

MARCH 2000

UNDERMINING THE KYOTO PROTOCOL

WILL WEAKNESSES AND LOOPHOLES IN THE KYOTO PROTOCOL NEGATE ITS ENVIRONMENTAL EFFECTIVENESS?

*While the Kyoto Protocol is
potentially an important first step in
averting global climate change a
number of potential weaknesses and
loopholes could make the difference
between it representing a first step
and it being largely ineffective*

Chris Rolfe, Staff Counsel
West Coast Environmental Law



EXECUTIVE SUMMARY

In December 1997, negotiators from all the Parties to the *Framework Convention on Climate Change* met in Kyoto, Japan, and successfully negotiated the *Kyoto Protocol to the United Nations Framework Convention on Climate Change* (the “*Kyoto Protocol*”). The *Kyoto Protocol* contains legally binding emission reduction commitments for developed nations.

It establishes a commitment period between 2008 and 2012 during which each nation listed in Annex B is required to reduce emissions to the “assigned amounts” listed for it as a percentage of 1990 emissions. Annex B Parties are allowed to meet their commitment through domestic emission reductions, purchases of assigned amount units (AAUs) from other Annex B Parties (emissions trading or joint implementation), purchase of credits for emission reduction projects in developing countries (under the Clean Development Mechanism or CDM) and through generating credits for sequestration of carbon in forests.

If the emission budgets in the *Kyoto Protocol* were strictly adhered to – i.e. if each nation listed in Annex B simply reduced emissions to its assigned amount -- the result would be an overall ten percent reduction of Annex B emissions from 1990 levels or a 21% reduction from business as usual trends. By itself this is clearly inadequate to stop climate change. However, the *Kyoto Protocol* is nonetheless potentially very valuable as a first step. Reductions in the next decade will not only slow the rate of climate change and reduce the risk of catastrophic climate change, but they will make it more feasible to achieve a given level of climate protection in the future. Meaningful reduction commitments are also essential to encourage the development of new, more efficient or cleaner technologies that will help reduce emissions in the long term.

Unfortunately, the *Protocol* could fail as a first step. A number of potential weaknesses and loopholes in the *Protocol* could lead to a situation where global emission trends are unaffected by the *Protocol*.

Compliance provisions will be essential to ensure that the Kyoto commitments are adhered to. Although compliance provisions are currently unresolved, there are three dominant potential problems. First, the US has proposed to allow excess emitters to “borrow” allowable emissions from future commitment periods. This would allow Parties to indefinitely postpone emission reductions and it reduces the potential for stringent future commitments. Second, many parties have resisted either financial penalties or trade sanctions as responses to non-compliance. Third, the combination of potentially weak enforcement responses, and buyers in an emissions trading system not being responsible for non-compliance of sellers, creates a situation where the environmental impacts of one nation’s non-compliance could spread and multiply.

Implementation of the Clean Development Mechanism raises the risk that the industrialized world will meet international commitments through projects in the developing world that would have occurred in any event. Receiving credit from such projects undercuts the environmental effectiveness of the *Protocol*.

While International emissions trading has the potential to lower the cost of achieving a given level of environmental protection, it may also allow Russia, the Ukraine and other states to sell portions of their assigned amounts that exceed their likely emission levels in



the absence of any emission reduction efforts. Again, the impact is to reduce environmental effectiveness.

Finally, a large number of problems related to the treatment of carbon forest and soil reservoirs could undermine the effectiveness of the *Protocol*. In particular there is a risk that substantial credit may be given in situations where there is no increment in sequestration rates or no change from current trends. In addition, there are risks that uncertainties in the quantification of sequestration could allow Parties to exaggerate actual sequestration. Substantial concerns also exist regarding the permanence of any sequestration.

In total, the potential loopholes identified are sufficient to more than negate the effectiveness of the *Protocol*.

LIST OF RECOMMENDATIONS

- Establish a Compliance Fund allowing any nation that exceeds its assigned amount to pay a fee dedicated to funding highly credible and reliable emission reduction projects in an amount equal to or greater than the overage. Do not allow borrowing, either as a flexibility mechanism or as an enforcement mechanism.
- Ensure that the Compliance Bodies have a full range of both potential and automatic responses to non-compliance. These should include facilitation for nations having difficulty with compliance, automatic restrictions on eligibility to sell AAUs from nations out of compliance with either emission limits or reporting requirements, and a graduated range of enforcement responses. The latter should include loss of treaty privileges, financial penalties and trade sanctions against greenhouse gas intensive goods.
- Establish Trading Rules that impose Joint Liability in conjunction with a Compliance Fund. Domestic rules should require financially solvent institutions to guarantee AAUs.
- The quantification of certified emission reductions should be guided by the principle that the Clean Development Mechanism should not reduce the environmental effectiveness of the *Kyoto Protocol*. To achieve this CDM should be limited to projects for which agreed technology matrices or benchmarking methodologies have been established. Benchmarks or reference technologies should represent best standard practices and baselines should be adjusted to reflect general improvements in technology. Only actual measured reductions should be credited.
- Limit hot air – the trading of AAUs that are excess to a nation’s business as usual requirements -- by limiting the AAUs available for trade to the lower of assigned amounts or the product of GDP during the commitment period multiplied by a nation’s emissions intensity in 1990.
- Any inclusion of sinks under Article 3.3 should be based on a balanced approach that is consistent with the findings of the Intergovernmental Panel on Climate Change (IPCC) Special Report. The definition of reforestation should only include land that is reconverted to forest use after being taken out of forest use for a period of at least one decade.
- The methodologies for including any additional activities under Article 3.4 should be consistent with the IPCC Special Report, and should ensure that credit is not given for non-incremental activities. Sequestration credits should be discounted to reflect uncertainties and the risk of sequestration being reversed.



UNDERMINING THE KYOTO PROTOCOL

INTRODUCTION

In December 1997, negotiators from all the Parties to the *Framework Convention on Climate Change* meeting at the Third Conference of the Parties to the Convention in Kyoto, Japan, successfully negotiated the *Kyoto Protocol to the United Nations Framework Convention on Climate Change* (the “*Kyoto Protocol*”). The *Kyoto Protocol* contains legally binding emission reduction commitments for those Parties — the developed nations — that are included in Annex B of the *Protocol* (the Annex B Parties). While the *Protocol* represents an important step forward, its effectiveness will depend on the resolution of a number of important issues.

This brief begins with an outline of the key elements of the *Protocol*. It then discusses world carbon emissions trends and discusses the difference the *Kyoto Protocol* will – potentially – make in averting climate change. It finds that the *Kyoto Protocol* is an important first step in reducing emissions, potentially leading to a ten-percent reduction from Annex B Parties 1990 emission levels. If the *Kyoto Protocol* is successful in achieving this level of reductions, it will only slow the rate of climate change, but it should unleash improvements in technology that will make future, more significant cuts feasible.

Unfortunately, the *Protocol* could fail as a first step. Indeed, a number of potential weaknesses and loopholes in the *Protocol* could lead to a situation where global emission trends are unaffected by the *Protocol*. The sum of the following weaknesses could vitiate the *Protocol*:

- Compliance and Liability Provisions will make the difference between the *Protocol* being legally binding in theory, and binding in fact.
- Implementation of credit from emission reductions in developing countries under the Clean Development Mechanism raises the risk that the industrialized world will meet international commitments through projects in the developing world that would have occurred in any event;
- International emissions trading may allow Russia, the Ukraine and other states to sell portions of their allowed emissions that exceed their likely emission levels under “business as usual;”
- The treatment of carbon forest and soil reservoirs; and



- The ability of Parties to use higher baseline years for some emissions.

Finally, this brief concludes with recommendations regarding how Canada can play a role in ensuring the effectiveness of the *Protocol*.

KEY ELEMENTS OF KYOTO PROTOCOL

COMMITMENT PERIODS AND ASSIGNED AMOUNTS

The *Kyoto Protocol* establishes a commitment period between 2008 and 2012. Individual allowable emissions quotas or “assigned amounts” are set for different Parties. Although proposals had been made for differentiation of allowed emissions on the basis of criteria such as population, GNP, or carbon intensity of the economy, the differentiations agreed to at Kyoto were purely political. Canada is to reduce its emissions by six percent; the US by seven percent; European Union Parties by eight percent. The Russian Federation is only required to stabilize emissions. Iceland is allowed to increase emissions by up to ten percent.

LEGALLY BINDING

The commitments included in the *Kyoto Protocol* are legally binding under international law. In comparison, the *Framework Convention on Climate Change* (FCCC), signed in 1992, only committed nations to “aim” to stabilize emissions at 1990 levels by 2000. As discussed below, the development of an effective compliance regime is essential to make legally binding commitments effective in fact.

EXCLUSION OF MOST FOREST AND SOIL SINKS

For most Parties, their assigned amount (i.e. allowable emissions) in the first commitment period is a percentage of gross emissions in 1990. Gross emissions are anthropogenic emissions of greenhouse gas emissions from energy, industrial processes, agriculture and waste. They do not include carbon fluxes from forests, soils and other carbon reservoirs. However, when calculating whether they are in compliance with allowable emissions, Parties count some but not all carbon fluxes from forests. They are required to count emissions and removals resulting from afforestation, reforestation, and deforestation since 1990. Other carbon fluxes associated with land use, land use change and forestry may be added under Article 3.4.

Also, an exception exists in relation to the rule that gross 1990 emissions are the basis for calculating allowable emissions in the commitment period. For Australia, the UK and Estonia — the three Annex B Parties that had positive net emissions from land use change and forestry in 1990 — allowable emissions in the commitment period are based on 1990 gross emissions plus net emissions from land use change and forestry.

SIX GASES

The *Kyoto Protocol* applies to six greenhouse gases: the three main greenhouse gases released by human activity (carbon dioxide, nitrous oxide and methane) and, to three gases that are released in small quantities but are both long lasting and extremely

powerful (hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride). In calculating their assigned amounts, Parties are allowed to use 1995 rather than 1990 emissions of hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride.

THE CURRENCY: AAUS, CERS AND ERUS

The *Protocol* includes a number of mechanisms for trading of emission reduction credits or emission quotas. In theory, trading allows Parties who can reduce emissions at low costs to reduce their emissions below their allowable emissions and sell credits or quotas to other parties, thus reducing the overall cost of compliance but achieving the same end. A number of different terms are used to describe what is traded under these mechanisms. In the context of joint implementation (i.e. project based trading) transfers of the quotas between parties are referred to as transfers of emission reductions units (“ERUs”). In the context of emissions trading, the units are referred to simply as “parts of the assigned amount”. The term “assigned amount units” (AAU) has come to mean either units transferred through the emissions trading system or through joint implementation. In addition, certified emission reductions (CERs) can be created in developing Parties and transferred to Annex B Parties under the Clean Development Mechanism.

CLEAN DEVELOPMENT MECHANISM

The *Kyoto Protocol* allows Annex B Parties to fulfil their emission reduction commitments through a clean development mechanism defined by the *Kyoto Protocol*. Essentially the clean development mechanism establishes a process for generating credits in non-Annex B Parties for use by Annex B Parties. Emission reductions accruing from projects in non-Annex B Parties can be used if they are certified under the clean development mechanism. The *Protocol* states that reductions will be certified on the basis of:

- Voluntary participation of each Party [to the *Protocol*] involved;
- Real, measurable, and having long-term benefits related to mitigation of climate change; and
- Emission reductions that are additional to any that would occur in the absence of the project.

Clean development projects are also to be approved by both the Annex B Nation using them and the host nation, and are supposed to benefit the host nation. The entities responsible for certification of emission reductions and the process for certification are to be determined by future Conferences of the Parties to the *FCCC*. The *Kyoto Protocol* allows Parties to meet their emission reduction commitments for the period 2008 to 2012 by using certified emission reductions (CERs) generated between 2000 and 2007.

JOINT IMPLEMENTATION

Under article 6, Annex B Parties can transfer and acquire from one another “emission reduction units resulting from projects” if the projects provide “a reduction in emissions or enhancement of sinks that is additional to what would otherwise occur.” When emission reduction units (ERUs) are purchased by a nation they are added to that nation’s allowable emissions and subtracted from the allowable emissions of the nation transferring them.



INTERNATIONAL EMISSIONS TRADING

Article 17 states that Annex B Parties can participate in emissions trading for the purposes of fulfilling those commitments. Under article 3, AAUs will be added or subtracted from national allocations when Parties trade AAUs under Article 17. Beyond these provisions, the *Protocol* simply states that the Conference of Parties to the *UNFCCC* will define the “principles, modalities, rules and guidelines” for emissions trading.

WORLD EMISSIONS AND CLIMATE TRENDS: WHAT KYOTO COULD MEAN

While the reductions called for in the *Kyoto Protocol* are clearly insufficient to avoid or significantly mitigate climate change, they ostensibly represent significant changes from projected emission trends in the absence of efforts to reduce greenhouse gases – i.e. they represent changes from business as usual patterns. If the emission budgets in the *Kyoto Protocol* were strictly adhered to – i.e. if each nation listed in Annex B simply reduced emissions to its assigned amount and did not engage in international emissions trading, joint implementation or the clean development mechanism and did not claim credit for carbon sequestration in soils or forests – the result would be an overall ten percent reduction of Annex B emissions from 1990 levels or a 21% reduction from business as usual trends.¹

By itself this is clearly inadequate to stop climate change. Extrapolated to 2100 the *Protocol* is expected to reduce warming by only about seventeen percent.² In the long term, deeper reductions will be necessary from Annex B Parties and developing nations will need to accept emission limits. However, the *Kyoto Protocol* is nonetheless potentially very valuable as a first step. Reductions in the next decade will not only slow the rate of climate change and reduce the risk of catastrophic climate change, but they will make it more feasible to achieve a given level of climate protection in the future.³ Meaningful reduction commitments are also essential to encourage the development of new, more efficient or cleaner technologies that will help reduce emissions in the long term.

However, whether the *Protocol* will have value depends on its ability to ensure meaningful changes from business as usual in the next decade. The answer to the essential question – whether the *Kyoto Protocol* will lead to changes in the greenhouse gases entering the atmosphere – is dependant on the resolution of many outstanding issues.

¹ Based on United States, Energy Information Agency, *International Energy Outlook 2000*, March 2000, Department of Energy, projections page 162. The reduction from business as usual is equal to the fraction of Kyoto induced reductions from business as usual from all Annex B except the former Soviet Union and Eastern Europe over projected Annex B business as usual emissions for all of Annex B. The ten percent figure is based on non Kyoto induced reductions from 1990 levels in the Soviet Union and Eastern Europe, plus Kyoto induced reductions from 1990 levels in the rest of Annex B.

² John Reilly et al., “Multi-Gas Assessment of the Kyoto Protocol” (January 1999) MIT Global Change Joint Program Report # 45.

³ Joseph Alcamo and Eric Kreileman, *The Global Climate System: Near Term Action for Long Term Protection* (Netherlands: National Institute of Public Health and the Environment, February 1996) calculates various “safe landing” corridors of emissions that would avoid both changes in climate that are too extreme and unrealistically rapid emission reductions in the future. The most conservative definition of a safe landing still involved faster increases in temperature than seen in the last 10 000 years. To reach the most conservative safe landing corridor, emissions from Annex 1 Nations would need to be reduced by between 37% and 64% of 1990 levels by 2010.

VITIATING THE PROTOCOL: LOOPHOLES AND WEAKNESSES

Whether or not the *Kyoto Protocol* is effective in mitigating climate change or beginning the shift to a low carbon economy will depend on whether it entails a truly significant change from business as usual. The results of international climate negotiations over the next year will determine if the *Protocol* presents an effective change from business as usual or simply an elaborate mechanism that allows greenhouse gas emissions to continue unchecked. This section identifies a number of key issues and potential loopholes that could effectively vitiate the *Kyoto Protocol*.

COMPLIANCE AND LIABILITY UNDER KYOTO PROTOCOL

The *Kyoto Protocol* is generally silent on the issue of compliance, merely stating that Parties will approve appropriate procedures and mechanisms to determine and address cases of non-compliance, including an indicative list of consequences, taking into account the nature of non-compliance. Based on experience with existing environmental treaties, there is a risk that the compliance provisions of the *Protocol* may prove inadequate. Few international environmental agreements contain strong enforcement provisions and fewer rely on such provisions. Instead, the enforcement of compliance depends on peer or public pressure on nations, and there is a higher risk of non-compliance when compliance is viewed as contrary to a nation's narrow self-interest.⁴ Two factors suggest the need for particularly strong compliance provisions in the context of the *Kyoto Protocol*:

- The relation between greenhouse gas emissions and some economic activities will inevitably create significant domestic pressure for non-compliance by producers of emissions intensive goods. Indeed, non-compliance could give certain sectors competitive advantages that are comparable to the advantages created by non-compliance with trade agreements. The global community has long recognized the need for strong enforcement provisions in trade agreements to ensure compliance.
- Emissions trading provisions in the *Protocol* create a situation where there is a potential to profit from the sale of AAUs while not constraining emissions growth. In particular, governments are likely to be tempted to make sanguine projections of emission reductions to justify massive selling of allowable emissions; subsequent governments may not accept the responsibility of buying those units back.

The history of compliance with the *UNFCCC* buttresses the fear that governments may delay taking meaningful reduction actions in the absence of clear commitments accompanied by consequences.⁵ Despite the clear need for strong compliance provisions, a number of proposals – many of them being actively championed by Canada or the U.S. – threaten to undermine an effective compliance system.

⁴ United States General Accounting Office, "Literature on the Effectiveness of International Environmental Agreements" (May 1999) GAO/RCED-99-148.

⁵ Although the *UNFCCC* includes a commitment from industrialized countries to adopt policies with the aim of stabilizing at 1990 levels by 2000, this commitment has been honoured largely in the breach. Six years after the Climate Convention was negotiated Parliament's Environment Commissioner concluded that many of the key elements necessary to manage the implementation of Canada's response to climate change were still missing or incomplete. Our primary response has been a program that challenged the private sector to voluntarily reduce its emissions. Emissions are currently 13.5 % above 1990 levels.



Postponing the Day of Reckoning: US Proposals for Borrowing

One of the greatest threats to an effective compliance regime is the US proposal for “borrowing.” Under this proposal, a nation that is out of compliance at the end of the first commitment period (and has not bothered or been able to purchase international emission allowances) would subtract their excess tonnes from the next compliance period allocation. In addition they would pay a penalty of extra tonnes.⁶ Although the United States has tried to package this as a penalty for non-compliance, it is essentially a re-packaging of US borrowing proposals that were rejected in the 1997 Kyoto negotiations. Parties would be able to exceed their initial budget by borrowing tonnes from a future budget, paying interest in the form of extra reductions in the future.

Nominally this keeps the atmosphere whole. In theory excess tonnes in one compliance period are balanced by excess reductions in the next. Practically, however, borrowing has the potential to undermine the *Protocol*:

- **Excuses delay in domestic action.** A government can choose to delay action by reasoning that it will be able to borrow, and make greater future reductions in the future.
- **Potential for punitive consequences are eliminated.** A nation can avoid any immediate consequences from non-compliance by borrowing its way out of non-compliance. More significant consequences – such as trade sanctions or penalties – are avoided. While nominally required to reduce more in the next compliance period, governments can instead simply borrow again or negotiate a higher limit.
- **Negotiating stringent limits becomes harder.** National limits are negotiated by consensus; governments saddled with an emissions debt due to past inaction are unlikely to accept stringent limits.
- **No “banker” exists to monitor risk of bad loans.** Unlike borrowing from a bank there is no banker to assess the risk of future non-compliance or to call in bad loans.
- **Delaying domestic action by one nation increases transition costs for other Parties.** Borrowing, by allowing Parties to choose delayed reductions, increases any transition costs for countries that work to meet the emission reduction schedule laid out in the *Protocol*. Energy intensive industries in these Parties will potentially face unfair competition in nations that have deferred compliance.

Compliance Fund

An alternative means of ensuring that any excess emissions are balanced by future reductions is the Compliance Fund. It is generally assumed that at the end of each commitment period Parties will have a relatively short “true-up” period in which they can balance actual emissions and allowable emissions. A nation that has excess emissions in this period will have the option of purchasing AAUs, or CERs to balance their emission budget, but the supply of these credits may be insufficient to meet demand.

⁶ United States (July 30, 1999) “Responses to Questions Related to A Compliance System under the *Kyoto Protocol*”

The Compliance Fund fulfils the same function as borrowing in this situation. It makes sure that any excess emissions are balanced by reductions, but unlike borrowing, it does not undermine effective compliance. Any nation that exceeds its emission budget can avoid non-compliance by paying a fee that funds highly credible and reliable projects that reduce greenhouse gases in an amount equal to the overage. Payment into the Fund would be immediate, unlike borrowing where consequences of excess emissions are delayed. Thus, the day of reckoning would not be indefinitely postponed. The fee would be large enough to deter Parties from using it, except as a last resort, and Parties would be better off reducing emissions during the commitment period. A portion of the compliance fund could be devoted to helping developing countries adapt to climate change.

Recommendation: Compliance Fund; No Borrowing

Establish a Compliance Fund allowing any nation that exceeds its assigned amount to pay a fee dedicated to funding highly credible and reliable emission reduction projects in an amount equal to or greater than the overage. Do not allow borrowing, either as a flexibility mechanism or as an enforcement mechanism.

Range of Enforcement Responses

A second major potential weakness of the compliance regime is that the range of responses to non-compliance may be very limited. Virtually all parties agree on the need for “soft responses” such as facilitation in complying with the technical aspects of the *Protocol*, and most parties have been open to withdrawal of treaty privileges such as the ability to sell AAs or loss of voting rights. However, Canada and many other countries have rejected the possibility of including trade sanctions or enforceable financial penalties in the responses available for cases of non-compliance. While facilitating compliance and soft sanctions might be an effective way of compelling compliance for parties who hope to benefit from sales of emission rights or financial assistance, it is unlikely to compel compliance for a party that has excess emissions.

Other environmental treaties and trade treaties have included the potential for trade sanctions or financial penalties. The *North American Agreement on Environmental Cooperation* provides for the assessment of monetary penalties against parties that do not enforce environmental laws. In the case of Canada, these are enforceable in Canadian courts. Mandatory payments into a Compliance Fund would be an appropriate response to non-compliance. Payment could in turn be enforced either by making penalty assessments enforceable in domestic courts or through trade sanctions.

The list of potential penalties for non-compliance with the *Montreal Protocol on Substances that Deplete the Ozone Layer*⁷ includes suspension of treaty privileges, specifically noting the potential for loss of trade privileges.⁸ Combined with both provisions banning trade in ozone depleting substances with non-parties, and the potential for banning trade in

⁷ Available at http://www.unep.ch/ozone/mont_t.htm

⁸ See Annex V to Report of the Fourth Meeting of the Parties to the *Montreal Protocol* available at http://www.unep.org/ozone/4mop_cph.htm



substances produced with ozone depleting substances,⁹ the *Montreal Protocol* allows for a wide range of sanctions for non-compliance.

Since the primary greenhouse gases are not traded as a commodity, banning trade in the gases themselves would be ineffective, but including the potential for trade restrictions on energy intensive goods or fossil fuels would help ensure that Parties cannot ignore the *Kyoto Protocol* with impunity. It would also be consistent with trade agreements' provisions for trade sanctions aimed at the sectors that benefit from non-compliance. The same rationale for making trade agreements enforceable through trade sanctions – avoiding the creation of unfair trade advantages – also suggests the need for trade sanctions to ensure compliance with the *Protocol*.

Liability

The problems of a weak compliance regime may be exacerbated by an approach to emissions trading that allows Parties buying AAUs to ignore whether the vendor is in compliance with emission limits and emissions reporting regimes. Under the terms of the *Kyoto Protocol* as it stands, there are no provisions for discounting or invalidating AAUs purchased from a nation that is out of compliance. Nor are there any restrictions on trading privileges associated with actual or potential non-compliance.¹⁰ Under a seller liability system, liability for non-compliance lies solely with the seller of AAUs. Parties interested in maintaining nominal compliance can increase emissions while buying ERUs or AAU from Parties that are out compliance or clearly on a path to non-compliance. The combination of a weak compliance regime and seller liability means that the environmental effects of one nation's non-compliance can multiply and spread.

A number of safeguards have been proposed to ensure that a few Parties' non-compliance does not undermine the entire system:

- Automatic loss of eligibility to transfer AAUs when a nation is out of compliance with inventory and reporting provisions of Articles 5 and 7;
- Annual surrender of AAUs equal to actual emissions for that year; and
- Requirements for Parties that have been out of compliance in past commitment periods to maintain a compliance reserve of excess AAUs in future commitment periods.

While these measures provide some limited protection against non-compliance, they would still allow a nation to vastly exceed its emissions budget while at the same time selling AAUs. It is possible to imagine a situation where a nation in dire economic difficulty might sell most of its allocation prior to the time when any surrender

⁹ See Article 4 of *Montreal Protocol*.

¹⁰ Future rules for trading developed under article 17 could specify a buyer beware system, but nations supporting trading have consistently supported a seller beware system. Article 6.4 provides that the buyer is only at risk if questions are raised under article 8 regarding compliance with "requirements referred to in this paragraph". Presumably "this paragraph" refers to all of article 6 since there are no requirements in article 6.4. Therefore, it is irrelevant whether or not the seller is in compliance with its emission reduction commitments. Article 17 is silent on liability, although article 3 refers to transfers of allowable emissions from one nation to another without anything suggesting that transfers would be invalidated if the seller were out of compliance.

requirements or reporting requirements would kick in. Their emissions, meanwhile, could continue to grow. Buyer liability on a last in first out basis– i.e. invalidating AAUs originating from a non-complying nation equal to the amount of excess emissions and starting with invalidation of the most recently transferred AAUs – is essential to guard against one nation’s poor behaviour vitiating the environmental impact of all Parties’ commitments. This would lead to a situation where Parties on track to compliance would be able to sell AAUs at a premium. This creates an incentive for Parties to comply quickly with reporting requirements and take strong, transparent measures to reduce emissions.

The main arguments made against buyer liability is first that one nation’s excess emissions could lead to a wave of non-compliance, and second that buyer liability adds to the transaction costs of trading. Both of these arguments are legitimate concerns, but both can be dealt with in the design of a system.

First, the concern regarding a wave of non-compliance stems from the following. If AAUs sold by Nation X to Nation Y were invalidated due to Nation X’s excess emissions, Nation Y would be out of compliance, and any nation purchasing from Nation Y would be out of compliance. Non-compliance could spread to nations purchasing only from “reputable” sellers. This problem can be avoided by a combination of joint liability and the Compliance Fund. Thus, if, for instance, Russia sells AAUs to a Canadian company and Russia is subsequently found out of compliance, the Canadian company, government or a guarantor of the AAUs would be able to either purchase valid AAUs on the market or pay into the Compliance Fund. To ensure that the costs of remedying invalidated AAUs are not transferred onto government, governments could impose requirements that users of internationally purchased AAUs have financially responsible organizations guarantee the validity of AAUs. So long as an approximate price for Compliance Fund units is known, the risk is insurable. Moreover, standard contracts between the seller of AAUs and buyers would give the guarantor a subrogated claim against Russia to cover the guarantors cost of payments into the Compliance Fund.

Second, while buyer liability does impose transaction costs – e.g. the cost of arranging guarantees and assessing Parties’ risk of non-compliance – it is comparable to transaction costs involved in purchasing corporate bonds. Provided Parties are required to provide timely inventories and reports on measures taken to reduce emissions, the market should be able to assess risk.

Recommendation: Full Range of Enforcement Responses

Ensure that the Compliance Bodies have a full range of both potential and automatic responses to non-compliance. These should include facilitation for Parties having difficulty with compliance, automatic restrictions on eligibility to sell AAUs from Parties out of compliance with either emission limits or reporting requirements, and a graduated range of hard enforcement responses. The latter should include loss of treaty privileges, financial penalties and trade sanctions against greenhouse gas intensive goods.

Recommendation: Joint Liability

Establish Trading Rules that impose Joint Liability in conjunction with a Compliance Fund. Domestic rules should require financially solvent institutions to guarantee AAUs.



CLEAN DEVELOPMENT MECHANISM AND CREDIT FOR BUSINESS AS USUAL

One of the main weaknesses of the *Protocol* is the possibility that under the clean development mechanism, credit will be given for projects which would have occurred in the absence of the mechanism. The *Kyoto Protocol* requires “reductions in emissions that are additional to any that would occur in the absence of the certified project activity.” This appears to be a requirement for “emissions additionality.” It does not require the project to be something that would not have occurred in the absence of the mechanism, i.e., it does not require “project additionality.” Therefore, credit could potentially flow from a project that reduces emissions but would have occurred anyway. If credit is given for such a project, and is used to avoid making an emission reduction in Annex B Parties, the net effect is to undermine the significance of that country’s emission reduction commitments. Because non-Annex B Parties are not subject to emission caps, there is no safeguard to ensure the realization of true reductions in emissions from business as usual.

The problem of credit being given for projects that are not additional is inherent in any system for generating credit outside of the Parties subject to binding limits. It is acute because many of the emission reduction projects for which credit is given are profitable or worth doing for reasons such as reducing local air pollution. Projects that reduce emissions occur all the time; they simply do not occur in the numbers to counteract the general trend to higher emissions.

There do not appear to be any efforts to quantify the reduction in *Kyoto Protocol* effectiveness that might occur as a result of non-additional emission reductions, and any such calculation is likely to be highly dependant on a range of uncertain assumptions. However, efforts to estimate the total size of the CDM market indicate that this loophole could be significant. A MIT study suggests a range for the size of the CDM market of between 593 megatonnes of carbon per year and 844 megatonnes, with a mid-point of 723 megatonnes.¹¹ If a mere ten percent of CDM credits represent reductions that are not real or would have occurred anyway, the result is 60 to 70 megatonne increase in Annex B emissions over what would be in the absence of trading or loopholes – roughly a two percent increase. The ten- percent figure is arbitrary and this loophole could be significantly larger.

The best way to mitigate the problem of credit being given for projects that would have occurred anyway is to establish stringent criteria for setting the baselines against which emissions additionality is measured. Benchmarks or technology matrices can be used to set appropriate baselines. Benchmarks are performance standards (e.g. y k.g. CO₂ per kWh) developed from criteria or objectively verifiable information such as emission intensity of recently established facilities within a sector. Benchmarks and baselines can float to reflect the ongoing improvements in efficiency brought about by the normal process of retrofitting and upgrading. Technology matrices identify a range of different technologies being used in a sector and set out which technology will be used to set

¹¹ A.D. Ellerman et al., “The Effects on Developing Countries of the Kyoto Protocol and CO₂ Emissions Trading” (November 1998) MIT Global Change Joint Program, Report # 41. Other studies have given widely variable results for CDM market size – from a low of 103 to a high of 723: see Christian Vrolijk “The Potential Size of the CDM Market” in *global Greenhouse Emission Trader* Issue 6, February 1999.

baselines in a particular application. Technology matrices need to be updated frequently to reflect trends in technological improvement.

To ensure environmental integrity of emissions trading, benchmarks or baseline technologies need to be set at a level where the amount of credit received for emission reductions from non-additional projects is equal to the amount of un-credited additional emission reductions. Once a benchmark is set, non-additional reductions from a cutting edge project that would have surpassed the chosen benchmark or baseline technology in the absence of credit trading may be credited. As well, while some projects would have fallen short of the benchmark in business as usual, as a result of the CDM, they are altered and surpass the benchmark. These projects will only receive partial credit (based on the extent to which the benchmark is surpassed) for their additional emission reductions.

An advantage to benchmarking and technology matrices is that they are developed for a large number of projects with multilateral oversight. In this context, there is greater transparency in the setting of baselines, and more scrutiny applied to the appropriate benchmarks or technology matrices. In comparison, project by project baseline setting is more open to gaming as both host country and the purchaser of CERs have an incentive to exaggerate the emission reductions achieved by a project, arguing that project specific conditions would have lead to a more emissions intensive technology in the absence of the CDM.

Recommendation: Benchmarking and Technology Matrices

The quantification of certified emission reductions should be guided by the principle that the CDM should not reduce the environmental effectiveness of the *Kyoto Protocol*. To achieve this, the CDM should be limited to projects for which agreed technology matrix or benchmarking methodologies have been established. Benchmarks or reference technologies should represent best standard practices and baselines should be adjusted to reflect general improvements in technology. Only actual measured reductions should be credited.

EMISSIONS TRADING AND HOT AIR

From an environmental perspective, the biggest problem with trading is the trading in "hot air." Eastern European nations have emission allowances for the 2008 to 2012 compliance period that exceed their likely emissions under a business as usual scenario. For instance, Russia and the Ukraine are both allowed to emit at 1990 levels in the compliance period. However, due to the collapse of their economies emissions are currently far below 1990 levels. Russian carbon dioxide emissions are currently only 74% of 1990 emissions. Projections for 2010 range from emissions being anywhere between 70% and 90% of 1990 levels by 2010.¹² Under trading rules supported by most non-EU-

¹² US Energy Information Administration, above at footnote 1, estimates former Soviet Union emissions to be 69% of 1990 emissions in 2010. Izrael, Yu *et al.*, "Mitigation Analysis for Energy System and Forestry Sector of the Russian Federation" in *Global Climate Change Mitigation Assessment: Results for 14 Transitioning and Developing Countries* (Washington, D.C.: US Country Studies Program, August 1997) at 139, projects emissions to be 81.2% in 2010, or 87.9% under an optimistic scenario for economic growth. The in-depth review of Russia's national communication projects these emissions to increase to between 80 and 90% of 1990 levels by 2010: UNFCCC Secretariat, *Summary of the Report of the In-Depth Review of the National Communication of the Russian*



developed nations, eastern European nations would be able to sell these surplus allowable emission rights. Allowable emission rights that are surplus to business as usual emissions (or “hot air” as they are colloquially referred to) will allow Parties buying the rights to increase their emissions while the Parties selling them do nothing to reduce emissions. Estimates of hot air from the former Soviet Union and Russian range from 111 to 318 megatonnes per year.¹³ This allows a three to nine percent increase in Annex B emissions relative to what they would be in the absence of trading and any loopholes.

Hot air has often been justified on the basis that it would help Russian, the Ukraine and other struggling eastern European economies with their difficult transitions to a market economy. However, it is likely that removing hot air would lead to many investments in the Russian economy that would make it more efficient while at the same time reducing emissions. While hot air will encourage a flow of cash to Russia, it does not encourage changes that will help the Russian economy and reduce emissions. Moreover, there is a risk that money transferred could be simply lost to corruption. Without hot air, there is an incentive to invest in the profitable emission reduction measures that abound in the inefficient Russian economy.

A number of mechanisms have been suggested for limiting hot air:

- Limiting AAUs available for trade to the lower of assigned amounts or the product of GDP during the commitment period multiplied by a nation’s emissions intensity in 1990. Thus, if the Russian economy recovers to 100% of 1990 levels, any reductions below 1990 levels would be tradable. If the economy recovers to 90% of 1990 levels and reductions are 80% of 1990 levels, ten percent of the Russian budget would be tradable;
- Using joint implementation (project based trading) as the only basis for trading with Parties that have projected emissions below their assigned amount; and
- Placing limits on the sale of AAUs by Parties.

Of these, the first encourages economy wide reforms within to reduce emissions, and the second encourages investment in specific projects. The third may limit hot air, but eliminates cost savings in achieving real emission reductions. The first two can be combined so long as calculations of improvements in energy intensity exclude the effect of credited Joint Implementation projects. As well, under the first, the Russian economy would fair well due to shifts from coal to natural gas.

Limiting hot air trading is not inconsistent with the *Kyoto Protocol*. During negotiations of the *Protocol*, Russia projected rapid economic recovery that would, in the absence of action, bring emissions back up to 1990 levels. Thus, Russia’s lax target is as much a reflection of over-optimism as it is a decision to allow hot air trading. The absence of rules

Federation (Geneva: FCCC Secretariat, 1997). Note the emissions referred to are for CO₂ from energy use only; however, this represents 72% of Russian greenhouse gas emissions in 1990 and is closely tied to methane emissions from energy production and transport which represents 20% of total Russian emissions.

¹³ These estimates replace earlier estimates of hot air by the author. The US Energy Information Administration, above at footnote 1, estimates hot air from the former Soviet Union as being 261 megatonnes per annum. in 2010, and estimates 56 megatonnes per annum. hot air from Eastern Europe. MIT estimates hot air being only 111 megatonne per year: Ellerman, above at footnote 11.

and guidelines for trading in Article 17 and the direction to determine these rules at a later date mean that hot air is an unresolved issue.

Recommendation: Limiting Hot Air

Limit hot air by limiting the AAUs available for trade to the lower of assigned amounts or the product of GDP during the commitment period multiplied by a nation's emissions intensity in 1990.

THE TREATMENT OF FOREST AND SOIL SINKS

Articles 3.3 and 3.4 of the *Protocol* call for adjustments to nation's allowable emissions quotas to reflect sequestration of carbon from the atmosphere due to direct human-induced land use change and forestry activities. Before discussing which activities may or may not be included, it is worthwhile noting some of the concerns with the inclusion of sinks under the *Kyoto Protocol*:

- **The Gross/Net Problem.** For most Parties, only the commitment period emissions are adjusted for land use change and forestry activities. However, most Annex B Parties had substantial net sequestration of carbon in 1990 and this net sequestration is projected to continue into the first commitment period under business as usual scenarios. Indeed, actual or projected net removals from land use change in forestry from Annex B Parties are nine percent of 1990 Annex B emissions.¹⁴ If all of this were credited it would amount to a nine percent increase in Annex B emissions over what is allowed in the absence of credit for sinks.
- **The Missing Sink.** For decades scientists have been unable to account for between 1.1 and 2.2 petagrams (1,100 to 2,200 megatonnes of carbon), an amount equivalent to 28 to 56 percent of Annex B 1990 emissions.¹⁵ Scientists are increasingly suggesting that the missing sink is located in northern (Annex B) forests and wetlands. Any crediting of a significant amount of this natural sequestration activity would defeat the effectiveness of the *Protocol*.
- **Quantification and Verification.** Measurements of carbon sinks are highly uncertain and can be radically different depending on methodologies. For instance, if Canada counts only above ground increments in sequestration due to regeneration after harvesting, it receives a credit equal to two percent of 1990 emissions in 2010. If both above and below ground carbon are counted, the result is net emissions to the atmosphere. Although uncertainty and methodological issues exist with other emissions (e.g. nitrous oxide from agricultural soils) the significance of the emissions are much lower so that uncertainty is unlikely to provide a mask for significant excess emissions.
- **Permanence and the Carbon Time Bomb.** Sequestering a tonne of carbon from the atmosphere will only have the same impact on the atmosphere as reducing a tonne of emissions, if the sequestration is permanent. There is no guarantee that carbon stores

¹⁴ See Appendix 1. These estimates are based on current IPCC measurement methodologies that were not intended for use to determine compliance with quantitative limit; more rigorous methodologies could increase the estimate of the gross/net effect.

¹⁵ Jocelyn Kaiser, "Possibly Vast Greenhouse Gas Sponge Ignites Controversy" (16 October 1998) v. 282 *Science* p. 386.



can be guaranteed for centuries, let alone millennia. Given risks of reversals of forest sequestration due to climate induced die back, sequestration is a high-risk strategy.

These problems permeate the sinks issue, whether it be inclusion under the CDM, how article 3.3 is interpreted or what sinks are added under article 3.4. However, there are a number of additional problems peculiar to the specific sections.

Article 3.3

Article 3.3 of the *Kyoto Protocol* 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 stocks in each commitment period shall be used to meet the commitments in this Article [i.e. emission limits for the first commitment period] of each Party included in Annex B.

Due to difficulties interpreting and applying the sinks provisions of the *Protocol*, Parties to the *Protocol* requested a Special Report on Land Use, Land Use Change and Forestry from the Intergovernmental Panel on Climate Change, an international scientific advisory group. Early analysis by West Coast Environmental Law¹⁶ had suggested that the most likely interpretation of Article 3.3 is that a nation's emissions during the first commitment period would be determined by:

gross emissions (i.e. all emissions not related to carbon reservoirs);

minus

- removals during the period 2008 to 2012 if these removals result from reforestation or afforestation since 1990;

plus

- emissions during the period 2008 to 2012 if these emissions result from deforestation since 1990.

West Coast Environmental Law suggested that afforestation, reforestation and deforestation would all need to be defined by reference to changes in land-use if Article 3.3 is to be interpreted in a balanced way. Neither growth on lands re-planted after harvesting nor emissions from harvesting areas that remain in forest use would be counted if there were to be a fair accounting with any scientific validity.¹⁷ This initial analysis is borne out by early drafts of the IPCC Special Report. However, Canada and

¹⁶ Chris Rolfe, "Kyoto Protocol to the United Nations Framework Convention on Climate Change: A Guide to the Protocol and Analysis of its Effectiveness", (January 22, 1998) West Coast Environmental Law Association.

¹⁷ This approach is consistent with IPCC definitions for afforestation ("planting of new forests on lands which, historically, have not contained forests") and reforestation ("planting of forests on lands which have, historically, previously contained forests but which have been converted to some other use."); Intergovernmental Panel on Climate Change, Working Group I. *Revised 1996 IPCC Guide lines for National Greenhouse Gas Inventories: Reporting Instructions* Glossary, (Geneva: IPCC, 1996). In practice, afforestation is usually used to refer to lands that have not been covered by forests for over 50 years, while reforestation refers to land cleared in the last 50 years. Deforestation is not defined, but it is likely to include the category of emissions the IPCC calls forest conversion. It will likely exclude harvesting followed by replanting or natural regeneration of forests as this would result in a huge, unfair penalty to nations with forestry operations and relatively long rotation periods between harvests.

other countries have argued that “reforestation” should include carbon sequestration due to regeneration after harvest, (even though the opposite side of the ledger -- emissions due to harvesting -- are not counted).

Currently, there is a dearth of data regarding the global implications of different definitions for reforestation, deforestation and afforestation. However, estimates for Canada indicate that the effect of an unbalanced approach to Article 3.3 could be significant. In the first commitment period, counting carbon sequestration from regeneration after harvest would give Canada a -2 to 13 megatonnes CO₂ credit during 2010. The negative figure represents actual sequestration if all above and below ground carbon stocks are counted. If the unbalanced approach to counting reforestation were to continue into later commitment periods, Canada would gain a credit of 37 to 42 megatonnes CO₂ -- six to seven percent of Canada’s GHG emissions – by 2020. Thus, in the case of Canada, the unbalanced approach to defining reforestation could reduce the environmental effectiveness of the *Protocol* by an amount equal to two percent of 1990 emissions in the first commitment period and, if extended into second and third commitment periods, would decrease environmental effectiveness by an amount equivalent to six or seven percent of Canada’s emissions. This possibility is particularly troublesome given the fact that the emissions associated with harvesting may be excluded.

There is also risk that definitions of reforestation could create an incentive to log old growth prior to 2008 and then claim credit for planting on clearcuts. This is true if either reforestation is defined to include re-planting after harvesting or if reforestation includes re-establishment of a forest on land taken out of agricultural production for a short time.

Recommendations: Article 3.3

Any inclusion of sinks under Article 3.3 should be based on a balanced approach that is consistent with the findings of the IPCC Special Report. The definition of reforestation should only include land that is reconverted to forest use after being taken out of forest use for a period of at least one decade.

Article 3.4

In addition to Article 3.3, Article 3.4 establishes a process for potentially including emissions and removals from land use change and forestry categories other than those included in Article 3.3:

The Conference of the Parties ... shall ... decide upon modalities, rules and guidelines as to how and which additional human-induced activities related to greenhouse gas emissions and removals in the agricultural soil and land use change and forestry categories shall be [included in determining whether a party is in compliance with emission limitations]... Such a decision shall apply in the second and subsequent commitment periods. A Party may choose to apply such a decision on these additional human-induced activities for its first commitment period, provided that these activities have taken place since 1990.

The potential for crediting of sequestration that is already occurring, even though there is no net increase in sequestration from 1990 (the gross-net problem and the missing sink problem) is particularly problematic. When combined with any



possibility that credit may be claimed for the missing sink, the implications for the *Kyoto Protocol* are very negative.

Recommendations: Article 3.4

The methodologies for including any additional activities under Article 3.4 should be consistent with the IPCC Special Report, and should ensure that credit is not given for non-incremental activities. Sequestration credits should be discounted to reflect uncertainties and the risk of sequestration being reversed.

Hot Air from Australia

Under Article 3.7 Australia, the UK and Estonia¹⁸ are allowed to base their 1990 baseline on net emissions — i.e. the baseline will include net emissions from land use change and forestry. From Australia's perspective, this was necessary so that it could continue with its high level of deforestation. For Australia, in 1990 the total of gross emissions plus net emissions from land use change and forestry was 23% higher than gross emissions.¹⁹

While Australia counts all of its land use change and forestry emissions in determining allowable emission limits, only emissions from deforestation will be counted in determining whether or not Australia is in compliance. If all of Australia's 1990 emissions were from deforestation, Australia gets a small advantage on top of its relatively high emission limits (108% of 1990 levels). Since 1990, Australia's net emissions from land use change and forestry have declined and continuing decline is projected.²⁰ This advantage is relatively small — about a 3% boost²¹ over the 108% increase already allowed.

However, if Australia's 1990 land use change and forestry emissions were not all from deforestation the boost becomes even greater. Based on the in-depth review of Australia's national communication, it is not clear that all Australia's 1990 land use change and forestry emissions fall within the IPCC's deforestation category. It could also come from changes in levels of carbon stored in forests, conversion of grasslands to agriculture and soil erosion. If half of Australia's emissions in 1990 came from sources other than deforestation, Australia would be able to increase gross emissions by 121% while doing nothing to reduce rates of deforestation. Estonia and the United Kingdom may also receive a windfall of allowed emissions, but the effect is much less significant.

¹⁸ These three countries were the only countries to have net emissions from land use change and forestry in 1990: see Framework Convention on Climate Change Secretariat *Compilation and Synthesis of National Communications from Annex 1 Parties*, Doc. No. FCCC/SBI/1997/INF.4 (Geneva: FCCC Secretariat, 1997) at page 16 and Framework Convention on Climate Change Secretariat "CO₂ emissions in land-use change and forestry" (1996) Table B.2 (available at UNFCCC web site).

¹⁹ Derived from Framework Convention on Climate Change Secretariat documents, *Ibid*, and UNFCCC Secretariat, *Summary of the Report of the In-Depth Review of the National Communication of Australia* (Geneva: FCCC Secretariat, 1995).

²⁰ Framework Convention on Climate Change Secretariat, *Ibid*.

²¹ Australia's projected total emissions from land use change and forestry for 2000 are positive but seven percent less than 1990 levels: *Ibid*. The 3% figure assumes another 7% reduction in emissions from land use change and forestry by 2010.

SOUTHERN HOT AIR

In the November 1999 international climate talks, Argentina announced its willingness to adopt a voluntary cap on emissions, to be two to ten percent below business as usual emissions depending on the two variables that affect Argentinean emissions most significantly: economic growth and world commodity prices for livestock. Argentina also noted that it did not intend to abandon its status as a developing country; it was not adopting the sort of legal limit imposed on Annex B Parties.

Similarly, Kazakhstan announced its intent to accede to Annex 1 of the *Framework Convention on Climate Change*. Under the strict terms of Article 6, this could allow Kazakhstan to participate in Joint Implementation, even though it does not have an assignment of allowable emissions under Annex B.

In either case it is essential that any voluntary commitments by non-Annex B parties need to ensure against hot air. If either Argentina or Kazakhstan are allowed to participate in joint implementation or international emissions trading, the cap on emissions must be below business as usual, and they must be subject to the same reporting and monitoring requirements as Annex B nations. Together Kazakhstan and Argentina emitted 130 megatonnes of carbon equivalent in 1995 (about 3 percent of Annex B 1990 emissions). Thus, the potential for hot air from these two countries alone is limited; however, it is essential that a precedent not be created for future luring of developing nations into voluntary commitments by offering inflated emissions caps. The consequences of doing so could be very significant as non-Annex B total emissions approach Annex B emissions (per capita emissions remain far lower).

This does not mean that developing countries cannot be lured into accepting emissions caps. Caps set at levels below business as usual can attract considerable investment into a developing country due to the abundance of low cost emission reduction opportunities. Moreover, they allow developing countries to profit from reforms that reduce emissions throughout the economy. The Argentinean approach of adopting a cap that floats with well-defined variables has merit as it helps overcome fears that caps may limit economic development. However, any such proposals need to be carefully analyzed to ensure that they do in fact represent caps that are below business as usual. In particular, caps need to reflect the trend toward lower emissions intensity as economies mature.

Recommendation: Voluntary Commitments

Participation in joint implementation or emissions trading should only be allowed where a Party accedes to the same monitoring and reporting requirements as Annex B Parties. Participation in these mechanisms should only be allowed for Parties that adopt caps that clearly represent reductions in business as usual emissions.

1995 BASELINE FOR 3 GASES

As noted above, countries are allowed to use 1995 as a baseline for emissions of hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride. This was, in part, necessary because of lack of data for 1990. However, because hydrofluorocarbons were used as a replacement for ozone depleting chemicals that were being phased out in the early 1990s, emissions of these gases during the period 1990 to 1995 skyrocketed. Although a 1995 baseline was preferable to the exclusion of the three trace gases, it



reduces the effectiveness of the emission limitations. The use of a 1995 baseline will allow Annex B Parties to increase total emissions by approximately one percent.²²

THE CUMULATIVE EFFECT OF WEAKNESSES AND LOOPHOLES

In summary, the cumulative effect of all the above weaknesses and loopholes could be to vitiate the *Kyoto Protocol*. In some cases the problems identified could, in and of themselves, negate the environmental effectiveness of the *Protocol*.

As noted above, if the emission budgets in the *Kyoto Protocol* were strictly adhered to – i.e. if each nation listed in Annex B simply reduced emissions to its assigned amount and did not engage in international emissions trading, joint implementation or the clean development mechanism, and did not claim credit for carbon sequestration in soils or forests – the result would be an overall ten percent reduction of Annex B emissions from 1990 levels or a 21% reduction from business as usual trends. This impact needs to be compared against the following:

Weakness or Loophole	Comments	Impact Megatonnes per annum Carbon equivalent	Excess Emissions Resulting from Weakness or Loophole as a Percent of Annex B 1990 Emissions
Weak Compliance	Could negate entire impact	?	?
CDM Baselines	Estimate crude; amount could be significantly higher	60-70 or more	2%+
Hot Air		111 to 318	3-9%
Sinks: Art. 3.3 & 3.4	Impact of gross net approach based on national communications. Any inclusion of hidden sink could result in far larger reduction in effectiveness.	365	9%
1995 Baseline for 3 gases		35	1%

²² Derived from “Review of the Implementation of Commitments, Second Compilation and Synthesis of second national communications” FCCC/CP/1998/11/Add.2 Table A.10

Over the next year, it is essential for negotiators to focus on strengthening the *Kyoto Protocol*, not reducing its effectiveness. Failure to do so will potentially negate the effectiveness of the *Protocol*.



Party	LUCF Removals 1990 or 1997	Notes: Data from 2010 projected, 1997 actual or 1990 actual. NE = LUCF sector net emitter NA = data not available	Gross Emissions 1990
Aus		NE	
Austria	13,753	1997	73,727
Belgium	2,057	2010	139,276
Bulgaria	7,807	2010	136,093
Canada	19,000	1997	599,450
Czech	5,000	2010	189,837
Denmark	2,063	2010	71,658
Estonia	11,546	2010	
Finland		NA	
France	64,906	2010	561,330
Germany	33,493	1997	1,210,047
Greece		NA	
Hungary	3,097	1990	101,634
Iceland		NA	
Ireland	9,690	2010	56,861
Italy	24,507	2010	533,762
Japan	55,811	2010	1,213,262
Latvia	13,752	2010	35,669
Liech	22	1990	260
Lithuania	7,667	2010	51,548
Luxembourg	295	2010	13,448
Monaco		NA	
Netherlands	1,700	2010	217,052
NZ	21,208	2010	72,516
Norway	14,800	2010	51,874
Poland	40,521		564,286
Portgual	1,152	1990	68,442
Romania	2,925	1990	264,879
Russia	550,000	2010	3,040,062
Slovakia	7,957	2010	72,496
Slovenia	2,293	1990	19,212
Spain		NA	
Sweden	22,000	2010	69,467
Switzerland	5,100	2010	53,749
Ukraine	70,702	2010	919,220
UK		NE	
USA	400,030	2010	5,983,570
Totals:	1,414,85		16,384,687

4

Estimated increase in GHG emissions relative to 1990 levels that occurs if there is full inclusion of land use change and forestry activities and a gross net approach is used: 8.6%

Notes:

Based on United Nations Framework Convention on Climate Change, Conference of the Parties, *Second Compilation and Synthesis of Second National Communications*. (7 October, 1998) FCCC/CP/1998/11/Add.2, Table C.2; and United Nations Framework Convention on Climate Change, Subsidiary Body for Implementation, *National Communications from Parties Included in Annex 1 to the Convention, Greenhouse Gas Inventory Data, 1990-1997*. (29 September, 1999) FCCC/SBI/1999/12, Tables A1 and A2.

Projections for 2010 removals have been used where available. Where not available, data for 1997 net removals have been used in preference to 1990 data. Total removals using 1990 and 1997 data only are 1,637,004.

The estimates of LUCF removals used in this document are based on IPCC methodologies that were not intended for determination of compliance with a legal limit. Data using more rigorous methodologies is not available.

If more rigorous IPCC methodologies are developed and include all emissions and removals in the Land Use, Land Use Change and Forestry sectors, the result could be an increase in the significance of the Gross Net Approach. This is due to the fact that certain IPCC assumptions clearly underestimate net removals (and thus the environmental significance of sinks). For instance, the IPCC assumes that all carbon sequestered in a tree is released on logging; in fact a significant portion of the sequestered carbon continues to be sequestered in forest products.

