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Issues and Options: The Kyoto Protocol's Second Commitment Period

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Issues and Options: The Kyoto Protocol's Second Commitment Period

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Summary and introduction

This paper explores a range of options for designing an international framework for climate protection beyond the Kyoto Protocol's first commitment period. Negotiations for the second commitment period could begin as early as 2004. In this paper, we hope to promote a better understanding of a wide range of future climate protection options and provide building blocks for further consideration of the Kyoto Protocol's second commitment period.

The possibilities for future commitments vary widely with respect to different kinds of greenhouse gas commitments (including their scope and legal character), use of market-based mechanisms, and other important elements of climate protection architecture. Section I of this paper explores each of these elements in detail. Indeed, there is a multitude of ways to combine the different elements in designing a climate protection regime, and especially for distinguishing between developed and industrialized country's actions. However, some of these design options are incompatible. Thus, Section I also articulates six possible "packages" of elements that form some coherent options for future commitments.

Section II examines some of the cross-cutting issues that accompany the adoption of any of the forms of commitments discussed in Section I. This includes the level of *participation* among Parties, *differentiation* of emission targets across Parties, and the overall environmental objective of the regime. Finally, Section III briefly explores the important and integrated topic of institutional capacity needs.

I Designing a climate protection architecture

Debates on the future of the climate change treaty have focused overwhelmingly on defining emission targets or, alternatively, on how to allocate future greenhouse gas emission rights across countries. Although they are a central feature of a future climate regime, emission targets are but one part of a coherent climate protection "architecture." Commitments might also vary widely with respect to their legal character, geographic scope, use of market-based mechanisms and other important elements of a climate protection architecture. This section explores each of these elements in detail. Table 1 summarizes the various elements and options of an international climate protection architecture.

1. Legal nature of commitments

Generally, all international treaty commitments are made voluntarily with sovereign states deciding themselves whether to participate in the agreement. Once the treaty comes into force, however, specific commitments may or may not be considered legally binding. In actuality, the legal nature of a given commitment will probably fall somewhere along a continuum between legally binding and non-binding, depending on the specificity of the promised action, the consequences of non-compliance, and the intentions of governments making the agreement.

The climate regime currently employs both non-binding and binding commitments. Some provisions, such as the greenhouse gas commitments under the Climate Convention, are widely considered non-binding pledges.[2] This is due to the general phrasing of the requirements and the lack of an accompanying system of enforcement. The Kyoto Protocol, however, establishes legally binding requirements for emission limits in industrialized countries. These emission limits are precisely spelled out in the agreement and backed by procedures and mechanisms (adopted in 2001) aimed at remedying cases of non-compliance, such as when a country exceeds its emission limit.

In the future, the climate change regime might successfully incorporate non-binding approaches (beyond those already stipulated in the Convention)

Table 1. Designing a Climate Protection Architecture: Possible Elements and Options

Element of Architecture	Options
Legal Nature of Commitment	1. Legally binding
	2. Non-binding
Type of GHG Limitation Commitment	1. International carbon tax (e.g., $10 per ton)
	2. Internationally harmonized policies and measures
	3. Fixed emissions target: cap on emissions (Kyoto-style targets)
	4. Dynamic emissions target: limit of emissions in relation to GDP growth
	5. Dual emissions targets: "safe zone" between a high and a low target
	6. Emissions target with price cap: target expands if emission reduction costs reach a certain threshold (e.g., $100 per ton)
	7. Sustainable development policies and measures (not harmonized)
Coverage and Scope of Actions	1. Gases (e.g., CO_2 only or all six principal greenhouse gases)
	2. Geographic (e.g., project, sector, national, regional, global)
Market-Based Mechanisms	1. Project- or sector-based trading (e.g., CDM)
	2. International emissions trading (e.g., Kyoto-style allowance trading)
Financial and Technology Commitments	1. Funding for adaptation, renewable energy investment, sustainable development policies and measures, technology transfer, etc.
	2. Compensation for climate impacts
Accountability Commitments	1. Non-compliance consequences
	2. Measurement, reporting, review

Note: Other potential elements of an international climate protection architecture exist but are not examined here. Likewise, there are other non-treaty-based strategies, such as technology-driven approaches, which are not examined here.
Abbreviations: GHG (greenhouse gas), GDP (gross domestic product).

into its architecture. Several of these are discussed in the following section, including policies and measures oriented around achieving sustainable development (Winkler *et al*. 2002), the Clean Development Mechanism (CDM) and emission targets, each of which might be effective in a non-binding form. Past experience with the Climate Convention, however, suggests that a *purely* non-binding system is unlikely to prevent dangerous climate change.

2. Type of greenhouse gas limitation commitments

Greenhouse gas limitation commitments will form a central element of a future climate protection architecture. Under this scenario, policy-makers have a variety of options. Some commitments would entail *harmonized* policies and measures across countries, such as the removal of fossil fuel subsidies or promotion of renewable energy. Countries could likewise promote climate protection through an international carbon tax. Although theoretically appealing, these kinds of internationally harmonized approaches have had limited traction in climate negotiations over the past decade. Thus, as explained below, the international community is likely to rely on different kinds of emission targets to achieve climate change objectives.

a. Emission targets

Emission targets offer several benefits relative to harmonized actions. First, by their very nature, targets can be *differentiated* across countries. For example, the Kyoto Protocol targets, range from a 10 per cent increase above 1990 levels (Iceland) to an eight per cent reduction below 1990 levels (European Union

and others). The concept of differentiation, rather than harmonization, better reflects the Climate Convention's promise to give "full consideration" to the "specific needs and circumstances" of Parties (UNFCCC 1992, Article 3.2). Second, decisions on *how* to achieve emission targets are left to the discretion of sovereign countries, without the intrusion of international rules. Generally, the preference for emission targets and trading (discussed below) is due to the legal framework underpinning international agreements, which is based on sovereignty and therefore voluntary assent (Wiener 1999). In effect, voluntary assent makes harmonized approaches—such as a global carbon tax or internationally coordinated policies—less politically workable than targets. Through a structured negotiating process, countries commit to a target they find politically acceptable with respect to environmental stringency and economic costs. Third, emission targets are compatible with market mechanisms (discussed below) such as international emissions trading (IET), which can help reduce costs.

One kind of target is a *fixed* (or, absolute) target, which establishes a maximum level of emissions a country can emit during a specified period. For example, targets taken by industrialized countries under the Kyoto Protocol entail fixed emission ceilings during the 2008 to 2012 time frame. Providing countries comply, fixed targets have the advantage of ensuring a particular environmental outcome via a "cap" on emissions, and can promote cost-effectiveness when coupled with emissions trading.

The difficulty with negotiating fixed targets stems from uncertainties over future emission levels and the costs of achieving any future emission target (Baumert *et al.* 1999, Pizer 1999, Victor 2001). The further into the future targets are set, the greater the uncertainties. These uncertainties carry two opposing risks: (1) a target set too stringently can potentially constrain economic development, which is an unacceptable consequence for many developing countries; (2) a target set too loosely, in contrast, can result in a weakening of other countries' targets. This second risk is due to the influence of IET. For instance, country A's excess emission allowances (due to weak targets) might be traded to country B, which would then be able to increase its own emissions (a phenomenon often referred to as "hot air" trading).

b. Emission targets with reduced uncertainty

There are at least three ways of designing emission targets which could potentially reduce economic uncertainties and environmental risks. The first is a *dynamic target* (CCAP 1998, Baumert *et al.* 1999, Philibert and Pershing 2001). Under this kind of target, a country's allowable level of emissions is adjusted according to some other variable, such as gross domestic product (GDP). A dynamic target of this sort was proposed by Argentina in 1999 (Bouille and Girardin 2002). Dynamic targets can reduce economic uncertainty in the target-setting process and promote environmental integrity (i.e., less unintentional "hot air"), particularly with respect to developing countries. Yet, dynamic targets pose certain challenges relative to fixed targets, including added complexity and data requirements (Kim and Baumert 2002).

A second way to design emission targets is to use *dual targets* (Kim and Baumert 2002) where a country has two emission targets. The lower (more stringent) target provides an incentive to reduce emissions, since reductions below this target would enable the country to sell emission reduction allowances. The higher (less stringent) target has a punitive function: exceeding this target puts the country out of compliance. Thus, the lower target would be a selling target and the higher one a compliance target. In the "safe zone," no penalty would be assessed if emissions fell between the selling and the compliance targets The dual target concept could also be combined with a dynamic target approach.

The third way addresses cost uncertainties by coupling targets with a *price cap* (Pizer 1999, Victor 2001).[3] A price cap places an upward limit on the costs of emission reductions, thereby providing greater up-front certainty about the potential magnitude of implementation costs for a given target. Additional emission allowances may be issued by a central authority if the cost of abatement exceeds the price cap (e.g., $100 per ton of CO_2). In such an instance, using the price cap would allow greenhouse gases to exceed the target level, effectively transforming a fixed target into a dynamic one.

c. Policies and measures

It should be noted that quantitative emission targets—fixed or dynamic; with or without a price cap—are not a necessary condition for climate protection, especially for countries whose emissions are relatively small. Many developing countries need not necessarily adopt quantitative emission targets, even over the next few decades, as their current and future

contributions to global greenhouse gas emissions are small.

Moreover, even some larger developing countries have demonstrated that they can take climate-friendly actions in the absence of firm targets. A wide range of energy efficiency and renewable energy measures are already helping to limit the growth of greenhouse gas emissions in developing countries, even though these measures are being taken for reasons other than climate change (Reid and Goldemberg 1999, Biagini 2000). Thus, *qualitative approaches* that advance country-specific sustainable development policies and measures (PAMs) could play an important role in developing countries' future climate protection efforts.

Winker *et al.* (2002) outline the concept of sustainable development policies and measures (SD-PAMs), where countries adopt a basket of policies and measures that are primarily geared toward their national sustainable development needs. For most developing countries, climate change is not an immediate priority, and sustainable development could be a more robust objective around which to organize action. The SD-PAMs approach attempts to harness this reality by beginning with the development objectives and needs of developing countries. The expectation is, by moving toward greater sustainability in their development path, developing countries will start bending the curve of their greenhouse gas emissions downward. This hypothesis is supported by the emission scenarios and other Intergovernmental Panel on Climate Change (IPCC) findings. According to the IPCC, a low-carbon future is "associated with a whole set of policies and actions that go beyond the development of climate policy itself" (Morita and Robinson 2001).

3. Coverage and scope of actions

Future commitments could vary with respect to their coverage and scope. Kyoto-style targets, for example, are nearly comprehensive in their emission coverage. They encompass all emission sources and certain sinks (i.e., emission absorption activities) within a country and also address all six main greenhouse gases. In the future, emission limits for some countries could be narrower in coverage, especially in developing countries where some gases are difficult to measure or monitor and may constitute only a small share of countrywide emissions.

A treaty could promote action at the project, sector, or countrywide levels. Project-based emission reductions (which also have sustainable development benefits in developing countries) are already authorized through the Kyoto Protocol's CDM. Sector-based commitments might encompass those parts of national economies where greenhouse gas emissions are most prominent, such as heavy industry, land use change and forestry, or electric power production. A SD-PAMs, discussed above, or a sector-based CDM (Samaniego and Figueres 2002) could be channels for such strategies.

In general, greenhouse gas commitments that are broader in scope and coverage will afford greater opportunity for participants to undertake emission reductions where they are least costly (see market mechanisms below). At the same time, however, the broader the scope, the higher a regime's monitoring and evaluation costs will be. For some countries, monitoring and reporting of some non-CO_2 gases or trivial emission sources might be difficult and expensive. The expense of rigorous monitoring and reporting of *de minimus* emission sources might be better channeled toward abatement activities in other, more significant, sectors.

4. Market mechanisms

Market mechanisms, like IET, are increasingly embraced by the international community in efforts to address climate change. The primary attraction of market mechanisms is *cost-effectiveness*, a principle enshrined in the Climate Convention (Article 3.3).[4] Emissions trading supports this principle by providing incentives for emission reductions to be undertaken where they are the least costly. The Kyoto Protocol incorporates an allowance trading system, as well as two (project-based) credit-trading market mechanisms—joint implementation and the CDM.

In the future, governments could decide to expand or alter Kyoto's market mechanisms. For example, Samaniego and Figueres (2002) outline a *sector-based* CDM that builds on the already operational *project-based* CDM. A sector-CDM would represent an expansion of the scope of the CDM to cover entire national sectors (such as cement or power production) or geographic areas (such as a municipality). This approach could support emission reductions and sustainable development benefits—the two expected by-products of the CDM—across a wider array of activities.

The hope of many is that future commitments will dramatically expand the *international* emissions trad-

ing system by including more developing countries, or even all countries (see below). The effectiveness of the trading system will depend on the strength of the underlying regulatory framework, including the monitoring and reporting system within participating countries. It is likely that IET, underpinned by a strong regulatory framework at the international and domestic levels, will deliver substantial cost-effectiveness benefits.

However, while domestic emissions trading experiments have often proven effective, international emissions trading is relatively untested. The Kyoto Protocol constitutes the first major experiment in IET. Yet some proposals for future commitments, as discussed below, place a great deal of reliance on the success of trading (i.e., by structuring an allocation system in order to induce large North-South financial transfers). Because of the untested nature of the IET, some caution is warranted. Achieving the positive results that have been demonstrated in domestic contexts will require competitive markets and other conditions that may prove elusive, especially within the confines of international treaty law where participation and compliance cannot be assured. In particular, effective monitoring, reporting, review, and compliance provisions are essential to the function of a trading system. Governments should be wary of agreeing to emission targets in the second commitment period that are overly dependent upon a trading system. Smaller steps, such as gradually expanding the trading system or the scope of the CDM, might be prudent near-term options (Baumert *et al.* 2003).[5]

5. Accountability provisions

Any effective climate protection architecture will require provisions for determining whether countries are adhering to their promises. These provisions include national monitoring and reporting as well as the review of information (such as emissions data) submitted by Parties in order to ensure accuracy and completeness. These requirements are essential conditions for implementing some options for greenhouse gas limitation commitments discussed above, since a government cannot manage what it cannot or does not measure. These requirements are also essential to the smooth operation of market-based mechanisms, especially IET. Equally important are the procedures and consequences to which countries are subject if they fail to comply with their obligations (or are suspected of non-compliance).

The Climate Convention provides the basic building blocks for such accountability provisions. The Kyoto Protocol (and subsequent 2001 Marrakech Accords) expands on the Convention requirements through detailed greenhouse gas measurement, reporting, review, and non-compliance procedures. "Expert review teams," for example, have the authority to raise potential non-compliance issues with the Kyoto Protocol's Compliance Committee. The Compliance Committee can then review suspected cases of non-compliance and, if appropriate, impose penalties. Under the Marrakech Accords, countries found to be exceeding their targets can be penalized during the next commitment period (for their overage, plus 30 per cent), lose the right to sell under the trading system, and be required to prepare a "compliance action plan."

6. Financial and technology commitments

Financial provisions—such as those for capacity building, adaptation assistance, and technology transfer—are essential to crafting North-South compromises. For example, the final package adopted as the 2001 Marrakech Accords comprises technical provisions for making the Kyoto Protocol operational *and* a financial component, however limited, aimed at helping developing countries address climate change and adapt to its physical impacts. This financial package includes an adaptation fund and a least developed country fund for which industrialized countries have pledged a relatively small amount of money. Currently, the climate change regime has designated the Global Environmental Facility (GEF) as its financial mechanism. In addition to managing several funds for the Climate Convention, the GEF finances activities supporting the Convention's implementation in developing countries, including capacity building, preparation of national communications and greenhouse gas inventories, and vulnerability and adaptation assessments.

To the extent that developing countries are asked to take on new greenhouse gas commitments, the design and funding of financial mechanisms will be critical. According to the Climate Convention, the degree to which developing countries will effectively implement their commitments depends on the degree to which they receive assistance from the industrialized countries (UNFCCC 1992, Article 4.7). The IPCC further states, "Most analysts…suggest that both equity and efficiency considerations create a case for large international financial transfers as part of any

regime for substantial reductions in greenhouse gas emissions" (Banuri *et al.* 1996).

7. Combining the elements

The elements discussed above could be combined in many ways. Indeed, there are a multitude of permutations for designing a climate protection regime, and especially for distinguishing between developed and industrialized country actions. However, just as oil and water do not mix, some of these options are incompatible. Future options must strike the appropriate balance of rights and obligations. The Kyoto Protocol provides a good example in this regard. The right to participate in IET, for example, is conditioned on a countries assuming a mandatory emissions target with associated monitoring, reporting, and review obligations.

Table 2 shows six viable combinations of elements that could form the basis of coherent commitments. Provisions for financial commitments and technology commitments (not shown), including those for adaptation, will also be critical variables in determining which options are acceptable to particular Parties.

The current regime is exemplified largely by numbers one and six. All countries have obligations under the Climate Convention, which calls for climate-friendly policies and measures as well as a reporting system (Art. 4, 12). The Kyoto Protocol re-affirms those commitments for developing countries (Art. 10) and also provides developing countries with access to the CDM (Art. 12). This best approximates option one. At the same time, the Protocol establishes a system of fixed emission targets for industrialized countries that are legally binding (Art. 3, Annex B; option 6).

There is considerable scope for creativity beyond the six options posited. For example, in some cases the commitment adopted might be flexible and evolve during the commitment period. Specifically, a developing country could adopt a non-binding target (fixed or dynamic) along with *strict* accountability requirements. In the event that emissions are reduced below the target level, the Party might be allowed to sell permits that represent their excess emission reductions. At the same time, failure to comply with the target might yield no punitive consequences; i.e., the target would remain non-binding, but no trading would be allowed (IEA 2002).[6]

Table 2. Six Options for Future GHG Commitments

Form of GHG Commitment	**Legal Nature of Commitment**	**Accountability Provisions**	**Access to Market Mechanisms**
1. Qualitative Target/PAMs	Non-binding	National reporting	CDM and/or Sector-CDMS
2. Sub-national/Sectoral Target	Non-binding	National reporting	CDM and/or Sector-CDMS
3. Dynamic Emissions Target	Non-binding	National reporting	CDM and/or Sector-CDMS
4. Fixed Emissions Target	Non-binding	National reporting	CDM and/or Sector-CDMS
5. Dynamic Emissions Target – single or dual targets – with or without a price cap	Binding	Strict monitoring, reporting and review requirements, including for GDP	JI $^{B\text{-}S}$, IET, $^{B\text{-}S}$ and CDM^{B}
6. Fixed Emissions Target – single or dual targets – with or without a price cap	Binding	Strict monitoring, reporting and review requirements	JI $^{B\text{-}S}$, IET, $^{B\text{-}S}$ and CDM^{B}

Abbreviations: Policies and Measures (PAMs); Clean Development Mechanism (CDM); Joint Implementation (JI); International Emissions Trading (IET); Gross Domestic Product (GDP); Buyer (^{B}); Seller (^{S}).

Another approach would be for (some) developing countries to have no targets at all, but require a certain number of reductions to be generated through the CDM. In this way, affirmative requirements to reduce emissions could exist, while allowing overall emission levels to remain unrestricted. This might sidestep technical and political problems associated with determining emission targets. Reductions could be generated through bilateral- or unilateral-type CDM projects (Baumert *et al*. 2000) and/or sector-CDM projects (Samaniego and Figueres 2002).

Finally, the options, including those in Table 2, are not mutually exclusive. Multiple forms of commitment/actions could be adopted. In this way, a menu of options might be crafted to best suit the diverse national circumstances of parties (Baumert and Llosa 2002). Establishing new "channels" for participation might help soften the current rigid divisions between industrialized and developing countries. To be sure, accomplishing this will first and foremost require industrialized country leadership, as called for under the Climate Convention. However, new ways of designing international cooperation, such as those discussed above, will also need to be considered, if not adopted.

II Future commitments: From form to function

To operationalize any form of future commitments discussed above, Parties must decide on other important and interrelated issues. For example, which countries should participate under various forms of commitment? How might reduction efforts be shared among participating countries? What should be the overall environmental stringency of the commitments, such that the ultimate objective of the Convention can be satisfied? These topics are also addressed below and summarized in Table 3.

1. Participation

A major issue for consideration is the question of which countries should adopt particular commitments. As discussed above, differentiation by *form of commitment* is already visible in the Convention and Kyoto Protocol. Currently, however, no participation "trigger" exists in the treaty architecture. Thus far, forms of commitment under the climate regime have been differentiated primarily on the basis of countries' designation as "Annex I" or "non-Annex I" Parties. Whereas these traditional distinctions will be useful and necessary in the future, new categorizations may be needed to differentiate the timing of actions across countries. For example, the 1987 Montreal Protocol includes different schedules for phasing out ozone-depleting substances based on a country's *per capita consumption* of certain controlled substances (0.3 kilograms per person).

Agreeing on one or more participation criteria would no doubt be a difficult and heated topic of negotiation. There are many different criteria that would warrant discussion, and the implications of using dif-

Table 3. Designing a Climate Protection Architecture: Possible Elements and Options

Issue	Options
Participation	1. Expand composition of Annex I
	2. Agree on participation "criteria" (e.g., a certain level of income per person) that determines when a country should take an action
	3. Global participation
Differentiation of Commitments	1. Pledge-based: Kyoto-style negotiations, reductions from business-as-usual
	2. Principle-based: Agree first on principles and then derive subsequent allocation rules from those principles (e.g., allowance allocations based on population size, relative responsibility, etc.)
Global Environmental Objective	1. Climate Convention objective
	2. Agreement to keep a certain stabilization option open in the future
	3. A quantitative objective, such as a limit on global emissions, concentrations, or temperature change that is consistent with the Climate Convention objective

ferent criteria would be significant. One approach would be to shape a participation trigger in accordance with the principles established in the Climate Convention. The Convention calls on countries to "protect the climate system on the basis of equity… and in accordance with their common but differentiated *responsibilities* and respective *capabilities*" (Article 3.1, emphasis added). Thus, those countries that have greater responsibility for causing climate change and capabilities for addressing it might be asked to take on commitments sooner (or in greater magnitude, as discussed below).

Parties are already exploring indicators of *responsibility* under the scientific and methodological examination of the "Brazilian Proposal." Further analysis on *capability* indicators might serve as a useful complement. For example, GDP per capita (measured in purchasing power parity) is often advanced as a proxy for administrative, technical and financial capabilities. Other indicators relevant to poverty, education, health, etc. might also be worthy of exploration. Of course, even if appropriate indicators were agreed upon, the Parties would still need to decide the *level(s)* at which particular actions or commitments might be triggered. Any set of plausible indicators, however, is likely to reveal that Annex I countries, especially the United States, should shoulder the largest requirements to limit greenhouse gases.

2. Differentiated commitments

As discussed in Section I.2, greenhouse gas emission targets tend to be differentiated across countries, with some countries required to reduce emissions more than others. (This subject is intertwined with participation, discussed above.) It is useful to consider two different procedural approaches—*pledge-* and *principle-based*—to negotiating emission targets, be they fixed, dynamic or qualitative. This distinction is important because it determines a starting point for negotiations and, more fundamentally, reflects differing and perhaps conflicting ways of viewing the challenge of climate protection.

Generally, the international negotiating process is best characterized as pledge-based; countries formulate their national positions and negotiate in their interests, voluntarily making commitments (alone or with other countries) at their sovereign discretion. Because the international legal order lacks the ability to require a country to participate, the tradition has been for countries to "pledge" particular actions in a bottom-up style. These commitments typically represent (and always purport to make) some divergence from the *status quo* or historical levels (e.g., targets relative to 1990 emission levels).[7] This pledge-based approach reflects the voluntary assent rule and the *realpolitik* of international negotiations.

Bottom-up negotiation processes like the Kyoto Protocol have been criticized as *ad hoc*, with negotiated results shaped mainly by political power and economic might rather than by objective criteria. Thus, many have called for negotiation on overarching principles or rules that, once agreed, would guide the subsequent emission reduction efforts among nations in an orderly fashion. Some notable principle-based allocation proposals include:

- allocation according to an equal per capita emission rights, including with a transition or convergence (see, e.g., Amin 2002);
- allocation of reduction requirements according to each country's relative responsibility for causing climate change (see, e.g., La Rovere *et al.* 2002);
- global application of the "Triptych Approach," which was used as a starting point for the EU burden sharing scheme under Kyoto (Groenenberg *et al.* 2001); and
- compromise proposals using more than one principle (see, e.g., Müller 2001).

Principle-based approaches are often advanced under the mantle of *equity*, a stated principle of the Climate Convention. The most recent IPCC assessment catalogs 13 equity principles and their associated allocation rules (Toth and Mwandyosa 2001), illustrating a diversity of views on what constitutes an equitable allocation of emission allowances across countries. Furthermore, many believe that, given North-South disparities in negotiating capacity and power, a principle-based approach to negotiating commitments is fairer *procedurally*. Some developing countries question whether they can ever get a "fair deal" if emission commitments are determined on the basis of raw bargaining power.

It is important to note that principles of equity are also relevant to pledge-based targets. It is likely that countries will invoke a variety or principles to justify proposed targets. In determining what is fair, as discussed above, countries are likely to rely on other (but related) Convention principles, such as responsibility, capability, as well as national circumstances (Art. 3.2) and sustainable development (Art. 3.4). Estimated compliance costs will also, no doubt, be a major

determining factor in negotiations over the relative stringency of future commitments.

Although highly relevant, the issue of equity and fairness should not be associated solely with the differentiation of emission commitments. For example, the Montreal Protocol on Substances that Deplete the Ozone Layer is widely perceived as equitable not just because country commitments were carefully differentiated, but also because industrialized countries ultimately compensated developing countries for phasing out ozone-depleting substances (Banuri *et al*. 1996). Similarly, the level of acceptable climate change will have a major bearing on equity because the impacts of climate change will be unevenly distributed. It is the totality of the climate protection architecture—not just differentiation of emission targets—that ultimately will influence whether governments perceive an agreement as equitable. Financial mechanisms, including funds for technology transfer, capacity development, clean energy, and adaptation, among others, will be especially important in crafting acceptable compromises.

3. Global environmental objective

To what end is the above-discussed climate protection architecture directed? What constitutes "climate protection"? There is currently no agreement on what constitutes a "dangerous" level of greenhouse gas concentrations, as outlined in the Climate Convention. The IPCC's most recent assessment report states that, "Given the large uncertainties that characterize each component of the climate protection problem, it is impossible to establish a globally acceptable level of GHG concentrations today" (Toth and Mwandyosa 2001).

Yet, an important step to building an environmentally effective climate regime would be to achieve greater clarity on a long-term goal (Berk *et al*. 2001, IEA 2002). A long-term perspective casts the climate protection challenge into sobering relief: Even limiting atmospheric greenhouse gas concentrations to a *doubling* of pre-industrial levels would likely require a wholesale transition in the world's energy economy. A more formal long-term objective might help shape more effective near-term actions in a way that is consistent with a variety of future atmospheric stabilization options. One promising approach explored by the COOL Global Dialogue Project is to ensure that global commitments keep future climate protection options open to a stabilization of CO_2 concentrations at 450 ppmv (550 ppmv including all gases) (Berk *et al*. 2001).

This approach is still consistent with the IPCC's reasoning in the Third Assessment Report:

> "[I]t is obvious that no 'once forever' solution exists. Making long-term commitments in any area where retraction is possible is problematic… therefore… the most promising approach to climate policy is sequential decision-making. This process involves a regular reassessment of the long-term climate risks (net damages from a given magnitude of climate change) and their management objectives (climate or GHG concentration stabilization) in the light of newly available information. Short-term strategies are then crafted so that both GHG emissions and the underlying socio-economic processes (resource use, technologies) evolve in a direction which makes future course corrections in any direction the least expensive" (Toth and Mwandosya 2001).

Greater direction on a long-term goal might improve the cogency of short-term, country-level commitments. At Kyoto, governments were negotiating both differentiation and an overall environmental goal for 2008–2012 simultaneously. By clarifying how short-term targets (2012–2017, for example) further a more meaningful long-term objective (keeping a 450 ppmv option open, for example), governments might also insulate themselves from criticisms and public perceptions that targets are merely political, with minimal bearing on climate change mitigation over the long-term. This was even a criticism levelled on the Kyoto process by U.S. President George W. Bush.

III Capacity needs

Government *capacity* touches on all of the topics discussed thus far. The ability of governments to make, keep, and comply with promised actions will have important implications for the overall effectiveness of the climate regime, equity and cost-effectiveness. In fact, research suggests that most instances of non-compliance with international agreements are not willful, but due to lack of state capacity (Brown Weiss and Jacobson 1998).

Capacity is not necessarily a pre-requisite to the adoption of commitments. Indeed, experience under the Convention and Protocol suggests that capacity is often built *after* commitments are adopted. Nevertheless, many options discussed in this paper would require significant changes in behaviour, and implementation of new practices and procedures at

the country level. For some countries, the implied changes may be difficult or impossible, especially within the relatively short time frame before the second commitment period, and the long time often needed to build certain capacities. Key areas of institutional capacity needs include the following:

- *Participation in the international negotiations*. Governments will need the capacity to assess various options and define a national position. This will require strong and stable delegations, policy coordination at the national level, and, in many cases, buy-in from key domestic constituencies.
- *Domestic policy formulation and implementation*. Once a commitment is adopted, governments must still formulate and implement relevant national policies. This may require new laws and/or regulations covering diverse economic sectors.

A full consideration of this topic is beyond the scope of this paper.[8] However, it is briefly worth elaborating how capacity needs will relate to other topics discussed in this paper.

1. Monitoring and reporting

As described in section I.5, domestic greenhouse gas accounting systems must conform to the detailed body of international guidelines on what and how to monitor and report to the international community. Reliable greenhouse gas data is needed to assess compliance with commitments and ensure that the information provided is consistent and comparable across countries. Collecting, compiling, reviewing and reporting data according to the appropriate methodologies requires a political commitment, financial resources, technical skills and capable domestic institutions. Currently, many countries, even some in Annex I, do not have the necessary capacities to comply with existing international standards.

2. Form and stringency of GHG commitments

The *forms* of GHG commitments discussed above (see Table 2) will vary with respect to the amount of capacity needed for effective implementation. Clearly, non-binding commitments (numbers 1–4) place less capacity demands on countries than legally binding ones (numbers 5–6), including in all three areas mentioned above. With respect to binding commitments, those that include dynamic targets probably have the highest capacity requirements, since governments would need to meet acceptable standards for measurement and reporting of GDP, not just emissions.

One rationale for advancing non-binding action for some developing countries—such as SD-PAMs or non-binding emission targets—would be for the country to gain practical experience and build institutional capacity progressively in key areas, such as monitoring and reporting of emissions. In addition, the *stringency* of any commitments adopted, as well as their coverage and scope (section I.3), will of course also influence capacity requirements.

3. Market mechanisms

Those countries that engage in emissions trading (domestic and/or international) will require additional capacities and institutional needs, some of which may take considerable time to build. A well-functioning emission market presupposes effective monitoring and enforcement as well as properly aligned economic incentives that favour competition and cost minimization. These conditions may not always hold. If non-compliance is likely or expected, this could damage market confidence, with adverse implications for cost-effectiveness. In addition, underlying institutions that support market development may be missing in some cases. For example, if in a particular country there is no underlying competitive market for everyday goods and services, or legal institutions to ensure secure transactions and legal remedies, then these approaches may not live up to their theoretical potential (Baumert *et al*. 2003). As well, countries that lack efficient (or functioning) court systems, a free press, as well as the ability to collect taxes and enforce property rights, will have difficulties implementing ambitious climate change policies, such as emissions trading.

4. Participation and allocation

The number of countries adopting binding emission limits will have major implications for the overall capacity needs of the regime. Many principle-based proposals for allocating emission targets, such as those discussed above, call for "global participation" (see, e.g., Toth and Mwandyosa 2001). If interpreted literally, these proposals involve fixed targets for *all* countries of the world. Although theoretically elegant, implementing a truly global allocation approach would necessitate a massive effort to build the relevant institutional capacity for proper greenhouse gas accounting systems, domestic policy implementation, and participation in the international climate negotiations. Fortunately, it is not necessary to

include all (or even most) countries in a formal emission control system. For instance, the 48 countries categorized as "least developed" by the U.N. amount to a mere 0.5 per cent of global carbon emissions.[9]

Thus, while *wider* participation is necessary to protect the climate, establishing a system of fixed targets and emissions trading for *all* countries is not environmentally necessary to achieve the objective of the Climate Convention, and it may not be practically achievable in the near future. An alternative approach, discussed above, might be to fashion a participation trigger that explicitly factors in considerations of capacities. Global allocation approaches might also be altered to a narrower category of countries.

In response to all of these challenges, the Conference of the Parties should craft obligations that are appropriate to the capacities of participating governments. On the other hand, Parties must also take proactive steps to gradually improve the government capacities, particularly in developing countries.

IV Conclusion: Building on the Kyoto Protocol

Clearly, the Convention and the Kyoto Protocol include the necessary foundations for further developing the climate regime. These include vital guiding principles in the Convention—including equity, responsibility, capability, cost-effectiveness and sustainable development. The foundation also includes the concept of differentiation of commitments between developed and developing countries. Likewise, the climate regime already provides a solid basis for greenhouse gas monitoring, reporting, and review systems. Market mechanisms, including the CDM and IET, are increasingly embraced by governments and civil society.

As the Kyoto Protocol comes into force, the climate protection debate will focus increasingly on improving and expanding the regime's architecture in the era beyond Kyoto's first commitment period. The options for different forms of commitments sketched in this paper suggest a wide variety of future possibilities, many of which could work together to strengthen the climate regime. To do this, however, the first step Parties must take is to launch a process, perhaps akin to the Berlin Mandate adopted at the COP-1 in 1995. This process should re-affirm existing principles as well as provide new guidance and a timetable for making key decisions related to the topics discussed in this paper. Then, governments can focus on converging on a mutually agreeable, near-term course of action that will help protect the climate system and promote sustainable development over the longer term.

Endnotes

1 The authors gratefully thank Nancy Kete, James Perkaus, Odile Blanchard and other members of the *Climate of Trust* project (Baumert *et al*. 2002) for their input. Some sections of this text have been adapted from various chapters of Baumert *et al*. 2002. Section IV benefited from a forthcoming paper by Willems and Baumert 2003.

2 Experts disagree on this point. Literally speaking, treaty commitments are binding on Parties. However, the loose phrasing of commitments in the UNFCCC, according to many, renders them aspirational rather than mandatory commitments. This differs from Kyoto's clear emission reduction requirements and non-compliance procedures.

3 Like a carbon tax, the level of a price cap would need to be harmonized across countries.

4 The merits of domestic emissions trading with respect to cost-effectiveness are extensively documented in the literature. See, e.g., Tietenberg 1985. For experiences with U.S. domestic programs, see e.g., Carlson and Burtraw 2000.

5 Kyoto offers a lesson in this regard. The market originally envisioned by Kyoto was dominated by several major buyers (i.e., the United States and Japan) and several dominant sellers (i.e., Russia and Ukraine, with other economies in transition selling smaller amounts). The withdrawal of a single country has transformed the market. Expected allowance prices have dropped as much as 20-fold, dampening incentives to invest in developing countries through the CDM. The consequences of a hypothetical U.S. withdrawal from the Protocol in 2007 or later, rather than in 2001, would be devastating. By that date, such a titanic shift in the market would undermine billions of dollars of investment in the developing and industrialized world. A Russian withdrawal (or ineligibility) might be even worse. (Baumert *et al*. 2003.)

6 This is sometimes referred to as a "non-binding target with trading." This can be misleading, however, since as soon as a single trade occurs, the government would (for the sake of environmental integrity) need to incur a legal obligation either to (1) meet their target (i.e., the target would become binding) or (2) buy back the allowances that it has sold in the event that the target is exceeded (i.e., there would be no trading in net). Also, it is important to note that such an option would not be appropriate for Annex I countries, since it is a *selling only* target.

7 In determining emission targets, governments will primarily be concerned with their business-as-usual (BAU, or "baseline") scenario, which represents the most plausible projection of future emissions. Several of the options discussed in this paper—dynamic targets, price caps, and dual targets—attempt to lessen some of the problems associated with BAU uncertainty. For a discussion of BAU and target setting, see Baumert and Kete 2002: 19.

8 Of course, a full assessment of capacity needs would also require an assessment of *existing* capacity.

9 Authors' calculations.

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