

GREENPEACE

*Undermining the Kyoto Protocol:
Environmental Effectiveness versus
Political Expediency*



Greenpeace International

Summary

An analysis of the proposals made by a number of Parties for a wide range of additional land use change and forestry activities, inclusion of these activities in the Clean Development Mechanisms and uncontrolled emission trading has been made. This shows that if all these options are adopted very little if any action domestically would be required by the Annex I Parties.

The potential (and actual) loopholes in the Kyoto Protocol **equal or exceed** the reduction requirements of the Protocol.

The Kyoto Protocol requires that the Annex B Parties, as a group, be 5.2% below 1990 levels by 2010. Within the Annex B group, the OECD members the Kyoto Protocol requires that this group of Parties (when their individual allocations are taken into account) be 6.6% below 1990 levels in 2010.

The most recent official projections for Annex B emissions in 2010 show that the emissions as a whole are likely to be 8% above 1990 levels in the absence of action to implement the Kyoto Protocol. The OECD members of Annex B are projected to be 16% above 1990 levels in 2010, whilst Russia, the Ukraine and Central and East European countries are project to be 12% below 1990 levels in 2010.

These projections mean that the OECD countries would have to reduce their emissions by 770 MtC/yr (Millions of tonnes of carbon per year) in 2010. By contrast Russia, the Ukraine and Central and East European countries would have an excess of allowed emissions over actual emissions of around 150 MtC/yr in 2010 (this is known as hot air). Built into the final deal in Kyoto were several small loopholes that are not under negotiation but which reduce the overall emission reduction effort required by about 90 MtC/yr. These are an allowance for countries (essentially Australia) which are deforesting to add their 1990 deforestation emissions to their allowed emissions in 2010 and a clause that permits countries to choose how to count industrial gas emissions (HFCs, PFCs and SF₆). These leave about 680 MtC/yr of abatement effort required.

The loopholes under negotiation are:

- Unlimited “Hot Air” emission trading would permit all of these 150 MtC/yr to be bought by OECD countries thereby permitting emissions to increase by this amount. If all this were used by the OECD countries to “meet” their emission obligations then the total remaining emission reduction effort would be 530 MtC/yr.
- The definitions of forests, deforestation, afforestation and reforestation activities which can then lead to sequestered carbon being counted for credit towards a countries emission obligations. Under the Kyoto Protocol every tonne of sequestered carbon counted permits an additional tonne of fossil fuel carbon to be emitted to the atmosphere that would not otherwise have occurred. This could either be quite small (of the order of 30 MtC/yr) or quite large (200MtC/yr) depending on the definitions adopted at COP6. If small this leaves about 500 MtC/yr of abatement effort remaining.

- In addition to the land use change and forestry activities above the Kyoto Protocol provides that additional activities may be agreed. Proposals have been made that would allow emission credit for a wide range of land use activities including agricultural soil protection, forest harvesting and regrowth (eg additional Land Use Change and Forestry Activities under Article 3.4). If agreed these would permit more than 200 MtC/yr to be claimed by 2010. At this level only 300 MtC/yr of emission reduction effort domestically would remain.
- The Clean Development Mechanism (CDM) allows industrial countries to claim credit for activities conducted in developing countries. Each unit credit claimed permits an increase by the corresponding amount in the fossil fuel and other industrial emissions of the industrial country. The CDM market size is potentially very large of the order of some hundred of millions tonnes of carbon/year, not taking into account the use of land use change and forestry projects. A minimum size would be of the order of 100 MtC/yr with a likely size more in the range of 200 MtC/yr. In other words only 100-200 MtC/yr of abatement effort would be required domestically.
- If land use change and forestry activities are permitted in the CDM then available supply of CDM credits would be much larger of the order of 700 MtC/yr by 2010. Even if only a fraction of these were available then there would remain very little incentive for domestic emission action.
- Finally the continued exemption of international aviation and shipping fuels from the Kyoto Protocol and with no firm agreement to consider on when and how to include them in controls, adds a further 90MtC/yr to the emissions to the atmosphere (above 1990 levels) by 2010.

Taking all these into account it is clear that the loophole options on the table at present would almost remove the need for domestic action on fossil fuel and other industrial gas emissions. In other words rather than reduce OECD emissions by nearly 7% the end result of rules for the Kyoto Protocol that do not have environmental integrity could be an increase in OECD emissions of the order of 15% (business as usual emissions).

Undermining the Kyoto Protocol: Environmental Effectiveness versus Political Expediency?

Introduction

It is well known that the Kyoto Protocol, with its nominal reduction target of 5.2% relative to 1990 for the industrialized countries included in Annex B to the Protocol will have only a marginal effect on the build up of greenhouse gases in the atmosphere. Prof Bert Bolin, Chairman Emeritus of the Intergovernmental Panel on Climate Change has calculated that the Kyoto Protocol slows the projected rise in global temperatures by only one-tenth to two-tenths of a degree Centigrade by 2050. The rise in CO₂ levels in the atmosphere, projected to be up 8% above 1990 levels by 2010, will only be about only 0.4 percent lower if the Kyoto Protocol is strictly adhered to.

Given these considerations the he Kyoto Protocol is only a small step towards global climate protection. However even this small step is under threat as the “details” of the implementation of the protocol are negotiated. This paper presents an analysis of the implications of some of the major proposals on the table for COP6.

Loopholes in the Protocol

There are three kinds of loophole problem can be identified:

- **Inflation of Assigned Amounts¹**. By far the land use and forestry (sink) provisions of the protocol (Article 3.3 and potentially Article 3.4) provide the greatest potential to allow for Parties to inflate their emission budgets. The Clean Development Mechanism (CDM) also provides a mechanism for systematic and large increases in the overall assigned amount of Annex I Parties. These problems can be addressed in the implementation of the Kyoto Protocol². Both the sink provisions and the CDM credits are likely to result in overall emissions to the atmosphere being higher than they would otherwise have been. Other provisions of the protocol that are not open for negotiations also allow an inflation of the allowed emission of

¹ Inflation of assigned amounts (also known as extra-budgetary crediting) can result in emissions to the atmosphere being higher than would otherwise have been the case. This situation arises where the allowed increase in the gross emissions is not offset by real decreases in emissions from the activities leading to the inflation of the assigned amount.

² Two other provisions built into the Protocol in paragraph 7 and 8 of Article 3 inflate the budget. The inclusion of land use change emissions in the baseline for Australia and the option of choosing 1990 or 1995 as the baseline for HFCs, PFCs and SF₆ both inflate the budget. The land-use change baseline provision inflates the budget by about 0.9% above what it would otherwise have been. The land-use change emissions built into the baseline would have decreased very substantially in the absence of the Kyoto Protocol (and have in fact done so) hence all, or nearly all, of these emissions would not otherwise have happened. The baseline change for HFCs etc inflates the budget by about 0.6% and if this had not been included these emissions would not have happened. Neither of these provisions can be affected by decisions of the COP.

Parties, which degrade the effectiveness of the target (see the final section of this paper).

- **Exclusion of sources**³. The Kyoto protocol's emission obligations do not include international aviation and marine transport emissions. According to the second compilation and synthesis of second national communications (FCCC/CP/1998/11) "these emissions increased by about 10 per cent from 1990 to 1995, one of the largest rates of increase for any category".
- **Hot air emission trading**⁴. Hot air does not inflate the assigned amount but can result in emissions being higher than they would otherwise have been.

Loopholes on the table

Proposals from a number of Parties would:

- Allow uncontrolled use of "Hot Air" emission credits;
- Add a large number additional agricultural and other land use activities under Article 3.4 and for "generous" interpretations of the terms afforestation, reforestation and deforestation under Article 3.3 of the Kyoto Protocol;
- Allow uncontrolled use of the CDM to meet emission obligations and permit the inclusion of land use change and forestry activities in the CDM.
- Failure to agree to control international aviation and marine transport emissions.

The quantification of these loopholes starts with an assessment of emission trends and projections to the first commitment period.

Emission Trends

Based on the data and emission projections submitted by Parties (and significant amendments made in the course of, or subsequent to, In Depth Reviews of National Communications (eg Russia), emissions in 2010 are projected for the Annex B group as a whole to be **8% above** 1990 levels. The Kyoto Protocol requires that these Parties be **5.2% below** 1990 levels by 2010.

In 1995 emissions from the Annex I Parties as whole were some **4.4% below 1990** levels and are projected to rise, in the absence of policy action to equal 1990 emissions by 2000.

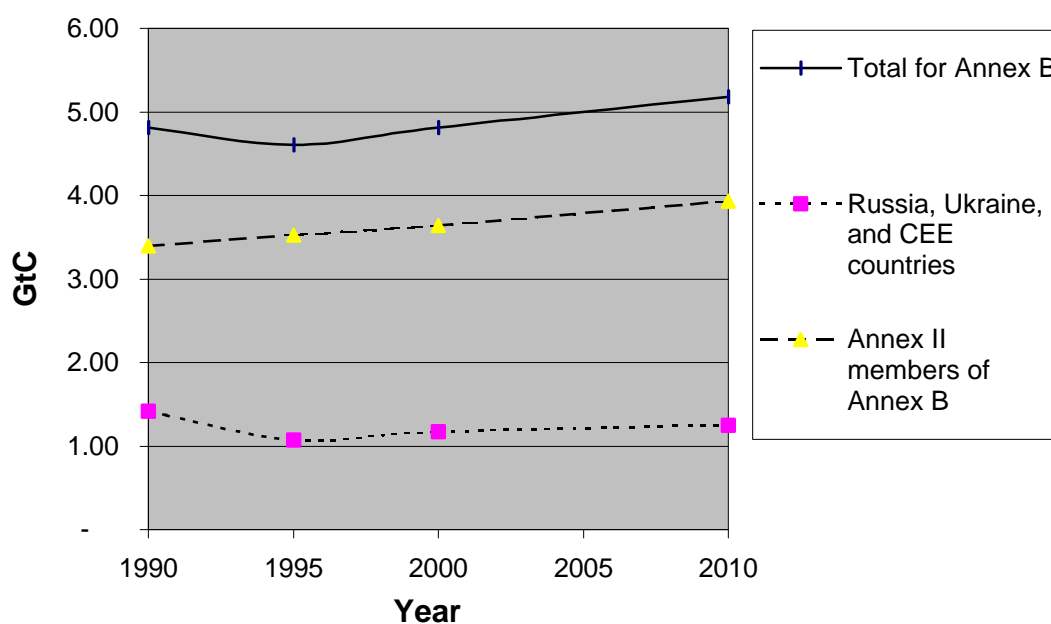
³ Exclusion of sources from the assigned amounts of Parties results in overall emissions to the atmosphere increasing, when the excluded sources are increasing. This is the case for the examples discussed here.

⁴ This is a specific situation arising when a Party has an emission allocation above what its emissions would actually in the absence of the Kyoto Protocol. If the emission allocation cannot be transferred this would not present a problem, and the total emissions from the Annex B Parties would be below the total of the assigned amounts. If the emission allocation is transferrable via emission trading or in some other way, then the existence of hot air results in overall emissions being higher than they would otherwise be (but not higher than the overall assigned amount).

As a group Russia, the Ukraine and Central and East European Parties in Annex B are projected to be **12% below** 1990 levels in 2010. The Kyoto Protocol requires that this group of Parties (when their individual allocations are taken into account) be **1.8% below** 1990 levels in 2010.

The OECD members of Annex B (not including Hungary) are expected to be **16% above** 1990 levels in 2010. The Kyoto Protocol requires that this group of Parties (when their individual allocations are taken into account) be **6.6% below** 1990 levels in 2010. Some Parties have projected their emissions for 2010 on the basis of climate policy mitigation measures in general consistent with their Kyoto Protocol obligations (eg Germany, Denmark), but most have not. For these Parties the projections from National Communications and revised inventories show that a reduction of about 770 MtC⁵ from expected 2010 levels will be needed to meet the Kyoto obligations. This is below the middle of the range reported by a number of sources (580-1160 MtC in 2010).

Emissions and projections to 2010 from Annex I Parties



These projections imply that the “Hot Air” available for trading is around 150 MtC/yr, equivalent to about 4.3% of the 1990 emissions from the OECD members of Annex B (not including Hungary). If these assigned amount units were **not** available for transfer then the Kyoto Protocol would generate a reduction of 8.2% relative to 1990 levels.

⁵ Million tonnes of carbon equivalent.

Table 1 Emissions for 1990, 1995 and projected emissions for 2000 and 2010

Emissions (GtC ⁶)	1990	1995	2000	2010	2010 Assigned Amounts	Projected Emissions in 2010 relative to 1990	Difference between Emissions and Assigned Amount
Total for Annex B	4,93	4,70	4,92	5,29	4,67	107%	0,62
Russia, Ukraine, and CEE countries	1,47	1,11	1,21	1,29	1,44	88%	(0,15)
Annex II members of Annex B	3,46	3,59	3,71	4,01	3,23	116%	0,77
% relative to 1990	100,0%	95,5%	99,9%	107,5%	94,8%		

Note: This table has been compiled from the reported emissions and projections for Parties reporting data in FCCC/SBI/1999/5/Add.1 and FCCC/CP/1998/11/Add.2, taking into account the IDR⁷ of the Russian National Communication and data in the Ukrainian National Communication. Owing to the issues referred to in these documents we have had to make some simplifying assumption in order to compile the data and projections into one combined table covering all gases where at all possible. The Parties providing the projections which have been combined to produce this table cover 98% of reported Annex I emissions in 1990. The projections have been scaled to account for the Parties not reporting projections in order to harmonize with the base year 1990 emissions used in this analysis.

Quantification of the loopholes

[1] Deforestation in the baseline: Article 3.7 provision for including Land Use Change emissions

The so-called “Australia clause” permits Parties whose Land Use Change and Forestry sector is a source of emission in the base year to count their Land Use Change emissions (deforestation) in the calculation of their assigned amounts. This has the effect of increasing the allowed emissions for the Annex I emissions by about 34 MtC/yr as a whole or about 0.7%. The Australian baseline for deforestation has been reduced compared to earlier inventory because of a change in the methodology used to estimate the Land Use emissions term. The UK also has a land clearance term that may be added into its base year emissions.

[2] Choice of baseline year for HFCs, PFCs and SF6 - Article 3.8

This permits Parties to choose between 1990 and 1995 emissions of these gases for the purposes of computing their assigned amounts. Based on data submitted by Parties this increases the assigned amount of Annex I Parties by about 53 MtC/yr. This is equivalent to an increase in emission to the atmosphere of about 1% relative to 1990 emissions.

⁶ Billion tonnes of carbon equivalent.

⁷ In Depth Review of National Communications.

[3] Hot Air or Russian Surplus

There a range of hot air (Russian surplus) estimates in the literature. Table 2 from a recent review shows that the range in the literature is large (92-374 MtC/yr). The lowest estimate in Table 2 of 92MtC/yr is based on National Communications submitted by Parties for CO₂ only and not including the Ukrianian National Communication.

An independent estimate has been made here based on the revisions to the Russian National Communication consequent upon Russian In Depth Review, the Ukrainian National Communication, accounting for non-CO₂ greenhouse gases as far as possible and using the projections of Parties for 2010. As is shown in Table 1 above the estimate “hot air” or surplus of the Russian Federation, the Ukraine and Central and East European Countries based on this analysis is 150 MtC/yr in 2010. As this estimate is consistent with the data and projections available under the FCCC reporting system and represents a reasonably conservative estimate of the Russian surplus this is the volume used in this analysis.

Table 2 Estimates of the Amount of Hot Air in 2010 (MtC equivalent)

	National communications	EPPA ^a	GREEN ^a	IEA ^a	SGM	IIASA ^a	EIA ^a
Former Soviet Union	81	111	130	n.a. ^b	247	275	324
Eastern Europe	11	0	0	n.a. ^b	42	69	50
Total	92	111	130	156	289	344	374

Source: Zhong Xiang Zhang (1999) “Estimating the Size of the Potential Market for All Three Flexibility Mechanisms under the Kyoto Protocol”, Faculty of Law and Faculty of Economics, University of Groningen. Final Report Prepared for the Asian Development Bank under Contract TA-5592-REG, November 1999. Original notes: ^a Only for CO₂ emissions; ^b n.a. = not available. *Sources*: Edmonds *et al.* (1998); Ellerman and Decaux (1998); EIA (1999); IEA (1998); OECD (1999); UNFCCC (1997a, 1997b, 1998a, 1999b); Victor *et al.* (1998)

[4] Article 3.3 Afforestation, Reforestation and Deforestation.

The IPCC Special Report on Land Use, Land Use Change and Forestry produced estimates of Afforestation, Reforestation and Deforestation by 2010 by estimating these terms in 1990 and assuming that they remained unchanged into the first commitment period. For the purposes of this analysis we have assumed that deforestation in the Annex I Parties will reduce to zero by the first commitment period and there will be no increase in afforestation and reforestation activities in the first commitment period above current levels. Table 3 shows the results of these assumptions with a mid-range estimate of 26,5 MtC/yr sequestered in 2010, which is equivalent to about 0.5% of 1990 industrial emissions.

Table 3 Afforestation, Reforestation and Deforestation Estimates

Afforestation, Reforestation and Deforestation (MtC/yr)	Low	Mid	High
IPCC Special Report Estimates based on IPCC Definitional Scenarios			
Afforestation and Reforestation	7	26,5	46
Deforestation in 1990	-90	-90	-90
Net Sequestration/Emissions	-83	-63,5	-44
Estimates used in this analysis based on IPCC Definitional scenarios			
No deforestation in 2010 no increase in Afforestation and Reforestation above 1990 levels	7	26,5	46

The choice of this scenario has been motivated by a number of factors which include: the IPCC used FAO estimates of deforestation in 1990, which are significantly higher than the Land Use Change emissions reported by Parties for that year; since 1990 these emissions appear to have declined significantly; the UNFCCC reporting date are what will be used for compliance purposes. It should be noted that it may be unrealistic to expect that AR activities will not increase above 1990 levels as the Kyoto Protocol provides an incentive to expand these.

Should Parties choose to use the FAO definitional scenarios for accounting for ARD activities then the ARD credits in the first commitment period could be very substantially greater than indicated here.

[5] Article 3.4 Additional Activities

The IPCC Special Report on Land Use, Land Use Change and Forestry has produced estimates for feasible additional activities by 2010 in the Annex I Parties up to about 520 MtC/yr. The Summary for Policy Makers has interpreted this work producing estimates for these in the first commitment period which sum⁸ to 288 MtC/yr based on an assessment of what is probable and assuming an ambitious policy agenda. The SPM notes that this estimate is likely to be on the high side. Two scenarios are looked at here 50% or 75% of this is available.

⁸ However as the list of activities included in this paper is not necessarily exclusive there is some question mark over whether this is the correct total.

Table 4 Relative potential in 2010 for net change in carbon stock through some improved management and changed land-use activities

Activity	MtC/yr
A Annex 1 Countries	
a. Improved Management within a Land Use	
Forest Management	100
Cropland Management	75
Grazing Land Management	70
Agroforestry	12
Rice Paddies	1
Urban Land Management	1
b. Land Use Change	
Conversion of Cropland to Grassland	24
Agroforestry	0
Wetland Reforestation	4
Restoring Severely Degraded Land	1
Total Annex I	288
B Global Estimates	
c. Improved Management within a Land Use	
Forest Management	170
Cropland Management	125
Grazing Land Management	240
Agroforestry	26
Rice Paddies	7
Urban Land Management	2
d. Land Use Change	
Conversion of Cropland to Grassland	38
Agroforestry	390
Wetland Reforestation	4
Restoring Severely Degraded Land	3
Total Global	1005

[6] Article 12 CDM Land Use Change and Forestry

Table 4 above shows the estimated potential for some LUCF activities globally from which can be inferred that the non-Annex I potential for 2010 is of the order of 700 MtC/yr. This estimate does not include forest conservation for which the estimated potential is somewhat larger and at a lower overall cost.

[7] Article 12 CDM Market size estimates

Estimates for the CDM market size in the literature vary substantially because of a variety of factors including differences in baseline growth of emissions and the availability of “hot air”, differing mitigation cost assumptions and modelling approaches.

Table 5 shows the estimated market size of the CDM from a recent study conducted for the Asia Development Bank, which shows that for a total mitigation effort 621 MtC/yr in 2010 the demand for CDM credits varies between 169 and 292 MtC/yr, depending upon requirements for domestic action. This is in the context of where about 105 MtC/yr of hot air is available, somewhat lower than the 150 MtC/yr used in this analysis.

Table 5 Estimates of the Contributions of Three Flexibility Mechanisms under the Four Trading Scenarios in 2010

Scenarios	Domestic actions	Hot air	Emissions trading and JI	CDM	Total supply
No limits	171.7	105.0	51.8	292.1	620.6
50% of reduction from BAU emissions	310.3	105.0	36.1	169.2	620.6

Source: Table 6 of Zhong Xiang Zhang (1999) "Estimating the Size of the Potential Market for All Three Flexibility Mechanisms under the Kyoto Protocol", Faculty of Law and Faculty of Economics, University of Groningen. Final Report Prepared for the Asian Development Bank under Contract TA-5592-REG, November 1999.

Table 6 shows a range of other estimates from the recent literature drawn from "The Potential Size of the CDM" by Christiaan Vrolijk in Global Greenhouse Emission Trader, Issue 6, February, 1999.

Table 6 Estimates for the CDM Market

CDM Certified Emission Reduction Unit size estimates (MtC/yr)	Low	Mid point	High	Price \$/tC
Haites, 1998	266	419	572	37
US Administration.	144	244	344	24-42
Austin et al (has large biomass component)	397	560	723	13-26
Vrolijk and Grubb	103	122	141	
Range (Minimum, Mid Point and Maximum)	103	336	723	13-42

Note: Compiled Tables 1 and 2 from Christiaan Vrolijk "The Potential Size of the CDM Market", in Global Greenhouse Emission Trader, Issue 6, February, 1999

For the purposes of this work the "no limits" case from Table 5 will be used as the basic estimate for the demand for CDM credits. This scenario estimates the CDM size assuming no controls on emission trading. As with other estimates here it is indicative. It should be note that this does not include land use change and forestry activities, which would most likely be cheaper and hence expand the available supply.

[4] Exemption for International Aviation and Marine Fuels (Bunkers)

We have assumed a medium range growth for international aviation and marine fuels. and have not accounted for the additional effect of CO₂ combustion in the upper troposphere and lower stratosphere from subsonic aircraft. Whilst the IPCC Special Report on Aviation and Global Atmosphere has found that the direct effect of CO₂ must be multiplied by a factor of 2 to 4 to get the true effect, this cannot be applied to the base year emissions of Parties in a scientifically consistent way. This is because the base year emissions make use of 100 year GWPs to compute CO₂ equivalent emissions and the enhanced effect for air traffic is computed on a different basis. If one were to do this on a consistent basis it would increase the relative significance of aviation emissions by a significant amount.

On a CO₂ alone basis the loophole in the Kyoto Protocol is equivalent to an increase of 90 MtC/yr in 2010 above 1990 levels, or about a 1.8% degradation in the Protocol's target.

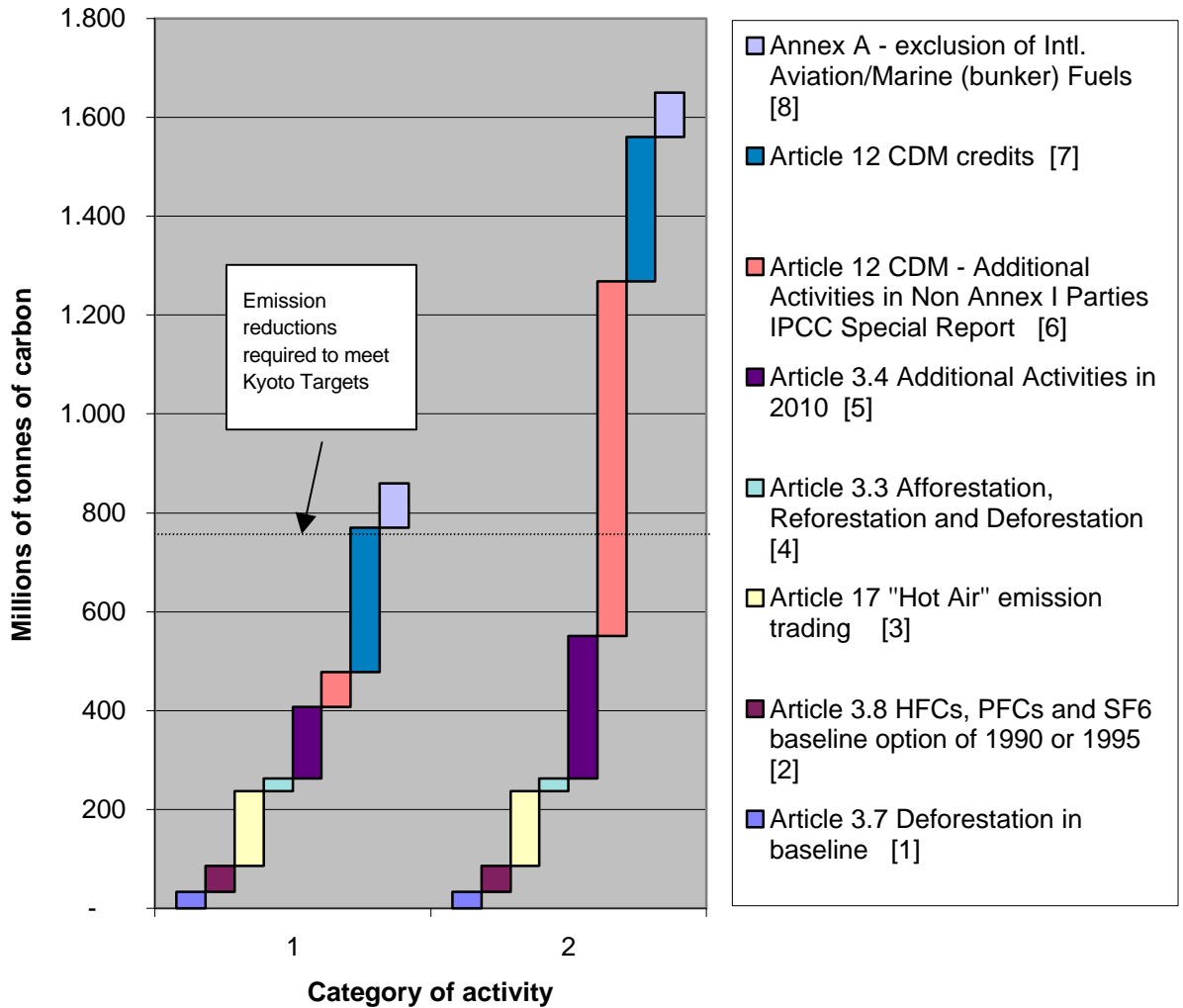
Overall Magnitude of the Loopholes

Table 7 summarizes the magnitude of the loopholes estimated here. The Column headed 1 varies the sinks categories for additional activities and CDM activities by taking 50% and 10% respectively. The column headed 2 provides the full estimate made in the IPCC special report for "additional activities" in both Annex I and Non Annex I Parties. The figure below shows the overall magnitude of these two scenarios compared to the estimate emission abatement required of 770 MtC/yr in 2010 in order to meet the Kyoto targets for the OECD countries.

Table 7 Magnitude of loopholes

Loophole category	1 (MtC/yr)	2 (MtC/yr)
Article 3.7 Deforestation in baseline [1]	34	34
Article 3.8 HFCs, PFCs and SF6 baseline option of 1990 or 1995 [2]	53	53
Article 17 "Hot Air" emission trading [3]	150	150
Article 3.3 Afforestation, Reforestation and Deforestation [4]	27	27
Article 3.4 Additional Activities in 2010 [5]	144	288
Article 12 CDM - Additional Activities in Non Annex I Parties IPCC Special Report [6]	71,7	717
Article 12 CDM credits [7]	292	292
Annex A - exclusion of Intl. Aviation/Marine (bunker) Fuels [8]	90	90

Kyoto Protocol



Conclusions

The loopholes now appear to represent a fundamental breach of the environmental integrity of the Protocol. The available loopholes equal or exceed the reductions required under the Protocol and there are sufficient possibilities available to permit Annex B Parties to “meet” their commitments without significant domestic action.

FOR MORE INFORMATION

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