COOPERATIVE MECHANISMS UNDER THE KYOTO PROTOCOL

The Path Forward

ENVIRONMENTAL DEFENSE FUND

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EXECUTIVE SUMMARY

The Kyoto Protocol, signed in December of 1997, represents a vital step forward in nations' efforts to address climate change. The Protocol includes legally binding limits on the total greenhouse gas (GHG) emissions of what are generally considered "industrialized" countries (enumerated in Annex B) and key provisions regarding accountability and flexibility. However, many believe that the ultimate success of the Protocol in meeting its emissions control objectives depends on three developments: the identification and adoption of cost-effective options for compliance, emission reductions activities that start well before 2008, and broad inclusion of Non-Annex B countries over the medium term.

Of the many potential compliance methods envisioned by the Protocol, a broad suite of methods, utilizing various types of flexibility mechanisms and what some call emissions trading, including the cooperative approaches of joint implementation, collective targets, and trading with nations that have not adopted legally binding emissions commitments, was expressly incorporated in Protocol language which establishes a framework for market-based emissions trading and related systems. As this paper demonstrates, such flexibility and market mechanisms provide important pathways to achieving the multiple objectives of successful implementation of the Protocol, achievement of early reductions, and participation of all nations, including developing nations.

After careful review of the Protocol and based on experience with emissions trading programs both in the United States and abroad, EDF has developed this paper to explain how flexibility, emissions trading and the closely related Kyoto Protocol mechanisms of joint implementation, collective targets or "bubbles", and the Clean Development Mechanism, provide a viable and useful implementation strategy for nations. At the same time it identifies those aspects of the Protocol's framework which need to be further addressed in Buenos Aires and it offers suggestions for addressing these issues.

The policy makers who will meet, or be represented, at the Fourth Conference of the Parties (COP-4) in Buenos Aires this November face both an enormous challenge and an enormous responsibility. Many believe that the devastating effects of extreme weather events that have always been a part of the climate system could turn out to be, from the retrospect of the next century, an advance snapshot of what may befall the planet on a much more frequent and intense basis if human activity continues to result in emissions that interfere with the climate system. Meanwhile recent events involving nuclear arms proliferation and news about the volatility and interdependence of economies in developed and developing nations around the world offer sharp reminders of the importance of international cooperation in confronting common threats.

This paper, for which we welcome comments and suggestions for possible future revision, is broken into eleven sections and is designed to provide detailed background on the points outlined in this Executive Summary.[1]

I. Introduction

The Kyoto Protocol on Climate Change provides:

- a first period for GHG emissions reduction commitments for industrialized nations (and any other nation that so chooses) from 2008 to the close of 2012;
- specific commitments by industrialized nations to reduce GHG emissions during this period by 5%, on average, below 1990 emissions levels; and
- a framework for trading "assigned amounts" of emissions and "certified emissions reductions," and the use of collectively adopted commitments, as means of achieving emissions reduction commitments.

From an environmental perspective, these legally binding emissions reduction commitments, if achieved, are a first step consistent with the goal of limiting warming to one degree Centigrade during the next 100 years. Failure to achieve these reductions, however, would likely lock the world into a rate of warming that in the view of many ecologists, would constitute dangerous interference with the climate system. From an economic perspective, the link between GHGs and fundamental economic activities cause many to fear that the cost of limiting their emissions will be high. For this reason, others question the capacity of any international agreement to establish a truly durable and efficacious regime for limiting these emissions. These concerns are brought into full relief when combined with concerns about the role of developing nations in contributing to climate change and their current exemption from the GHG emissions limitations under Kyoto Protocol.

Mindful of these challenges, which, of course, were prominent even before the COP-3 in Kyoto, EDF first introduced a concept of "emissions budgets" at the February 1996, meeting of the Advisory Group on the Berlin Mandate (AGBM) in Geneva at the invitation of the Netherlands. A year later, after developing this concept extensively and seeing it incorporated in the United States' January, 1997 proposal to the negotiations, EDF published "Emissions Budgets: Building an Effective International Greenhouse Gas Control System". As laid out in that paper, cumulative GHG emissions limitation and reduction commitments, or "emissions budgets," are the building blocks both of a verifiable and legally binding protocol and an effective international emissions trading market. It is through such a market that nations and businesses can address the issue of cost, flexibility and international economic competitiveness that likely will remain among their paramount concerns. At the same time, it is through the incentives created by such a market that early actions and long-term compliance by industrialized countries with their

[1] Copies of this paper and many of the cited references are available at www.edf.org. For further information, please see the contact page at the end of this paper.

GHG emissions obligations can be assured and that incentives may be provided for developing countries to participate in an international GHG regime.

To the extent that the Kyoto Protocol relies on a cumulative emissions limitation approach, each Party will be free to meet its own emissions limit commitment in any way, consistent with its own sovereign priorities, that it chooses. Each Party, acting in its sovereign capacity, will determine in accordance with its domestic processes and preferences whether to participate in international emissions trading, and which private entities, if any, it will empower to participate in such trading.

This approach is designed to capitalize on the world's greatest asset in addressing the global threat of climate change -- human ingenuity in all of its diversity. The emissions trading approach rewards those who act early to innovate, reduce emissions, and lower costs. Cumulative limits on actual GHG emissions provide a straightforward, uncomplicated policy framework with clear environmental goals and easily measured performance that is sufficiently flexible to capture these assets consistently over time. Accordingly, it is imperative that COP-4 and subsequent COPs implement the Protocol in ways that would ensure the viability of the emissions trading approach, and avoid the temptation to act in ways that would stymie the realization of the benefits such an approach can deliver. The loss of these benefits could jeopardize the prospects of solving the problem of climate change at all.

II. Key Attributes of an Environmentally and Economically Effective Market for Reducing GHG Emissions

Critical to success in designing emissions trading programs is the coupling of rigorous accountability for environmental performance with circumspection in attempting to prescribe market activity in the program rules. This allows the regulatory community to focus, instead, on ensuring the attainment of those specific environmental objectives for which the program is being used. This lesson is drawn not only from observing successful domestic trading programs, but also in observing agreements such as the Kyoto Protocol itself in which countries agree to achieve an emissions limit but are not required to use any specific means of so doing. When an emissions trading program is designed using this principle it results in a system in which environmental and economic performance are mutually reinforcing.

Such a system creates a market by enabling nations and industries to search for, or "demand," the lowest cost emissions reductions that they can find, in the case of GHG emissions, anywhere in the world. Because of these searches, innovators face strong incentives to create a "supply" of such emissions reductions to meet the demand. Under a market regime such as the one that the Kyoto Protocol seeks to create, this mutual process of searching for, and creating, valid emissions reductions depends on endowing the program with certain critical attributes:

- *Accurate* measurement *and reporting* requirements for GHG emissions and emissions reductions assure nations' ability to assess compliance and investors' ability to assign monetary value to emissions ;
- The environmental *integrity and equivalence* of reductions that are transferred and used to offset emissions must be assured, including through the application of remedies adequate to address emissions in excess of Parties' emissions limitations;
- As a condition of participation in the creation and transaction of legitimately tradable GHG reductions, investors require that the unit of trade be fully *fungible* so that reductions by one source can be exchanged to discharge the obligation of another source;
- *Consistent*, stable rules that provide a reasonable expectation about the opportunities to turn pollution reductions into financial rewards stimulate investor participation; and
- *Transparent* rules governing compliance and trading provide both public and investor confidence in the compliance system and the market.

III. Emissions Trading Under the Kyoto Protocol: A Pathway To Credibility and Successful Implementation

Part A of this section provides a *concise review of those Articles in the Protocol that constitute the foundation for emissions trading. T*he Kyoto Protocol creates its legally binding emissions reduction commitments by allocating to each industrialized nation listed in Annex B ("Annex B Party") an "assigned amount" of GHG emissions for the 2008-2012 period. In Articles 3, 4, 6, 17 and Annex B, the Protocol builds an international GHG emissions trading system on this foundation of "assigned amounts." Finally Article 12 creates the opportunity for trades, through the Clean Development Mechanism (CDM), of certified emissions reductions.

As described in Part B, the Protocol's fundamental definition of compliance is in the form of an explicit total quantity of emissions for which each nation is accountable. Ultimately, the overall effect of the compliance and accountability framework is to create the obligation that cumulative GHG emissions be equal to, or less than, the Party's assigned amount as increased or decreased by transfers of parts of that assigned amount, including through transfers of emissions reduction units resulting from projects under Article 6; transfers of certified emissions reductions through the CDM; and domestic offsets. This allows the international GHG regime to function as a framework within which the sovereignty of nations is fully preserved yet their accountability for their performance is made explicit. This is the single most important element in building a reliable system for achieving nations' GHG obligations, regardless of whether or not they choose to utilize emissions trading as an implementation strategy.

As described in Part C of this section, the Protocol also establishes a multi-year commitment period, which provides nations with the flexibility to decide how to meet the

simultaneous demands of their GHG emissions obligation and their preferences for economic development and growth. As Part D indicates, this cumulative emissions mechanism not only provides flexibility but also fosters the practice of "saving" unused increments of emissions and thus encourages early reductions.

As described in Part E, the Protocol has an added element of flexibility in that it allows international emissions trades. Such a policy expands the benefits of inter-temporal trading and emissions "savings" across a bigger landscape and results in that much more environmental innovation as well as benefit for the global economy.

Part F describes how the Protocol's Clean Development Mechanism provides a direct avenue for developing nations to participate in emissions trading and thus in the global emissions control regime. Emissions trading provides strong incentives for directing investments in cleaner, less carbon intensive infrastructure. Therefore, inclusion of developing nations in the trading program enables investors to make these investments, thus assuring that new development occurs in the most environmentally sustainable manner feasible.

As described in Part G, the flexibility provided by trading is critical not only to the structure of the Protocol but to its credibility over time. The challenge of ensuring sovereign nations' voluntary compliance with a GHG protocol is fundamental. Paradoxical or "circular" as it may seem, the surest way to build and safeguard the credibility of the Protocol is to develop attainable pathways to compliance. The simple ability of emissions trading and "savings" to offer flexibility, cost-savings and to encourage broad participation make compliance that much easier and, as a result, are instrumental to the Kyoto Protocol's long-term credibility. In view of this, COP-4, its successors and national policy makers must take special care to accomplish two sets of tasks. First they must supply those elements not already provided by the Protocol itself that are necessary to make GHG emissions trading work. At the same time, they must avoid decisions or actions that would erect barriers to or impose nonproductive constraints on legitimate trading activity.

IV. The Mechanics of Emissions Trading Under the Protocol: Focus on Environmental Performance and Accountability

As described in Part A of this section, by defining nations' compliance obligations in terms of their actual total GHG emissions, the Protocol replicates one of the most successful features of the sulfur dioxide (SO_2) emissions trading program adopted by the U.S. as part of the Clean Air Act Amendments of 1990 to combat acid rain. In fact, this similarity allows the U.S. experience in designing its acid rain trading program to illuminate key aspects of the trading system established by the Protocol and to point the way to additional elements needed to ensure the proper functioning of the Protocol's compliance and trading system. To date the U.S. acid rain trading program has demonstrated a wide variety of benefits from trading: in addition to providing cost-savings and stimulating innovation the acid rain emissions trading program has prompted sources to make more

reductions in SO_2 pollution than they are required to in order to take advantage of the "savings" and flexibility opportunities offered by the emissions trading market.

This experience is illustrative of the fundamental role that trading and "flexibility mechanisms" can, and must, play in the Parties' implementation of their commitments under the Protocol. Trading makes compliance easier and, more than anything else, a record of widespread compliance by the Parties strengthens the credibility and durability of the Protocol. Yet, another important lesson to draw from the U.S. acid rain experience is that when faced with programmatic design issues, as COP-4 currently faces, U.S. policy makers chose to focus primarily on the environmental performance or accountability of the program rather than on the details involved in market development. A guiding principle was to minimize the amount of market decisions made by regulators and maximize the amount of business decisions made by sources. COP-4 faces the same challenge of letting the market mechanism develop on its own while focusing on assuring the environmental performance of the program.

To be sure, the upcoming COP-4 and, possibly, subsequent COPs, must address key issues in order to create a sound trading system. The Protocol itself, however, already has done much to establish such a system. Part B of this section reviews the charge for COP-4 to develop principles, rules, modalities and guidelines for emissions trading in the context of the features already built into the Protocol language. Paralleling the mechanics of the U.S. SO_2 program, Articles 3.10-11 and 3.13 ensure the fundamental integrity of trading between and among Annex B/Annex I Parties, whether they are relying on "emissions trading" under Article 17, including through project-based trading under Article 6, or what has been dubbed "bubbling" of emissions between or among two or more Parties under Article 4.

In fact, as described in Part C of this Section, while Article 6 provides additional clarification that Parties may allow "legal entities" to engage in project-based trading, it is not clear that given the provisions of Articles 3.10-11, COP-4 needs to address trading under Article 6 in order for such trading to proceed in a sound way. Article 3.10-11 puts the onus on each Party engaged in trading project-based reductions under Article 6 to adjust their assigned amounts in response to trades, therefore placing the responsibility on the individual Parties themselves to ensure the appropriate certification and quantification of traded project-based reductions under Article 6. This frees COP-4 to focus on accountability and reporting requirements.

In contrast, as described in Part D of this section, trading between Annex B and non-Annex B Parties, governed by Article 12 and the Clean Development Mechanism, critically depends on the elaboration of rules and guidelines to ensure the integrity of such trading. Although the language of the Protocol specifies that the "Conference of the Parties as a meeting of the Parties" is to provide such elaboration, Article 12.10 explicitly contemplates that emissions reductions achieved as early as 2000 may be included in trading. For this reason it is imperative that COP-4 at least identify fundamental principles and recommendations for governing such trading so that Parties, and even private entities,

can begin making emissions reduction investments in non-Annex I countries. Such guidance in the form of interim rules adopted at Buenos Aires that provide recommended approaches to future COP/MOPs would simply need to address:

- The setting of project baselines for purposes of establishing additionality; and
- Methodologies for quantifying, verifying and reporting, on a project-by-project basis, emissions reductions relatives to those baselines.

These rules should be guided by a focus on actual emissions performance. They should avoid imposing burdens that do not enhance the actual-emissions integrity of trading under the CDM. The rules must accommodate the greatest breadth possible of emissions reduction and sequestration ventures and should therefore place the burden of proof on project proponents. Such "proof" should demonstrate the project baseline in both qualitative and quantitative (expressed as mass emissions in tons) terms. There are also two options for addressing "leakage" concerns. The first is to identify the class of projects which are likely to be plagued by leakage and require the project proponents to demonstrate how leakage will be avoided. The other is to develop a scope of challenges to these projects and require all project proponents to address any challenges that may be raised.

V. The Rules for Accountability Under Article 17: Tools for Assuring the Integrity of The Kyoto Protocol

To secure the integrity of the Protocol, it is imperative that the "accountability" rules established by COP-4 include provisions needed to ensure the integrity of the entire trading system with regard to all Annex B Parties, whose total emissions exceed their assigned amounts, regardless whether any such Party has engaged in trading or not. Fortunately, the inclusion in the Protocol of the structures for emissions trading expand the opportunities for assuring the Protocol's integrity. Articles 3.10-3.11, 5 and 7 provide the initial elements for assuring the integrity of the Protocol, but these alone are not sufficient to provide strong incentives for nations to limit their actual emissions to their assigned amounts. Article 17's directive that the Conference of the Parties "shall" develop accountability rules for emissions trading, however, offers an important avenue for completing the elements needed to secure the integrity of the overall Protocol. Ultimately, the integrity and accountability of the Protocol and of the emissions trading system are identical; indeed, the need for establishing accountability would be central even in the absence of trading. In this regard, the U.S. acid rain program provides some examples of provisions COP-4 could adopt. It is important to note that these options are not mutually exclusive and indeed, in combination, can be mutually reinforcing as a deterrent to intentional failure to comply and a safeguard against accidental failure to comply.

First, as described in Part A of this section, at the end of a commitment period, COP-4 could institute a "true-up" period of six months during which time any Party,

whether it has engaged in trading or not, whose actual emissions exceeded its assigned amount could be required to obtain surplus parts of the assigned amount from other Parties.

At the end of the true-up period any Party, whether it had engaged in trading or not, whose actual emissions still exceeded its assigned amount (as increased or decreased, of course as a result of its trading activity) would face an automatic remedy that consisted of three parts. One part, described in Part B, would be an automatic deduction from the Party's assigned amount for the subsequent compliance period equal to the amount by which the Party exceeded its current assigned amount (effectively a form of "seller liability"). A second part, as described in Part C, would include an additional deduction, equal for example, to 20% of the level of excess emissions, to repay the debt to the atmosphere and reinforce the incentive to comply.

Finally, as described in Part D, a third component of accountability flows from the process of tracking the interim progress of each Party. Annual reporting could be used to track the progress of each Party in meeting its overall assigned amount. If a Party's actual emissions were in excess, by a certain margin, of its total assigned amount, COP-4 could institute automatic discounts on emissions reductions or parts of assigned amounts transferred by the Party that would have the effect of encouraging Parties to stay "on track" toward meeting their emissions commitments. The prospective market signal that flows from this approach, effectively a form of "buyer liability" that could continue into future compliance periods, would provide a sober warning to Parties and investors about the consequences of noncompliance, underscoring the role of emissions trading as a means of facilitating and incentivizing compliance.

Taken together, as described in this section, these accountability elements provide a blended form of buyer-seller liability that holds sovereign nations accountable for the environmental consequences of a failure to meet their commitments, while at the same time delivering to private sector actors clear and predictable rules that foster credible transactions.

VI. The Role of Article 17 Accountability for Emissions Trading in the Wider Context of Party Noncompliance: Creating Incentives for Sovereign Compliance

Ultimately, the integrity of an emissions trading program is fully dependent on the integrity of the overall program of which it is a part. Fortunately, the same tools that ensure the environmental accountability and integrity of the emissions trading system enable the emissions trading system itself to offer incentives favoring compliance with Parties' emissions limitation obligations.

In addition to facilitating compliance, emissions trading thus offers an important collateral benefit. Well-designed emissions trading programs can create an economic dynamic that provides strong incentives for Parties and industries to meet their

compliance obligations by conditioning participation emissions trading market on compliance with emissions obligations.

VII. A Comprehensive Reporting System for Emissions Performance and Trading

The Protocol language in Article 3 makes it readily feasible for COP-4 to develop a simple but unified reporting system for tracking simultaneously Parties' actual emissions, their trading activity and their ultimate compliance.

Part A presents a reporting approach that provides a unified mechanism for accountability and trading. Under this approach transferred emissions reductions (again, "parts of assigned amounts", "emissions reduction units" or "certified emissions reductions" under Articles 3 and 17, 3 and 6, and 12, respectively) would be "vintaged" by country of origin, year of origin and, for certified emissions reductions, project of origin, and reported annually during the five-year compliance period. It would be through each year's report that the mechanics of accountability would be automatically triggered while at the same time international emissions trading would be effectuated.

Part B presents an approach for the double-entry record-keeping, as specified in Article 3, that guarantees that all trades are for surplus emissions reductions.

Part C describes how this reporting approach could be linked to the accountability provisions described in Section V and Section VI in order to endow the emissions trading system with full transparency.

VIII. Measurement and Quantification

This section underscores the importance of accurate measurement and quantification procedures. Although COP-4 does not need to finalize guidelines in Buenos Aires, it can direct the resources at its command and send a signal to nations and other private parties to focus energy on developing sound methods for quantifying emissions and emissions reductions.

IX. Domestic Actions: Institution Building and Early Action Strategies

This section outlines four actions that nations can take now to further advance the development of emissions trading programs and the successful implementation of the Protocol. These include establishing national registries; designating institutions to authorize and track GHG emissions and trades; in the case of non-Annex I countries developing criteria for approving participation in CDM transactions; and adopting programs to award emissions reduction credit for early actions resulting in legitimate emissions reductions.

X. Issues in Conflict

This section addresses three issues that may tempt COP-4 to depart from its focus on environmental performance: “Supplementarity”, Economies in Transition, and Forward Sales.

In keeping with the conviction that under an otherwise well-designed system emissions trading is but one of any number of compliance methods, this paper concludes that adopting a rigid “cap” on Parties’ compliance through trading as opposed to domestic actions is necessarily arbitrary from the perspective the ultimate objective of the Protocol -- limiting Annex B Parties’ total net emissions. At the same time, this paper argues that concerns arising over the prospect of nations like Russia trading the difference between their assigned amount and their currently expected actual emissions are best addressed neither by reopening the Protocol to revise Annex B nor by restricting trading, but by adopting bilateral strategies that exploit the dynamics of the trading market itself to stimulate investments in emissions reductions and compliance. The paper concludes that there are substantial environmental benefits to be gained by offering the possibility of forward transfers of parts of assigned amounts prior to 2008 as an incentive for private sector actors to undertake early investments that begin to bend the business-as-usual trajectory of GHG emissions in a climate-friendlier direction.

XI. Conclusion

COP-4 is likely to face a number of challenges ranging from demands to reopen the Protocol to calls for the imposition of a variety of restrictions on trading itself. In addressing these issues, it is essential that the participants bear in mind that the greatest challenge confronting the international community may be inertia. Thus, what is needed is for COP-4 to continue to send the signal of resolve broadcast by the Kyoto Protocol in order to stimulate action by governments and the private sector to reduce GHG emissions. The impasses likely to occur were the Protocol to be reopened would have the opposite, potentially fatal effect on the Protocol. Further, the single greatest hurdle to participation by individual governments is cost. COP-4 must signal that the global economy will be guaranteed the lowest cost burden from emissions control.

In addition, that signal of resolve must be augmented by strategies that stimulate new emissions-reducing actions. In that regard, emissions trading can play a critical role because of its ability to create incentives for investment in environmental improvement. Accordingly, this paper counsels an understanding of trading - in all of its forms in the Kyoto Protocol, including JI, CDM, and collective targets - as nothing more than one of a myriad of alternative pathways to compliance. Fundamentally, trading does nothing but exchange one increment of emissions reductions for another. Trading occurs *only* when it

is *mutually* beneficial to *both* parties to the transaction. At the same time, trading is critical because of its unique ability to facilitate compliance.[2]

This paper examines these proposals carefully, and concludes that in light of practical experience around the world with the operation of environmental markets, restrictions on trading that do not affect the fundamental integrity of the trading system -- that is, the substitution of one increment of reductions for another -- should be rejected as hindrances to compliance, and, therefore, as obstacles to the success of the Kyoto Protocol.

Accordingly, it is against this backdrop that negotiators must weigh proposals to impose restrictions on who may trade (industrialized or other nations, governments or private actors), on what may be traded (types, quantities, and origin of assigned amounts/certified emissions reductions), and on when, where, and how trading may occur. The paper examines these proposals carefully, and concludes that in light of practical experience around the world with the operation of environmental markets, restrictions on trading that do not affect the fundamental integrity of the trading system -- that is, the substitution of one increment of reductions for another -- should be rejected as hindrances to compliance, and, therefore, as obstacles to the success of the Kyoto Protocol.

[2] Dudek, Daniel J., Joseph Goffman, Deborah Salon, Sarah Wade, "More Clean Air For The Buck: Lessons From The Acid Rain Emissions Trading Program," EDF, November 1997.

I. INTRODUCTION

The Protocol adopted by COP-3 in Kyoto, Japan in December, 1997, requires industrialized nations (i.e., the OECD nations plus Russia, certain former Soviet Republics and other Eastern European nations) to limit their greenhouse gas (GHG) emissions to, on average, 5% below 1990 levels for the period from 2008 through 2012.

In the atmosphere, greenhouse gases (GHGs), the byproducts of fundamental economic activities like energy production, transportation and agriculture, can lead to accelerated warming resulting in dangerous changes to the earth's climate system. Analyses produced by the Intergovernmental Panel on Climate Change (IPCC) indicate that failure to limit the emissions of these gases is expected to be damaging to natural ecosystems and costly to the many human societies that have developed during the 10,000-year period of relative climate stability leading up to the present.[3] Additional concerns have been raised regarding the global economy's ability to handle the magnitude of required GHG reductions in a very short time frame. This concern leads some to call for policies to support early actions by nations and sources.

At the same time, as a result of the link between GHGs and activities fundamental to both industrialized and developing economies, many fear that the costs of limiting their emissions will be high. For this reason, others question the capacity of any international agreement to establish a truly durable and efficacious regime for limiting these emissions. This doubt is intensified by the fact that the international GHG regime that the Kyoto Protocol purports to create will exist only as the artifact of continuing voluntary agreement between and among sovereigns, often in competition with each other, and representing the widest possible diversity of economic needs and resources and political and cultural aspirations. As a result, the tools that can be used to induce or enforce compliance by sovereigns with their GHG emissions obligations may be limited -- and downright meager when contrasted with those that domestic authorities can bring to bear to ensure that their private sectors comply with domestic emissions limitation requirements.

These concerns about implementation are bolstered by the FCCC's codified distinction between nations with advanced industrial economies (denominated as "Annex I Parties" in the parlance of the FCCC) and those at all other stages of economic development. This distinction was largely preserved in the initial structure of the Kyoto commitments and obligations, which place no new emissions limitations on non-Annex I Parties. Nevertheless, because of rapid economic growth and other conditions, the latter category of countries are expected to contribute an ever increasing proportion of global anthropogenic emissions of GHGs. Consequently, the international regime must be sufficiently dynamic to induce those nations ultimately to participate in a worldwide effort to limit GHG emissions. This inducement is key both to an environmentally effective

[3] See Intergovernmental Panel on Climate Change, Science of Climate Change; Impacts, Adaptation and Mitigation of Climate Change: Scientific-Technical Analyses, Cambridge University Press, 1996.

agreement and to limiting economic advantage from non-participation and the mere displacement of emissions and their associated industries from country to country.

In view of these circumstances, the durability and credibility of the Kyoto Protocol will be continually subject to a stringent set of exacting tests of equity, economic efficiency, flexibility, and compliance feasibility -- all while each nation's government acts to the fullest extent of its sovereignty in choosing how to respond to its Protocol obligations.

Mindful of these challenges, which, of course, were prominent even before the COP-3 in Kyoto, EDF first introduced a concept of "emissions budgets" at the February 1996, meeting of the Advisory Group on the Berlin Mandate (AGBM) in Geneva at the invitation of the Netherlands. A year later, after developing this concept extensively and seeing it incorporated in the United States' January, 1997 proposal to the negotiations, EDF published "Emissions Budgets: Building an Effective International Greenhouse Gas Control System". As laid out in that paper, emissions budgets are the building blocks both of a verifiable and legally binding protocol and an effective international emissions trading regime. Such a regime, in turn, represents the only reliable, realizable mechanism through which the international community can meet the manifold challenges that a successful greenhouse gas protocol must overcome, beginning, of course, with ratification and the achievement of the GHG emissions reductions specified in the Kyoto Protocol.

EDF recognized that such a system would have to be gauged against the goals it aimed to achieve. The 1992 The Kyoto Protocol adopted by the Third Conference of the Parties (COP-3) to the United Nations Framework Convention on Climate Change (UNFCCC) specifies that its objective, and that of any protocol to it, shall be to prevent "dangerous" anthropogenic interference with the world's climate system.[4] Although many leading ecologists have urged that the rate and amount of warming not exceed 1° C. over the next century,[5] implying an ultimate concentration target of 450 ppmv CO2-equivalent, the UNFCCC Parties did not select a long-term concentration target when they adopted the Kyoto Protocol on Climate Change in 1997. The Protocol adopted by COP-3 in Kyoto, Japan in December, 1997, establishes:

- a first period for emissions reduction commitments for industrialized nations (and any other nation that so chooses) from 2008 to the close of 2012;
- specific commitments by industrialized nations to reduce GHG emissions during this period 5%, on average, below 1990 emissions levels; and
- a framework for trading "assigned amounts" of emissions and "certified emissions reductions" as means of achieving emissions reduction commitments.

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4 United Nations Framework Convention on Climate Change (UNFCCC) (1992), Art. 2.

5 H. Mooney et al., Letter to President Clinton (May 21, 1997).

At the heart of this mechanism lies a global GHG emissions reduction trading market. It is through the properties of this market, acting together with overall limits on Parties' GHG emissions, that the Protocol will meet its various tests over time. Specifically, it is through such a market that nations and businesses can address the issue of cost, flexibility and international economic competitiveness that likely will remain among their paramount concerns. At the same time, it is through the incentives created by such a market that compliance by industrialized countries with their GHG emissions obligations can be assured and that developing countries may be induced to participate in an international GHG regime.

Overall the commitments undertaken by the Parties in Annex B, as a first step, are sufficiently stringent to keep open the possibility of limiting warming to one degree over the next century, **provided that the all-important framework of binding obligations to limit total GHG emissions under the Kyoto Protocol remains intact so that it can deliver sufficient options and incentives for sovereigns to meet their commitments.**

Ultimately, the great promise of the Kyoto Protocol lies precisely in the extent to which it establishes binding legal obligations for Annex I nations to limit their actual GHG emissions while offering them the opportunity to find the most productive and cost-effective paths to compliance through a global market for GHG emission reductions. This promise rests on the framework incorporated in the Protocol text:

KYOTO PROTOCOL EMISSIONS TRADING FRAMEWORK

- Parties' emissions limitation and reduction obligations are defined expressly in terms of 5-year cumulative GHG emissions totals ("allowed amounts" in the parlance of the Protocol).
- Parties with such obligations may use emissions trading
  - *Emissions Trading Among Nations With Caps (Trading in Parts of Allowed Amounts)*
  - *Joint Implementation Between Nations With Caps (Project-Based Emissions Reduction Units)*
  - *"Clean Development Mechanism" Between Industrialized and Developing Nations (Certified Emissions Reductions)*
- All Annex I Parties must report their GHG emissions from sources and removals by sinks annually, in a transparent and verifiable manner (Articles 3, 7 and 8).
- The rigorous double-entry bookkeeping system established under Articles 3.10, 3.11 and 3.12 provides a solid foundation for transparent accounting for compliance as well as tracking of emissions trades.

Critical as they are, these framework elements, by themselves will not bring into being a viable, robust and active GHG emissions trading market. Achieving a vibrant market and its benefits critically depends on the decisions of both the upcoming Conference of the Parties and of individual national governments in implementing the requirements of the Protocol.

The following sections review the provisions of the Kyoto Protocol and evaluate their potential for resulting in a dynamic GHG emissions trading market. Subsequent sections highlight the points on which both the international community and national governments must focus at Buenos Aires if their subsequent decisions are to lead to an environmentally and economically successful GHG emissions trading market.

II. KEY ATTRIBUTES OF ENVIRONMENTALLY AND ECONOMICALLY EFFECTIVE EMISSIONS TRADING MARKETS

Properly designed emissions trading markets capitalize on the common interests of nations, sources and the public to create a system whose environmental and economic performance are mutually reinforcing. Emissions trading requires sources to internalize, or monetize, the costs associated with pollution control, while at the same time it maximizes their flexibility, enabling sources to lower their compliance costs. This, in turn,

facilitates, and even creates a demand for, Parties' and firms' compliance, thus enhancing the overall performance of the environmental program. In order to stimulate these outcomes, well-functioning programs reinforce performance by making the actual performance of nations and other actors transparent. These effects stem from the design of the market but can only be delivered through its actual operation. Thus, it is critical that the design and rules governing the market serve to promote its operation.

COMMON INTEREST IN MARKETS

- Ensuring Environmental Performance:
  - *Compliance with Emissions Limitation Requirements*
- Cutting Costs and Providing Flexibility
- Driving Entrepreneurial Forces Toward Innovation, Efficiency and Environmental Improvement
- Preserving Full Sovereign Discretion
- Encouraging Broad Participation

Critical to success in designing emissions trading programs is the coupling of rigorous accountability for environmental performance with circumspection in attempting to prescribe market activity in the program rules. This allows the regulatory community to focus, instead, on ensuring the attainment of those specific environmental objectives for which the program is being used. This lesson is drawn not only from observing successful domestic trading programs, but also in observing agreements such as the Kyoto Protocol itself in which countries agree to achieve an emissions limit but are not required to use any specific means of so doing. When an emissions trading program is designed using this principle it results in a system in which environmental and economic performance are mutually reinforcing.

These markets enable nations and their private sectors to search for, or "demand", the lowest cost emissions reductions that they can find, in the case of GHG emissions, anywhere in the world. Because of these searches, innovators face strong incentives to create a "supply" of such emissions reductions to meet the demand. It should be easy to see that the supply and demand for emission reductions are analogous to the supply and demand of any other good and serve as the basic building blocks of all markets.

It is critical that the design and rules governing the market serve to promote its operation.

Under a market regime such as the one that the Kyoto Protocol seeks to create, this mutual process of searching for, and creating, valid emissions reductions depends on endowing the program with certain critical attributes. Specifically, five elements are essential to ensuring that the Kyoto Protocol and the emissions trading markets it creates

operate with both *environmental integrity and economic integrity*. Environmental and economic integrity are two aspects of the same set of features -- credible commitments to compliance based on the accurate *measurement* of actual emissions performance, which, by definition, includes the accurate quantification of traded emissions reductions. In addition, government officials, the public and financial investors must be assured that traded emissions reductions are in fact legitimately equivalent to the emissions they are offsetting.

Moreover, only if creators of, and searchers for, cost-effective emissions reductions -- that is, sellers and buyers -- can transact such reductions freely, constrained only by requirements necessary to ensure the environmental legitimacy of the traded reductions, will the market be able to perform its key function of providing low-cost, and, at the same time, genuine, compliance with emissions limitations. Anything that diminishes the *fungibility* of emissions will reduce the intensity of entrepreneurial search for emissions reduction opportunities among both buyers and sellers, impeding the environmental effectiveness of the program. Companies investing in emissions-reducing activities almost certainly will wish to be assured that they will be able to sell the reductions they earn and recoup their investments. The ultimate buyers of reductions will want to know that they will be able to use the purchased reductions to meet their legal compliance obligations. If, however, the program develops large paperwork requirements, time lags, or uncertainties resulting from restrictions that are arbitrary and unrelated to the actual emissions performance of the program or from the granting of discretionary authority, participation will be needlessly discouraged.

Similarly, *consistency* is also key to creating incentives for innovation. The most important long-range result of any economic incentive program is to tap the creative energies of many differently situated buyers and sellers, enticing them to engage in an unending search for ever better ways to reduce emissions at lower and lower cost. Rather than relying on small groups of experts and the *a priori* decisions they make to determine what each polluter should do, technical experts and self-interested stakeholders everywhere are invited to test their ideas in the marketplace. These creative responses will not be elicited in the absence of fixed rules of the game and a reasonable expectation that opportunities for pollution reduction can be turned into financial rewards.

THE FIVE KEY ELEMENTS FOR MARKET INSTRUMENTS: BUENOS AIRES RULES

- Integrity - adequate accountability
- Measurement - accurate quantification of emissions
- Fungibility - minimal constraints on trading
- Consistency - fixed rules applied objectively
- Transparency - accessible reporting and program operation

III. EMISSIONS TRADING UNDER THE KYOTO PROTOCOL : A PATHWAY TO CREDIBILITY AND SUCCESSFUL IMPLEMENTATION

A. The Emissions Trading Framework in the Kyoto Protocol

The Kyoto Protocol creates its legally binding emissions reduction commitments by allocating to each industrialized nation listed in Annex B ("Annex B Party") an "assigned amount" of GHG emissions for the 2008-2012 period. The Protocol then builds an international GHG emissions trading system on this foundation of "assigned amounts." (Kyoto Protocol Articles 3, 4, 6, 17 and Annex B.)

The Protocol provides for two principal types of trading: trading in "parts of assigned amounts" of allowable emissions; and trading in "certified emissions reductions." In the first category, any Party that has adopted a legally binding emissions limitation under Annex B of the Protocol (Annex B Party) may transfer increments or "parts" of its total "assigned amount" of GHG emissions, that is, its emissions limitation agreed to in Annex B. Such transfers are referred to in the Protocol as "emissions trading" under Article 17. Accounting provisions in the Protocol ensure the environmental integrity of emissions trading between Annex B Parties by explicitly requiring a transferring Party to deduct the transfer from its assigned amount before the acquiring Party can add the transfer to, and thus increase, its assigned amount. (Articles 3.10 and 3.11)

Also in the first category, the Protocol provides that certain highly industrialized nations denominated, in the parlance of the UNFCCC, as "Annex I Parties," may transfer, or authorize other legal entities to transfer, assigned amounts in connection with individual projects undertaken in other Annex I Parties where such projects yield emissions reductions (Articles 3 and 6). These transfers result in the identical accounting consequences as emissions trading under Article 17 described above (see Articles 3.10 and 3.11), but are often referred to as "joint implementation."

In the second category of trading, Annex I Parties, operating through the Clean Development Mechanism (CDM), a new institution created by the Protocol, may acquire, and thereby increase their total allowable emissions, certified emissions reductions resulting from cooperative projects in non-Annex I Parties. (Article 12 and 3.12). Because the latter group of Parties have not adopted emissions limitation and reduction commitments under Annex B, a greater degree of scrutiny is required in order to ensure that such transactions actually involve reductions below what would have otherwise occurred in the non-Annex I Parties in the absence of the transactions. Thus, there is the need for clear, easily defined "business as usual" emissions baselines against which

emissions reductions can be certified and quantified. While the Protocol ensures the environmental integrity of both forms of trading between Annex B Parties by explicitly requiring a transferring Party to deduct the transfer from its assigned amount before the acquiring Party can add the transfer to, and thus increase, its assigned amount, trading under the CDM, in contrast, must rely on subsequent rulemaking to establish qualifications for CDM projects in order to ensure that reductions are traded consistent with the environmental integrity of the overall trading and compliance system.

B. Actual Emissions Performance: The Basis of Accountability

The Kyoto Protocol's fundamental definition of compliance -- i.e., in the form of an explicit total quantity of emissions for which each nation is accountable as specified in Article 3 and Annex B -- is the cornerstone for building both a mechanism that can deliver the GHG emissions reductions specified in the Protocol and a dynamic emissions reduction market. By simply defining nations' commitments in terms of overall GHG emissions for which they are responsible -- as opposed to prescribing specific policies and measures applicable to all, the Protocol allows the international GHG regime to function as a framework within which the sovereignty of nations is fully preserved. At the very least this means that the Protocol is capable of encompassing the inevitable variety of domestic policies and measures -- ranging from emissions taxes and technology standards to emissions cap-and-trade systems -- that each nation may choose to adopt in the exercise of its sovereign decision-making for the purpose of meeting its international obligations. Equally important, by defining compliance explicitly in terms of actual emissions, the Protocol provides the single most important ingredient for building a reliable system of accountability for nations' GHG emissions performance.

MINIMUM ELEMENTS: DEFINING WHAT IS TRADED

- For Industrialized Nations (ET and JI)
  - *Parts of Assigned Amounts*
  - *Measured in Carbon Equivalent Units*
  - *Identified by Nation of Origin*
  - *Identified by Date of Issuance/Creation*
- For "CDM" Emissions Reductions Units:
  - *Carbon Equivalent Units*
  - *Identified by Nation AND Project of Origin*
  - *Identified by Date of Verified Reduction*

The Kyoto negotiators' decision to rely on a total emissions limit has a very encouraging parallel to the actual experience of the United States under U.S. legislation known as the Clean Air Act Amendments of 1990. Historically, Clean Air Act programs have imposed a variety of requirements on pollution sources, but only rarely have these made the sources directly or expressly accountable for their total emissions. As a result,

these programs have tended to achieve fewer emissions reductions than intended or desired. In contrast, to combat acid rain, the U.S. Congress in 1990 amended the Clean Air Act to reduce emissions of sulfur dioxide (SO_2) from thermal electric power plants. The 1990 amendments held each plant *legally accountable for meeting a specific total emissions limit.* This feature, together with the inclusion of emissions trading, has made the SO_2 program one of the most successful of U.S. environmental policy initiatives.[6]

C. Matching Accountability With Flexibility: Cumulative Multi-Year Commitments

Equally critical to the ultimate success of an international GHG regime is the integration of flexibility elements with express accountability on the part of each nation for meeting an explicit emissions limit. Structuring each nation's commitment as a set of successive five-year obligations not only reflects the cumulative aspect of the effect of greenhouse gases on climate warming, but it also offers economic actors and nations' economies a temporal framework in which they can rationalize their response to the simultaneous demands of meeting their GHG emissions obligation and of maintaining economic growth in inevitably dynamic economic conditions. As a result, sources and nations will be able to minimize the costs associated with GHG compliance. At the same time, the 5-year commitment period still creates a time horizon short enough to signal meaningful accountability so that nations and private companies will feel compelled to manage their GHG emissions to meet their commitments.

D. Matching Accountability With Flexibility: The Role of Emissions "Savings"

The inherent opportunity for year-to-year "saving" of unused increments of each nation's GHG emissions commitment within each five-year commitment period creates an explicit incentive for early reductions. Since it is the cumulative effect of GHGs in dangerously accelerating the *rate* of warming and of resulting climatic and ecological change that represents a critical aspect of the threat posed by global climate change, honing incentives for early reductions is essential. Recognizing this, Article 3.13 explicitly permits "savings" of unused increments of a nation's emissions commitment, or assigned amount, to be carried forward for use in later periods.

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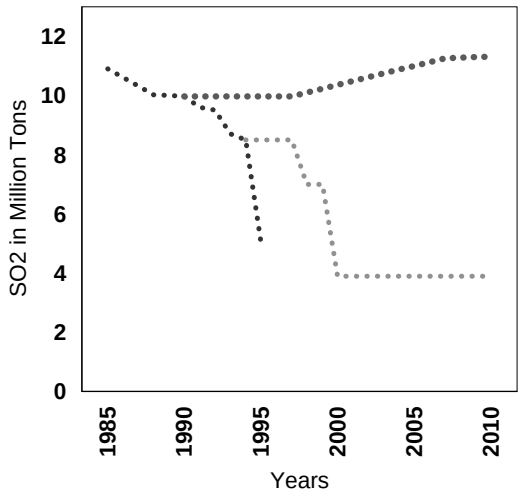
[6] See: "More Clean Air For The Buck: Lessons From The Acid Rain Emissions Trading Program," Dudek, Daniel J., Joseph Goffman, Deborah Salon, Sarah Wade, EDF, November 1997. See also: "1996 Compliance Report: Acid Rain Program," EPA document number 430-R-97-025, June 1997.

EMISSIONS TRADING SYSTEM WITH "SAVINGS"

- Establishes Management Over Time
- Creates Rewards for Early Reductions
- Stimulates Innovation
- Provides Hedge for Emissions Intensive Sectors

Here, too, the U.S. has gained valuable experience in its efforts to combat acid deposition resulting from air pollution. Paralleling Article 3.13, the Clean Air Act acid rain program explicitly allows power plants to "save" any increment of pollution reductions they achieve beyond the reductions required by the law itself. As a result of the incentives created by this "savings" feature of the program, power plants have reduced their emissions of sulfur dioxide by 35% more than required by the law.

SO2 EMISSIONS CAPS AND FORECASTS - PHASE I UNITS



Actual SO2 Emissions

Title IV Emission Limits

EPA's Forecast - "No Title IV"

According to an MIT Energy Laboratory analysis, the dramatic drop in emissions in 1995 can be attributed mostly to the SO2 allowance trading program which was implemented in that year.

In addition to direct environmental considerations, among the effects created by both the opportunity for nations and sources to manage emissions over time and the resulting incentives for early reductions is the stimulation of innovation in reducing or avoiding GHG emissions. Successful innovation not only lowers cost in and of itself, but it also is further rewarded through the economic value garnered by traded or "saved" GHG emissions reduction units or increments of assigned amounts. Increasing investment in environmental innovation opens an ongoing flow or supply of the technologies and

practices necessary to sustain, and ensure the both the economic affordability and environmental efficacy, of a long-term global commitment to curb GHG emissions.

E. Matching Accountability With Flexibility: International Emissions Trading

The system of cumulative limits on total emissions also allows trading between and among sovereign nations and, if sovereigns so agree, between companies in different countries. The same set of benefits provided by inter-temporal trading through saving also emerges from international emissions trading. The dynamics of "savings" and trading are virtually identical -- as are the benefits. Since such trading confers an affirmative economic value upon actions that produce surplus reductions, the emissions trading market rewards environmental innovators and any industry or sovereign that "over-complies" with its emissions reduction responsibility. In addition, emissions trades, almost by definition, allow the trading companies or nations to achieve the same net emissions reduction at a cost lower than that which they would have incurred in making their reductions in the absence of the trade. That companies -- and sovereigns -- can resort to trading in addition to whatever other emissions reduction strategies might be available guarantees that they will enjoy increased flexibility in integrating their economic needs and their GHG compliance requirements.

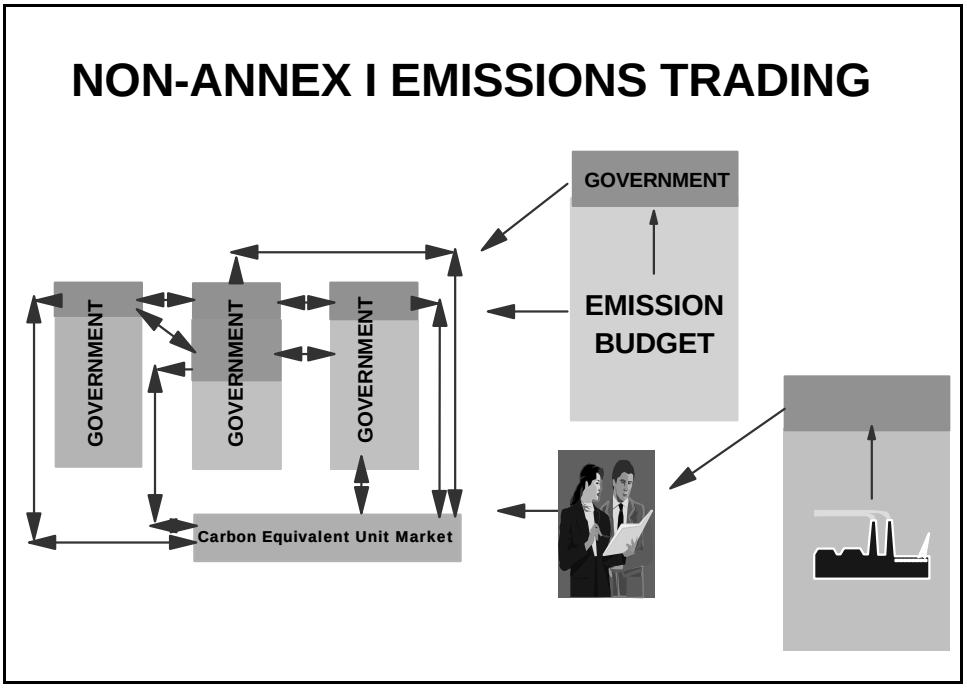
F. Broadening Participation: The Role of the Clean Development Mechanism

The participation, or lack thereof, of developing countries in meeting greenhouse gas control obligations raises both environmental and economic concerns. Here, too, the emissions trading mechanism is critical to addressing these concerns. While industrialized country leadership in GHG emissions reductions is environmentally defensible, and even imperative, given that industrialized countries have, historically, been responsible for the greatest atmospheric loading of anthropogenic GHGs, a focus on developing country participation is also environmentally warranted. Developing country GHG emissions are rising in rough parallel to their economies' increasing importance and activity in the global marketplace. In fact, unless a GHG protocol creates a robust structure that provides incentives for the participation of these nations in GHG emissions limitation and reduction activities, it will lack environmental credibility.

Moreover, there is economic concern about the Kyoto Protocol in both North and South. Many in industrialized nations fear that disparate treatment of industrialized countries and developing countries will harm the competitiveness of industrialized nations' economies. Many in developing countries similarly fear that if they are forced to take commitments comparable to those of Annex B countries, they will be stymied in their own pursuit of economic growth.

Participation of all nations in greenhouse gas emissions reduction will be essential if nations are to achieve the UNFCCC objective of preventing dangerous anthropogenic interference with the climate system. Developing nations, however, face many competing demands as they search for resources for sustainable development. From the perspective of *atmospheric science*, while developing nations do not need to begin participating at precisely the same time as industrialized nations, it will be impossible to meet the environmental objective if either group waits indefinitely. The longer either group waits, the more difficult the objective will be to attain.

Fortunately, at Kyoto, nations developed a Protocol structure, critically supported by the incentives generated through emissions trading, that invites early participation by developing nations. The Protocol's emissions trading structure offers developing countries the potential for enhanced capital flows toward GHG-reducing activities while at the same time it addresses the competitiveness concerns of industrialized countries. Key issues, however, remain to be resolved in Buenos Aires and beyond.



The Kyoto Protocol puts in place a credible set of incentives for developing countries to join the new world of markets for emissions reductions. Under the Protocol, any developing nation and, if governments agree, any private company, may earn tradable emissions credits by participating in individual projects in developing nations that reduce emissions below what would have otherwise occurred. This project-by-project approach, established under the CDM, provides an important opportunity for developing nations and companies to learn about emissions reductions and credit trading by gaining experience with projects, in effect learning-by-doing. Under the Protocol, Clean Development

Mechanism projects can earn credit beginning in the year 2000 - providing a strong incentive for developing nations to begin such projects early.

The Kyoto Protocol also provides that any nation that adopts a legally binding emissions limitation or reduction commitment can get the benefit of participating in full emissions trading. The advantages of full emissions trading are that by taking an assigned amount and participating in full trading, nations can avoid the substantial transaction costs associated with proving the emissions reductions from each individual project under the Clean Development Mechanism,[7] and can open their entire domestic markets to broad-based investment in cleaner development paths that generate transactable credit by reducing national emissions below the assigned amount. Under the Protocol, any developing nation can sign up to a GHG emissions limitation commitment that accommodates that nation's legitimate development needs, provided that a ¾ majority of the other Parties to the Protocol assent to the commitment level proposed by the developing nation.

Nations will need to see whether, over the near-term, these market incentives encourage developing nations to begin participating early in project-based emissions reduction activities, and ultimately to adopt "growth" commitments. In addition, the operation of these mechanisms will depend in part on the outcome of the Buenos Aires negotiations. Finally, at Buenos Aires, nations may consider whether further incentives are needed to spur developing nation commitments.

G. The Importance Of Cost Savings

The flexibility and consequent cost savings provided by trading is critical not only to the structure or design of the Protocol, but to its credibility over time. Regardless of whether a protocol imposed quantitative emissions limitations, as the Kyoto Protocol does, or required specified technologies or taxes, the challenge of ensuring *sovereign nations'* voluntary compliance with a GHG protocol is one of the fundamental environmental challenges in designing any such protocol. Paradoxical or "circular" as it may seem, the surest way to build and safeguard the credibility of the Protocol as an international legal instrument commanding widespread adherence throughout the community of nations is to build a program that is achievable and demonstrate the fact of widespread compliance. Broad compliance -- almost by definition -- renders the Protocol credible in the view of individual sovereigns reinforcing their resolve and commitment to meeting their obligations.

That emissions trading can reduce costs is supported by logic and experience. At base trading does nothing more than give economic actors and nations the ability to search, without constraint, for the lowest cost means of reducing emissions. A recent

[7] For a more detailed discussion of this point see Dudek, Daniel J. and Jonathan Wiener, "Joint Implementation and Transaction Costs", paper prepared for the Environment Directorate, Organization for Economic Cooperation and Development, Paris, 1996, 69 pp.

study by the Massachusetts Institute of Technology confirmed that when given that opportunity, companies required to make reductions under the U.S. acid rain program used emissions trading, and the wide variety of solutions it enabled, to lower their costs significantly[8].

The importance of temporal flexibility embodied in both cumulative commitments and the availability of "saving" is vividly illustrated by examining their significance for the emissions-intensive sectors and activities that dominate, at least in part, most industrialized and developing country economies. Since nations will accept to make the transition to low-emissions economies only if they can do so while maintaining robust economies, the predominance of these sectors dictates that nations have the flexibility needed to manage this transition over time. Similarly, the ineradicable economic self-interest of the companies that operate in these sectors, and the workers they employ, demand that they, too, be afforded the tools needed to meet their emissions obligations while remaining viable. The ability to trade and save GHG emissions reductions (or portions of assigned amounts) for future use provides precisely the mechanism for accommodating continued activity by these companies and sectors while allowing nations to meet their GHG emissions commitments. At the same time, the environment benefits directly from the acceleration of reductions represented by such "saving".

Already, at least one major multinational company, British Petroleum, has demonstrated the significance of the flexibility inherent in saving and trading to GHG-intensive industries. Even before COP-3, BP committed itself to developing a pilot emissions trading between and among its business units for the express purpose of developing experience for itself, and for the international community, so that the company could master the trading tool in anticipation of an international regime in which GHG emissions were constrained. That the company is willing to invest considerable resources in the learning effort offers powerful evidence of how critical trading is likely to be in reconciling economic activity with GHG emissions limitation obligations -- and how much credibility trading has in the international business community.

The simple ability of emissions trading and "savings" to offer flexibility and cost-savings and thus make compliance that much easier is, as a result, instrumental to the Kyoto Protocol's long-term credibility. **In view of this, COP-4, its successors and national policy-makers (should the latter, as a matter of sovereign discretion, wish to afford their government and their private sectors the option of trading) must take special care to accomplish two sets of tasks. First, they must supply those elements not already provided by the Protocol itself that are necessary to make a GHG emissions trading market work. At the same time, they must avoid decisions or actions that would erect barriers to, or impose nonproductive constraints on, legitimate trading activity.** It should be recalled that emissions trading is simply *one of many pathways for* compliance with an environmental performance requirement.

8 Ellerman, A. Denny, et al., Emissions Trading Under the U.S. Acid Rain Program: Evaluation of Compliance Costs and Allowance Market Performance, MIT Center for Energy and Environmental Policy Research, Cambridge, Mass., 1997

Therefore, the greater the obstacles to trading, the greater the obstacles to compliance itself, and the less credible the Protocol will become. For these reasons, how the international community and individual nations approach the task of implementing the trading provisions of the Protocol may be as telling a test as any of their commitment to the success of the Protocol.

IV. THE MECHANICS OF EMISSIONS TRADING UNDER THE PROTOCOL: FOCUS ON ENVIRONMENTAL PERFORMANCE AND ACCOUNTABILITY

ESTABLISHING THE "CURRENCY" AND EQUIVALENCE OF EMISSIONS TRADING IN ASSIGNED AMOUNTS, EMISSIONS REDUCTION UNITS UNDER ARTICLE 6 AND CERTIFIED EMISSIONS REDUCTIONS THROUGH THE CLEAN DEVELOPMENT MECHANISM

The Protocol text addresses GHG emissions trading in five different Articles. Article 17 explicitly authorizes Parties with GHG emissions limits to use emissions trading to fulfill their commitments. Articles 6 and 12 provide for the trading of emissions reduction credits created as a result of emissions reduction projects in both industrialized nations and developing countries. Article 3 sets out the accounting system by which Parties' emissions performance, and their trading activity, are to be measured. Finally, Article 4 provides a mechanism through which a group of Parties that adopts a collective target, or, as some have referred to it, a "bubble" or "umbrella" target, can meet their collective target through trading, joint projects or differentiated national reduction targets, according to their sovereign wishes. Together, these provisions themselves provide much of the structure needed to sustain an international GHG emissions trading system. The challenge for COP-4 and subsequent negotiating sessions is to identify with precision those additional elements truly needed to complete the building of such a system.

As already stated in this paper and by many others, the Parties' work at COP-4 must be informed by the three major objectives of such a system. The first, of course, is ensuring that the system of GHG emissions limits and trading results in full compliance with the emissions limits imposed by Annex B of the Protocol, which demands, of course, that the program provide for accurate measurement and quantification, environmental integrity and full transparency. The second is that nations and private sector actors must be free to manage and reduce their costs by finding and harvesting the most cost-effective emissions reductions available, which depends on ensuring fungibility and consistency. This, in short, is the essence of emissions trading. Third, with the forces usually associated with environmental markets now unleashed by a GHG emissions trading system, that system must be free to drive entrepreneurial energies toward environmental innovation and improvement, which also require fungibility and consistency.

Fortunately, international negotiators and domestic policy-makers can supply the elements needed to achieve them simply by focusing on the *mechanics* of a sound emissions trading system. They need not brave the more formidable political challenges often associated with complex international and national policy-making. Instead, to answer the question "what is needed to make trading work to fulfill these objectives?" negotiators need focus only on the relatively simple question "what is tradable?", from which they can also deduce the answer to: "what does the market need in order to function?".

A. The U.S. Acid Rain Program: An Example

Using the example provided, once again, by the U.S. acid rain emissions trading program, the straightforward exercise of answering that question reveals the specific elements needed to create a successfully functioning trading system. For example, "What is tradable" are any reductions in emissions that are "surplus," *i.e.,* they can be substituted for other emissions reductions and yield the same quantity of total emissions reductions that would occur if they were not *traded.* The acid rain program works by using exactly the same approach that the Protocol itself does -- and the mechanics of the acid rain program work in a way that makes any traded emissions reductions surplus by definition.

Each sulfur dioxide-emitting power plant in the continental U.S. is subject to an annual SO_2 emissions budget. Any plant whose emissions are below its budget either may transfer the incremental difference between its emissions and its budget to another plant or can save the difference and add it to its emissions budget for a future year. This is because any unused portion of a plant's budget is, by definition, "surplus," since all such plants are subject to an overall SO_2 emissions budget equal to the cumulative total of all plants' budgets. As a result, under any emissions trade, emissions reductions at one plant can replace those at another and the total amount of reductions achieved is the same as would occur if both plants made reductions. Thus, the allowances are fully **fungible**.

To facilitate the operation of the program, the U.S. Congress provided for its implementation through the allocation of emissions allowances. Every year, each plant is allocated an allowable amount of emissions for each ton of SO_2 in its annual emission budget. These allowances, which are nothing more than a standardized, transactable, increment of allowable emissions, expressed in terms of tons of SO_2, make both trading and compliance easier. At the end of each year, the U.S. Environmental Protection Agency compares the number of allowances a plant holds with its actual emissions which are **measured** using continuous emissions monitors. The number of allowances a plant holds may be greater or smaller than the number initially allocated to it depending on whether the plant has acquired or transferred allowances or saved allowances from previous years. Sources that fail to hold enough allowances face severe and automatic penalties which include fines and an automatic deduction from future allocations. This assures the **integrity** of the program. Again, since the total number of allowances allocated each year is no greater than the total emissions budget for all plants, at a minimum the same quantity of total emissions reductions is achieved no matter how much

or how little trading occurs. Public access to reporting documents and clearly defined rules provide both **transparency** and **consistency**, and substantial savings have already occurred.

Equally important, this use of allowances as both the "currency" of trading and, at the same time, the instrument of compliance reveals a key mechanical feature of trading that has been substantially incorporated into the Kyoto Protocol already. Thanks to Articles 3.10 and 3.11, the Protocol establishes an identity between compliance and trading as a matter of basic mechanics. Whether Parties are trading "emissions reduction units" generated by individual emissions reduction projects pursuant to Article 6, or whether they are trading "part(s) of an assigned amount" pursuant to Article 17, the Protocol specifies that the transferring Party is to deduct the trade from its "assigned amount" and the acquiring Party is to add the trade to its "assigned amount".

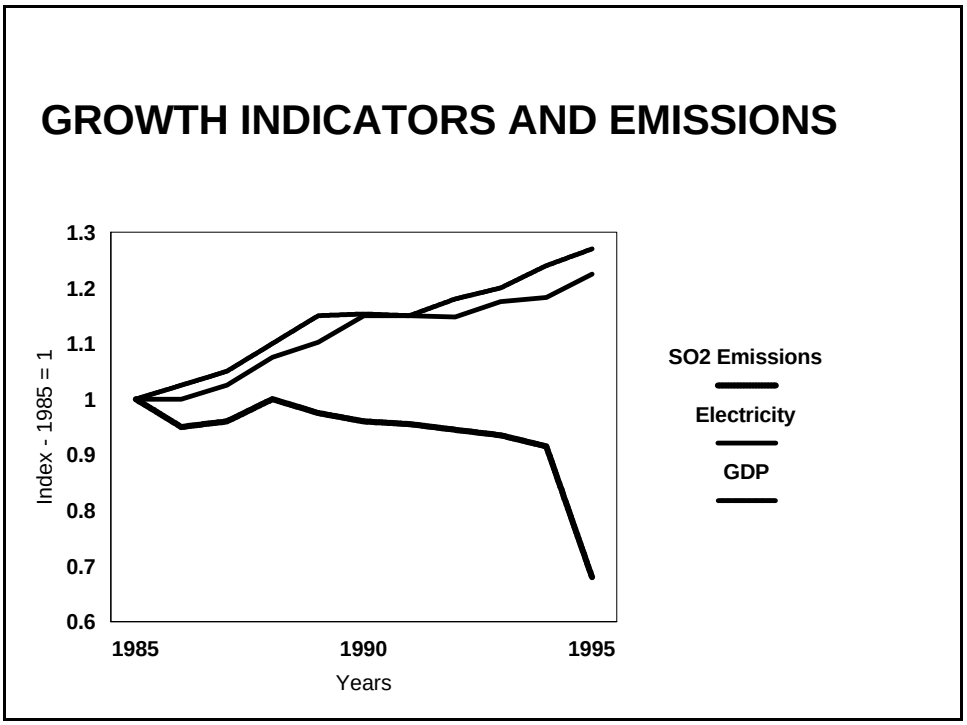
The currency of trading, at least between Parties with "assigned amounts" enumerated under Annex B, is thus "part(s) of assigned amounts," and the currency or instrument of compliance is the same, since, as in the case of allowances under the acid rain program, traded "part(s) of assigned amounts" are directly added to, or subtracted from, Parties' "assigned amounts". As a result, a Party's ultimate compliance is determined by comparing its actual emissions for the period 2008-2012 with its "assigned amount" as increased or decreased by trades added to, or deducted from, it.

B. The Mechanics of Annex B Emissions Trading: Focus on Assigned Amounts and Actual Emissions

Article 17 specifies that the COP "shall define the relevant principles, modalities, rules and guidelines, in particular for verification, reporting and accountability for emissions trading." Similarly, Article 6, which authorizes trading of project-based emissions reductions "additional to any that would otherwise occur", specifies that the COP "serving as the meeting of the Parties to this Protocol may ... elaborate guidelines ... including for verification and reporting." And Article 12 specifies that "the Conference of the Parties serving as the meeting of the Parties to this Protocol shall, at its first session, elaborate modalities and procedures with the objective of ensuring transparency, efficiency and accountability through independent auditing and verification of project activities."

Nevertheless, it is the Protocol text itself, in Article 3, which establishes the most important rule or element of the trading system. Again, by stipulating that Annex B Parties' trades under ***both Article 6 and*** Article 17 must be added to, and subtracted from, their "assigned amounts", Article 3.10 and 3.11 render trading under Article 6 and Article 17 virtually indistinguishable for purposes of accounting for Parties trading activities and fully establish the unified mechanism for ensuring that all traded emissions reductions are "surplus" and can substitute for other emissions reductions. With this fundamental rule embedded in the Protocol itself, the tasks remaining for COP-4 and subsequent COPs are substantially narrowed.

At the same time, those tasks must be critically focused, because, as in the case of the U.S. acid rain program, the "currency" of trading is identical with that of compliance. Accordingly, the task of COP-4 is not to "regulate trading", but to complete the mechanics of trading and accountability rules for compliance, the fundamental elements of which are provided by the Protocol text itself.



Faced with a legislative framework quite similar to that provided by Article 3 of the Protocol, the U.S. EPA, in implementing the Clean Air Act acid rain trading program, chose to concentrate its regulatory resources exclusively on environmental accountability and rejected any role in "regulating trading" apart from the task of ensuring the integration of trading with accountability. The EPA's approach reflected two judgments. First, the agency concluded that the ultimate determination of compliance rested exclusively on whether or not a source's actual SO_2 emissions matched the number of allowances it held.

As a result, the EPA rejected all regulatory approaches that entailed scrutinizing the economic or technical circumstances associated with any source's SO_2 emissions reductions, provided that such reductions actually occurred. Second, the EPA determined that if it were successful in establishing sound mechanics for overall compliance accountability in the first instance, and in the second instance for trading as one of several alternative paths for compliance, the SO_2 emissions trading market in effect would build itself through the economic energies of the private sector. That is, EPA would not need to mandate the price or limit the quantity or origin of SO_2 in trade. To date, the EPA's judgments have been completely vindicated: compliance with the emissions reduction requirements of the program is at - and even better than - 100%; millions of tons of SO_2

allowances have been traded in private transactions; and price competition has delivered significant cost savings.

Because the acid rain program relies completely on an emissions budget system, with sources' compliance defined exclusively in terms of comparing their actual emissions with the number of allowances they hold, it offers a striking analogy for the Kyoto Protocol. Indeed, the Protocol's drafters adopted an identical approach: ultimately, *the only consideration germane to determining a Party's compliance is whether its actual cumulative GHG emissions match its assigned amount as adjusted by emissions trading.* The success of the Protocol depends on maintaining this analogy and rejecting proposals that demand that the Conference of the Parties scrutinize or regulate the economic, political or technical circumstances under which Parties have achieved, acquired or transferred otherwise legitimate, actual GHG emissions reductions relative to valid emissions baselines or Parties' assigned amounts under Annex B.

Adherence to this principle is critical for at least two reasons. First, if the Protocol is to achieve its goal of limiting actual GHG emissions to the atmosphere to the levels specified in Annex B, then Parties must be held accountable not to surrogate or indirect measures of compliance such as technologies deployed, domestic policies adopted or financial expenditures undertaken, but to their actual GHG emissions. To be sure, one of the key virtues of the Protocol is that it permits sovereigns to select from the full menu of policies and measures in accordance with their priorities while still holding them accountable for their actual cumulative GHG emissions. To the extent that rules adopted by COP-4 or subsequent COPs make either compliance or qualifications for trading *for purposes of the Protocol itself* dependent on the adoption of specific measures or policies, they will undermine the fundamental integrity of the Protocol. This is because such rules would create a regime in which Parties' accountability -- i.e., for specific actions as opposed to actual GHG emissions -- would be divorced from their ultimate GHG emissions performance. The likely result would be that the Protocol would encounter many of the problems plaguing U.S. pollution control programs that do not follow the acid rain model: sources may be fully in compliance with specified obligations, but they nevertheless fail to achieve the full measure of expected emissions reductions. When compliance is linked to specific measures rather than actual emissions, no legal entity, public or private is held accountable for the failure to achieve required reductions.

The second reason for demanding that COP-4 and subsequent COPs focus the rules of trading exclusively on actual emissions and nothing else is that the Protocol is intended to create accountability for *Parties, i.e., sovereign nations*. Accordingly, the trading system must be able to accommodate every possible domestic policy approach to complying with international GHG emissions commitment obligations -- e.g., pollution taxes, technology standards, marketable permits -- that sovereigns may choose to adopt in the exercise of their domestic discretion. A system that presupposed the adoption of certain measures and the exclusion of others would be untenable because it would require sovereign nations to forfeit at least some of their own policy-making prerogatives. Similarly, a trading regime that discriminated among different sovereign nations,

invalidating emissions reductions or transactions based on differences in economic or political circumstances, would create invidious distinctions of the sort incompatible with sustaining a voluntary agreement among sovereigns.

C. Trading Under Article 6

By themselves Articles 17 and 3 are sufficient to create the structure for emissions trading between and among Annex B Parties. Even in the absence of Article 6, it seems clear that the Protocol contemplates that under Article 17 individual Parties could determine as matter of their own discretion whether to restrict trading to governments themselves or to permit non-governmental entities to trade emissions reduction created by individual projects. Article 6, however, specifically provides for the trading between Annex I nations of "emission reduction units" from individual projects. In addition, Article 6.3 permits Parties to authorize "legal entities" to participate in trading activities.

1. Project Baselines and "Additionality": A Matter of Sovereign Discretion

Article 6.1 conditions such trading on, among other things, the approval of the Parties involved and the qualification of the emissions reductions as "additional to any that would otherwise occur". Ostensibly, these provisions, especially the latter, put a binding constraint on the project-based trading authorized under the Article such that only those reductions and projects that met the "additionality" requirement could be included in trading. This apparently constraining effect, however, is called into question by two other provisions. Although defining "additionality" through rules subsequently adopted by the Parties would seem to be required, Article 6.2 provides that subsequent rulemaking merely "may" elaborate guidelines implementing trading under Article 6.

That Article 6.2 uses only permissive, and not mandatory, language is perfectly logical, however, in view of the provisions of Article 3.10 and 3.11. For the mechanics of these provisions create an accounting system that provides automatic, or "built-in", additionality. Under these provisions a Party acquiring emissions reduction units pursuant to Article 6 may add them to its assigned amount *only* if they are subtracted from the transferring Party's assigned amount. As in the case of trades of parts of Parties' assigned amounts under Article 17 and these same paragraphs of Article 3, this mandatory double-entry bookkeeping ensures the "additionality" of the transferred emission reduction units -- guaranteeing, again, as in the case of trading of "parts of assigned amounts" under Article 17, that trading Article 6 can occur only in a "zero-sum" context. Because their transfer will result in a reduction of the transferring Party's assigned amount, and because that Party will be in compliance only if it achieves emissions reductions *in addition* to those transferred, the transferred reduction units will necessarily be surplus or "additional" with respect to the Party's assigned amount for each commitment period.

In view of this, the priorities of COP-4 and subsequent COPs become increasingly clear and well-focused: the key to the integrity of emissions trading under Article 6 lies not primarily in elaborating guidelines and rules on "additionality" or on the kinds of projects that Parties may or may not include in emissions trading. *Rather, what is essential to the integrity of Article 6 is ensuring that the fundamental system of holding Parties accountable for compliance with their assigned amounts is sound and credible.* Again, it is through Article 3.10 and 3.11 and Parties' *actual compliance* with their assigned amounts, that the "additionality" test, and therefore the environmental and economic integrity, of Article 6 trading is established. (At the same time, Parties that "bubble" under Article 4 may choose to adopt their own well-defined requirements for project-based emissions trading between countries that fall within the "bubble" in order to ensure that such emissions trading can be undertaken consistent with meeting the Parties' collective commitment.)

If, in turn, the accountability regime for Annex B Parties is credible and persuasive, then it is each Party itself -- rather than the negotiators at COP-4 or subsequent COPs -- that is in the best position to ensure the appropriateness of trading activities under Article 6. This is because each Party that approves the transfer of project-generated emissions reductions puts itself in direct peril of being held accountable any time that transferred emissions reduction units -- which, pursuant to Article 3.11 are subtracted from the Party's assigned amount -- fail to reflect actual, "additional" emissions reductions. In such cases, the Party's assigned amount would be reduced but its actual emissions would not be. Under a credible accountability regime, then, each Party will be reluctant to risk the possibility that a trade of emissions reduction units reflecting emissions reductions that were not "additional" would leave it with excess unaccounted-for emissions, placing it in noncompliance with its international obligations. Thus, a credible set of accountability rules will prod Parties to develop their own domestic implementation procedures to guarantee the "additionality" of each increment of emission reduction units transferred. Only in this way will they be able to eliminate the risk any such transfer will produce a shortfall in their remaining assigned amounts.

2. Project-Based Trading Under Article 6: One Option for Emissions Trading

Apart from clarifying that legal entities other than Parties themselves can be authorized to engage in project-based emissions trading, Article 6 could be seen to be superfluous in view of the superseding effect of Article 3.10-11 and the onus those provisions put on each individual Annex I Party to assure the "additionality" of any such traded reductions. This has caused some to speculate that rather than being superfluous, Article 6 imposes a direct constraint on emissions trading under Article 17. Specifically, these analysts wonder whether Article 6 requires that Parties engage in emissions trading only when they or legal entities they designate explicitly link transfers of parts of assigned amounts to discrete emission reduction units created pursuant to Article 6. Were this the case transactions between Parties involving only parts of assigned amounts would not be permitted.

To be sure, this speculation captures what many Parties themselves, especially those that participate in an Article 4 "bubble", might conclude is the most prudent way to conduct the trading that they, as a matter of sovereign discretion, choose to undertake. At the same time, however, the language of the Protocol itself together with the dictates of sovereignty preclude any interpretation that would constrain Parties' emissions trading to that outlined under Article 6. Paragraphs 10 and 11 of Article 3, drafted with identical language, explicitly distinguish between "parts of assigned amounts" and "emissions reduction units", separating the two terms with the a comma and the word "or", and between Article 6 and Article 17, similarly separating "Article 6" and "Article 17" with an "or" as well in the phrase "in accordance with the provisions of Article 6 or of Article 17."

In fact, it would be anomalous if, apart from specifying their compliance obligations and the mechanics of the trading system, the Protocol were to dictate to sovereigns how to manage their assigned amounts, which are, in effect, nothing but "emissions budgets" analogous to economic budgets. Yet, were Article 6 to be applied as a mandatory constraint on sovereigns' trading of parts of their assigned amounts, then the Protocol would be guilty of just such a breach of sovereigns' prerogatives. Again, provided that the Protocol's accountability rules are sufficiently credible to elicit sovereigns' commitment to meeting their obligations, there is no justification for this, or any other, impingement on sovereign discretion in determining how Parties are going to meet their compliance obligations, including through trading.

D. Trading under the Clean Development Mechanism: Early Start and "Additionality"

Articles 6 and 17 govern trading between and among Annex I and Annex B Parties respectively. Article 12 establishes a Clean Development Mechanism for the purposes of trading between Annex I and non-Annex I Parties. As in the case of Article 6, CDM transactions are to be for "reductions ... that are additional to any that would occur in the absence of the certified project activity." (12.5 (c)). Such reductions are necessarily project-based since the vast majority of non-Annex I nations are not subject to assigned amounts pursuant to Article 3 and Annex B. For the same reason, the "additionality" test is critical since Article 3.12 allows Parties to add to their assigned amounts emissions reductions acquired through the CDM. While the provisions of Article 3.10-11 in effect subsume the additionality test for Annex I nation trading under Article 6, non-Annex I countries are not subject to assigned amounts under Article 3, rendering Article 3.10-11 inapplicable. As a result, the additionality test established under 12.5(c) is absolutely indispensable to the environmental integrity of the emission trading, since it is only through such a test that emissions reductions suitable for offsetting emissions reductions elsewhere can be identified.[9]

[9] It is not clear whether the provisions and procedures established under Article 12 would continue to govern trading for non-Annex I countries that were added to Annex B in the future, since Article 17 and Article 3.10 and 3.11 permit Annex B to transact parts of assigned amounts. Thus, the effect of these provisions could be similar to that discussed in the previous section of the paper concerning the interaction of

1. The Importance of Early Action

Ostensibly, the implementation of CDM trading under Article lies wholly beyond the purview of COP-4 since the Protocol specifies that it is the "Conference of the Parties serving as the meeting of the Parties to this Protocol" that is to "elaborate modalities and procedures" for "verification of project activities", "ensure the collection of administrative expenses" and "supervis[e] ... an executive board" for the CDM. Such a meeting of the Parties to the Protocol cannot take place until the Protocol goes into effect pursuant to Article 25. Article 12.10, however, strongly suggests that it is imperative for COP-4 and subsequent COPs to take at least some action to facilitate early trading activity between Annex I and non-Annex I nations. Specifically, the paragraph provides that "certified emission reductions obtained during the period from the year 2000 up to the beginning of the first commitment period can be used to assist in achieving compliance in the first commitment period." Thus, Article 12.10 and the accompanying Decision of the Parties contemplate the adoption, sufficiently prior to the year 2000 to enable certified emissions reductions to begin in that year, of interim rules for the operation of the CDM.[10]

Article 12.10 and accompanying "Prompt Start" Decision of COP-3 explicitly favor early action that launches emissions trading between Annex I and non-Annex I countries. The logic for this is broad and compelling. In the view of many analysts, investments in emissions reduction in non-Annex I countries are among the most cost-effective that Annex I companies and countries can undertake. Providing an opportunity for them to gain positive experience and learning with respect to such investments, especially if they prove to be an affordable pathway toward compliance, can enhance both their willingness to meet their compliance obligations and, thus, the overall credibility of the Protocol itself.

By the same token, those developing economies experiencing the greatest growth in the current economic time horizon are making substantial infrastructure investments whose environmental consequences, including GHG emissions, could have long-lasting effects for good or ill. Investments of the sort that yielded transactable GHG reductions for the host economy or the foreign investor simultaneously would help provide capital to enable the economy where the investment occurs ("the investment economy") to direct economic growth along paths that were less, rather than more, GHG emissions-intensive. In addition to the environmental benefits that would result directly from this outcome, achieving growth in this way would make it that much easier for these countries to accept, eventually, full participation in solving what is truly a global environmental problem.

At the very least, early participation in project-based trading would offer non-Annex I Parties an alternative or additional path for engagement in the global enterprise of managing greenhouse gas emissions. This, too, may be critical since the dispute over differential GHG obligations between industrialized and developing countries has proven

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Articles 6 and 17.

[10] Paragraph 5(e) of Decision 1/CP.3 (10 December 1997).

to be, and will continue to be, volatile -- especially as GHG emissions from non-Annex I Parties continue to increase.

Opening incentives and means for any sort of early action in reducing GHG emissions is critical for the environment.

Finally, of course, opening both incentives, and the means, for any sort of early action in reducing GHG emissions, is critical for the environment since, without pathways for early action, the Protocol effectively sanctions at least another ten years of uncontrolled GHG emissions, further burdening the atmosphere and making it more difficult for those Parties with legally binding caps on GHG emissions to achieve those limits in the 2008-2012 compliance period -- and further diminishing the prospects of limiting GHG emissions enough to avoid dangerous anthropogenic interference with the climate system.

Without action by COP-4, this array of benefits made potentially available by Article 12.10 may not be realized until far into the future, if at all. Without reliable guidance, continued uncertainty will mean that investments in GHG emissions reduction activities in the form of trading between Annex I and non-Annex I Parties are unlikely to occur. Fortunately, the task of providing CDM guidance is quite manageable. Such guidance, perhaps in the form of interim rules adopted in Buenos Aires that provide recommended approaches to future COP/MOPs, simply would need to address:

- the setting of project baselines for purposes of establishing additionality; and
- methodologies for quantifying, verifying and reporting, on a project-by-project basis, emissions reductions relative to those baselines.

Presumably, reporting requirements pertinent to such trading will be encompassed in the general reporting structure established pursuant to Article 7.

2. "Additionality" and Baselines: Focusing on Actual Emissions

Such interim rules or guidelines should observe two basic principles. First, as discussed above in connection with emissions trading between industrialized nations under Articles 3, 6 and 17, the exclusive focus should be on actual emission performance and the environmental integrity which is founded upon this approach. Second, the guidelines, which will serve as de facto rules, should avoid imposing costs and burdens that do not enhance the actual-emissions integrity of such trading. Emissions trading transactions between Annex I and non-Annex I countries should constitute a fully dynamic market that delivers the maximum cost-savings and incentives for investment and innovation.

Without doubt, the greatest -- and most critical -- challenge to the CDM is the formulation of guidelines for project baselines. It is these baselines which will serve as the mechanical means of determining the "additionality" of emissions reductions and of qualifying them as "surplus" for purposes of offsetting or replacing emissions reductions elsewhere. Thus, although the determination of "what would have happened otherwise" is, in part, a qualitative inquiry, ultimately, the baseline has to capture the emissions consequences, in quantitative terms, if the reduction-generating activity did not occur. This is because it is the change in emissions resulting from the project that qualify as a tradable reduction, and, of course, the "currency" of trading and compliance is actual emissions and emissions reductions.

At the same time, the criteria and general description of the kinds of projects encompassed by Article 12 are broad enough to suggest that virtually every kind of activity that reduces, avoids or sequesters GHG emissions can be a valid source of transactable emissions reductions. In fact, one of the major objectives of emissions trading generally is to stimulate as broad a search as possible for cost-saving opportunities and environmental innovation. Accordingly, while ensuring the environmental integrity of trading between Annex I and non-Annex I, the interim and eventual rules of the CDM must accommodate the greatest breadth possible of emissions reduction and sequestration ventures.

To do this, the interim rules should place upon any proponent of a GHG reduction or sequestration project the burden of coming forward and demonstrating the appropriate baseline for that project in terms both qualitative and quantitative. In demonstrating the baseline qualitatively, proponents should be required to use a "present practices" approach setting forth the status quo activities for which the project is providing a change, alternative or substitute. Whenever possible, this approach should take a literal view, setting forth the recent and ongoing practices or technologies of the host country. The project proponent also should be required to calculate a quantitative emissions baseline for the project, expressed in terms of annual mass emissions in tons. In exchange, the interim rules should guarantee investors a "safe harbor" for any reductions which they report in accordance with the rules.

In keeping with the actual-emissions-performance paradigm of the overall Protocol, the availability and calculation of certified emissions reductions should be based exclusively and in every case on *verified actual emissions reductions* - that is, reductions that have already occurred and whose occurrence has been verified relative to the annual mass emissions project baseline. In many cases, an instrumental challenge will be to apply the appropriate methodologies of quantifying actual emissions generated, or carbon sequestered, by the project. This challenge is likely to be common throughout the compliance and trading system for all nations and other legal entities. Accordingly, the methodologies identified by the Subsidiary Body for Scientific and Technical Advice and the Intergovernmental Panel on Climate Change must be used to provide quantification of project emissions and emissions reductions.

3. "Leakage" and "Loopholes"

Many have identified the problem of "leakage" as one that can undermine the environmental integrity of project-based trading between Annex I and non-Annex I Parties, precisely because the latter are not subject to assigned amounts for their total GHG emissions. These analysts have hypothesized that certain kinds of investments or activities in effect could "cause" economic shifts to other emissions-increasing activities, thus extinguishing the emissions reductions ostensibly gained by the investment or project. The threat to the environmental integrity of project-based trading arises if such emissions shifts occur without being detected or accounted for and the emissions reductions purportedly achieved by the project are used in place of emissions reductions elsewhere.

As Article 12.7 explicitly requires, the ultimate - and, by extension, any interim - rules for the CDM therefore must put in place a mechanism for identifying, and holding nations accountable for, such emissions shifts in the determination of the availability and quantity of transactable emissions reductions claimed for a project. Two alternative approaches are available. Under one, the guidelines could specify the kinds of projects for which such emissions shifting is a possible or likely effect. Proponents of such projects would have the burden of demonstrating that such leakage had not occurred or, in cases in which shifting did occur, quantifying the resulting emissions and deducting them from the quantity of emissions reductions claimed for the project.[11]

A second alternative is to include in the scope of challenges which may be brought against a project challenges based on demonstrations of such otherwise unaccounted for emissions shifts. In fact, the two approaches can be combined.

4. "Financial Additionality": Not An Appropriate Test

Some also have suggested that an element of the test of "additionality" be "'financial additionality". Such an approach would be fundamentally incompatible not only with a "present practices" approach but also with the overall focus on actual emissions and emissions performance upon which the Protocol itself relies. Again, the purpose of emissions trading and in particular of trading between Annex I and non-Annex I countries is to effectuate changes in emissions from the status quo, regardless of the political, economic or technical reasons for actual emissions that occur under the status quo. Consequently, interposing a demonstration of "financial additionality" on projects proposed under the CDM or its preliminary guidelines would exemplify a requirement that adds transactions costs without enhancing environmental performance in terms of changes in actual emissions. Indeed, by inhibiting efforts to harvest cost-effective and innovative

[11] Recall that Article 12.7 of the Protocol provides, "The Conference of the Parties serving as the meeting of the Parties to this Protocol *shall,* at its first session, elaborate modalities and procedures with the objective of ensuring transparency, efficiency *and accountability* through independent auditing and verification of project activities." (emphases added).

emissions reductions in non-Annex I Parties, such a test could be environmentally counterproductive.

V. THE RULES FOR ACCOUNTABILITY UNDER ARTICLE 17: TOOLS FOR ASSURING THE INTEGRITY OF THE KYOTO PROTOCOL

As noted above, Article 17 of the Kyoto Protocol requires the Parties to develop rules for accountability. In the case of Article 17, accountability rules for emissions trading are to be developed by the Conference of the Parties to the Protocol. The acid rain program highlights four tools which COP-4 should consider.

The provisions of Article 3.10, 3.11 and 3.12 , define what is tradable under the Kyoto Protocol. In the way that they operate, Articles 3.10-3.12 restrict what is tradable to any emissions reductions or parts of assigned amounts that are "surplus" to those a Party needs in order to meet its assigned amount. These are the only such reductions that are tradable. It is only in that way that a given increment of emissions reductions or part of an assigned amount can be put in the place of another or added to another Party's assigned amount while ensuring that the overall emissions limit for all of Annex B is met. This logic is sustainable, however, only if ***all*** Annex B Parties, including even those that have not engaged in trading, ultimately meet their assigned amounts for the 2008-2012 period. Otherwise, while any two trading partner Parties may be in compliance, no given increment of emissions reductions is truly "surplus" ***from the perspective of the total Annex B emissions commitment*.** In such a case, total Annex B GHG discharges to the atmosphere would exceed the total amount permitted to Annex B Parties collectively -- i.e., the overall Annex B emissions commitment that comprises the sum of all Annex B Parties' assigned amounts.

For example, consider trading between two Annex B Parties. Pursuant to Article 3.10 and 3.11, the transferring Party deducts the traded amount so that the acquiring Party can add that amount to its assigned amount without creating a net emissions increase relative to what the two Parties' total emissions would have been in the absence of the trade. This double-entry bookkeeping mechanism established by 3.10 and 3.11 produces this result, however, only if the transferring Party's actual emissions do not exceed its assigned amount after subtracting the amount transferred. If the transferring Party's actual emissions exceeded its assigned amount, then the trade would necessarily result in a net emissions increase: the emissions reductions of the transferring Party purporting to take the place of reductions by the acquiring Party simply would not exist if the transferring Party exceeded its commitment.

2008-2012	***Before Trade***	***After Trade***

Transferring Party (Party #1)	*Assigned Amount 1000 Actual Emissions 800*	*Assigned Amount 800 Actual Emissions 800*
Acquiring Party (Party #2)	*Assigned Amount 1000 Actual Emissions 1200*	*Assigned Amount 1200 (1000 + 200 P-#2 '09) Actual Emissions 1200*
Total -- Both Parties	*Assigned Amount 2000 Actual Emissions 2000*	*Assigned Amount 2000 Actual Emissions 2000*

Table 1: Transferring Party Has "Extra" Assigned Amount; After Trade, Total Actual Emissions Match Assigned Amounts

2008-2012	***Before Trade***	***After Trade***
Transferring Party (Party #1)	*Assigned Amount 1000 Actual Emissions 1000*	***Assigned Amount 800 Actual Emissions 1000******
Acquiring Party (Party #2)	*Assigned Amount 1000 Actual Emissions 1200*	*Assigned Amount 1200 (1000 + 200 P-#2 '09) Actual Emissions 1200*
Total	*Assigned Amount 2000 Actual Emissions 2200*	*Assigned Amount 2000 Actual Emissions 2200*

Table 2: Transferring Party Does Not Have "Extra" Assigned Amount; After Trade, Total Actual Emissions Exceed Assigned Amounts, Because Party #1's Actual Emissions Exceed Its Assigned Amount

Consequently, in order to ensure the environmental (and economic) integrity of the trading system, COP-4 must create an accountability mechanism to reinforce, and ensure the efficacy of, Article 3.10 and 3.11. The U.S. acid rain emissions trading program, which uses exactly the same "emissions budget" template that Article 3 adopts for Annex B Parties, also had to solve this problem. Again, the acid rain program can treat *any* SO_2 emissions allowance unused by a source as automatically, or by definition, tradable and "savable" because ***all*** affected SO_2 sources, ***even those that do not engage in trading***, are subject to a collective emissions budget or cap. That cap is equal to the fixed total of SO_2 emissions allowance allocated to them every year. It is this overall SO_2 emissions cap that qualifies and guarantees as "surplus", and therefore tradable, unused emissions allowances -- just as the overall Annex B commitment (comprising the sum of all Annex B Parties' assigned amounts) guarantees and qualifies as "surplus" and therefore tradable "parts of assigned amounts" transferred pursuant to Article 3.10 and 3.11.

COP-4 can choose from among several options.

A. Compliance "True-Up"

Under this approach, the COP-4 trading rules would establish a "true-up" period for the first six months following the close of a 5-year compliance period. During that time, any Annex B Party, whether it has engaged in trading or not, with GHG emissions in excess of its assigned amount would be required to obtain parts of assigned amounts from other Annex B Parties or emissions reduction units from the Clean Development Mechanism pursuant to Article 12. This mandatory "true-up" would ensure that any part of an assigned amount transferred between Annex B Parties and any increment of emissions reductions transacted between companies would represent a true, environmentally equivalent offset of the emissions for which such transacted reductions are being exchanged.

B. Automatic Deduction

To ensure the efficacy of the overall emissions cap so critical to the integrity of the SO_2 emissions allowance trading system, the U.S. acid rain program includes a mandatory accountability feature automatically triggered by any source whose SO_2 emissions exceed the total allowances it holds at the end of an annual compliance period. In those cases, the EPA must deduct -- automatically -- from the source's allowance allocation for the immediately following year the number of allowances needed to offset fully the source's excess emissions. In this way, the acid rain program automatically ensures the integrity of each and every allowance trade -- again, by ensuring that *any* traded or saved allowance represents emissions reductions **in excess not only of those needed by the transferring source but also of those needed by the entire universe of sources subject to the program's SO_2 emissions budget or cap.**

If they are to succeed in ensuring the integrity of the Annex B emissions trading system, the trading rules adopted by the COP-4 must include a virtually identical accountability device. Specifically, the rules should provide that for any Annex B Party, *whether it has engaged in trading or not*, whose cumulative GHG emissions, at the end of the 5-year compliance period, and/or subsequent "true-up" period, exceed its assigned amount (as adjusted pursuant to Article 3.10-13 to reflect trading and savings activity), its assigned amount for the following 5-year compliance period will be reduced by the amount by which its emissions exceed the assigned amount.

The "true-up" period tends to make the atmosphere "whole" relative to the total Annex B GHG emissions commitment virtually by the end of the compliance period in question. Conversely, the automatic-deduction approach makes the atmosphere "whole" only at the end of the subsequent compliance period. The value of the automatic-deduction mechanism , however, is that because it is automatic, it requires no

additional enforcement with respect to a violating Party's performance. This "automaticity" that may make the automatic deduction device a critical accountability feature since it ensures "built-in" integrity for the GHG emissions trading system.

C. Making the Environment Whole: Repaying The Atmospheric Debt

At the same time, the effect of the automatic deduction as an enforcement measure may be enhanced in a way that also rectifies the delay in full compliance that the deduction approach effectively permits. In any compliance period, if Parties emit more than their assigned amount, the atmosphere is affected not only by the excess emissions during that compliance period, but also by the amount of warming those excess emissions cause over their atmospheric lifetime - which may run from decades to centuries or longer. Accordingly, to hold Parties accountable for the atmospheric effects of these excess emissions, the rules should specify that the quantity by which a Party's assigned amount is reduced for the purposes of offsetting its excess emissions must be greater by at least 20%, for example, than the total emissions by which it exceeded its assigned amount. By augmenting the deduction, the rules will then account for, at least partially, the atmospheric debt incurred by the delay in achieving the full measure of emissions reductions contemplated for each compliance period. In addition, this additional deduction increment would double as the first tier of a graduated approach to international accountability of Parties' quantified commitments under Article 3 and Annex B.

AUTOMATIC DEFICIT DEDUCTION

- Option to Limit to a Fixed Percentage of Assigned Amount
- A Critical Element of Sovereign Accountability
- With "Atmospheric Penalty," Necessary to Maintain Environmental Integrity
- Necessary for Market Feedback and Discipline

D. Tracking Compliance within the Commitment Period

Another component of accountability is to track interim progress of each Party. Annual reporting of each Party's emissions could be used to track the progress of each Party in meeting its overall assigned amount. If a Party's actual emissions were in excess, by a certain margin, of its total assigned amount, COP-4 could institute automatic discounts on emissions reductions or parts of assigned amounts transferred by the Party, that would have the effect of encouraging Parties to stay "on track" toward meeting their emissions commitments. This approach underscores the role of emissions trading as a means of facilitating and incentivizing, and not avoiding, compliance. From the perspective of maintaining the accountability and integrity of the trading system, this discount would

provide some degree of insurance against transfers from Parties that might be less likely to meet their assigned amounts.

The box below summarizes the menu of remedies available to guarantee the accountability and integrity of the emissions trading system against Parties' emissions in excess of their assigned amounts:

PROGRESS TRACKING and ENFORCEMENT PROVISIONS

- For Net Emissions Greater Than Assigned Amount
  - All Excess Deducted From Period
  - Atmospheric Penalty (e.g. 1.2:1.0)
- For Net Emissions Greater Than 110%
  - Mandatory Discount for All Non-Tendered Exported Amounts
- For Net Emissions Greater Than 120%
  - Prohibition on Sales
  - Mandatory Review by COP

VI. THE ROLE OF ARTICLE 17 ACCOUNTABILITY FOR EMISSIONS TRADING IN THE WIDER CONTEXT OF PARTY NONCOMPLIANCE: CREATING INCENTIVES FOR SOVEREIGN COMPLIANCE

The engine that will drive the development of an effective market for GHG emissions is the imperative of international accountability, coupled with and subsequent domestic enforcement. If there is no international consequence to Parties who exceed their quantified emission limitation and reduction commitment, private market actors will be reluctant to participate in the international GHG market notwithstanding that individual nations may impose consequences upon companies operating within their borders. This reluctance will arise because, in the absence of credible international accountability, there will be no mechanism to ensure the financial and environmental integrity of any reductions transacted. Without such integrity, there will be no investment. Without investment, the market will not develop, and the environmental and economic benefits of emissions trading -- ranging from its ability to facilitate compliance and continually uncover lower cost compliance alternatives, to its capacity to speed up emissions reduction activity and drive innovation and to its ability to sustain agreement among nations in the first instance -- will be lost.

The engine that will drive the development of an effective market for GHG emissions is the imperative of international accountability, coupled with and subsequent domestic enforcement.

It is critical to understand how central the combination of international accountability and domestic enforcement are to the environmental effectiveness of the Protocol. International accountability for Annex B commitments is a matter independent of the choice of policy instrument. International accountability is also central to assuring Parties that the Protocol will be fair and not distort competitiveness between nations. In fact, the ability of individual sovereigns to create and carry out credible domestic compliance regimes depends directly on the credibility of the international accountability regime.

Accordingly, the COP-4 accountability rules should embrace the following elements:

- Automatic Consequences - as discussed above, these would establish an automatic deduction of any emissions exceedance by an Party from that Party's next assigned emissions amount in an amount GREATER than the quantity of the Party's excess emissions.
- Automatic Discounting of portions of assigned emissions amounts transferred from any Party exceeding its assigned emissions amount.
- Prohibition on additional sales/transfers of portions of assigned emissions amounts from any Party exceeding its assigned emissions amount until that Party returns to compliance.

Among other things, these provisions would enlist the economic dynamics of the emissions trading market itself in unlocking the riddle of sovereign compliance with the Protocol.

To illustrate why this challenge is so daunting, the enforcement tools afforded the U.S. Environmental Protection Agency under the federal Clean Air Act make a revealing contrast with the remedies practically available in an international context in which the accountable Party is a sovereign. For example, Title IV of the Clean Air Act, which established the emissions trading program for SO_2 reductions requires companies to pay an *automatic* penalty of $2,000 (adjusted for economic inflation) for each ton of excess SO_2 emitted. In addition to the *automatic* deduction in their future allowable emissions. In addition, they are subject to a full panoply of civil and criminal sanctions under the Clean Air Act's general enforcement provisions. The availability of these remedies and the ability of enforcement officials to bring them to bear against companies reflects a widespread and highly durable consensus that permeates virtually every sector of U.S. society, a consensus, in turn, that, together with the threat of these sanctions, elicits compliance from the vast majority of regulated industries.

Similar tools are not nearly so readily available in an international context, nor is there likely to be a comparable consensus amongst sovereigns in the foreseeable future. Moreover, an attempt to implement a tool such as international monetary penalties for noncompliance risks the possibility that the penalty could not be set sufficiently high so as to act as a true deterrent to noncompliance. If the penalty is set too low, nations and industries will simply calculate the discounted present value of noncompliance, expend their present-day resources on productive activities other than GHG emissions reductions, and count on paying the monetary penalty in cheaper future dollars or Euros or other national currencies.

Consequently, although the Kyoto Protocol explicitly imposes quantified GHG emissions limits and reduction requirements on Annex B Parties, apart from Article 18, which does little but allude to future deliberations, it leaves wholly unanswered this question: if, at the end of each compliance period, there are nations whose GHG emissions exceed their commitment levels, what happens? Environmentally, the atmosphere will continue to be subject to unacceptable levels of GHG emissions. By the same token, from the point of view of the integrity of a protocol purporting to embody "legally binding commitments", the credibility of such an agreement would be destroyed if, instead of being held accountable for meeting their legally binding emissions reduction obligations, those nations simply are permitted to start with a "clean account" in the next commitment period. The prospect of such an outcome actually lessens the chances for Protocol ratification, especially in those nations that traditionally rigorously enforce through domestic authorities their international obligations. To these countries and their affected constituencies, the Protocol is likely to be unacceptable unless all Annex B Parties and their firms are subject to credible consequences for noncompliance.

At the other extreme, remedies and sanctions that excluded such nations from the GHG emissions commitment and trading system or imposed general trade sanctions would, if imposed without any intermediate measures, also render any agreement non-credible on environmental grounds. Simply banishing non-compliers from the trading system would be self-defeating as a first-order sanction, since those countries would continue to emit GHGs at excessive levels. In fact, one of the key functions that the Protocol's accountability strategy must serve is ensuring that countries facing difficulties in complying are provided a mechanism or path that eases their achievement of compliance. A first-resort exclusion of these countries from the trading system would be environmentally counterproductive.

As for an approach that relied on general trade sanctions, the recent history of trade sanctions demonstrates that nations are extremely reluctant to administer such sanctions. Their imposition as a first-order measure requires a degree of political will that is unlikely to exist in the GHG context in the near term. Moreover, the environmental objectives of a protocol --not to mention the economic competitiveness concerns of nations with GHG emissions reduction and limitation commitments -- strongly suggest that the protocol should seek to engender a dynamic that will encourage those nations in the developing world, which initially may not be subject to legally binding GHG reductions obligations, to

assume such obligations eventually. General trade sanctions, however, may discourage, rather than encourage, other Parties from taking on emissions commitments. . It is hard to imagine that nations considering accepting legally binding GHG commitments would choose to do so if the result were to expose them, as a first-order sanction, to the economic losses created by trade sanctions. Moreover, any proposal to adopt such measures likely would raise questions with regard to the relationship between the Protocol and the obligations of nations participating in the World Trade Organization.

Ultimately, such sanctions doubtless will have to be included as sanctions under the enforcement authority of Article 18, but it is hard to see them serving any role other than that of last resort. On the contrary, the effectiveness of the Protocol's GHG emissions limitation regime will depend on structured accountability rules that apply automatically. To accomplish this, the COP-4 rules must incorporate the measures outlined above, fashioned as an extension of the emissions trading system itself. If fully implemented, these provisions would both ensure inter-temporal environmental accountability for excess emissions and create an inherent disciplinary feedback against nations' noncompliance. Thus, the emissions trading market itself may be the best tool for disciplining and guiding sovereign decision-making.

A. Automatic Deduction

As already discussed, the automatic deduction would be implemented by reducing a Party's assigned amount for the following 5-year compliance period by the full amount of the nation's excess emissions at the conclusion of the current compliance period. This automatic deduction would be augmented in size by an additional percentage of sufficient size to ensure that the mechanism itself would not be used as a routine compliance option. If the additional percentage were relatively small, the automatic deduction would, in effect, operate as a kind of mandatory "borrowing" from the next compliance period. However, by making the additional percentage sufficiently large so as to make the atmosphere "whole" and, further, operate as a strong deterrent to noncompliance, the automatic deduction operates NOT as a "borrowing" element, but as a compliance element. Accordingly, as a remedy for what would be treated as an initial instance of noncompliance, this automatic augmented deduction would be a second-tier response, which could be followed by more stringent sanctions in the event the nation's emissions exceeded its commitment level in the following period.

In addition to ensuring that each Party's accountability was truly continuous from commitment period to commitment period, the automatic deductions from Parties' consecutive assigned amounts for excess emissions would serve two other functions intrinsic to the integrity of the Protocol 's GHG emissions limitation and reduction system -- both of which have been discussed at length in the preceding section. First, these deductions would ensure that the environment was compensated both for the GHG emissions reductions initially lost and, through the additional "interest", for the delay in achieving those initially lost reductions. Second, in the absence of an automatic deduction

for excess emissions, emissions reductions transferred by non-complying nations could be used to offset emissions generated by the industries or nations acquiring the emissions reductions notwithstanding the fact that such emissions reductions did not represent surplus emissions reductions. By offsetting the non-complying nation's excess emissions, however, the automatic debit would ensure that GHG emissions reductions transferred by the non-complying nation were surplus or ultimately became surplus. Again, the automatic deduction is an essential element of both the Protocol's system of accountability and to its environmental integrity.

Party #1: End-of-Compliance-Period Statement, Years 2008-2012
Initial Assigned Amount: 200 X 5 years = 1000
Less Transfers: - 200 (2009) = 800
Actual Emissions: 1000
EMISSIONS ACCOUNT DEFICIT: 200
Party #1: Beginning-of-Compliance-Period Statement, Years 2013-2017
*Initial Assigned Amount: 180 X 5 years = 900**
Less 2008-2012 Deficit: - 200
Less Atmospheric Repayment (20% X 200) - 40
ASSIGNED AMOUNT, 2013-2017 660
**** Note: Assigned amount assumes 10% reduction from first commitment period, ONLY for purposes of illustration***

Table 3: Operation of the Automatic Deduction

B. The Discount

Though indispensable, the automatic deduction alone is not sufficient to reward compliers and sanction non-compliers in a credible, effective and reliable way. In fact, the automatic deduction offers a partial answer at best to the question of what it is that the Protocol can use or create to compel or induce a sovereign to achieve compliance with its GHG emissions commitment. Certainly the prospect of an automatic deduction, augmented by a sizable "atmospheric repayment" percentage in the immediately following

compliance period, signals nations that an "emit now, pay later" strategy for managing their GHG emissions over time would be inevitably expensive and potentially risky.

For nations whose commitment to, or capacity for, compliance is only marginal, however, the deduction from the ensuing assigned amount can prove to be little more than a mere restatement of the nation's future obligation, an obligation that in itself has little credibility unless backed by something more than attenuated threats of eventual sanctions. Since, as discussed above, a compliance strategy that relies primarily on the imposition of sanctions is simply not credible in this context -- and could even be self-defeating, the rules implementing the Protocol's trading system needs to incorporate a mechanism that will lead sovereigns to *prefer* compliance over noncompliance even if they are not persuaded by the possibility of sanctions.

It is from the inherent economic dynamics of the GHG emissions trading market that such a preference must come. In fact, the rules should seek to rely directly and explicitly on the emissions trading market as the mechanism for delivering that preference. To maintain accountability, they should include an automatic and immediate imposition of discounts on parts of assigned amount or GHG reductions exported by nations whose annual reports show that the combination of their emissions and their exported reductions is putting them over their total assigned amounts. In those cases, the rules should require that, beginning in the year -- within any 5-year compliance period -- in which this first occurs, governments applying those reductions to their own assigned amounts automatically discount, by the proportion of the exporting country's excess GHG emissions, the exported reductions' tonnage value for emissions offset purposes.

This automatic discount is necessary because without it, exported GHG reductions from non-complying nations would be available to offset in full other nations' actual emissions notwithstanding the fact that the exported reductions and parts of assigned amounts did not represent actual surplus reductions. Although the automatic deduction addresses this issue as well, the remediation it provides does not occur until the subsequent commitment period. In addition, this approaches imposes liability only on "sellers" of parts of assigned amounts/emissions reduction units. Introducing automatic discounting on non-tendered reductions would maximize the effectiveness of market discipline through a system that combined seller and buyer liability.

Equally important, this automatic discounting would force the market to value various countries' exported reductions differently based on their compliance, exacting a price for noncompliance and creating a premium for quality. Reductions from compliers would earn more than those from non-compliers at least in proportion to the tonnage-value discount imposed on the latter. At the same time, industries and nations buying exported reductions would exercise preference for reductions from complying nations, and invest effort in ensuring that reductions they acquired were from countries in compliance or on a course for compliance. Thus, by sending a market signal back to nations that fail to manage their emissions reduction obligations, this discount provision can work with the

automatic deduction to impose a discipline both on these sovereigns and their industries and on their emissions trading partners.

Because one critical attribute of the automatic discount is its shifting of some risk -- and, therefore, incentive -- to buyers, the discount enhances the integrity of the emissions trading system in another way. Buyers' preference will be for reliable trading partners who can deliver emissions reductions and parts of assigned amounts that will retain their full value in offsetting emissions in the context of buyers' own compliance obligations. As a result, a preponderance of the emissions reductions and parts of assigned amounts transacted in the global emissions trading market may be those that *in the first instance* are highly likely to represent truly surplus reductions.

At the same time, in contrast to a regime in which non-compliers were excluded from the emissions trading market de jure, the fact that it would be the market, in exercising its preferences, that produced the effective exclusion of non-compliers from emissions trading comports with an overall strategy of using the market to elicit compliance. In this instance, the loss of economic opportunity resulting from this exclusion could act as a spur to drive non-compliers to take the actions necessary to achieve compliance. In fact, industries and other entities seeking to generate surplus GHG emissions reductions and sell them in the global market would become constituents for compliance within their own countries. In the face of the limitations that characterize an international enforcement regime, the protocol must rely on using the incentives inherent in a global GHG emissions trading market to mobilize as many constituents as possible in favor of compliance.

From a superficial perspective, an approach, such as an automatic discount, which exposes buyers to uncertainty as to the use-value -- in this case, the emissions-tonnage value -- of their acquisition would seem to be incompatible with an active exchange market. However, a simple comparison to currency markets, or, for that matter, to any transaction involving currencies that are "foreign" to one of the parties, and which regularly fluctuate in value in comparison to the party's "domestic" currency, demonstrates that this uncertainty is a routine part of international commerce. Moreover, it is easy to imagine that transaction partners and intermediaries would find a variety of hedging or insurance instruments readily available to manage such uncertainty. Only if it resulted in the full confiscation of an emissions reduction's offset value would a discount system fatally inhibit the development of an international emissions trading market.

In this case, no such confiscation would be necessary. The concurrent presence of the automatic discount mechanism would render surplus, at least eventually, exported reductions, even from initially non-complying countries. Consequently, the emissions-offset value of such reductions would not have to be discounted to zero. By the same token, the discounting would be applied only for those emissions reduction credits and/or parts of assigned amounts presented for use in meeting the buyer's compliance obligations ***after*** the selling nation's exceedance of its total assigned amount emerged in annual reporting. Emissions reduction credits and parts of assigned amounts that had

been used prior to that time would not be discounted, thus avoiding the imposition of retroactive liability for purchasers of a sort that could inhibit emissions trading activity.

At the same time, however, the discount device can be used on an extended basis over more than one commitment period for any non-tendered reductions or parts of assigned amounts transferred by Parties that continue to be emitting GHG in excess of their assigned amounts (or, more specifically, of their intra-commitment period benchmarks) as adjusted to offset excess emissions from a previous commitment period.

Without *both* an automatic deduction applied to assigned amounts for subsequent compliance periods *and* an automatic discount applied within each commitment period for emissions reductions and parts of assigned amounts exported by nations demonstrably exceeding their total assigned amounts, the Protocol would lack adequate mechanisms for ensuring not only nations' accountability for compliance, but also the credibility of the system itself. Without the ability to rely, in any but the most extreme circumstances, on the kinds of remedies, sanctions or other coercive measures typical of domestic pollution control laws such as the U.S. Clean Air Act or, in some instances, the general system of international commercial trade, the Protocol must develop a fully integrated set of incentives to ensure accountability and thus motivate compliance.

That is yet another reason that the Kyoto negotiators' decision to implement GHG emissions reduction and limitation obligations through a system of emissions trading is so indispensable to the success of the Protocol. An emissions trading market is virtually the only mechanism that can provide such incentives. At the same time, the emissions trading and accountability regime must be carefully designed to hone these incentives. Just as the opportunity to create early reductions and "save" them for future use intensifies incentives for early action and for the development of environmental innovations, features like a discount applied to the GHG emissions reduction and parts-of-assigned-amount exports of non-compliers are essential to perfecting those incentives that can effect nations' -- and their firms' -- preference for compliance. Moreover, such a discount does more than provide a tangible instrument for delivering such incentives. Without a discount, the emissions trading system will lack important mechanisms that can be readily usable in the first instance to perform the function -- traditionally served by penalties and similar remedies in domestic legal programs -- of holding sovereigns accountable if they stray from the path of compliance.

C. Prohibiting Sales and Transfers

Clearly, Parties that have exceeded their assigned amounts logically cannot provide emissions reductions qualified to offset other Parties' emissions. For this reason alone, beyond a specified threshold of excess emissions such Parties cannot be permitted to transfer reductions and portions of their assigned amounts (although they could continue to acquire parts of assigned amounts). Such a prohibition also serves as an economic

incentive favoring compliance, since Parties and their industries will be barred from opportunities to profit from the international emissions trading market.

VII. A COMPREHENSIVE REPORTING SYSTEM FOR EMISSIONS PERFORMANCE AND TRADING

A. Measurement and Reporting: Vintaging

At the center of both the Protocol's compliance and trading systems is a mechanism for reporting Parties' emissions performance and their trading activities. Fortunately, by establishing actual emissions performance under an assigned amount as the metric for compliance and by specifying a double-entry system for implementing trading in parts of assigned amounts, the Protocol makes it readily feasible to rely on a unified reporting system for tracking simultaneously Parties' actual emissions, their trading activity and their ultimate compliance**.**

ANNUAL BUDGET REPORTING

Imported Reductions

Costa Rica	Czech Republic	Mexico	Netherlands	Russian Federation
2,000	**500**	**1,500**	**1,000**	**5,000**

ANNEX I PARTY B

Emission Budget (average annual)	Domestic Emissions	Domestic Offsets	Exported Reductions	Imported Reductions	Emission Savings (cumulative)
150,000	**175,000**	**15,000**	**5,000**	**10,000**	**(5,000)**

Emissions, Reductions, Tracking and Trading

Annex B Party #1	Assigned Amount (average)	Domestic Emissions (actual)	Domestic Offsets	Exported Parts of Assigned Amounts	Imported Amounts and CERs	Year-End Balance
Year 2008	1,000	1,000	200	200	100	100

Year 2009	1,000	1,200	200	300	100	(100)*
Year 2010	1,000	1,200	200	100	-----	(200)*
Year 2011	1,000	1,200	100	100	200	(200)*
Year 2012	1,000	1,000	100	150	50	(200)*
Total	**5,000**	**5,600**	**800**	**850**	**450**	**(200)***

1. Assigned Amount, expressed in annualized terms as one-fifth of its total allowable amount for the period 2008-2012.

2. Actual Domestic Emissions Reported in Total and By Sector.

3. Domestic Offsets. In this category, a nation could report *surplus* GHG emissions reductions generated as a result of actions in GHG emissions sectors not regulated under its domestic programs and not used by its sources in meeting compliance under those programs.

4-5. Exported and Imported Parts of Assigned Amounts (Including Specified Emissions Reduction Units from Article 6 Projects) and Certified Emissions Reductions. These would be reported expressly by vintage, i.e., their country of origin and year of origin in the case of parts of assigned amounts, and, in the case of transfers of certified emissions reductions under Article 12, by country of origin, year of origin, and project of origin. Article 12 transfers could not occur until the amount of emissions reduced or sequestered in any project-year had been verified. Vintaging enables Parties to track all transfers, enabling transparency, integrity and accountability to be maintained. For example, under the accountability rules proposed above, since reductions or parts of assigned amounts exported by nations whose annual reports revealed that they were exceeding their total assigned amounts would be discounted, in terms of their emissions value, before they could be applied to the importer's domestic compliance program, the identity of the country transferring the parts of assigned amounts and the origin of the parts of assigned amounts would have to be maintained.

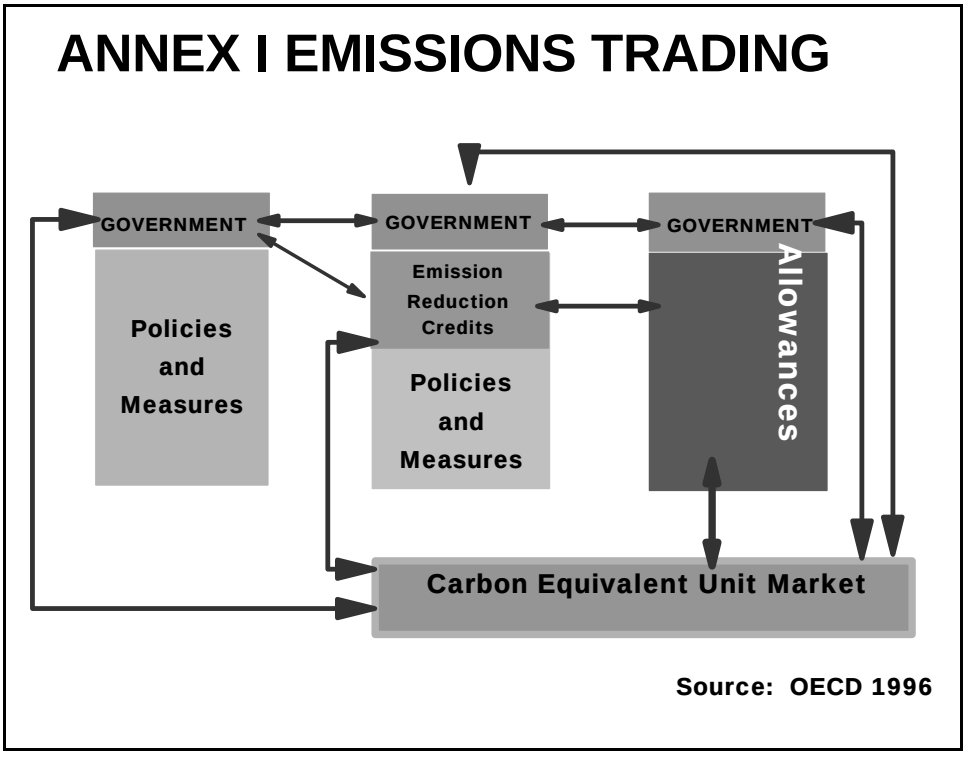
6. Year-End Balance and End-of-Period Balance. These would be the annual difference between actual emissions and allowed amounts, adjusted based on offsets, imports and exports. If in any year a nation's emissions exceeded its annualized commitment as adjusted to reflect domestic offsets, exports and imports, then such savings would be expressed as a negative value. In addition, of course, reports at the end of each commitment period would state a net sum of the Party's savings, either positive or negative. In revealing each Party's performance relative to its total assigned amount of GHG emissions the report would show either a net savings to be carried forward and added to a future assigned amount pursuant to Article 3.13, or a net debit, which, under the accountability rules described above, would be deducted immediately from the Party's assigned amount for the ensuing period, along with an atmospheric penalty.

This reporting approach would provide a unified mechanism for accountability and trading. It would be through each year's report that the mechanics of accountability would

be automatically triggered while at the same time international emissions trading would be effectuated.

B. Reporting and Tracking of Trading

Through this approach, which is, precisely the double-entry record-keeping specified in Article 3 (since every Annex B Party's report would show both exports and imports), the international emission trading system can accommodate GHG emissions trading between and among private industries in different nations while ensuring both the integration of private and sovereign trading and full accountability for Parties' performance against their assigned amounts. In addition, it does not presuppose any particular set of policy approaches that participating nations may choose to use on a domestic level, nor does it rely on developing extensive new institutional authorities internationally.



In fact, under this system, if governments so choose, virtually any company operating under virtually any domestic policy regime can transact the international sale of surplus GHG emissions (allowable amounts or certified emissions reductions). Meanwhile, the integrity of the system of accountability remains assured. This approach achieves this by requiring nations to report annually *all* emissions exports, whether initiated by the sovereign itself or any private industries operating within sovereign borders. Even private sales transactions, therefore, of necessity will have to be effectuated through both their being reported to the government of the seller and a corresponding *deduction being taken*

from that sovereign's assigned amount. At the same time, this approach permits the use of a variety of "clearing" mechanisms ranging from the establishment of accounts with the country of origin to the use of international GHG insurance mechanisms of various types.

To ensure that this occurs with every such transaction, sovereigns whose industries are purchasing portions of allowable amounts or certified emissions reductions should agree not to recognize or accept such tons for compliance purposes in the absence of a demonstration that the exporting sovereign had acknowledged the transfer and, if the exporting sovereign is an Annex B Party, had subtracted the tons sold from its own allowable amount. Of course, in accepting such purchases, the importing sovereigns would be able to report either a net increase in their own assigned amounts or a net decrease in their emissions. This approach thus effectively makes all international GHG emissions trading take the form of inter-sovereign trading of increments of the sovereigns' assigned amounts. As a result, this approach, following the requirements of Article 3.10-11, guarantees that, *by definition or as a creation of the accounting mechanism* itself, *all* trades are for *surplus* reductions. In effect, certifying that a traded reduction is surplus, often a prohibitively cumbersome process in other trading approaches, is a fully inherent feature of the Kyoto Protocol accounting mechanism.

C. Reporting and Accountability

The reporting mechanism is also a crucial trigger for the Protocol's two key accountability mechanisms. Since the fifth annual report in each commitment period will include a summing of each nation's cumulative "savings", both positive and negative, those reports that indicate a net deficit -- that is, emissions in excess of a Party's assigned amount as adjusted to reflect trades -- will trigger, as proposed elsewhere in this paper, an automatic deduction from the affected Party's assigned amount for the ensuing period.

Similarly, at any time during the course of a commitment period a nation's annual report may reveal that its cumulative emissions exceed by a certain percentage (e.g., 10%) of its total assigned amount for that 5-year period. In that case, the discount requirement would be automatically triggered for application by every other sovereign whose companies held reductions exported by that nation. Again, the discount, would be applied to those reductions that were presented by the companies that had acquired them for use in offsetting their own emissions and thus meeting their domestic emissions obligations or were otherwise used by the sovereigns themselves to augment their assigned amounts or offset their emissions. However, the discount would take effect only beginning in the first year after a nation's "emissions deficit" was revealed and would affect only those transferred reductions that were submitted subsequently. Nevertheless, the ability of the annual reports to reveal, essentially immediately, the creation of nations' "deficits" before the end of the 5-year period would allow the Protocol's rules for implementing trading to require that the discount be applied automatically by all Parties

with assigned amounts and holding unused parts of assigned amounts form non-complying Parties.

Finally, the reporting approach outlined here, especially with its use of vintaging by year and country for transfers of parts of assigned amounts and by year, country and project for transfers of emissions reductions from non-Annex I nations endows the trading and compliance system with full transparency. Such transparency is essential to the international and market credibility of the Kyoto Protocol as the international community progresses through "learning by doing" in the effort to manage GHG emissions. In addition, such transparency is likely to reinforce Parties', and their firms' and citizens', commitment to a sound trading and compliance system.

VIII. MEASUREMENT and QUANTIFICATION

Quantification is essential to the successful implementation of the Kyoto Protocol because the Protocol defines Parties' obligations expressly in terms of quantified limitations on total actual emissions. At the same time, the integrity of the emissions trading system created by the Protocol depends on one increment of emissions reduction being literally exchanged for – that is, put in the place of -- another. Before any such exchange or transaction between emissions sources can be credited for purposes of national compliance, the amounts transferred must be known with reasonable certainty. No prudent Annex B government would sanction a transfer of part of its assigned amount unless it had relatively secure knowledge of its actual emissions inventory, or, in the case of a transfer associated with a specific reduction project, relatively secure knowledge of the actual reductions achieved by the project.

It is imperative, therefore, that the resources of the SBSTA, the IPCC, national governments and even private parties be focused on issues and methodologies for quantifying overall national emissions and the emissions reductions resulting from projects and initiatives designed and implemented to achieve such reductions.

QUANTIFICATION AND REPORTING

- Framework Established by FCC and Kyoto Protocol
  - *National Reports*
  - *"Double-Entry" Bookkeeping Incorporated in Article 3.10 and 3.11*
- "Double-Entry" Should be Extended to CDM Reporting (Buenos Aires)
- Buenos Aires: Article 7 National Reports Should Include Full Compliance and Trading Ledger
  - *Party's Quantified Emissions Limitation*
  - *Transfers To and From the Party*
  - *Vintage Information on all Such Transfers*
    - *Date of Reduction, Nation of Origin or Receipt, project of Origin for CDM Transfers*
  - *Domestic Offsets*
  - *Party's Actual Emissions*
    - *SBSTA, SBI and IPCC Should Identify and Disseminate Emissions Quantification* Protocols

REPORTING AND TRACKING: INSTITUTIONAL NEEDS FOR COMPLIANCE AND MARKET OPERATION

- All Parties
  - Establish or Authorize National Registries of Persons and Entities Engaged in Trading
  - Designate National Authorities or Private Entities to Authorize and Track Transfers
- Non-Annex Parties
  - Identify Nations, Persons, Entities and Agencies Certifying and Verifying Emissions Reductions
- Secretariat: Publish Parties' Annual Reports

IX. DOMESTIC ACTIONS: INSTITUTION-BUILDING AND EARLY ACTION STRATEGIES

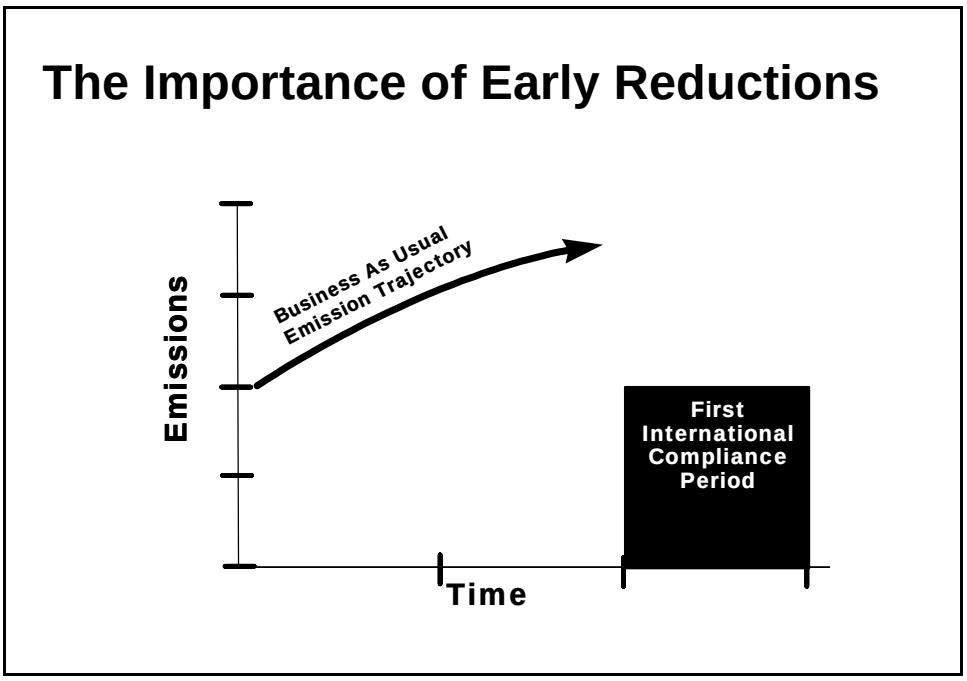
A range of actions by national governments is important for market development, reporting, accountability, and compliance -- and could contribute directly to the Protocol's requirement of Parties demonstration of progress by 2005. These include:

- The development of national registries which would register and legally acknowledge individuals or organizations engaged in emissions trading activities either as reduction producers, market intermediaries, or individual owners. Registries would significantly reduce transactions costs and increase accountability.
- The designation of national authorities for acknowledgment of receipt and transfer of allowable amounts and certified emissions reductions. In addition, since Parties to the Protocol must report and track not only their own emissions, but also any emissions transferred to and received from others, and since these transfers and receipts will be counted against each Party's calculated emissions for purposes of measuring whether it is in compliance with its legally binding commitment under the Protocol, Parties will need explicitly to nominate a domestic authority with the legal and technical competence to acknowledge transfers and receipts.
- In the case of Parties without assigned emissions amounts operating under the Clean Development Mechanism, an added element of transfers is the certification, verification and quantification of emissions reductions produced and proposed for transfer between Parties. Certification services ultimately may be provided by private parties. Such services would need to be informed as to minimum performance criteria.

Meeting the Initial Challenge: A Market Mechanism to Spur Reductions and Jump-Start the Emissions Trading Market

Under the Protocol, Annex B Parties' GHG emissions limitation obligations do not apply until 2008 at the earliest, notwithstanding the Protocol's 2005 demonstration of progress requirements. Ten years of continued uncontrolled "business as usual" emissions pose both an environmental and economic threat. While highlighting the environmental problem, Figure X depicts the challenge that the U.S., for example, faces in meeting the Protocol's greenhouse gas emissions requirements. According to some analyses, U.S. greenhouse gas emissions could be more than 30% above 1990 levels by 2008 if its economy hews to a business-as-usual course. If the U.S., and other Annex B nations, remain on their current course and follow the upward curve of greenhouse gas emissions shown in figure X, then these countries will be faced with the prospect of making abrupt changes in order to bring their greenhouse gas emissions down to required levels

or the Protocol will have little more effect than the "commitments" to emissions stabilization included in the FCCC itself.



It is the abruptness of such change that threatens to inflict the greatest economic difficulty in the near term, increasing political resistance to compliance with the Protocol's obligations and limiting the range of innovative choices industrialized societies can make in responding to the climate challenge. The upward curve poses a serious environmental risk, too. Greenhouse gases do their damage by staying in the atmosphere for long periods of time, from decades in the case of a carbon dioxide to centuries in the case of other greenhouse gas. That is why preventing their release in the first place is so important. Because the Protocol's limits are not imposed until 2008, however, the atmosphere faces ten more years of what could be unchecked greenhouse gas emissions increases of the sort shown by the upward curve. Those continued greenhouse gas emissions increases represent that much more warming potential added to the atmosphere.

Fortunately, however, the market-based emissions trading approach embraced by the Protocol offers a solution to this dilemma. Again, starting in 2008, the Protocol would create a world-wide market for greenhouse gas emissions reductions. In such a market, companies and countries that could make *more* greenhouse gas reductions *than required* would be able to earn money by selling them to countries and businesses facing greater difficulty in making their own cuts. Thus, companies will have a positive economic incentive for making extra greenhouse gas emissions reductions.

An identical economic incentive system can be put in place as a matter of domestic policy by Annex B nations – and put in place quickly – to stimulate businesses to begin making such greenhouse gas reductions *prior to* 2008. Under this approach, companies that made such early reductions would be able to earn greenhouse gas emission reduction credits that they could save and use for purposes of meeting their mandatory greenhouse gas emissions reduction requirements. They could also sell them to other companies who might need them for the same purpose. In either case, such a program would make greenhouse gas reductions achieved today or any time before 2008 financially valuable to the companies who made such reductions, in just the same way that extra reductions made after 2008 would be valuable in a greenhouse gas emissions trading market after 2008.

The goal of such an early reduction program for greenhouse gases would be to achieve the same results, discussed in a earlier section of this paper, now being produced by the U.S. acid rain program: through the economic forces spawned by emissions trading, give businesses an economic reason to reduce their greenhouse gas emissions *before* they have to. At the same time, such a program could be strictly voluntary. Figure 1 shows how such a program can be designed. Participants who choose to join the program would agree to keep their greenhouse gas emissions at a certain level – somewhere between the levels specified in the Kyoto Protocol and the business-as-usual curve shown in Figure 1.

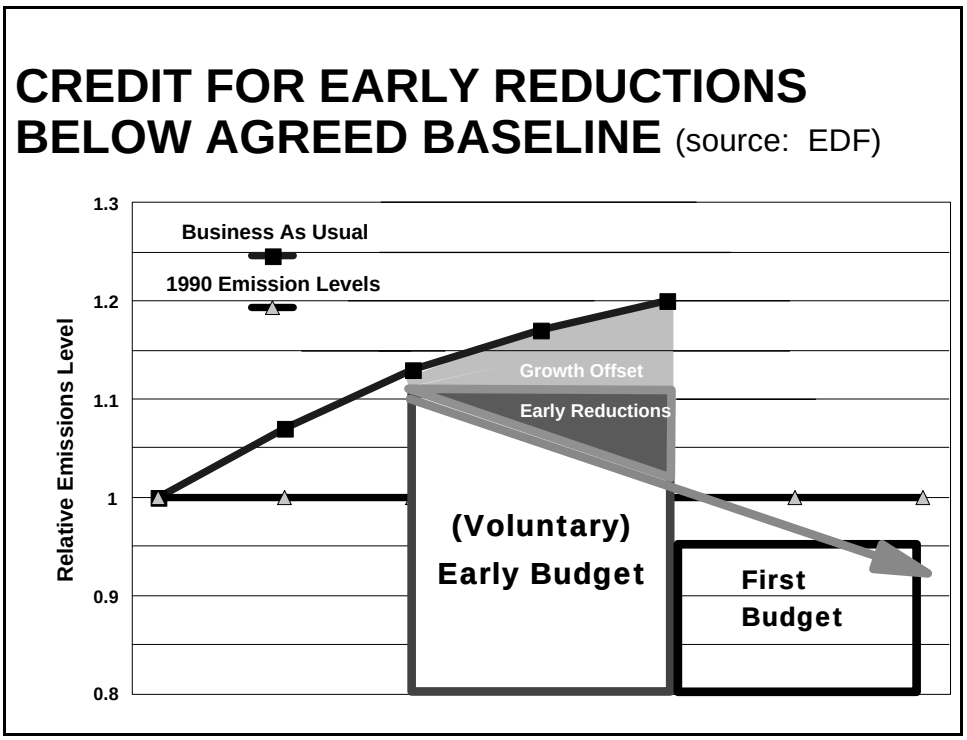


Figure 1: Credit for Early Reductions

As shown in figure 1, for any greenhouse gas reductions they made below the specified level, businesses would receive greenhouse gas emissions reduction credits

drawn from the Party's assigned amount for the first commitment period, which they could use to comply with any future, post-2008 obligations. Under such a program, early greenhouse gas reductions would have tangible financial value. As a result, companies with opportunities to make greenhouse gas reductions before 2008 would have a compelling financial reason for doing so.

As also shown in figure 1, an effective early reduction program could slow, if not reverse, the climb of the upward curve of business as usual emissions. As a result, the industrialized economies' transition to compliance with the Kyoto Protocol's greenhouse gas emissions limits would be that much smoother and more affordable. Companies that had been able to build up "savings" of early reduction credits would have a cost-effective compliance option already on hand when they faced mandatory compliance obligations after 2008. In addition, by giving businesses a direct financial incentive for initiating greenhouse gas investments sooner, an emissions-trading-based early reduction program would ensure that cost-savings innovations were put in place that much sooner. Consequently, in addition to addressing the short-term economic costs of an abrupt transition to compliance, such a program also would be laying the foundation for cost-effective compliance over the long term as well. In addition, since the credits awarded to early reducers would be drawn from the assigned amount and otherwise allocated to industries not undertaking early actions, such a program would create competitive advantages for companies that did move to make reductions before 2008. These early actors would also provide energetic constituencies favoring national compliance.

At the same time, the environment would benefit directly through the avoidance of additional greenhouse gas emissions prior to 2008, and the discovery and use of environmental innovations could begin that much sooner. In addition, prompt initiation of domestic programs like this could accelerate government and business experience with emissions trading in Annex B nations -- and, if those domestic programs recognized reductions achieved by overseas projects, in non-Annex B nations as well.

To be sure, apart from Article 12.10, which provides that project-based reductions in non-Annex I countries beginning as early as year 2000 can be used to meet Annex B Parties' compliance obligations, the Protocol all but precludes the use of "early reduction credits" as a strategy through which Annex B Parties can meet their commitments -- i.e., they cannot add pre-2008 reductions to their assigned amounts unless they do so pursuant to Article 12.10. Indeed, Annex B governments establishing domestic early reduction credit programs (including multilateral institutions seeking to support investments in emission reduction projects in Annex B countries prior to 2008) must *deduct* from their assigned amounts any credits they award companies for pre-2008 reductions. If they do not do so then their total emissions for the commitment period will exceed their assigned amounts.

In effect, early reduction credit programs are nothing more than domestic policies adopted by Annex B governments for allocating increments of their assigned amounts -- in

this case, to those that take early action to reduce emissions. Because of this, sovereigns have complete latitude in adopting criteria for identifying early reductions that qualify for credit and are free to shape those criteria to meet their own policy preferences. For example, Annex B governments interested in supporting trading with non-Annex I countries can formulate criteria under which they would award emission reduction credits to companies that engaged in such transactions. If successful in stimulating emissions reduction investments in non-Annex I countries, such an approach could aid the establishment of the Clean Development Mechanism by generating the kind of learning and experience needed to ensure that the CDM's rules and processes were sound. Moreover, by recognizing emissions reductions gained through overseas investments, Annex B governments' early reduction credit programs could speed the development of international emissions trading generally, ensuring that its benefits were that much more readily available by the time the Annex B commitment period began in 2008.

Early reduction credit programs are nothing more than domestic policies adopted by Annex B governments for allocating increments of their assigned amounts.

Finally, the success of the Protocol, and of the emissions trading system, in delivering the promised results and benefits, depends in part on Annex B governments' sending clear signals of resolve -- that they are committed both to reducing emissions and to doing so through an international emission trading market that allows companies and governments to manage costs and that rewards innovative investment in emissions control. The establishment of early reduction credit programs by key Annex B nations would do much to send such signals.

X. ISSUES IN CONFLICT

The importance of the Protocol's commitment to a compliance and trading paradigm that rests exclusively on actual emissions performance and cumulative emissions commitments cannot be overemphasized, especially since COP-4 could face a series of temptations to depart from it as the negotiators confront several issues that have stirred controversy over the past year.

A. Cap on Trading: "Supplementarity"

Article 17 specifies that trading "be supplemental to domestic actions for the purpose of meeting quantified emission limitation and reduction commitments under that Article." Some have suggested that this language be implemented by imposing a fixed numerical restriction (e.g., 49%) on the quantity of emissions reductions that a Party could achieve through international emissions trading, as opposed to through domestic policies and actions. While proposed as an option for spurring domestic action in industrialized nations, such an approach fundamentally misunderstands the logic, and could, if adopted, even undermine, the integrity, of the Protocol. That integrity rests on twin pillars: first, that the only measure of a Party's compliance lies in the matching of its actual GHG emissions with its assigned amount under Annex B, as adjusted by trading, and second, that only GHG emissions reductions that can be substituted for other reductions can be traded.

A vital corollary of these twin pillars is that no one path leading to emissions reductions is superior to, or more valid than, any other provided that actual reductions in emissions occur. Under this approach to compliance and trading, there is simply no logical way to distinguish between any given increment of surplus or tradable emissions reductions and any other. For that reason, introducing a fixed "cap" on compliance through trading, as opposed to any other equally efficacious compliance method, introduces considerations wholly unrelated to a Party's emissions or emissions reduction performance. In contrast, it is precisely the exclusion of considerations unrelated to emissions performance and the exclusive reliance on actual emissions performance on which the integrity of the Protocol entirely depends.

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A "cap" on trading would, of necessity, be arbitrary. It could increase compliance and transactions costs without bringing any additional environmental benefit. For those Parties that sought to permit private companies to engage in trading such a restriction would impose burdens on domestic regulators and transactions costs on the industries seeking to engage in trading. Specifically, regulators and companies would have to devise mechanisms, by definition adding layers of complexity and potentially inequity, in order to ensure that any given trade fell within the quota created by the trading cap at the time it was imposed.

It has been argued that such a cap would spur technological innovation and capital stock turnover in industrialized countries. In fact, however, such a restriction would curb one of the dynamics most critical to an emissions trading market's capacity to deliver

improvement in environmental results: a cap would constrain the continuous, open-ended search for the most cost-effective emissions reductions. A cap on trading would put a cap on this very process, likely inflating compliance costs and slowing the pace and penetration of innovation. By driving up the cost of innovation, and thus discouraging the development and deployment of new technologies, not to mention voluntary agreement by sovereigns seeking to preserve their full prerogatives, the costs of such a cap would be environmental, and not just economic.

Finally, imposing a "cap" on trading might simply be superfluous from the perspective of spurring domestic action by industrialized nations. A variety of factors, ranging from transactions costs to the broad-spectrum efficiency and environmental gains often linked to investments in GHG reductions, are likely to favor domestic actions in the U.S. and most Annex B countries. Because of the complex demands created by the need to comply with GHG emissions limitations these factors must be weighed continually against those that might favor international investments by Annex B nations and industries. This continual weighing process will work best to deliver optimal economic and environmental results if it is carried out by the widest variety of governmental and private decision-makers over time, rather than on the fixed, arbitrary and once-for-all basis that would be represented by a rigid cap on trading.

B. Emissions Trading and Economies in Transition

Each Party in Annex B is subject to a quantitative GHG emissions limit or reduction commitment for the period 2008-2012, formulated as a multiple of its 1990 GHG emissions. Since 1990, a variety of political and economic circumstances have put some Annex B Parties on trajectories that put their *expected* GHG emissions well below their assigned amounts under Annex B. Most notable in the group are Germany, whose overall GHG emissions have dropped in the wake of the absorption and economic integration of East Germany; the United Kingdom, whose GHG emissions trajectory has been altered by dint of market-oriented reforms adopted in its energy economy, and the nations of Eastern Europe, the Russian Federation, and other economies in transition whose political and economic changes have altered their expected GHG emissions profile considerably since 1990.

In the case of the United Kingdom and Germany, the European Union's burden-sharing agreement and collective GHG commitment announced in connection with its pre-Kyoto positions last year appeared to have taken account of these nations' expected GHG emissions changes. Specifically, the expected reductions were reflected in the overall reduction target proposed by the European Union, a target which included permitted emission increases for some other member nations. A similar approach may be followed with regard to the expected emissions changes of East European nations that are seeking to be admitted to the European Union. Meanwhile, the European Union's 1997 proposal for a 15% reduction under it original burden-sharing agreement is, obviously,

substantially below the GHG emissions permitted under Annex B, which amount to no more than an 8% reduction for the European Union.

The European Union's disposition of the emissions reductions expected from the U.K. and Germany has aroused little comment, while the treatment of reductions expected from Eastern Europe has attracted only slightly greater notice. In 1995, the aggregate GHG emissions from these nations exceeded that of the Russian Federation.[12] In contrast, however, many have expressed the fear that if Russia's expected GHG emissions trajectory results in substantial transfers of parts of its assigned amount to other Annex B Parties, then the latter will be able to achieve compliance with their assigned amounts without having to make "investments" in substantial new emissions reductions. Based upon that fear, it has been suggested that the Protocol text be re-opened, to negotiate either a different commitment for Russia, or a tighter limit on GHG emissions for all of Annex B.

To be sure, given the scope of the climate change threat, and the long atmospheric lifetime of most greenhouse gases, it would be environmentally preferable if Annex B Parties adopted even smaller assigned amounts for the 2008-2012 period than the levels enumerated in Annex B. Overall, however, the commitments undertaken by the Parties in Annex B, as a first step, are sufficiently stringent to keep open the possibility of limiting warming to one degree over the next century, **provided that the all-important framework of binding obligations to limit total GHG emissions under the Kyoto Protocol remains intact so that it can deliver sufficient options and incentives for sovereigns to meet their commitments.**

That success depends, in turn, on the inclusion of sovereigns, and their willingness to be included, in the joint enterprise of controlling global GHG emissions. An important aspect of the Kyoto Protocol's incentive-based structure is its ability to offer sovereigns whose economic circumstances have resulted in lowered emissions the possibility of access to new investment capital for revitalizing old infrastructure and enabling cleaner development paths. Their participation in the Protocol has the potential to engage significant investment in further emissions reductions and greater environmental protection. An attempt, however, by rule or other arrangement, to bar certain Parties otherwise in compliance from trading, risks opening the entire Kyoto Protocol to re-negotiation - a prospect that could delay implementation of the Protocol significantly. Moreover, such an attempt would breed the kind of invidious discrimination fatal to sovereign cooperation and participation. Furthermore, efforts to adopt specific measures targeting Parties on the basis of such projections would have the environmentally perverse effect of reducing those nations' access to capital needed for the environmental improvement and revitalization that can enable them to shift their development to a less GHG-intensive trajectory. Discriminating against those nations will only intensify resistance on the part of those very nations whose cooperation and willing participation in

[12] See "World Development Indicators," The World Bank, 1998 (CO2 emissions for Russia totaled 1818 million metric tonnes in 1995, whilst CO2 emissions for Germany, the UK, Poland, the Czech Republic, Hungary and Romania totaled 2104 mmt).

the Protocol are essential to the environmental success of the Protocol and, because of their economic upheaval, understandably may be at premium.

The issue itself -- whether Parties' expected emissions outcomes reflect more or less legitimate "reasons" or causes -- is completely hypothetical at the moment. It would be anomalous for COP-4 or subsequent COPs to attempt to regulate trading on the basis of mere projections of a Party's expected emissions. Such a rule would introduce considerations in no way connected with Parties' ***actual emissions,*** which are, as noted above, the sole consideration in the Kyoto Protocol framework for determining sovereigns' compliance. Ultimately, it is the durability of this framework, and its actual-emissions fabric, that will determine the success of the Protocol over the long term. That is why negotiators should resist efforts to amend that framework by discriminating among sovereigns based on *how emissions are achieved*. Negotiators instead should focus their efforts on providing any additional elements needed to ensure that in 2012, when actual emissions performance takes the place of what are currently mere expectations, the operational definition of compliance, matching Parties' actual GHG emissions with their assigned amounts, remains the only test and is successfully applied.

Fortunately, the trading system of the Kyoto Protocol itself provides remedies to address the concerns of those who would re-open the Protocol or otherwise restrict trading as a means of dealing with uncertainties about whether some Annex B Parties will have the commitment or the resources to make affirmative investments in GHG emissions control or in the domestic regulatory structure needed to achieve and demonstrate compliance. For those Parties of concern, trading creates economic opportunities, in the form of additional revenue and material resources, as well as opportunities for bi- or multilateral engagement with other Parties. These opportunities, in turn, can provide the pathway through which Parties with greater resources and their own strong resolve to ensure the success of the Protocol can address concerns about the performance of Parties with fewer resources and less clear intentions.

Specifically, Parties seeking to acquire parts of assigned amounts could use their transfer agreements to ensure that the revenue and resources transferred to their trading partners is targeted to investment in new GHG emissions control projects and to building the domestic regulatory infrastructure needed to ensure the transferring Parties' compliance. This strategy, which directly taps the self-interest of the Parties of concern, is far more likely than Protocol-wide attempts at discrimination to produce the desired results.

Curbing global climate change depends on the participation, ultimately, of all major emitting sovereign nations, and on the robust implementation of strategies that provide incentives to mobilize investment capital, drive technology innovation, and provide a smooth and rapid path for capital stock replacement. Discrimination that restricts the participation of any, hurts the environment of all, undermining these incentives and making it more difficult to achieve the environmental goal of reducing GHG emissions. The ultimate effect of such discrimination may be to drive away those Parties whose participation and compliance could be positively engaged through trading backed by

bilateral or multilateral targeted investment strategies. For that reason, measures adopted to restrict trading otherwise sanctioned under Articles 3, 6 and 17 could be tragically counterproductive since they could deprive the international community of these critical strategies for buttressing compliance in key Annex B Parties.

C. "Forward Sales": Trading Without Rules?

Environmentally, one of the most important elements of the Kyoto Protocol is the set of incentives it can deliver to economic actors to begin GHG reductions early, well before the start of the first (2008-2012) compliance period, as discussed above. Notwithstanding the environmental importance of such early action to reduce GHG emissions, some have argued that neither governments nor their private sectors should engage in, or sanction, emissions trading activity prior to the establishment of all rules, guidelines and requirements needed to carry out fully emissions trading and compliance under the Protocol. Such a stance would undermine the Protocol's ability to engender incentives favoring action in the form of investments in reducing or avoiding emissions.

Moreover, the argument fundamentally misunderstands why the Protocol, in relying on the accountability of sovereigns for ultimately matching their actual emissions performance with their assigned amount, leaves completely unfettered those sovereigns' prerogatives in managing both their total emissions and their assigned amount. The credibility of the Protocol rests on establishing a regime which ensures that sovereigns comply with their emissions limitation obligations without curtailing or compromising their sovereign discretion. At the same time, the most immediate threat to the capacity of the Protocol to bring about effective management of GHG emissions is simple inertia. Faced with uncertainty on a variety of issues and fears of unacceptable costs, if not outright unfeasibility, governments and private investors are likely to lapse into self-perpetuating inaction, a response seemingly sanctioned by the fact that the Protocol imposes no legally binding requirements for ten years. Emissions trading can reverse that dynamic, however, since it functions to place an affirmative economic value on emissions reductions. Consequently, companies or nations that seek to engage in trading commitments with each other are only responding to the incentives which, by design, emissions trading seeks to engender.

To be sure, it is important to make clear that early firm-to-firm emissions trading activity must remain contingent upon the subsequent adoption of applicable rules by international and domestic authorities. While those who engage in early transactions bear the risk that subsequent rules may not fully recognize their transactions, however, discouraging or prohibiting such trading or early trading between Parties would be counterproductive. Specifically, early trading is likely to connote early mobilization of resources to reduce emissions. At the very least, early trading creates exactly the kind of experience, or "learning by doing", that can inform policy-makers' decisions, reveal costs and opportunities associated with compliance and speed up governments' and firms' mastery of the emissions trading system. By directly or indirectly easing the pathways

toward compliance, all of these effects can only enhance the credibility of the Protocol, including in the near term when governments around the world are weighing critical issues of ratification and implementation.

At the same time, so long as the Protocol maintains a viable system for sovereign accountability, the risks associated with attempting to tap these early benefits should be minimal. Early trading activity in the private sector necessarily will be subject to the rules subsequently adopted by domestic and international authorities. In addition, transfers of parts of assigned amounts between Annex B Parties that happen to occur prior to 2008 or even to further elaboration of various aspects of the Protocol are no different from such transfers that may occur after these events. This is because the Protocol itself already provides explicitly for the accounting for such transfers under Article 3.10-11. As a result, sovereign accountability remains fully in place. A Party making such a "forward" transfer would be doing nothing more than tightening the margin of compliance with its assigned amount while remaining fully accountable for meeting that assigned amount. Such a transfer would be fully within its proper sovereign discretion, which, again, it would be exercising without curtailing its compliance accountability. At the same time, such a transaction could bring to the transferring Party resources needed to ensure its compliance over the long term, while signaling to the rest of the international that to the transacting Parties, the credibility of the Protocol was sufficiently compelling to warrant their commitment to the transaction.

XI. CONCLUSION

This paper has attempted to identify the elements critical to the international greenhouse gas trading regime that the Kyoto Protocol seeks to establish. .As the international community moves forward in implementing the Protocol and its obligations to limit greenhouse gas emissions, delivering on the promise of emissions trading is essential if the agreement reached in Kyoto is to remain efficacious and credible over time. Only a system of international emissions trading can effectively span the diversity of national interests, legal systems, norms, implementation strategies, and preferences represented among the community of nations. The very essence of emissions trading is choice -- the ability to choose when, where, and how much.

At the same time, only emissions trading has the capacity to modulate both total cost as well as the distribution of costs among nations. Economic analyses of greenhouse gas control are remarkably uniform in ascribing huge cost savings to emissions trading. The key to delivering these cost savings is the creation of a framework for trading which reduces transactions costs, provides environmental and financial credibility, and rewards innovation. This paper has identified the minimum elements necessary.

BACKGROUND NOTE

For over a decade, the Environmental Defense Fund (EDF) has been engaged in the design, development, and implementation of markets for environmental protection. These activities have ranged from the creation of markets for water savings from conservation investments to reduce irrigation to the acid rain allowance trading system of the Clean Air Act Amendments of 1990. Since 1985, EDF has been concerned about the problem of global climate change and has worked to further scientific understanding of the problem and to develop and implement practical, cost-effective solutions.

EDF scientists have contributed to the body of research on the process of climate change and its impacts on ecosystems and communities from the islands of the Pacific to the forests of America's First State, New Hampshire. EDF economists, attorneys and analysts have developed the operation of environmental markets through research and real-world programs and transactions that provide learning-by-doing and measurable, significant environmental improvement.

To tackle the problem of climate change effectively, EDF recognized that nations would need to develop a durable, agreed framework that would deliver both performance accountability and a set of economic incentives for nations and the private sector to harvest the widest range of greenhouse gas (GHG) emissions reductions, beginning as early as possible, and as cost-effectively as possible. EDF turned to the policy framework that has proven its potential to meet these kinds of challenges: the power of the environmental marketplace.

This paper builds upon EDF's February, 1997 publication, "Emissions Budgets: Building an Effective International Greenhouse Gas Control System", which set forth a proposal for an international greenhouse gas (GHG) emissions "budget" and trading system as a framework for an international protocol that could deliver the environmental and economic benefits desired.

The Kyoto Protocol adopted by the Third Conference of the Parties (COP-3) to the United Nations Framework Convention on Climate Change in December, 1997 incorporated almost all of the critical elements -- some in detail, some in principle -- needed to establish such a global GHG emissions trading framework. This paper presents the important environmental and economic benefits of market-based approaches to tackling the problem of climate change, focusing in particular on GHG emissions trading. The paper's analysis is presented in the context of the 1997 Kyoto Protocol on Climate Change, and in that context, it addresses the key issues that policy-makers will face at the Fourth Conference of the Parties, to be held in Buenos Aires in November, 1998.

For additional information or to make comments please contact the following people at EDF:

Daniel J. Dudek
Senior Economist
Phone: 212-505-2100
E-mail: DJD@edf.org

Joseph Goffman
Senior Attorney
Phone: 202-387-3500
E-mail: joe@edf.org

Michael Oppenheimer
Senior Scientist
Phone: 212-505-2100
E-mail: Michael_Oppenheimer@edf.org

Annie Petsonk
International Counsel
Phone: 202-387-3500
E-mail: annie@edf.org

Sarah Wade
Economic Analyst
Phone: 202-387-3500
E-mail: swade@edf.org