

Reinvigorating the Kyoto System, and Beyond
*Maintaining the Fundamental Architecture, Meeting
Long-Term Goals*

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While it is increasingly clear that anthropogenic emissions of greenhouse gases (GHGs) are causing potentially irreversible shifts in Earth's climate, efforts to craft a durable and effective architecture for addressing the problem remain stymied by deep divisions between north and south, between major emitting nations and those that will be most affected by global warming, between some nations that are heavily export-dependent on fossil fuels and the rest of the world. Even within governments, disagreements among different ministries with different mandates have stalled action. This delay is not without cost: every year that nations postpone action to reverse GHG emissions growth and bring forward a robust response, the time window for averting dangerous levels of climate change narrows.

The L20 provides a potentially important forum that could offer much needed global leadership on innovative approaches for overcoming international divisions on this crucial challenge. In particular, L20 leaders' experience in strengthening the world's international financial architecture provides an important lens through which to view new approaches for the international market-based architecture to reduce GHG emissions. The following paper proposes, for L20 consideration, three approaches to rejuvenating the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto process. We ground our argument in these integrated assumptions: The incentive-based architecture that was incorporated, if imperfectly, in the Kyoto Protocol provides an optimal basis to broaden participation and develop a viable long term approach to address climate change. Further, we assert that the Kyoto formulation of successive near-term (decade-scale) targets for limiting total emissions of greenhouse gases (GHGs) provides a necessary element for achieving the long-term goal of the UNFCCC (stated in its Article 2). Our analysis is motivated by three main objectives: 1) US participation, 2) developing country/non-Annex I participation,¹ and 3) coupling near-term obligations of the Parties to an effective long-term strategy for limiting climate change.

Let us first provide some scientific, economic, and policy justification for these assumptions and objectives. The assumption that an incentive-based framework ought to be maintained reflects what appears to be a growing consensus among Annex I Parties about the most cost-effective, innovation-spurring means of reducing emissions. We point in particular to the rapid development of cap-and-trade systems in the EU as well as some individual countries. It is also inconceivable that the US would abide by any regime that did not allow implementation of legally binding obligations in a flexible manner. Nevertheless, one can reasonably argue over many of the details of the framework, and some aspects that reach beyond emissions allowance trading, like implementation through sequestration, have been notoriously controversial. We discuss some of these issues below.

¹ Discussions framed in terms of “industrialized” vs. “developing” countries overlooks the fact that some of the most greenhouse-intensive nations in the world are transition economies that do not consider themselves to fall within either of these categories. In this paper, to underscore that industrialized, transition and developing countries all have important roles in the effort to combat climate change, we instead refer to “Parties included in Annex I of the UNFCCC” and “Parties not included in Annex I,” using as a shorthand the terms “Annex I” and “non-Annex I” countries. This usage is consistent with both the UNFCCC (see, e.g., Articles 4.2(b) and (g)) and the Kyoto Protocol (see, e.g., Article 1.7).

The assumption that near-term obligations ought to be framed in terms of targets for limiting total GHG emissions is really a reflection of the language of Article 2 of the UNFCCC. A global concentration objective can only be sensibly disaggregated to national obligations if the latter are framed as near-term emissions goals. No other approach is available to translate national action directly into concentration response. If over time it proves convenient to express the Article 2 objective in terms of global or regional temperature change or other metrics of climate change, a translation from that metric to concentration would be necessary, but national obligations would still be most sensibly framed as limits on total net emissions.²

Some have proposed technology-based obligations for countries as a substitute for emissions targets. These pose the difficulty of not allowing a quantitative connection to the Article 2 objective. Additionally, they deflect regulatory concern away from trying to affect the *outcomes* of warming. In other words, they distance the control from the rationale. Further, they put governments in the position of choosing technology winners and losers, which, experience suggests, dampens innovation, creates trade friction, and drives up costs. We believe such approaches would lead to policy that costs more and accomplishes less, as well as policy whose motivation is less transparent to the public, and therefore less durable.

Others, including the current US administration and several developing countries, have proposed a global adaptation-only strategy. There are several difficulties with this approach. First, it is unfair, displacing costs from emitter nations to those who emit little and yet are highly vulnerable. Second, even if high-emitting nations agreed to bear the costs of low-emitting countries' adaptation, the strategy fails to acknowledge that at some point, climate change is highly likely to become problematic for all countries because, for some impacts and populations in all countries, there is no effective adaptation (e.g., withdrawal from coastal areas is the only plausible response to ice sheet disintegration). Finally, "adaptation" is a complex phenomenon that involves planned and unplanned responses at the international, national, local, and individual level. No one scale of response is adequate, and the differing scales to some extent compete and interfere with actions taken at the other scales. There is no such thing as a unified strategy that works for all in the sense that emissions mitigation does.

With regard to our three objectives, it is both politically unimaginable and ultimately, physically impossible to maintain a viable climate stabilization regime without US participation. The key issue is when, and under what terms, US re-entry is needed in order to avoid foreclosure of many plausible long term objectives, i.e., at what point would US abstention virtually guarantee that the entire world would be subjected to unacceptable levels of warming? We return to this point later. One might assume that the US could act in parallel with a comprehensive international agreement but remain

² By "total" emissions we mean absolute emissions (as contrasted with emissions per unit of economic output) from all sectors of a national economy. By "net emissions" we mean, as stated in the UNFCCC, anthropogenic emissions by sources and removals by sinks of GHGs not controlled by the Montreal Protocol. We elaborate on these further below.

outside of it. While such a strategy might serve a purpose during a transient period, we do not believe it is viable over the long term. Both economic and environmental performance is hampered when emissions markets are needlessly fragmented. In any event, the emerging EU trading system, which explicitly opens the door to trading with other Kyoto Parties and with nations and even subnational entities like U.S. states that have adopted caps on total emissions, is likely to create market pressure on other actors, including the US, to follow suit.

As to non-Annex I nations, there is a strong basis in science for assuming that a successful climate regime must entail their significant participation in the long term, in the form of action to reduce emissions of GHGs to the atmosphere. A regime that involves emissions reduction by Annex B countries alone cannot stabilize concentrations at levels that plausibly avoid dangerous climate change (e.g., below a doubling; see O'Neill and Oppenheimer, *Science* 296, 1971, 2002), unless business-as-usual growth in emissions from non-Annex I countries follows the slow-growth (SRES) scenarios. Similarly, assuming that industrialized nations comply with emissions limits, but non-Annex I nations' emissions grow at a middle-range business-as-usual rate (e.g. the middle of the SRES range), non-Annex I countries would still need to begin limiting emissions not later than the 2020-2030 timeframe to maintain a plausible chance to achieve concentrations in the 450-500 ppm range." While the US has been the most vocal among Annex I nations in voicing concern over this conundrum, the issue is increasingly drawing the attention of others in the EU, Canada, Russia, and Japan.

One could argue that technology would eventually allow direct removal of carbon dioxide from the atmosphere followed by geologic sequestration, and that obligations could safely rest in the hands of industrial countries to do so. Aside from questions related to burden sharing, it is not yet even remotely plausible that such technology will become available at reasonable cost. Therefore, if global obligations are to be guided by the concentration objective of Article 2 of the UNFCCC (or other environmental measures that respond to concentrations, like temperature), national obligations of necessity would be in the form of targets for limitation of total net emissions. The third objective is probably the least understood yet most vital to a sensible regime. If a criticism of technology-based targets is their disconnection from environmental objectives, then a criticism of near-term targets and timetables like Kyoto is that they may easily become detached from any sensible long-term goal. Near-term goals are rightly determined by a process that weighs political, economic, and distributional concerns. However, such a process needs a compass to point in an overall direction that is rational from an environmental point of view. UNFCCC Article 2 is supposed to provide that compass.

The Review of Adequacy of Commitments (UNFCCC Article 4.2(d)) was designed to maintain alignment between near-term commitments embodied in amendments/protocols and the long-term objective of Article 2. Parties will undertake the review next year with the objective of establishing targets for the post-2012 period. There is no reason to believe that absent such a compass, environmental goals will ever be achieved.

However, due to a combination of scientific uncertainty, economic disagreement and political complexity, it is unlikely that a long-term numerical target such as a target for stabilization of GHG concentrations (whether or not moored to a concept of net benefit maximization, as some have suggested) will be agreed by the UNFCCC Parties for at least a period of years or longer. Nevertheless, it remains critically important that near-term obligations remain consistent with obtaining any of a range of plausible numerical long-term objectives. Some such numerical objectives, it appears, already have become difficult or impossible to attain, absent at least temporary overshoot and return to such concentrations or major technological breakthroughs that can actually remove large amounts of carbon dioxide from the atmosphere.

A renovated UNFCCC/Kyoto process therefore must be sensitive to two potentially conflicting exigencies: the reality that obligations may need to be altered in order to garner the participation of the US and non-Annex I nations, versus the need to avoid foreclosing eventual opportunities to meet plausible, environmentally determined numerical long-term objectives. The challenge is to bring the US and major non-Annex I emitters into a framework of limits on total GHG emissions, but not on a timetable so slow, or with emission obligations so tenuous, that the whole world is irrevocably subjected to dangerous climate change.

Detailed considerations

The foregoing discussion leads naturally to several courses of action:

1. ***Maintain Targets and Timetables.*** The international framework ought to retain the targets and timetables (T&T) structure of emissions obligations. Proposals to remove T&T for emissions reductions either revolve around “best efforts” approaches or remove emissions obligations entirely. The latter has been discussed above while the former is simply not credible from the perspective of maintaining consistency with any plausible numerical interpretation of the Article 2 objective, even one chosen on a preliminary basis. The world’s most successful international agreements - to control arms, reduce tariffs, protect patents, eliminate ozone-depleting chemicals – are built on a template of legally binding targets and timetables. Agreements that merely exhort the parties to use best efforts to meet non-binding goals – to combat desertification, protect forests, or, in the case of Article 4.2(b) of the UNFCCC itself, to “aim” to return GHG emissions to 1990 levels - generally speaking have failed to achieve their stated objectives.

Amendment of the general T&T framework is an approach which holds promise for meeting the Article 2 objective and redressing problems related to US participation, while doing minimal overall damage to the original agreement, including the emissions trading provisions (which to some extent are energized by the particular distribution of obligations in Kyoto). At the outset we acknowledge certain complexities inherent in T&T, for example, predicting economic growth and energy use 15 years ahead of the time when the obligation becomes due. It was this very problem, and the perceived burden faced by the US due to the high emissions and energy intensity of its economy, that led the US to forward the flexible mechanisms so forcefully.

At this juncture, it is probably unrealistic to expect the US to adhere to the Kyoto targets without so stretching the existing definitions of emissions reductions, offsets, or allowances under the rules developed to implement Kyoto that agreement that it had in fact complied would not be possible. Several potential alterations to the Kyoto formula, all requiring some sort of amendment of the existing framework, follow.

- *Alter the allocation of emission allowances for the US alone*

The most straightforward approach is to renegotiate the US target while maintaining everything else about the framework, including the 1990 baseline and 2008-2012 compliance period. The advantage is that it keeps things simple. The disadvantage is that it requires all countries to accept US exceptionalism via a process of amending Annex B. More likely such a negotiation would lead to a broader set of revisions in light of experience of the past 7 years. This might be viewed as wise, or as dangerous to the long-term nature of the regime.

- *Shift the US baseline to 2000 or some other year*

This approach is straightforward, but also invites a broader renegotiation. There were several “special deals” in Kyoto, e.g., for Australia and Iceland. A problem is that a shifted baseline could permanently distort the framework since it could affect negotiations on subsequent commitment periods.

- *Alter the way sinks are counted*

Credits for forest carbon sequestration under Kyoto Articles 3.3 and 3.4 could be allocated in a manner that gives the US far greater flexibility. An extensive (and difficult) discussion of this issue occurred in the run-up to COP-6. It corresponds to changing the baseline for forest growth in order to include credit for natural re-growth. We disfavor this approach because it creates the potential for a perpetual resort to credits that do not actually reduce atmospheric concentrations. Furthermore, a bad precedent thus might be created for accounting that would affect the treatment of other trace gases, for instance, and reverberate through and dilute the effectiveness of the entire structure.

- *Provide the US with a one-time higher allocation of sinks credits.*

At COP-6bis in Bonn and at COP-7 in Marrakesh in 2001, UNFCCC Parties reached a somewhat arbitrary agreement on a one-time allocation of sinks credits for most Annex B nations, and these are inscribed in an Appendix to the COP decision. Since the US withdrew from the negotiations in early 2001 prior to the Bonn and Marrakesh meetings, no allocation for the US was ever inscribed in the Appendix. While it would require all countries to accept US exceptionalism (or open the possibility of several other “special deals” at the same time), a one-time adoption of a relatively generous sinks allocation for the US would not set any accounting precedent, since the Appendix was adopted with the express agreement that it would not be precedential for subsequent commitment periods, and that any Party could have its allocation reconsidered. (See Decision 11/CP.7) Moreover, it could be done by a COP decision rather than the extensive negotiation required for amendment of Annex B.

- *Lengthen the commitment period*

Five-year emissions commitment periods are arbitrary. They do not satisfy business-cycle averaging, one of the original intents. The commitment period for the US alone could be extended, but this creates a bizarre system with complex implications for emissions trading. If the commitment periods for everyone were extended, the effect of Kyoto would be diluted. This creates a modest risk of foreclosing some future options but one which is no worse than diluting some of the targets. However it fails to redress the US perception of inequity in burden sharing since everyone gets a break. Furthermore, the longer the budget period, the more it extends beyond the period of political accountability.

- *Expand the greenhouse gases covered*

Means could be found to account for and include other climate-changing species in the Kyoto framework. Among these are tropospheric ozone and black carbon (soot). This approach would increase flexibility, reduce the burden on carbon dioxide reductions, and may favor the US (and possibly some non-Annex I countries should they decide to join). It would point in a natural direction for the development of the framework rather than distorting it. On the downside, including these species in the system before science permits proper accounting would invite the creation of phantom credits. IPCC ought to be asked to review this approach and suggest means to implement it as it did for sinks in a Special Report.

2. *Adapt T&Ts to non-Annex I countries.*

The great strength of the Kyoto framework is that it provides opportunities and incentives for participating countries, companies, and communities to grow “environmental capital” at the same time that they grow economically. Experience with emissions trading for controlling acid rain in countries as diverse as the US, Poland, and China indicates that these systems provide incentives to maintain economic growth while driving emissions down below allowable levels. The resulting surplus emissions allowances form “environmental capital.” This capital can be saved for the future and can leverage new investment in cleaner development.

The Kyoto Protocol’s Annex B targets provide opportunities for some nations to form environmental capital - every ton of emissions reduced below the target level represents a ton of environmental capital. But the Protocol raises hurdles for non-Annex I countries, whose projects under the Clean Development Mechanism (CDM) necessarily must undergo rigorous analysis to ensure they actually reduce emissions below what would have otherwise occurred (“additionality”), and do not inadvertently encourage increased emissions (“leakage”) elsewhere.

Allowing non-Annex I countries into the cap-and-trade system avoids these hurdles. But in the pre-Kyoto discussions, many developing nations opposed an opt-in provision known as “Annex X” or “Article 10” because they feared it would lead to mandatory commitments for them. Some NGOs were reluctant to support the opt-in approach because they feared it could undermine the principle of “common but differentiated responsibilities” by which industrialized countries were to “take the lead”. And some

industries aiming to kill Kyoto altogether opposed the opt-in approach precisely because its inclusion would have made the treaty somewhat more palatable to the U.S. Senate.

The Annex X or Article 10 debate has faded, but developing country fears that targets could restrict their economic growth – fears in many cases fomented by oppositionist US industry – remain. At the same time, many developing countries are frustrated with the necessarily slow pace of CDM projects. Here we offer two ideas that could afford non-Annex I nations greater opportunities to participate in environmental capital formation while maintaining economic growth and addressing the environmental necessity of bringing large-emitting developing nations into the global GHG emissions limitation framework.

- *Environmental capital endowments (ECEs)*

One promising approach would be to allocate to early adopters of Annex B targets an initial endowment of “environmental capital” in the form of assigned amount units (AAUs) *above* their business as usual emissions trajectory, based on reasonable macroeconomic analysis of expected emissions. (See, e.g., D. Dudek, J. Goffman, "Emissions Budgets: Building An Effective International Greenhouse Gas Control System", Environmental Defense Fund, New York, New York, February 1997, and D. Dudek et al., "Cooperative Mechanisms Under the Kyoto Protocol: The Path Forward", Environmental Defense Fund, New York, New York, June 1998). These nations could use their ECE to finance investments in cleaner development, without the need for project-by-project demonstrations of additionality and leakage. When such investments reduce emissions below business-as-usual, they render a larger surplus of AAUs, forming more environmental capital.

From a science perspective, there probably is sufficient atmospheric “headroom” between current concentrations and plausible long term goals to offer such endowments to early adopters of total caps on net emissions. That atmospheric space will not last. As we have noted before, if either the US or developing countries wait indefinitely, it will become impossible to meet the Convention’s Article 2 objective. But it is also true that the longer either waits, the more difficult – and more costly – the task becomes. Affording nations an initial ECE provides a powerful incentive for them to adopt an emissions target soon.

Ample precedent for this approach exists not only in the Montreal Protocol on the Ozone Layer, but in Kyoto itself. The Kyoto targets for Russia and Ukraine, though much-criticized, provide substantial ECEs in the form of allowances created by maintaining emissions below 1990 levels. The possibility of accumulating such allowances is likely to influence the emission efficiency of new infrastructure and thereby affect emissions levels for decades.

ECEs for nations that adopt limits on their total emissions could also address much of the US Senate’s concern about developing country participation.³ At the time of the Senate’s

³ Precedent of a different sort for this kind of approach exists under a program initiated by President George H.W. Bush, and continued under the administrations of both President Bill Clinton and President

vote on the advisory “Byrd-Hagel amendment”, which occurred during negotiations over the Kyoto Protocol, a number of senators indicated that in their view, an emissions cap-and-trade framework that included developing countries would ameliorate their objections to the anticipated agreement. The lead author of the resolution, Senator Robert C. Byrd of West Virginia, emphasized that the treaty ought to contain incentives for the world’s developing nations, along with industrialized nations, “to make responsible and environmentally sound choices as they develop.” Mr. Byrd said, “The emissions limitations goals, to be fair, should be based on a country's level of development...The initial commitment to action ...could be relatively modest, pacing upwards depending upon various factors, with a specific goal to be achieved within a fixed time period. There are plenty of tools to encourage the developing world to make meaningful commitments.” (Senator Robert C. Byrd, July 25, 1997).

Providing non-Annex I nations with initial ECEs might be viewed skeptically by some who fear that industrialized nations would simply purchase the initial endowments from developing nations, resulting in dilution of Kyoto targets and an overall increase in total global emissions. This risk must be acknowledged. However, near-term commitments have to be taken in the context of long-term considerations. If done soon, aggregate ECEs for first-movers can be set at levels within the emissions envelope needed to avert dangerous climate changes.

- *Compensated reductions*

Another promising approach,⁴ initiated by Brazilian experts and presented at COP-9, addresses the growing recognition that reducing tropical deforestation – which may account for from 10-25% of total anthropogenic GHG emissions - could make a critical contribution to global efforts to stabilize GHG concentrations.. The proponents note that current annual emissions from deforestation in Brazil and Indonesia alone could negate 4/5 of Kyoto’s emissions reductions. Incentives for reducing tropical deforestation are vital to the effectiveness of the climate regime. Given how rapidly forests are being decimated around the world, time is of the essence.

The “compensated reduction” approach allows countries that elect to reduce national deforestation to below their 1980-1990 average to receive post facto compensation in the form of AAUs, while inviting them to stabilize or further reduce deforestation in the

George W. Bush, which provides an environmental capital endowment to developing nations by affording them the opportunity to undertake debt-for-nature swaps, in which official foreign debt is partially forgiven and partially paid back in local currency that is directed to environmental protection, including forest conservation. See, e.g., Executive Order Assigning Foreign Affairs Functions and Implementing the Enterprise for the Americas Initiative and the Tropical Forest Conservation Act, July 8, 2004, text available at <http://www.whitehouse.gov/news/releases/2004/07/20040708-22.html>. This model would also fit well with the environmental capital endowment framework. Developing countries that adopt growth caps on their greenhouse gas emissions could negotiate agreements with lender nations under which portions of the debt could be paid back in local currency that is then directed to cleaner development, fostering emissions reductions that yield even more surplus emissions allowances, enabling those nations to form even more environmental capital..

⁴ See “Tropical Deforestation and the Kyoto Protocol: A New Proposal,” available at: http://www.amazonia.org.br/english/guia/detalhes.cfm?id=92568&tipo=6&cat_id=83&subcat_id=400

future. This approach could provide large scale incentives to reduce tropical deforestation and broaden developing country participation in Kyoto. It would support efforts to bring future commitments for all nations into the realm of full carbon accounting, covering all pools of carbon, rather than the truncated approach of Kyoto Articles 3.3 and 3.4. And it would provide developing nations with even greater access to environmental capital. As the authors point out, even using conservative estimates, the carbon value of compensated reductions could be as much as five times the value of cattle pasture in Brazil, and offer a better return on investment than most new oil palm plantations in Indonesia.

In the past, objections to crediting avoided deforestation in the CDM have revolved around the high potential for leakage, measurement uncertainty, and the view that forest uptake of carbon dioxide is impermanent. The authors point out, however, that deforestation does not “leak” into the energy or transport sectors, and national deforestation can be measured at the beginning and end of a commitment period just as can national emissions for Annex I countries. While international “market leakage” for timber exports is an issue, it is a much bigger issue under Kyoto as-is, because forest sinks and activities that increase carbon stocks in Annex I countries are credited, but developing-country forest destruction is not debited. An Annex I country could cease timber harvests altogether at home, replace them with tropical imports, and still receive credit under Article 3.4 of the Kyoto Protocol. Enlisting tropical forest countries into compensated reductions would reduce, not increase, this problem.

3. Intensity targets, “no enforcement” approaches, and price ceilings.

Three approaches that are, from time to time, suggested as alternatives for encouraging the participation of the US and developing countries are (i) converting Kyoto’s absolute targets into limits on GHG emissions per dollar of GDP (so-called intensity targets); (ii) allowing developing nations to participate in emissions trading regardless whether they agree to comply with absolute caps; and (iii) fixing a ceiling on the price of allowances. Each of these approaches has serious defects.

Intensity targets, formally proposed by President George W. Bush, don’t address the fundamental environmental challenge of reducing *total emissions* because intensity targets reinforce the link between economic growth and GHG pollution. Cap-and-trade, by contrast, encourages participants to drive economic growth up while driving total emissions down. However, emission intensities might be useful as guidance for defining ECEs for developing countries.

“No enforcement” approaches encourage developing countries to adopt voluntary targets and participate in emissions trading, even though it is clear from the outset that if they fail to meet their targets, there will not be any consequence. Not only do such approaches undermine the “rule of law” in the regulatory arena in precisely those nations that need most to bolster it, they also create a serious moral hazard problem. A variant of these approaches, under which developing countries that adopt voluntary targets may participate in emissions trading if they reduce emissions below targeted levels, but are not penalized if emissions exceed allowable levels, ameliorates some of the problems of “no enforcement” approaches. But this variant does not address the concerns of non-Annex I

nations that would like to begin participating in emissions trading sooner than the end of the Kyoto commitment period. While nations with ECEs could begin immediately using their ECE to leverage financing for large-scale emission reduction programs, nations that follow “no enforcement” approaches will have to wait until the end of their voluntary target period in order to determine whether they have any surplus allowances available for trading.

The “price ceiling” (‘cost cap,’ ‘safety valve’) is a species of the no-enforcement approach under which, if the market price for allowances reaches a certain level, governments print more allowances (non-enforcement) and sell them at the ceiling price. There is no requirement to rectify the environmental harm. From a business perspective, price ceilings destroy the incentive to comply with absolute targets – why invest in emissions reductions today when you know the government will bail you out at a fixed price tomorrow? This approach would be least likely to entice the US back to the international arena, particularly given the longstanding American antipathy to price controls (dating back to the Nixon administration), and to energy taxes, which is in effect what price ceilings are.

Conclusion

Surveying the range of options available for rejuvenating the UNFCCC/Kyoto process, we conclude that three approaches hold the greatest promise for bringing the US back to the process, bringing non-Annex I nations into the process, and integrating long-term considerations into near-term objectives. These are maintaining the structure of near-term targets and timetables and emissions cap-and-trade; renegotiating the US target or providing a one-time sinks credit adjustment for the US for the 2008-2012 timeframe; and expanding the opportunities for developing nations to participate in environmental capital formation, by providing initial environmental capital endowments (ECEs) for early joiners of Annex B, and by providing compensated reductions for nations that reduce deforestation below baseline levels. The recommended course encourages early participation by developing countries while limiting the gap between the emissions reduction envisioned at Kyoto and the reductions actually achieved in the first budget period. Accordingly, dangerous anthropogenic interference with the climate system would more likely be avoided.