision about the terms under which pre-budget crediting could take place, the COP would be bound to take account of paragraph 5(b) of Article 12 which requires that CDM projects provide “Real, measurable, and long-term benefits related to the mitigation of climate change”. Pre-banking of credits does not appear to offer such a guarantee, hence there would be a strong argument for the COP to strictly limit the extent to which Parties are able to use the pre-budget banking facility in Article 12 to meet their commitments.

The treatment of sinks under the CDM is quite problematic, but if allowed would add to the budgetary inflation without necessarily reducing global emissions by the amount corresponding to the credits obtained by Annex I Parties.

Article 6 - Project Based Joint Implementation Credits

Article 6 specifies that the ERUs may be obtained from emission reductions and from enhancement of removals by sinks that are additional to what would otherwise have occurred. The creation of emission reductions units (credits) before the budget period is neither excluded nor mandated by the text in Article 6. Further, paragraph 2 of Article 6 does not specifically require that the COP take any decisions on the implementation of Article 6 before Parties conduct projects for ERUs. Hence one interpretation of the Kyoto Protocol would be that all that Parties have to do is agree between themselves to do a project and to demonstrate that the project credits are additional. Parties objecting to pre-banking under Article 6 could presumably only do this towards the end of the first budget period.

A further element of Article 6 relates to the fact that projects may be undertaken in “any sector” of the economy, thereby potentially including the Land Use Change and Forestry Sector not covered by Article 3.3 or additional activities agreed pursuant to Article 3.4.

For the purposes of examining the potential for pre-banking under Article 6, two major classes of projects can be distinguished. The first relates to those emissions and sources covered by Annex A of the Kyoto Protocol and the second relates to all Land Use Change and Forestry activities.

I Annex A Gases and Sources and Land Use Change Emissions for Parties operating under paragraph 7 of Article 3.

As Annex A sources and gases define the initial assigned amount for Annex I as a whole under the Kyoto Protocol (except for the cases under Article 3.7), transfer of JI project credits deriving from these sectors of the economy are effectively a zero-sum game. If a Party wishes to sell project credits from activities before the budget period; these credits would be subtracted from its assigned amount during the budget period. In other words, the issue of pre-banking does not exist in the sense defined above.

However, where “hot air” exists, then as with trading under Article 17, the capacity to sell Article 6 JI credits would inflate the actual emissions during the budget period above that which would otherwise have occurred.

II Land Use Change and Forestry sector

Several categories can be distinguished here relating to activities under Article 3.3, Article 3.4 and other Land Use Change and Forestry activities not covered by these Articles.

Article 3.3 activities

Afforestation, reforestation and deforestation resulting from activities since 1990 have to be reported by Parties and must be “measured, verifiable changes in carbon stocks in each commitment period”. In other words, Article 3.3 activities are not in effect defined before the first budget period and hence the categories adopted have little or no meaning for the purpose of pre-budgetary activities under Article 6.

Any ERUs generated during the budget period and transferred would be deducted from the assigned amount of the selling Party and do not create any greater problem in terms of budgetary inflation than is already created by Article 3.3.

Could the changes in carbon stock referred to in Article 3.3 as defining the emission credits obtained be measured for periods before the commitment (budget) period and then counted towards a Party's emission commitment? In principle it would seem possible to do so by a Decision of the Parties; however, this would arguably change the balance of the Kyoto Protocol very significantly. A simple route would be to allow quite general Land Use Change and Forestry credits for Article JI projects before the budget period (see below).

Article 3.4 additional activities

Any activities agreed under Article 3.4 modify the assigned amount e.g. "additional human-induced activities related to changes in greenhouse gas emissions by sources and removals by sinks in the agricultural soils and the land-use change and forestry categories shall be added to, or subtracted from, the assigned amounts for Parties included in Annex I".

In other words the compliance test implied by Article 3.4 involves (in the absence of Article 3.3 sources and removals):

$$\begin{array}{lcl} \text{Gross emissions in Annex A} & \leq & \text{Adjusted assigned amount} \\ & = & \text{Assigned amount} + \text{Article 3.4 Removals} - \text{Article 3.4 Sources.} \end{array}$$

However, Article 3.4 does not limit the application activities to only removals and sources *during* a commitment period, and, in effect leaves the issue of pre-budget activities open to the COP. In this context, the COP/MOP "shall, at its first session or as soon as practicable thereafter, decide upon modalities, rules and guidelines as to how, and which, additional human-induced activities" are to be counted. In other words, a decision would have to be explicitly made to allow Article 3.4 categories to be used for pre-banking of credits by a Party domestically.

If the COP made such a decision, then those additional activities conducted before the first commitment period would result in further additions to the assigned amount i.e. inflation of the budget. If these were the result of JI projects, then this would result in pre-banking of emissions. The result of such a decision would be inflation of the Annex I budget as a whole. It would seem unlikely however that the COP would make such a decision, if only because a significant number of Parties would object and proposing Parties would be unwilling to push a vote on this matter.

The more likely situation is that Article 3.4 activities would be defined for the first and subsequent commitment periods as for Article 3.3, and modifications to the assigned amount would occur only as a consequence of removals and sources that occurred during the commitment period.

Land Use Change and Forestry activities

The above considerations imply that any attempt to generate JI credits from Land Use Change and Forestry activities *before* the budget period would probably not have to take account of definitions agreed under Article 3.3 or 3.4 and instead only demonstrate that additional removals have occurred. As a consequence of the lack of a requirement for a decision by the COP/MOP on the definition of JI projects, it would seem open in theory for a Party to attempt to use Article 6 JI to get pre-budget credits from sinks activities. However, there is a compelling reason why this probably would not occur.

Without enabling decisions by the COP/MOP, Land Use Change and Forestry reductions generated under JI projects, once transferred, would simply reduce the host Party's assigned amount during the budget period, without having provided a compensating increase in its assigned amount or decrease in its net emissions. The Land Use Change and Forestry reductions (additional removals) would not be added, under the current terms of the Kyoto Protocol, to the host Party's assigned amount. In other words, pre-budget period Land Use Change and Forestry ERUs would not be very attractive to a potential seller. They would result in a reduction in the seller's assigned amount during the budget period without being counterbalanced by either a corresponding decrease in its net emissions during the budget period or increase in its assigned amount due the Land Use Change and Forestry activity.

In principle the COP could make decisions allowing Parties to incorporate either a change in their assigned amount or a modification to their reported emissions to reflect the additional Land Use Change and Forestry activities before the budget period, which would remove this disincentive. Paragraph 4 of Article 7 may provide such an opportunity. In practice however, such a decision would be very difficult to achieve given the likely opposition of many Parties and the public to such a move.

Conclusion

There is some potential within the Kyoto Protocol for pre-budget banking of emission credits leading to the inflation of the Annex I emission budget.

Article 12 CDM Credits: Pre-budget banking of emission credits resulting in inflation of the Annex I budget is clearly possible under Article 12 CDM, and the COP cannot forbid this, given the explicit mandate for this in paragraph 10 of Article 12. However, specific decisions have to be made by the COP/MOP in order to implement Article 12 and hence to allow Parties to use the CDM credits to modify their assigned amounts. The COP/MOP could take decisions that strictly limit the scope for use of pre-budget credits by Annex I Parties to meet their own commitments.

Article 6 JI ERUs: Pre-budget banking of ERUs under Article 6 of the Protocol does not appear to be viable unless specific decisions are taken by the COP/MOP that would enable this to be both possible and beneficial to the host Party. Whilst pre-budget period generation of ERUs is not ruled out by the Protocol, transfers of credits from Annex A sources and gases would not change the assigned amount for Annex I as a whole. This could contribute to the "hot air" problem, as would Article 17. For Land Use Change and Forestry activities the situation is more complex, but there does not appear to be scope for pre-budget banking of Land Use Change and Forestry generated credits unless specific enabling decisions are taken by the COP/MOP because:

- Article 3.3 credits are by definition during the commitment periods.
- Article 3.4 additional activities and the rules and modalities for how these are to be counted have to be agreed by the COP before they can be defined and used. The COP/MOP *could* decide to define these activities from before the budget period, in which case there could be significant pre-budget banking.

- Without specific decisions by the COP/MOP there is a counter incentive to the use of additional Land Use Change and Forestry activities to generate ERUs before the budget period. A party with a lot of “hot air” in its budget period may not be worried about the disincentive involved.

The COP/MOP would have to take specific decisions that modified the existing accounting framework for emissions and/or accounting of assigned amounts before sinks could be used in a pre-budgetary context to generate credits.