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Secretary-General Ban Ki-moon participates in an event to present the final report of the
International Commission on Climate Change and Development at the United Nations in New
York on May 12, 2009.
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**Volume XVII, 2009**

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Introduction

For anyone interested in international environmental treaty negotiation, 2009 is a banner year. Seventeen years after the initial signing of the Climate Change Convention in Rio, the countries of the world will try once again – this time in Copenhagen – to figure out how to reduce greenhouse gas emissions before global mean temperatures rise beyond reversible and safe levels. There is no longer any meaningful scientific debate about whether or not human-induced greenhouse gas emissions will trigger climate change. They will. When this will happen, however, what the localized effects will be and what can be done to reverse the process are still very much under discussion.

In this seventeenth volume of Papers on International Environmental Negotiation, the contributors offer bold ideas about how best to proceed given what we know. They examine possible strategies for inducing North-South cooperation, offer step-by-step approaches to setting more ambitious greenhouse gas reduction targets, sketch new administrative arrangements for encouraging technology sharing and increasing development assistance, and suggest new roles for non-governmental interests (NGI’s). Under normal circumstances – given the power of the status quo – the negotiations in Copenhagen will lead to “more of the same” modest and unenforceable targets that the North refuses to accept until the South agrees to do its part while the South demands that the North take responsibility for the current situation that is mostly its responsibility. The next generation of international negotiators, represented by the contributors to this volume, finds that unacceptable. They are searching for ways to shake up “the system.” They are optimistic, and their proposals deserve attention.

Professor Lawrence Susskind
Professor William Moomaw

“Looking Beyond Kyoto: A Vision for 2050 – And How to Get There” by Justin Ginnetti sketches a successor regime to the Kyoto Protocol – a Copenhagen Protocol – that will align States’ development and environmental interests. He defines the “ultimate objective” of the new Copenhagen Protocol as encouraging low-carbon development rather than merely discouraging greenhouse gas emissions. He focuses on the technological capacity of States rather than their economic interests, using solar energy to illustrate, and outlines a financing structure that would allow each country to meet its 2050 energy needs by relying on renewable energy (without stranding energy assets).

Ines Kapphan suggests that a new climate change regime needs to provide incentives for technology transfer to developing countries. In “A Framework Proposal for a post-2012 Copenhagen Protocol – How to Reach 80% Reductions by 2062,” the author proposes an innovative approach to achieving 80% reductions over the next fifty years. She suggests that by exploiting regional and temporal differences, the ambitious objective of continuously cutting total world GHG emissions by 3% a year can be realized without sacrificing economic growth in either developing or industrialized countries. The key is the creation of a new category of CDM (Clean Development Mechanism) projects that will make technology transfer possible.

Pointing to the extraordinary divergence of interests within the South, Mikhtar Amin, in “Post-Kyoto Climate Change Negotiations: The View from the Coalition of One Hundred,” argues that the traditional categorization of the South as a coalition with common interests is not accurate.
Amin focuses on a significant group of countries within the South whose voices are increasingly marginalized in international climate change discussions. He refers to these countries as the “Coalition of One Hundred” and identifies their interest in a per capita carbon emissions-based burden-sharing framework along with the need to link sustainable development and climate change, and provide additional funds for adaptation.

Climate change has accentuated differences between poor and rich countries with regard to poverty, vulnerability, and lifestyles. In “From Kyoto to Copenhagen: Breaking down Barriers between the North and the South,” Alexandra Zamecnik suggests ways of enhancing the interaction between the “North” and the “South,” including updating the categorization of countries used in the Kyoto treaty. She also proposes the creation of new technical working groups to engage countries in conversations about the specifics of emission reduction strategies, and to give developing nations the information they need to realign themselves according to what is most important to them. To ensure that the Clean Development Mechanism catalyzes change more effectively, Zamecnik suggests redefining CDM project boundaries.

In “The Role of NAMAs in Developing Countries: Including a Registry and Carbon Credit Permits in the New Copenhagen Protocol,” Kwanbo Kim suggests creating a global Registry and Carbon Credit Permit System based on Nationally Appropriate Mitigation Actions (NAMAs). The New Copenhagen Protocol, he argues, should establish a Registry of NAMAs in developing countries. Then, it should recognize a Carbon Credit System for verifying mitigation generated by these NAMAs. Such a plan could provide important incentives for the participation of developing countries in the international climate change regime.

At the core of “Revamping the Institutional Framework of CDM” by Alejandra Maupome Cagigal and Diego F. Osorio, is the assumption that individual efforts should be rewarded with Certificates of Emission Reduction, and that clusters of these actions should be able to achieve CDM status. They focus on new ways of reshaping the CDM, taking a bottom up approach. Their objective is to involve a broader set of stakeholders in each country and to democratize the CDM governance system.

The Kyoto Protocol has yet to achieve significant global greenhouse gas reductions. In “Strengthening the Kyoto Protocol: Accountability, Monitoring, and Enforcement,” Megan Samenfeld-Specht proposes a strategic approach to strengthening accountability under the Protocol. She recommends clear, long-term global greenhouse gas reduction targets. Once an overall goal is established, she suggests a treaty framework that would lead to shorter-term, country specific targets. Second, she outlines a strengthened system of re-enforcing commitments, based on the allocation of benefits provided to the parties to the Protocol. Potential benefits include access to research, investment capital, and development assistance. Third, she suggests a monitoring system that would rely on the expertise and resources of global and local non-profit organizations. Finally, she recommends the inclusion of non-profit organizations and the private sector in global climate negotiations through a series of well-structured round tables.

Forests will play an important role in the post-Kyoto era of carbon sequestration. Both developed and developing nations seem to be more open to the idea of protecting forests as a means of generating valuable carbon credits, although there are many different ideas about how to do this. Early pro-
posals, such as Reducing Emissions from Deforestation and Forest Degradation (REDD) are helpful, but a more comprehensive system is needed in the long term. In his paper “Forest Protection and Regeneration in the Post-Kyoto Era,” William Smith proposes an International Forest Protection Agency (IFPA) to protect forests for their roles in carbon capture through sustainable forest management, biodiversity, water supply management, and local economic development. The IFPA should monitor compliance through remote sensing, establish a financing structure, and support the principle of equity. This is the way to protect forests while adapting to and mitigating the effects of climate change.

Climate change is only a symptom of the more formidable problems of unsustainable resource use and the failure to internalize environmental externalities. Any global response to climate change ought to address these underlying problems. Kyle Glover, in his paper, “Pathway, Not Stopgap: Climate as a Down Payment on Sustainable Development,” tries to sketch a multilateral environmental framework that would do this. He suggests a carbon tax as the most efficient means of accomplishing these aims. Second, he suggests that the tax be “phased in” over time, serving as an incentive for developing less carbon-intensive technologies and allowing the targets of the tax to adjust their emissions to minimize the burden. Additional incentives, including a global product labeling scheme, are included. Finally, Glover suggests that wealthier countries ought to phase in the tax before poorer countries do and concludes by noting that the current economic downturn provides an opportunity for the United States to take on a new leadership role.
The Contributors

The Editors

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Alejandra Maupomé Cagigal is a LLM Candidate at Harvard Law School. She worked as an analyst for the Climate Change Team at ICF International Consulting in London and collaborated in a study of the long-term developments in European carbon markets and interactions with power generation. She also wrote a report on the environmental philanthropy activities of financial institutions and advised an agricultural multinational on its carbon footprint management strategy. Maupomé holds a Masters Degree in Environmental Policy and Regulation from The London School of Economics and Political Science and a Bachelor Degree in Law from Universidad de Las Américas Puebla in Mexico.

Justin Ginnetti is an MALD candidate at Tufts’ Fletcher School, where he has been studying the link between climate change and forced migration. “The Humanitarian Costs of Climate Change,” a paper co-authored with Mackinnon Webster and Peter Walker, was published last fall by the Feinstein International Center and will appear in the Journal of Environmental Hazards. Ginnetti is editor-in-chief of the Fletcher Forum of World Affairs, Fletcher’s biannual foreign policy journal.

Kyle Glover is entering his fourth year of a concurrent degree program at the Fletcher School of Law and Diplomacy and Harvard Law School. He is a winner of the Robert B. Stewart Prize, has been a board member of the Harvard Mediation Program and Harvard Negotiators, and has taught negotiation in North America and Europe. Glover worked as a professional photographer in North and Central America, Europe, and South Asia.
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Alexandra Zamecnik recently graduated from the Fletcher School of Law and Diplomacy at Tufts University with a concentration in international environmental policy and development economics. She worked with Rainforest Alliance’s TREES (Training, Extension, Enterprises and Sourcing) program in Guatemala and Nicaragua. She also worked for the new business team of the Latin America and Caribbean (LAC) region of Chemonics International, managing their new business portfolio.
Looking Beyond Kyoto: A Vision for 2050 – And How to Get There

Justin Ginnetti

Executive Summary

In this paper, I propose a successor regime to the Kyoto Protocol – a Copenhagen Protocol – that is both effective and politically viable because it aligns States’ developmental and environmental interests. The first part of this report briefly explains the historical necessity of defining a new “ultimate objective” for the Copenhagen Protocol and suggests what it should be. Part 2 elaborates on the new objective, justifies its logic, and illustrates how the Copenhagen Protocol would work in practice in one sector: renewable energy.

Please note: this report will incorporate aspects of the current negotiations as they are (i.e., reflecting statements of the States Parties at sessions in Accra, Ghana, and Poznan, Poland, pursuant to the “Bali Action Plan”); and, due to the orientation around a new objective, as they could be. In short, I will endeavor to ground my prescriptions in the facts.

Part 1: The need for a new objective

Article 2 of the United Nations Framework Convention on Climate Change (hereafter “the Convention,” or “UNFCCC”) reads: “The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.”

Two facets of this objective demand improvement: its ambiguity (What constitutes “dangerous anthropogenic interference with the climate system,” and who is authorized, by the Convention or otherwise, to make such a determination?); and its focus on the stabilization of greenhouse gases, or “mitigation.”

This lack of definitional clarity in the “framework” helped produce an ineffective, unprincipled Kyoto Protocol in December 1997, and it continues to threaten current negotiations. Consider the two dispatches below, the first from the August 2008 session in Accra, Ghana, and the second from the Conference of the Parties that took place in Poznan, Poland, in December 2008:

“‘There is nothing new,’ complained one disgruntled delegate emerging from the mitigation group. ‘Not a single sign of progress or movement; parties just exchanged polarized views. We have yet to reach a critical mass to move forward’”; and

“Many delegates in the AWG-LCA [Ad Hoc Working Group on Long-term Cooperative Action] opening session on Monday afternoon seemed singularly unimpressed by the dispute over whether to form a contact group to discuss a shared vision. ‘I thought we had agreed on
"this already,’ said one, ‘Can you believe that there was no shared vision on forming a contact
group on shared vision?’ asked another.

More than a decade after Kyoto, emissions reduction targets remain front and center of the negotia-
tions, often preempting negotiations that address other interests of the States Parties. Thus, when the
Parties negotiate, they have the wrong conversation and argue about the role of historical emissions
rather than discussing what can be done.

What, then, is the right conversation? First, the right conversation will be guided by a clearly defined,
consensus “ultimate objective” that explicitly incorporates State interests in plain language; this objec-
tive shall also be stated in a way that generates a Copenhagen Protocol and other instruments that
primarily encourage desired behavior rather than treaties that single-mindedly focus on curbing unde-
sirable behavior. I suggest amending Article 2 of the Convention so that its ultimate objective is: “to
align the developmental and environmental goals of the Parties such that they can reduce greenhouse
gas concentrations in the atmosphere below CO₂-eq 300 ppm.”

The point of stating the Convention’s objective in terms of developmental goals is fourfold:

• to acknowledge that all States Parties consider themselves to be “developing” in some fashion,
  including the OECD States Parties;
• to compel the Parties to articulate their developmental goals during the negotiations so that their
  obligations taken pursuant to the Copenhagen Protocol speak directly to these stated goals;
• to marry these goals to the Convention’s “ultimate objective”; and
• to give new, more productive meaning to the principle of “common but differentiated responsibil-
  ities,” which will inform how developed country Parties help developing country Parties meet their
  Protocol commitments and developmental goals at the same time.

The revised objective will change the form of the negotiation by structuring discussions around inter-
est rather than positions and help the Copenhagen Protocol to become an instrument that creates
club goods and induces both broader participation and compliance. If the Copenhagen Protocol is
worded in terms of what states can do rather than what they cannot, a decade of bargaining may final-
ly yield to a more effective problem-solving negotiation of the kind posited by Fisher et al. and
Hopmann. Plus, this kind of agreement will be more difficult to scuttle: if the U.S. offers to sub-
sidize 50,000 MWh of solar capacity in India and India accepts, it will be that much more difficult
for China to explain (to the other Parties and to its citizens) why it is refusing money to finance
75,000 MWh of wind capacity from the EU.

Furthermore, by making capacity one of the main components of the new agreement, the UNFCCC
Secretariat and Copenhagen Parties can induce compliance through interacting measures of assistance
and persuasion, which are less costly, intrusive, and adversarial than punitive fines or sanctions.
Assistance and persuasion are also better adapted to the functions of existing international institutions
or linkage with WTO instruments. For example, “mainstreaming” climate change adaptation and
mitigation measures into development practice has long been a goal of the United Nations
Development Programme (UNDP), development banks, and bilateral foreign aid agencies. A main-
streamed policy alignment would be one co-benefit of a Copenhagen Protocol based on a shared
vision of development.
Part 2: How – and why – the Copenhagen Protocol will work

The Copenhagen Protocol should declare a long-term goal of a paradigm shift to renewable energy (RE) and state: “By 2050, 85 percent of every Party’s total energy needs should be met by RE sources such as wind, solar, geothermal, biomass, tidal, or other means recognized by the Conference of the Parties.” This commitment will apply to all Parties equally. Juxtaposed with development goals, the principle “common but differentiated responsibilities” will take on a new meaning, one that requires developed States Parties to help developing States Parties meet their RE targets.

The Copenhagen Protocol does not necessarily need to encompass all aspects of the new Convention objective. In 2009, agreement may be reached for only one sector, such as energy, meaning that additional protocols would have to address transportation, industry, forestry, land and water use, and other areas for which regulation would help achieve the Convention’s objective.

Why a percentage goal instead of a scorecard?

A percentage goal is simpler and more transparent than a scorecard – there is no need to devise a point system and then negotiate the allocation of points to desired activities – and it underscores the common of “common but differentiated responsibilities.” Most importantly, a percentage goal is more flexible than a scorecard and can incorporate measures not yet contemplated and changes in strategy based on circumstances. In the last few years, for example, China has invested heavily in coal-fired power plants, which have a decades-long lifespan; it does not make economic sense for China to take these facilities offline “prematurely.” During the next few decades while these coal plants remain online, China can prepare for its conversion to a primarily renewables-based energy sector by investing in efficiency; China could implement more efficient technologies that already exist, it could innovate and apply new ones, or both. Gains in efficiency are analogous to investments in RE because they reduce the denominator, the total energy demand by which China’s RE supply is divided.

Some have challenged the efficacy of a percentage goal. They suggest, “What if China’s investment in RE is so large that the ‘permissible 15 percent’ of the country’s coal-fired energy production is sufficient to have a deleterious effect on the environment?” There are two responses to this argument. First, adopting a percentage goal doesn’t preclude the utilization of other means of reducing CO₂ emissions, such as a cap-and-trade system of carbon permits or a carbon tax. Second, if China invested that heavily in RE, the “economies of scale” effects would likely be such that the (marginal) cost of producing RE would probably be comparable to that of using fossil fuels. Lastly, if China were burning that much coal or oil, they will have to pay the consequences domestically. These would include health care costs due to increased prevalence of respiratory illnesses, and lower productivity in their agricultural sector due to air pollution – both of which already pose problems for policy-makers in Beijing.

The logic of a percentage RE goal also has to do with focusing the Copenhagen Protocol on the actual interests of the States Parties – producing energy, for example – rather than a historical symptom of those interests – greenhouse gas emissions. In the negotiations, China and India often cite their right to develop, a right recognized by Article 4 of the Convention, as an excuse for not taking on emissions reduction commitments. This argument is a sleight of hand: economic growth or develop-
ment does not necessarily require additional emissions of CO₂. Just because this has usually been the case in the past does not mean it must be so in the future. Venezuela and Kazakhstan, for example, both emit more CO₂ per capita than France but no one would argue that Venezuela or Kazakhstan are more developed than France. What about the argument that France “got to where it is” by emitting CO₂? Luckily, this isn't that persuasive either. During the half-century from 1950–2000, Venezuela and Kazakhstan each emitted more CO₂ per capita than France (and Japan, Italy, Ireland, Norway, Switzerland to name a few others) on a cumulative basis as well. From this we can conclude that development does not necessitate CO₂ emissions; and CO₂ emissions do not always result in development.

**Why 2050?**

As I will demonstrate below, a long-term goal is more consonant with the time scales that inform the cost-benefit analyses that dictate capital investments in the energy industry. First, a long-term 2050 target also allows for changing circumstances and for different states to arrive at the same destination by their own path. One valid criticism of the Kyoto Protocol is that it demanded “too much too soon,” meaning that it was not economically feasible for many Annex I Parties to meet their assigned emissions reduction targets during the 2008–2012 commitment period. Since few governments, if any, are setting policy for the next four decades, a 2050 target avoids this problem.

Secondly, the adoption of a single long-term time horizon would represent progress beyond what the Parties have achieved thus far. Some States have proposed another short-term target of 2020 for the Kyoto successor agreement; others have suggested emissions reduction targets for 2050. Setting a binding, long-term target will reinforce mitigation because this commitment will send a clear market signal to venture capitalists and stimulate additional investment in RE technologies; short-term goals that look to 2020 can be helpful benchmarks that provide an opportunity for States Parties to revise their existing domestic policies and make a course correction. But a 2020 target alone – or dependence on any short-term target exclusively – is vulnerable because it is not scaled to the lifespan of capital stock in this sector. By analogy, if average housing stock were expected to last for a century, it wouldn't make sense to set policy by thinking only in terms of 10–20 years.

A Copenhagen Protocol that looks ahead to 2050 will also help States Parties meet their necessary adaptation needs by reorienting research on the impacts of climate change around a more uniform timetable. Like the States Parties’ proposals on mitigation, the Intergovernmental Panel on Climate Change (IPCC) publishes assessment reports that employ inconsistent time horizons. The IPCC’s Fourth Assessment Report contains numerous comparisons of observed behavior during 1980–1999 to global climate model predictions for 2080–2099; this range was not universally adopted, however, and there are numerous gaps due to the fact that the IPCC authors and editors must draw upon existing research, which itself is not uniformly scaled. Therefore, by agreeing on a common long-term target for policy, the Parties to the Copenhagen Protocol can legitimately ask the IPCC for a more consistent, useful product to guide investment in adaptation measures. In turn, the IPCC would likely welcome such an invitation because climate scientists unanimously prefer to compare longer periods of data where there is less “noise” in the data. Ultimately, a more precise vision of 2050 will better inform how funding for adaptation projects should be allocated.

1. A New Classification System for States Parties

One criticism of the Kyoto Protocol is that it is simply ineffective. One part of this argument concerns the fact that Kyoto requires no binding commitments from major greenhouse gas emitters China and India – a shortcoming that has, in turn, prevented the U.S. from ratifying the agreement. In return for the capacity building, financing, and technology transfer described a little later on, developing country parties should accept a more fluid, more principled categorization of States Parties that accommodates changed circumstances, such as the industrialization of a Party’s economy or the urbanization of its population.

The Parties should establish three categories (A, B, and C) and then determine who fits where using objective criteria. Many Parties have already signed on to this concept, and Turkey, for example, has suggested numerous criteria, such as the Human Development Index or a per capita indicator based on GDP, energy consumption, or CO₂ emissions. While each of these indicators has its merits, I propose a composite scorecard that is very simple and which also takes into consideration both emissions and capacity (here indicated by per capita GDP):

\[
\text{CO}_2 \text{ Emissions (MtCO}_2) \times \text{GDP (}) \times \text{Population} = \text{MtCO}_2 \text{-$ / Person}
\]

**Category A:** States whose CO₂-$ / Person score is above 10,000,000

**Category B:** States whose CO₂-$ / Person score is between 1,000,000–9,999,999

**Category C:** States whose CO₂-$ / Person score is below 1,000,000 (i.e., “everyone else”)

This formula draws upon the IPAT (Impact = Population x Affluence x Technology) framework, which was proposed in the early 1970s. I think a modified IPAT formula works best because it “incorporates key features of human dimensions of environmental change.” To smooth States’ transition from one Category into another, I also propose using a five-year moving average to determine the scores. For example, China would calculate its 2012 score by adding its scores from 2007, 2008, 2009, 2010, and 2011, and then dividing that number by 5. This report’s Appendix contains a provisional list of States and Categories using data from 2005–2007 (years for which I found data).

2. A New Development Mechanism

The percentage-based goal of the Copenhagen Protocol would work as follows: each State Party would work its way up from its existing RE base to an 85 percent dependence upon renewables. For example, the U.S. currently relies on RE for about 9 percent of its energy needs; some countries use much more, some use none. All would need to get to 85 percent by 2050. In return for accepting this binding commitment and agreeing to the new categorization system, Category A States Parties would receive an initial transfer of funds and RE technology from Category A States Parties – with the potential to receive much more funds and technology down the road. If a Category A or Category B State Party uses no RE, it would pay for the initial investment on its own.

The key is that each State Party will have the capacity to meet at least a fraction of its energy needs from RE by the end of 2012. A positive non-zero percentage among each State Party to the Protocol
will prevent “leakage” (the spread of non-renewable energy production) to these states, because each State Party’s annual RE capacity target will be based on existing capacity.

A straight linear projection to 85 percent RE capacity in the year 2050 determines each State Party’s “target” path, as shown by the dark line in Figure 1 below:

![Figure 1: Renewable Energy as a Percent of Total Energy: Hypothetical “Target” Path and Actual Path](image)

The target determines whether a state is eligible to export its “surplus” renewable energy (i.e., that which exceeds the target): if the state’s production falls above the dark line, it can; if not, it will have to purchase the energy via the Copenhagen Protocol’s enforcement mechanism.

3. Governance: addressing equity through enforcement

The Copenhagen Protocol enforcement mechanism explicitly aligns economic development and climate change goals. The benefit for the climate change regime is that it will have direct input into the development process; and the benefit for the development community is the provision of more – and more predictable – funding flows. Best of all, this enforcement mechanism emphasizes the principle of efficiency: instead of spawning a new bureaucracy it uses existing channels and institutions, and funds that flow from developed to developing country Parties can be either invested in RE capacity and development or adaptation measures that reduce vulnerability to climate change impacts. Here is how it works:

If a Category A State Party falls short of its yearly RE target, it will have two options:

- purchase (or require its energy companies to purchase) the shortfall by purchasing the equivalent number of megawatt-hours (MWh) (or GWh) from a State Party that has an RE surplus; or
- pay for the installation of RE capacity (equivalent to the size of its shortfall) in Category B and/or Category C States Parties.
If a Category B State Party falls short of its annual RE target, it will have a slightly different set of choices. It may either:

- purchase the equivalent number of MWh (or GWh) from another Category B State Party or from a Category C State Party that is currently has an RE surplus; or
- pay for the installation of the RE capacity (equivalent to the size of its shortfall) in a Category C State Party.

The Category C States Parties whose RE production in a given year falls below the projected target will not be penalized. Historically, these Parties have contributed least to the climate change, and they are most vulnerable to its negative impacts. Instead of being punished, Category C States Parties are instead eligible for more funding: they will have proposed CDM project proposals fast-tracked; and they will invite foreign aid and foreign direct investment from Category A and Category B States Parties.

The enforcement mechanism also relies on efficiency at the macroeconomic level given the new, and expanding, demand for renewable energy and States' desire to purchase foreign energy at the lowest cost. Assuming that not every State Party will immediately invest heavily in renewables upon ratifying the Protocol, a global RE market will generate a reinforcing feedback loop for the “first mover” States that invest in RE and exceed their RE target.

Here's how: First, let's assume that wind energy in Mexico is slightly more expensive than coal or oil. Mexico will nevertheless have an incentive to invest in wind energy production, because if it exceeds its annual target and sells its RE surplus to the U.S., Mexico will have passed on the additional costs to the U.S. The U.S., in turn, still benefits from this system, because the purchased energy from Mexico may cost less that it would have had it been if produced in the U.S. If Mexico then reinvests in RE, it will continue to surpass its target and thus have an opportunity to sell again the following year. Best of all for Mexico, all of its new energy capacity will have been paid for by the U.S., and it will provide co-benefits for other parts of the Mexican economy. At a certain point in our hypothetical case, the size of the U.S. shortfall will become so large that it will make sense for the U.S. to expand its domestic RE production. This will put the U.S. on track toward its 85 percent goal.

The principle of efficiency also works, albeit indirectly, in more traditional developmental contexts. Category A and B States Parties will spurn corrupt or instable Category C States Parties when they decide where to invest in RE development. For example, the U.S. will not likely choose to fund the installation of RE technology in a developing State Party that is governed by an openly hostile regime such as Iran. Therefore, this enforcement mechanism can also be a tool for enacting political reform.

And once the RE investment has taken place in Category C states, the added capacity may reorganize social structures and create new opportunities for civil society. This effect has been demonstrated not just in liberal democracies like the U.S. during the 19th and 20th centuries, but also even in Pakistan under a military dictatorship.

As Figure 1, above, indicates, a percentage goal can accommodate any number of paths to the ultimate objective of 85 percent reliance on renewables. However, given what we know about economies
of scale and existing stock of power plants, the likely paths are fewer and more predictable, as shown here in Figure 2:

\[ \text{Figure 2: Three Paths to 85\% Renewable Energy by 2050} \]

The straight line, also the Copenhagen target, would signify a steady investment in RE technology that constantly outpaced cumulative growth in energy production by a fixed amount: energy demand grows, but RE capacity grows a little more each year. This is the least likely path to 85\%.

The S-shaped growth of the solid black line describes the behavior of a State that converts early to RE production. As is shown by the chart, once a State’s installed base of RE capacity grows sufficiently large, it actually surpasses the Copenhagen target. Production skyrockets for two reasons: first, this State reaps the profits of being an energy exporter; and second, the “economies of scale effect” reduces the marginal cost of RE such that it is less expensive than coal, oil, or natural gas. Finally, the dotted line defines the path of a late adopter, a State whose current and short-term demand for energy outstrips its RE capacity. Perhaps this State has just brought dozens of coal-fired power plants online. Instead of prematurely decommissioning these new plants, this State will find it much more economical to invest in energy efficiency measures that reduce the total demand for energy. In the 2030s and 2040s, however, as the coal-fired plants reach the end of their lifespan, the cost of RE energy will have come own such that this State can convert to renewables at a fairly rapid rate.

For States like China and India, which are experiencing rapid urban development and are “locked into” a significant amount of fossil fuel-based energy production for the coming decades, the “late adopter” path would be facilitated by investment in energy efficiency measures. Many of these measures – in insulation, lighting, air conditioning – can be implemented at a net savings, as suggested below in Figure 3. The chart in Figure 3 considers CO\(_2\) abatement rather than energy effi-
ciency, but one can reasonably use CO$_2$ abatement as a proxy for energy efficiency for activities associated with buildings. Figure 3’s chart also calculates abatement costs for Europe, but, again, one can reasonably assume that at least some savings in Europe would also apply elsewhere; Sinton et al., for example, found significant opportunities to improve upon energy efficiency in China.$^{xv}$ In reality, even the States Parties that embark upon an RE-intensive trajectory right away will find it profitable to invest in efficiency, because measures or policies that reduce energy consumption will amplify their gains in RE capacity. As mentioned above, they will be shrinking the denominator - their total energy demand.

![Figure 3: Relative Cost of CO2 Abatement Measures](image)

**Figure 3: Relative Cost of CO2 Abatement Measures** (Source: Enkvist, Per-Anders, Tomas Nauclér, and Jerker Rosander. 2007. “A Cost Curve for Greenhouse Gas Reduction.” In The McKinsey Quarterly, 1:35–45.)

**Conclusion: the Compatibility of a Renewable energy target with other goals**

Disagreement about how to regulate emissions from the aviation sector should not prevent movement action on RE goals – especially if consensus exists there. Therefore, a sectoral approach, such as the Copenhagen Protocol proposed in this report, is preferable to one treaty that endeavors to satisfy all stakeholders. The RE plan presented here doesn’t attempt to solve the entire problem of climate change – it just helps the States Parties shift to a new energy paradigm. Even if the States Parties reach their 85 percent RE target, they will still need to regulate (and reduce) CO$_2$ emissions associated with the remaining 15 percent of their energy production. A global carbon tax or cap-and-trade system that regulates industrial and transportation emissions can also regulate “leftover” emissions from the energy sector too.
One potential problem inherent to a multi-sector approach concerns loopholes. This is a valid criticism, but I would argue that even “comprehensive” agreements would create potential regulatory gaps. While it is always possible to amend comprehensive agreements, one benefit of a network of sectoral protocols is that no one protocol pretends to be a “one size fits all” solution to the numerous challenges that attend an issue as complex as climate change. This is especially relevant when some aspects of climate change, such as how best to address adaptation, involve more uncertainty than others. Thus, each climate agreement should be regarded simply as a tool in a larger toolbox that is the Convention.

If structured properly, the 85 percent RE target and a separate adaptation financing mechanism could actually reinforce each other. Developing country Parties have long argued that polluters take responsibility for their historical emissions. Therefore, contributions to the (Kyoto-established) Adaptation Fund could be based on a 20-year moving average of CO₂ emissions (either per capita or national total). A 20-year average (as opposed to a 5- or 10-year average) reaches back far enough to force States to reckon with their past emissions, but it’s also short enough so that States have an incentive to become early RE adopters and reduce their CO₂ emissions.

In order for this patchwork of sectoral agreements to cohere into a meaningful whole, they would need to be bound by an overarching, organizing principle. This underscores the utility of an unambiguous, forward-looking “ultimate objective” such as the amendment to Article 2 of the Convention proposed at the beginning of this report. Sharpening Article 2 alone won’t bring about an effective Copenhagen Protocol – but how can one expect the States to solve this “collective action” problem if they do not share a collective vision of their objective?
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* non-parties to the UNFCCC

Notes


A Framework Proposal for a post-2012 Copenhagen Protocol - How to Reach 80% Reductions by 2062

Convergence towards 3% Reductions per Annum by all Countries in 2062

Ines Kapphan

1. Negotiating a Contingent post-2012 Climate Change Treaty

The UNFCCC and its Kyoto Protocol (KP) have set a significant precedent as a means of solving a long-term international environmental problem. The Kyoto Protocol’s most notable achievements are the stimulation of an array of national policies, the creation of an international carbon market and the establishment of new institutional mechanisms (such as the CDM and JI). Yet, these are only the first steps towards implementation of an international response strategy to combat climate change.

The effectiveness of the Kyoto Protocol is currently constrained by modest emission reduction objectives and will therefore have a limited effect on atmospheric GHG concentrations. The good intentions set out by the Kyoto Protocol during the first commitment period will need to be followed-up by measures to achieve deeper reductions to effectively stop climate change in the future.

In December 2009, the world’s leaders will gather in Copenhagen to negotiate a successor agreement to the Kyoto Protocol, where the engagement of the major emitters in the world – notably the United States and China – will be key to its success. The members of the Copenhagen Conference of the Parties (COP) should seize the unique opportunity to negotiate a post-2012 agreement that shows that lessons from the first commitment period (from 2008-2012) have been learnt. The challenge will be to find a new technologically feasible and politically acceptable solution to drastically cut carbon emissions over the next 50 years. In addition, the regulatory structure of existing KP mechanisms will need to be improved for its overall success.

1.1 Aligning the Positions of the World’s Major Emitters

The efforts of China and the United States in the next few years will determine the worldwide efforts in slowing climate change to a large extent.
extent.\textsuperscript{ii} In the past, China and India along with other developing countries were exempted from taking on commitments to reduce emissions on the grounds that the industrialized countries bore the heaviest responsibility for global warming. Given the extraordinary growth in these countries over the past ten years, that argument seems no longer sustainable (UNFCCC, 2007\textsuperscript{a,b}).\textsuperscript{iii} As the bulk of the growing energy demand in the world occurs in developing countries, the CO\textsubscript{2} emission growth accordingly will be dominated by developing countries. Therefore, finding a way to include China, as well as the other developing countries will be crucial.\textsuperscript{iv}

Getting developing countries – termed Non-Annex I countries under the Convention – to adopt aggressive climate change policies will be much easier if the United States as well as Australia and Canada are on board. For the past eight years, the Bush Administration has refused to join the Protocol, saying that it is flawed because it fails to hold developing nations such as China and India to the same mandatory greenhouse gas emissions caps as the industrial nations. Since the inauguration of President Obama in January 2009, the tone in the White House towards the international efforts to combat global warming has changed. President Obama has signaled a new era for science in United States policy towards climate change and stressed that he would make decisions “on fact and science rather than ideology,” an explicit rejection of the administration of President George W. Bush, who has been widely criticized for doing the opposite (Dickinson, 2008). Under Obama’s presidency, the House of Congress has approved a bill, the American Clean Energy and Security Act, which curbs the heat-trapping gasses scientists have linked to climate change. The final bill has a goal of reducing greenhouse gases in the United States to 17 percent below 2005 levels by 2020, and 83 percent by mid-century. These first signs of sea-change can be expected to induce a change in the administration’s attitude towards the next climate negotiations. Yet, the U.S. position that any international treaty to reduce emissions that contribute to global warming must include legally-binding commitments from developing countries such as India and China, should be taken seriously.\textsuperscript{v}

Developing countries on the other side argue that it seems unfair to expect impoverished people to cut back on energy consumption, which is not even sufficient to meet their basic living conditions. As a block, developing countries have thus far taken the position that industrialized countries would need to strongly reduce their CO\textsubscript{2} emissions first before they would be ready and willing to adopt quantitative emission reduction targets thereby relying on the UNFCCC principle of “common but differentiated responsibilities” (UNFCCC, Article 3, Principles, 1992). The position of developing countries is not as uncompromising as it seems at first sight. Most developing countries have signaled in Bali a willingness to contribute to GHG emission reductions contingent on developed countries’ financial and technological support in building a low-carbon intensive energy infrastructure (Santarius T., et al, 2008).

China is signaling its recognition of the increasing importance of climate change issues. In 2007, China released the National Climate Change Program (on June 4, 2007) that is the first national program of this kind in developing countries that requires to cut the country’s greenhouse gas emissions by 950 MtCO\textsubscript{2} equivalent per year by 2010 (Zhang, 2008). In March 2009, the Chinese Prime Minister, Wen Jiabao, announced to increase spending on clean technology as part of a plan to cut carbon emissions.\textsuperscript{vi} Its willingness to cut its soaring CO\textsubscript{2} emissions is contingent on a global deal with the United States and the rest of the developed world. According to the founding dean, Professor Kiang, of the College of Environmental Science at the University of Beijing, China would join a post-
2012 climate change treaty and seek to reduce their emissions to a definite figure, as long as this was part of a global agreement that involved all countries acting together – including the United States – and transferred modern energy technology to China (McCarthy, 2007). Under the same contingencies, other developing countries would (most likely) sign a post-2012 climate treaty as well.

As for the European Union (EU), it does not seem to take much to get the Europeans to commit to significant post-2012 emissions reductions. By proposing to unilaterally reduce CO\textsubscript{2} emissions by 20% (below 1990 levels) in 2020, the EU has set positive precedent. The EU is willing to extend this target to a -30% target if other industrialized countries also adopt significant reduction targets (European Commission, 2008).

These observations sketch a rough outline of how a post-2012 climate change treaty would need to look like to satisfy the interests of all parties, i.e. China, the U.S., the developing countries and Annex-I countries. In sum, no one party will commit to act if commitments from all other parties are missing – except for the EU. On the other hand, all countries are dedicated to contribute to climate change mitigation if all other countries also intend to act. This is a typical prisoner’s dilemma situation where the world, and the entire atmosphere, could be better off if only a significant number of countries committed themselves to action. At the moment, however, due to a lack of trust and missing enforcement institutions not many countries – apart from the EU – are willing to undertake action without credibly being assured that the others will follow up on what they initially promised to do. Since countries are sovereign states, there is no supranational government to rely on for enforcing commitments. In such an environment, it is important to work with self-enforcing mechanisms in international treaties. What is needed is a mechanism that ensures that those countries who commit themselves to act first are in the end not culminated, otherwise they won’t start to act.

In addition to setting incentives for all countries to sign a new climate treaty with concrete, targeted responsibilities towards reducing GHG emission, the new climate agreement requires a built-in, self-enforcing mechanism that ensures that global GHG emissions are being reduced with high certainty over the life-time of the treaty. The contribution of this paper is to introduce such a mechanism that aligns the interests of different parties with respect to a Kyoto successor agreement, so that in the end the world can move rapidly forward with climate change mitigation. The mechanism that is being proposed builds on the idea of “making action of developing countries contingent on action by industrialized countries,” and therefore falls in the category of contingent-based commitments. Before deriving the fundamentals behind the commitment mechanism in Chapter 2, the objectives to be accomplished with a post-2012 climate change agreement are being summarized in the following. Lastly, – Chapter 3 presents the details to be discussed in Copenhagen with respect to implementing a new framework proposal.

### 1.2 Objectives for a Copenhagen Treaty

#### 1.2.1 Primary Objective - Agreeing on a Stabilization Level

The ultimate objective of the United Nations Framework Convention on Climate Change (UNFCCC) is to stabilize atmospheric concentrations of greenhouse gases at a level that will prevent dangerous anthropogenic interference with the climate system. Findings of the IPCC Working Group III
show that without additional policies, global GHGs emissions are projected to increase 25-90% by 2030 relative to 2000x (UNFCCC, 2008b). Fossil fuel dominance is expected to continue to 2030 and beyond if the world does not take any action. To better understand how the GHG concentration in the atmosphere would be changing throughout the 21st century the Intergovernmental Panel on Climate Change (IPCC) uses insights from climate change modeling that relate different emission growth scenarios to concentration levels. Furthermore, these GHG changes are related to changes in the mean temperature from which possible consequences for our livelihoods, ecosystems and economies are predicted.

A 450 ppm (parts per million) stabilization scenario may limit global warming to 1.2 to 2.3°C by 2100, provided that CO2 emissions peak around 2010, and fall to about 40 per cent below present by 2050 and about 70 per cent below present by 2100 (UNFCCC, 2008b). Carbon dioxide amount is already 385 ppm and rising by about 2 ppm per year. An increase in CO2 concentration to 550 ppm is projected to lead to an average temperature increase of ~6°C. From a scientific point of view what follows is that deep emission cuts are needed immediately in order to avoid significant increases in mean temperature.

Defining what is dangerous anthropogenic interference with the climate system and, consequently, the limits to be set for policy purposes are complex tasks that can only be partially based on science, as such definitions inherently involve normative judgments. Therefore, a stabilization level is not quantified by the UNFCCC. Discussions on future actions on climate change in Copenhagen need to involve the question at what level stabilization should be sought, and what constitutes “dangerous.”

The primary objective in Copenhagen should be to use these and other scientific findings (such as Hansen J. et al., 2008) to agree on a concrete stabilization level. The EU, for instance, made staying below the 450 ppm concentration level an official policy objective as this was the consensus among member countries that this was the level needed to help avoid irreversible damage to the global climate and its ecosystems (European Commission, 2005; Watanabe R. et al, 2008). With the scientific evidence available about climate change and its consequences for the environment, achieving a GHG concentration at 450 ppm by 2050 might also become the general consensus among the participants in Copenhagen. If in the future, further scientific research produces new insights, which justify a re-consideration of this assessment, the political debate about what is the appropriate GHG stabilization level can be picked up. For the moment what matters is that a decision is being made, otherwise any discussion about how best to reach this level becomes irrelevant.

1.2.2 Subordinate Objectives

Engagement of All Countries

According to the UNFCCC, mitigation efforts over the next two to three decades will determine to a large extent the long-term global mean temperature increase and the corresponding climate change impacts (UNFCCC, 2008c).

In industrialized countries, overall CO2 emissions have been reduced by 4.7%, a trend that was strongly influenced by the emission reductions caused by the disintegration of the formerly centrally
planned economies in Central and Eastern Europe and the resulting phase-out of inefficient energy and industrial production techniques. However, recent data presented by the UNFCCC Secretariat shows that CO₂ emissions in the groups of industrialized countries have grown again by 2.3% since the year 2000. Based on historic responsibility and current economic capabilities, industrialized countries must continue to take the lead in combating climate change (which is in accordance with Article 3, paragraph 1, of the Convention), and first of all get their own emission paths under control.

As laid out in the Bali Action Plan, attaining the GHG emission reductions that are needed to achieve the ultimate objective of the Convention requires a comprehensive response by all countries. Developing countries’ efforts to eradicate poverty and enhance economic growth are set to require vast amounts of energy and huge investments in energy-related infrastructure. At the same time, the greatest greenhouse gas mitigation potential - around 70% of what is possible worldwide - is precisely in these parts of the world (UNFCCC, 2008c). Therefore, the future climate change regime requires further engagement of developing countries, in particular those whose emissions already, or will in the near future, significantly contribute to atmospheric concentrations. However, developing countries may need special incentives to assume reduction responsibilities - such as technology transfer - that are in line with safeguarding their economic development.

Create Incentives for True Technology Transfer to Developing Countries

The energy sector is responsible for the largest share of global CO₂ emissions. Alerting are therefore the facts that energy demand in developing as well as in industrialized countries is steadily growing. In the period up to 2030, the energy supply infrastructure world-wide will require a total investment of $22 trillion, with about half of that in developing countries. Many developing countries experiencing rapid growth are making huge investments worth billions of dollars in capital stock, such as infrastructure and power generation, that will be used for thirty years or more. Without massive investments in green technologies in developing countries emissions will be going up by 50%, instead of down by 50% as science says they should (UNFCCC, 2008d). Due to the long-lived nature of most energy infrastructure (lock-in effect), it is critical that action begins now to promote the development and use of low-carbon technologies.

A strengthened international post-2012 climate change regime needs to encompass and foster international technology cooperation and innovation. Effective and efficient mitigation of climate change depends on the rate of global diffusion and transfer of technologies. Too often, however, the debate over GHG emission reductions pits near-term action against long-term action of investment in technology, when both are necessary and are much more effective when undertaken together. A new climate change treaty will need to help overcome this problem so that the future energy demand of developing countries is met in a climate-friendly manner.

In the near term, it is essential to take advantage of existing technologies and while making substantial investment in the technologies of the future. Technology cooperation between developed and developing countries, and increasingly between developing countries, will be needed on an unprecedented scale. The Copenhagen treaty should provide incentives for “true” technology transfer to developing countries so that these countries will be able to leap-frog the carbon-intensive development stage that industrialized countries underwent. At best, the new mechanism decouples economic development from emission growth.
Reforming the CDM

The use of flexible mechanisms set out in the Kyoto Protocol led to the establishment of a market for carbon offsets. Notably, the Clean Development Mechanism (CDM) has created a large project pipeline – about 250 million carbon offset credits are expected by 2012 – and mobilized substantial financial resources. On the other hand, the CDM has faced methodological challenges regarding the determination of baselines and additionality which currently hinders the widespread extension of carbon emission projects in Non-Annex I countries (World Bank, 2008a). If designed appropriately, the CDM could prove to be a win-win mechanism. First, the CDM could provide an opportunity for developing countries to get increased access to more advanced energy efficiency and could thus help to accelerate economic development along a more sustainable path. Second, it will help industrialized countries in meeting their emission commitments at a lower overall cost than would otherwise have been the case.

As pointed out in the previous section, the CDM did not live up to achieving the level of infrastructure investment that is required to help developing countries leap-frog a carbon-intensive stage of development. The CDM could have contributed greatly to infrastructure investments (in energy), but instead the existing, complex CDM monitoring methodology for large-scale projects has proven itself a barrier (World Bank, 2008b). The mystery of the low penetration rate of energy related projects – even in countries undergoing power emergencies and rampant blackouts, as 35 countries in Africa are currently experiencing – can be explained by the high upfront costs such programs require. The investment horizon that is being set out by the KP (through its commitment phases) has proven to be too short for those projects to become profitable. In addition, the numerous HFC-23 projects that led to a vast supply of CERs on the market for carbon offsets (in phase I) reduced the incentives for investments in alternative carbon projects, especially if those required time until the first carbon offsets could be earned. Also, the positive incentives for economic development that were expected from carbon finance projects remain to be demonstrated.

In order to expand the potential of the CDM, policy makers will need to critically review the current process of registering CDM projects and the accreditation of carbon offset credits. To review, improve and extend existing climate change policies, negotiators should rely more on scientific evidence and make use of existing best practices for technology transfer. Such an approach implies that existing regulatory laws – for CDM/JI – need to be revised. Especially market incentives that might have been neglected unintentionally need to be taken into account in order to make the CDM work. To do so, it would be advisable to have experts from different scientific backgrounds, such as business, economics and engineering, advise politicians and policy makers.

Creation of a Global Carbon Market

Similar short-comings exist with the mechanism of emission trading. Despite the fact that the protocol has stimulated the development (and implementation) of emissions trading systems, a fully global emission trading system is far from being realized. Currently, emission allowances issued, for instance under the European Union Emission Trading System (ETS), are not fungible with other ETSs due to vast differences in regulatory structures. At the moment, a European company wishing to purchase a European Union Allowance (EUA) has to pay the price that it costs another European company to reduce its emissions, i.e. by implementing a less-carbon intensive production technology.
By linking emission trading systems from several countries with each other, someone needing to buy an allowance is now faced with a broader spectrum of companies selling allowances. Since countries vary in their technological levels, a broader pool of companies also means that more opportunities within the system exist for reducing emissions. Thus, the potential for reducing CO₂ at a lower cost is higher among a more heterogeneous group of companies (Jotzo et al., 2008). The price for an emission allowance is therefore going to be cheaper in a system with a larger pool of sellers. Therefore, a global carbon market would contribute to the goal of having carbon emissions reduced at the lowest costs possible.

If governments aimed for the establishment of a truly global ETS, policy makers would need to find ways of linking their trading systems with each other. For the creation of global carbon market, the set-up of national emission trading systems needs to be reviewed in order to align its fundamentals so that linking becomes an option (Haites, 2009). As for the revision of the CDM, an expert group with researchers and practitioners from different backgrounds - among them private sector participants - should be in charge of providing innovative solutions on how to link the already existing emission trading systems with each other.

For the future, climate change regulation under political debate should always be analyzed by specialists before it is implemented in order to avoid some of the above-mentioned slip-ups. By considering ex-anti the economic incentives, spill-over effects or externalities that might be created through new climate policy, unintended consequences for market participants can be avoided. The time for a trial-and-error period, i.e. time to figure out what works and doesn't, has run out and we need to undertake more efforts to guarantee that new laws and regulations end up achieving what politicians and negotiators had intended initially. To establish scientific co-operation across different sciences a permanent expert group should be established within the existing UNFCCC framework.

To sum up, agreeing on stabilizing GHG emissions at a sustainable level should be the main focus for the upcoming climate negotiations. For achieving a specific GHG stabilization level, technological innovation and the rapid, widespread transfer and implementation of low-carbon technologies in developing countries, including know-how for mitigation of greenhouse gas emissions, is required and needs to be supported. For the purpose of enhancing implementation on the ground, the existing regulatory structure of the flexible mechanism (CDM/JI) needs to be revised. Without improving the registration and accreditation process of the CDM/JI, it will be difficult to expand the coverage of the flexible mechanisms and many carbon abatement opportunities in the world might pass by. How these objectives translate into concrete policy will be described in chapter 3. In the following chapter, the foundation for the contingent commitment mechanism through which a specified GHG concentration level can be achieved is explained.

2. Implementation of the Primary Objective

With an agreed upon concentration level, different ways of achieving it exist. For instance, in order to reach 450 ppm by 2055, Moomaw (2008) suggests that we would need to reduce our carbon emissions by 80 percent by 2055 in order to turn the tide on climate change. The proposal by Moomaw (2008), named the “3% Solution” to climate change envisages that all countries reduce their GHG emissions gradually by three percent per annum (with respect to the previous year). This would imply
that in 23 years the world will have reduced its emissions by 50 percent, and by 75 percent in 47 years. Starting today, we could attain our 80 percent reduction after 53 years.

2.1 Revised Version of the “3% Solution to Climate Change”

Instead of all countries continuously reducing their emissions by three percent (relative to the previous year), one could imagine that some countries reduce their emissions by more than three percent to make up for other countries. What matters at the end of a year in order to achieve the “3% Percent Solution” is that total world emissions have gone down by three, and not so much by whom these GHG emissions have been reduced. Theoretically speaking, it would be possible that a small group of countries took on the responsibility to reduce emissions each year by an amount that equals a three percent reduction of global emissions.

Agreeing on national emission reduction targets without having a rule or basis for deciding who should reduce how much opens up a bargaining-game. In 1997 at the COP in Kyoto, the various degrees of reduction commitments were rather the result of a political give-and-take and not motivated by a joint consensus about historic contributions to climate change, or the economic capabilities to mitigate. Without an objective criterion determining each nation’s emission reductions, the struggle could be even greater this time as developed and developing countries are involved likewise. Given the lack of such a burden-sharing formula, it seems easier to keep the number of countries in charge of reducing the world’s carbon emissions low.

Two Stage Negotiation Approach

One way of avoiding a North-South debate at Copenhagen would be to break with the previous negotiation approach from Kyoto and introduce instead a two-stage negotiation process. In the first stage, all members of the COP select a group of countries in charge of taking on the task of reducing global emissions by three percent according to some objective criterion. In the second stage, only those countries that belong to the selected group negotiate on how best to split the burden (see section 2.2).

Clearly, charging one group of countries with the mitigation responsibility of the entire world should not be a permanent solution and it would not be politically feasible either. Concentrating action on a few will help to ensure that the action needed to reach a set concentration level can start immediately. In addition, administrating and monitoring a few countries in their reduction efforts will also be easier. The idea is that the selected group undertakes all necessary mitigating efforts and over time will be relieved by other countries that join and take over some of the reduction responsibilities from the selected group. Let me call the group of countries responsible for reducing the world’s emission the “First-mover” group, and the group to which all other countries belong the “Second-mover” group. What is needed is a condition or formula that determines when countries from the second-mover group need to become active, and the extent of GHG reductions for which these countries become responsible (see section 3.2).

“Reaching a common goal at differentiated speed”

At the time when the Convention was negotiated, developing countries did not make commitments to reduce or limit greenhouse gas emissions as the principle of “common but differentiated responsi-
bilities” was applied. In Copenhagen, in order to agree to post-2012 climate treaty, we should move forward and refine this principle to “reaching a common goal at differentiated speed.” This implies that member countries should first agree on a specific concentration level of CO₂ and a date at which this should be reached (see section 3.2). Second, they should also agree on a method on how to ensure that this concentration level will be reached. For example, countries might agree on reaching the common goal of stabilizing GHG emission at 450 ppm over the next fifty years by reducing total world GHG emissions by three percent each year. Alternative formulations where the date or the concentration level varies can be thought of as well, and should be the outcome of a political debate among member countries. The refined principle differs from the initial one by specifying a measurable objective, setting a deadline and agreeing on a method for implementation. It embraces the original version as it still grants countries flexibility in splitting the responsibilities amongst each other.

Over the agreed time period, countries may make progress towards the revised “3%-Solution” at differentiated speed, i.e. some countries may be reducing less or more in the interim period. Ideally, at the end of the commitment phase all countries should be reducing 3 percent of their GHG emissions (compared to the previous year). According to this principle, if developing countries continue to emit CO₂ (instead of immediately starting to mitigate) then industrialized countries would need to assume additional responsibilities and reduce more than 3 percent per annum.

The question that remains is what criterion to use for deciding which countries should belong to the first-mover group. Developing countries have in the past proposed to use per capita GHG emissions, since in general poorer countries tend to have lower per capita GHG emissions. xvi On the basis of this criterion all industrialized countries would belong to the first-mover group. Industrialized countries would favor an alternative measure that uses the metric of GHG emission per unit of economic output (i.e. GHG emissions per USD of GDP). In general, developed countries display lower GHG intensities per unit of economic production process than developing countries. Yet, this criterion would violate the principle of “common but differentiated responsibilities.” In addition, finding consensus amongst the North and South for one of the two metrics would be difficult. What is needed is a “fair” criterion which takes not only historic responsibilities into account, but considers future contributions to GHGs and is grounded on verifiable, scientific insights.

2.2 Criteria for Selecting First-Mover Countries

Developing countries and industrialized countries do not only differ by income, and their historic and future contributions to global warming, they also differ in their short- and long-term potential to mitigate emissions. The concept of “mitigation potential” has been developed by IPCC (2007a,b,c) and is defined as the scale of GHG reductions that could be made, relative to emission baselines, for a given level of carbon price. xviii Some countries do possess a huge mitigation potential starting as of today, while other countries’ mitigation potential will be at its peak in the future. Differences over time and across countries in mitigation potential could be exploited to determine which countries should belong to the first- and second mover group.

From an economic point of view it would be advisable to require a country to reduce emissions when its potential to do so is vast (since economic costs will be low). The benefit of “mitigation potential” as an objective criterion is that it is future-oriented (compared to the alternative metrics presented
above), i.e. one’s obligation to mitigate is conditioned on one’s capabilities (either today or in the future), while it safeguards the principle to act based on historic responsibilities for the climate change problem. In order to determine which countries should be asked to start mitigating, the mitigation potential across countries today and in the future needs to be analyzed more closely.

**Exploiting Differences in Long- and Short-term Emission Savings Potential across Countries**

Using mitigation potential to determine when a country has to act makes it possible to exploit the varying degrees of (asymmetrically distributed) technological opportunities for reducing GHG emissions around the world. In general, the mitigation potential varies by sector and the available mitigation technologies (McKinsey & Company, 2009). Analyzing the contribution to global emission (in relative terms) from different sectors shows that there are already big differences. By 2004, CO₂ emissions from power generation represented over 27% of the total anthropogenic CO₂ emissions and the power sector was by far its most important source. About 26% of GHG emissions were derived from energy supply (electricity and heat generation), about 19% from industry, 14% from agriculture, 17% from land use and land-use change, 13% from transport, 8% from the residential, commercial and service sectors and 3% from waste (UNFCCC, 2007a). Given that differences in the stage of economic development are closely related to specific compositions of industries and technologies, the mitigation potential will also vary across countries. In general, developed countries tend to be more industry heavy which implies that emissions from power generation and energy supply play a greater role in their mitigation portfolio, while in the economies of many developing countries the largest contributions are from the agricultural sector. As the latter develop, the contribution of emissions from the agricultural sector decreases (in relative terms to the country’s overall emissions) while emissions from other sectors, such as the energy sector, become relatively more important in the country’s emission portfolio (FAO, 2008).

Energy-intensive industrialized countries such as the United States possess in the near future a vast potential to reduce GHG emissions without sacrificing their living standards (Moomaw, 2008). Some of the cheapest options for reducing emissions in developed countries involve electricity and energy savings in buildings, fuel savings in vehicles, and providing public awareness on the efficient utilization of energy (McKinsey & Company, 2009). In the United States, energy efficiency improvements throughout the energy system (especially at the end use side), can play a significant role in preparing the economy for its low-carbon future. Lifestyle changes can reduce GHG emissions too. Changes in consumption patterns that emphasize resource conservation contribute to developing a low-carbon economy. Measures related to personal energy consumption behavior can be implemented at a very low cost as all what they require is a re-thinking of one’s lifestyle. Yet, in the aggregate benefits from lifestyle changes makes up a large contribution to mitigating emissions (Pew Center, 2008).

For paving the way for a low-carbon economy in industrialized countries, significant improvements in the efficiencies of energy production, distribution, and end-use technologies, as well as the use of lower carbon fuels and energy carriers such as hydrogen will be required. The transition has other benefits as well, such as increasing energy security, improving public health, and promoting economic development as this was the case in Germany in the solar and wind power industry. Compared to German standards, the distribution of solar, wind, geothermal heating and biomass for electricity generation is in many other industrialized countries still in its infancy. Some of these industries require
public support, while others are more mature and need only market incentives for their deployment and diffusion (IPCC, 2007c).

Next, growth rates which determine future emissions vary also by sector. Since 1970, GHG emissions from the energy supply sector have grown by over 145%, while those from the transport sector have grown by over 120%; as such, these two sectors show the largest growth in GHG emissions. The industry sector’s emissions have grown by close to 65%, LULUCF (land use, land-use change and forestry) by 40% while the agriculture sector (27%) and residential/commercial sector (26%) have experienced the slowest growth between 1970 and 2004. Taking the large growth rates of emissions in the energy sector together with the increasing importance of energy in developing countries shows that in developing countries the future mitigation potential in this sector will be huge. There will be a vast potential for energy savings in the long-term (compared to the business as usual).

Critical for unleashing these future savings potential in developing countries is that the right investment decisions to meet their growing energy demand are being made today (see section 1.2.2). The need for energy in developing countries can be addressed through a combination of mature renewable energy technologies, such as solar, wind, and hydro power. China’s wind potential, for instance, is among the largest in the world. Wind power capacity is currently on track for nearly 400 percent growth by 2013 (from 24GW to 117GW) and the Chinese government has recently announced the intention to support an even more aggressive growth trajectory. Furthermore, China is already the world leader in solar thermal energy for hot water, with 60 percent of installed systems. Similar investments in green infrastructure are needed in other developing countries. The largest mitigation potential from the industrial sector is, however, available at the moment in energy intensive industries, i.e. in developed countries. On the other hand, the largest mitigation potential – that can be realized immediately as investments in infrastructure are not required – in developing countries is in agriculture, more precisely in the conservation of forests (Nelson G., 2009). At the current rates of deforestation developing countries contribute to more than 20% of human-caused greenhouse gas emissions, making deforestation across the globe a significant contributor to human-induced climate change.

To sum up, industrialized countries possess a high mitigation potential already today, which might decrease over time without innovation. Even if countries like the United States managed over the next couple of years to use energy more efficiently, without new technological innovations a level of GHG reductions might be reached at which it becomes difficult and costly to continue reducing more than three percent at home. The mitigation potential in developing countries is huge in the short-run only in certain sectors (agriculture), while an even greater mitigation potential exists in the future (in the energy supply and power generation sector). To tap into the future mitigation potential of developing countries, steps towards the implementation of a new, low-carbon infrastructure will need to be taken today, while industrialized countries will need to upgrade their energy infrastructure to access its own potential in this sector. In this respect the current global economic downturn may actually be providing the impetus needed to move to a low-carbon economy. Historically, periods of depressed economic conditions have provided an opportunity for investment in infrastructure and new technologies at lower cost than at other times. In responding to the current financial crisis, there has been widespread recognition of a need for substantial investment by governments to restore confidence. Government fiscal stimulus packages are intended to reinvigorate depressed economic conditions.
Many political leaders are making investment in clean energy and energy efficiency a central tenet of their economic recovery efforts. Using insights about mitigation potential, it makes sense to have industrialized countries take the lead with emission savings (first-mover group) and to complement these efforts in the future with emission savings from developing countries (second-mover group).

3. Implementation of the Subordinate Objectives

The negotiations in Copenhagen in December 2009 should lead to an agreement on the architecture of a post-Kyoto Protocol with the figures to be filled in during the years thereafter, the latest by 2012. As for the primary objective, the first challenge in Copenhagen will be to agree on a GHG concentration level to be reached at a set point in time. Based on the concentration level, scientists need to determine how much of the total world GHG emissions need to be reduced every year given current emission growth rates. Next, delegates will need to find an approach which guarantees that the concentration level will be reached with high certainty by the end of the new commitment phase. In section 2.1, we proposed a revised version of the “3 % Solution” to climate change. Others alternatives, such as a sectoral approach to GHG mitigation (Meckling J. et al., 2009), exist as well. For the implementation of the primary objective, we proposed to use objective criteria, such as mitigation potential (see section 3.1), in order to select a group of countries which becomes in charge of meeting the objective – at least in the near future. Specific binding emission targets will need to be negotiated by first-mover countries. As before, those countries may assume different responsibilities as long as the total amount of GHG emission reduced by them is equal to 3% of total world emissions. In the following, concrete policy proposals are made in order to create incentives for true technology transfer, to reform the existing CDM regulatory structure and to pave the way for the creation of a global carbon market.

3.1 Creation of an Advisory Think Tank Group

Scientific insights from climate change science, physics, and chemistry contributed to our current understanding of the global warming problem. The natural sciences first of all discovered the global warming phenomenon and then continuously fostered our understanding of emission growth, CO₂ concentrations in the atmosphere, and the corresponding temperature increases. Regular assessment reports are being published by the International Panel for Climate Change (IPCC, 2004). As for other sciences, individuals such as Nicholas Stern (Stern, 2006) or Bill McKibben also contributed through their publications and presentations to our understanding of the policy responses available to climate change. With their insights about economic efficiency of different climate change regulatory tools – carbon tax, quantitative emission restrictions, and regulations – economists contributed to the development and implementation of cap-and-trade systems such as the European Emission Trading System (EU-ETS). Apart from the IPCC whose focus is on climate change science, no other international institution exists that pools the academic findings related to combating climate change and makes them available to politicians and negotiators. Given the obvious need for expert advice on international responses to climate change (see section 1.2) the input from other scientific disciplines could be greatly improved within the existing institutional structures of the UNFCCC.

As was pointed out in section 1.2, policy makers’ intention with respect to enhancing technology transfer through the CDM has not been fully realized as there are a number of barriers to the wider
uptake of CDM projects. These range from legal, regulatory, institutional, financial, and lack of technical capacity to the need for investment in infrastructure necessary for new energy technologies. A wide range of innovative public policy approaches and capacity building will be needed to overcome these barriers. Yet, the CDM underperformed mainly because the market incentives, which set signals for stakeholders in carbon finance, were not anticipated, or fully thought through by delegates. For instance, negotiators neglected the fact that investors undertake carbon offset projects based on risk and the returns associated with the project. Looking at emerging market private equity investments, we know that risk varies greatly by country. In order to undertake an emission abatement project in a politically-unstable environment or in a country with uncertain administrative bodies, an investor demands a higher return. Yet, the price for one certified emission reduction (CER) unit, i.e. one abated ton of carbon equivalent, is the same for all CERs no matter from which country they are. Therefore, it is not surprising that Africa hosts only a few CDM projects at the moment given that the risk of undertaking investments in some African countries is by far higher than, for instance, in Asia or Latin America. To avoid these constructional weaknesses of the CDM in the future and in order to improve the existing regulatory structure, politicians and delegates at the climate negotiations will need to rely more on science-based expert advice.

Similar to the IPCC which gathers scientific evidence and information about the advancement of climate change and its consequences, a think tank group comprising the best researchers from different scientific fields – economics, business, finance, and engineering – is needed to foster cooperation on climate policy issues across sciences. For this purpose, the UNFCCC’s institutional structure should be amended by creating a Think Tank Group for enhancing scientific understanding among climate change policy makers. At the moment, within the UNFCCC the Expert Group on Technology Transfer (EGTT) is tasked to identify ways to advance technology transfer activities under the Convention. In addition, the Global Environment Facility (GEF) is in charge of allocating and disbursing about US$ 250 million per year in grants for enhancing the development of markets related to climate change and for technology transfer projects, including support for energy efficiency, renewable energies and sustainable transportation. The knowledge of existing sources should be integrated in the Think Tank Group.

The task of such of the Think Tank Group would be similar to the IPCC’s; experts should support policy-makers and delegates in understanding market mechanisms behind the CDM/JI and emission trading systems. To do so, the think tank should publish regular reports on the latest insights on how to reform the CDM, and how to link emission trading systems with each other. Furthermore, it should make best-practice cases of CDM projects available to a wide audience and keep the world informed about technological progress (or lack there of) in developing countries. At the end, the experts from the Think Tank Group should be in a position to inform policy makers about what projects are technically feasible, constitute a good choice in a given country, and what are their benefits for sustainable economic development, and under what conditions will investors finance them.

3.2 Details for Implementing the 3% Convergence Mechanism

Freedom of Geographical Destination

Bundling the responsibilities to achieve the “3% Solution” (see section 2.1) would not imply that the selected group needs to reduce the required quantity of emissions within their domestic territories
only. At one point, such a rigid constraint might require that those countries would need to shut down entire carbon-intensive industries, which would affect the economic activities of these countries dramatically. In addition, such a restriction creates an unwanted problem, namely carbon leakage. If the first-mover countries chose to establish an ETS in order to meet its international mitigation commitments, companies that are regulated under the ETS may decide to re-locate to second-mover countries to avoid paying for the CO₂ emissions. To avoid carbon leakage and to allow first-mover countries to achieve their mitigation commitments at the most cost-efficient way, they need to be granted the flexibility to reduce their emissions at home or abroad by carrying out a project-based mechanism, such as the CDM. As long as the freedom to choose whether to reduce GHG emissions themselves, i.e. within their domestic territory, or to purchase the equivalent carbon credits or emission allowances (from other first-mover countries) is acknowledged by all members to the Convention, the selected countries are ensured that any additional unit of emissions can be mitigated at the lowest economic costs possible.

Continuation of the Flexible Mechanisms

The government of a first-mover country faces many options on how to achieve its Copenhagen commitments either through CDM/JI or by creating an ETS. As before, governments may purchase Assigned Allowance Units (AAUs) from other governments from the first-mover group. Given that reduction commitments will be substantially higher under the Copenhagen agreement, the likelihood that other governments are selling their AAUs is however small.

In practice, the corresponding quantities of GHG allowances that each country of the first-mover group is still allowed to emit will be handed out taking into account the different, individual reduction commitments. As pointed out in section 2.2, countries belonging to the first-mover group will need to negotiate on how to split the burden of reducing, for instance, the 3 percent of total world emissions. If not stated otherwise, the existing UNFCCC structure in charge of monitoring and administering compliance should also be in charge of implementing the Copenhagen outcome. By the end of a year, a first-mover country will need to demonstrate its compliance with the UNFCCC, i.e. demonstrate that it emitted only the amount of GHG emissions that it was granted. When implementing, for instance the revised “3% Solution,” the initial amount of allowances handed out in the first year will need to be reduced every year, i.e. each first-mover country has to return the corresponding amount of allowances to the UNFCCC. To achieve their reduction commitments, governments can invest in carbon funds, such as the ones from the World Bank Group, which will deliver in return, emission reduction units from CDM. Alternatively, governments may decide to fund carbon offset projects in second-mover countries through their domestic development banks, which yields the benefit of job creation at home. Lastly, as under the KP, governments can forward their compliance to the private sector and create a cap-and-trade system. Under an emission trading system, the government decides which agents - companies, private households, public entities - to regulate and ask those agents to reduce their emission by granting them a small amount of emission allowances, which can either be distributed via an auction or through grand-fathering. It has now become the obligation of the regulated industries, or households, to ensure that they can meet their emission reduction targets by the end of the year.
Creation of a New CDM Unit

In order to foster technology transfer through the CDM, the existing mechanism needs to be upgraded. CDM projects that actually transfer low-carbon intensive energy technologies and contribute to the creation of an environmentally sustainable infrastructure in developing countries need to be distinguishable from traditional CDM projects which often only harvest the low-hanging fruits, i.e. do not contribute to the building of a low-carbon infrastructure (Umweltbundesamt, 2006). Let me call CDM projects that actually lead to technology-transfer and building of climate-friendly infrastructure CDM Plus projects. The carbon offsets harvested from these projects shall be called CERPlus credits, instead of certified emission reductions (CER) which are issued from the traditional CDM projects. By creating a second, separate CDM unit, a new financial asset class is born which means that prices of traditional CERs should differ from prices of CERPlus credits. More importantly, the new asset class of the CDM can be used to create the missing incentives for technology transfer to developing countries. To do so, existing mitigation technologies need to be screened in terms of whether they lead to the building of a green energy infrastructure need. The executive board of the CDM at the UNFCCC should work together closely with experts from the newly created Think Tank to determine which abatement technologies can be categorized as leading to infrastructure investments and technology transfer in developing countries. Only carbon offset projects that use these mitigation technologies will be eligible for the CDM Plus. By distinguishing the efforts to invest in a long-term infrastructure projects from the traditional CDM projects, incentives to invest in true technology transfer are created. To entice carbon offset investors, who have so-far shied away for undertaking long-term carbon offset projects (for reasons explained in section 1.2), a premium needs to be add so that their exist a benefit to invest in the new asset class. CDM Plus projects will at a future date lead to the pay-out of an additional carbon allowances from the UNFCCC, i.e. everyone who invests in these abatement projects will not only receive the traditional carbon credit, but gets a second allowance for free for having undertaken the necessary investments in climate-friendly technologies that are needed to help developing countries leap-frog the carbon-intensive stage of development. Under what conditions the pay-out of the second allowance takes place and the occurrence of the event will be explained below.

Criterion Determining when Second-Movers Have to Start Mitigating

As the number of CDM Plus projects increases over time in developing countries, their level of low-carbon energy infrastructure increases. Thus, the quantity of CDM Plus projects is an indicator of the technological maturity of a host country. In order to use the new CDM unit as an indicator, the absolute number of CDM Plus projects has to be interpreted relative to the initial situation in the host country and the future energy demand of the country. Therefore, country-specific factors such as population, population growth rates, initial GDP, initial infrastructure and power generation need to be considered. For finding an appropriate indicator that determines a country's technological maturity, delegates of the climate negotiations should work together with experts from the Think Tank Group. The outcome of this undertaking should be a formula, based on the number of CDM Plus projects and the individual characteristics of host countries, which can be used to assess a host country's progress towards a sustainable green infrastructure.
The point at which a developing country has to assume GHG reduction responsibilities should ideally be linked to its stage of technological maturity. Technological maturity relates to the country's ability to satisfy its energy needs in a climate-friendly manner, it is also linked to its mitigation potential (see section 2.2). If developing countries have reached a point where they possess capacities to save GHG emissions without sacrificing their economic well-being, they should be required to support the ongoing efforts of first-mover countries. The above-mentioned formula can also be used as an objective measure to determine a tipping point, i.e. a point in time from which developing countries can be expected to contribute to mitigation efforts. Again, the UNFCCC monitoring unit would also be in charge of making public each country's progress towards reaching the tipping point. Once a second-mover country has matured, passed the tipping point, it will need to start mitigating emissions after a grace-period. Since industrialized countries have at that point worked towards achieving the 3% Solution, mitigation action by second-mover countries would constitute additional abatement efforts. Instead, for having received CDM Plus projects that fostered a low-carbon development, second-mover countries will gradually need to take over the reduction commitments of first-mover countries until they are mitigating 3 percent of their emissions relative to the previous year. That is, at the moment of reaching one's technological maturity, the second-mover country receives from the UNFCCC monitoring unit as many AAUs as the country's total GHG emission at the time of reaching the tipping point. This implies that the second-mover country will now need to undertake and implement policy measures which ensure that its GHG emissions in the following year won't exceed its assigned allowances.

Given that the UNFCCC keeps track of the progress all second-mover countries make in reaching its tipping point, governments are alerted and have sufficient preparation time to implement the necessary institutions and policies required to handle the next phase. After a short grace period during which developing countries neither have to reduce emissions nor are allowed to increase their own, matured second-mover countries will need to start mitigating, i.e. emit less than the level of GHG emission in the tipping point year. Since the CDM Plus asset is attributed additional benefits for the project developers in first-mover countries – an additional allowance at an unspecified time in the future – negotiations about the quantitative restrictions for developing countries upon reaching the tipping point can be avoided. The number of CDM Plus projects, where one unit equals one tone of carbon dioxide equivalent, determines automatically the commitment reductions for second-mover countries.

As pointed out, the idea is that project developers and investors of CDM Plus projects are awarded one additional unit of emission rights from the UNFCCC once the country in which the carbon offset project was carried out has reached its tipping point. Thus, to facilitate implementation and registration with the UNFCCC, the CERPlus units need to be issued including detailed information about the mitigation methodology, the host country and the economic agent holding the CERPlus title. Each time the CERPlus unit is sold to another agent, the information about the sale will need to be tracked by the UNFCCC in order to enable the pay-out. Once the pay-off allowance for having undertaken a CERPlus project has been issued to the agent possessing it, the UNFCCC simultaneously will need to collect an AAU from the host-country in order for the global capped emissions to remain constant. If the second-mover country has established an ETS, the government will need to reduce the emission allowances in the ETS. The mechanism behind CDM Plus ensures that first-mover countries have an incentive to invest in pro-climate infrastructure today, as this will be reward-
ed in the future. Under the Copenhagen agreement, first-mover countries have total control over how much abatement activity they are willing to carry out in second-mover countries and how much domestic emission reductions they want to undertake. By investing in CDM Plus projects, first-mover countries are earning a guarantee that the future part of their reduction commitments are being taken over by developing countries. The latter, on the other hand, receive the technology and energy infrastructure needed to leap-frog a carbon-intensive stage of development and are only required to reduce emissions once they are in a position to do so.

3.3 Summary

The two-stage approach to solving the 21st century climate change problem is built around a contingent agreement – no matter to which group (first or second-mover) a country belongs – it will always be required to act at some point, while always receiving benefits at another point in time. First-mover countries must act immediately under the proposal (since their mitigation potential is high) and receive their benefits later; in second-mover countries, infrastructure investment and the greening of technologies happens first (for unleashing their future mitigation potential), while the obligation to contribute to solving the 21st century global warming problem comes at a later point.

The proposal creates a mechanism that requires action by developing countries only after the developed countries have fulfilled their part. GHG reductions in developing countries are contingent on having reached technological maturity. As for the political feasibility, industrialized countries, like the U.S. should favor the mechanism since developing countries are part of the new climate change treaty and will need to subsequently adopt GHG reductions commitments in the future; in fact the speed and the magnitude at which developing countries will need to start mitigating lies in the power of industrialized countries.

The proposed mechanism encourages technology transfer because only those projects that actually lead to long-term infrastructure development and technology transfer qualify for receiving an additional allowance in the future. The so-called "long hanging fruits" projects will still happen – as the demand for carbon offsets from first-mover countries will be large at the beginning, given that the long long-term projects will take a few years to deliver offsets. A notion of equity and fairness among countries in sharing the present and future responsibilities for our atmosphere is re-established since richer countries, who are responsible for the current GHG concentrations have to act immediately, while poorer countries, who will be responsible for GHG concentrations in the future (unless their policies change), need to act when their time has come. First-mover countries will need to start reducing at home immediately since the total assumed responsibility of reducing 3% p.a. of total world emissions implies that the demand for carbon offsets from the CDM market may not be able to deliver that many credits – at least in the short-term – to enable the rich to buy their way out. This side-effect should please environmental non-governmental organizations in industrialized countries that have been pushing for action at home. Most importantly, the contingent-based mechanism ensures that developing countries receive technology transfer. A major push in research and development (R&D) for new energy-saving technologies is required to foster the future mitigation potential in industrialized countries. Investments in R&D, either by governments or the private sector, are more likely to happen if the Copenhagen Protocol encompasses a long-term horizon and when pressure to innovate is high today.
References


A Framework Proposal for a post-2012 Copenhagen Protocol - How to Reach 80% Reductions by 2062


World Watch Institute, (2005), China Calls on the U.S. to Join Kyoto Protocol, by Yingling Liu on December 1, 2005; http://www.worldwatch.org/node/144.


Notes

i The United States signed the Kyoto climate accord to reduce greenhouse gases a decade ago but, unlike 177 other countries, the U.S. never ratified the treaty. The pact expires in 2012. A detailed overview of the history of climate change negotiation is provided by Wytze van der Gaast (2008).

ii China which currently ranks second in the world's CO₂ emissions is projected to pass the United States sometime between 2025 and 2030 as the largest emitter of carbon dioxide.

iii The International Energy Agency warned in its _2008 World Energy Outlook_, that 97 percent of projected growth in emissions of carbon dioxide from energy use through 2030 (without aggressive action) will come in developing countries, with three-fourths of that growth in China, India and the Middle East. By 2025, China could account for one-quarter of global CO₂ emissions according to China Environment Forum, Woodrow Wilson International Center for Scholars [http://wilsoncenter.org/7/index.cfm](http://wilsoncenter.org/7/index.cfm)

iv Chris Flavin, the president of Worldwatch, said that “Without their (developing countries) participation, the next round of emissions limits will hardly be meaningful.” (World Watch, 2005).

v Republican Jim Sensenbrenner, who attended Poznan talks from Dec. 1.-12. 2008, a top Republican on the House select committee on energy independent and global warming wrote in a letter to President Barack Obama that “… any treaty that does not include legally binding and verifiable greenhouse gas emissions reductions from developing countries will not be ratified by the U.S. Senate because it will not accomplish the fundamental goal of reducing global emissions.” (Marrero, 2008).

vi In particular, the Chinese Government plans to increase spending on science and technology by over 25% on 2008 levels with extra funding assigned to wind, solar, nuclear, and clean coal technologies. China’s $586bn fiscal stimulus package has secured praise for assigning more than 30 per cent of spending to low-carbon projects and programs to clean up pollution (UNEP, 2009).

vii The main body to govern the development of an international climate policy regime is the UNFCCC, which is an intergovernmental organization without supranational powers.

viii According to Article 2 of the Convention, such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner (UNFCCC, 1992).

ix Two thirds to three quarters of this increase is projected to come from developing countries, though their average per capita CO₂ emissions will remain substantially lower than those in developed country regions. (UNFCCC, 2008b).

x These and other stabilization scenarios are described in IPCC (2001a, b).

xi The Bali Action Plan stresses that developing countries will need support in responding to this challenge, following the principle of common but differentiated responsibilities.

xii According to the IEA (2008), global energy demand will grow by 55% by 2030.

xiii Levels of foreign direct investment (FDI), commercial lending, and equity investment all increased greatly in recent years. These are the dominant means by which the private sector makes technology-based investments in developing countries and economies in transition. However, private sector investment in the form of FDI in developing countries has favored East and South East Asia, and Latin America (UNFCCC, 2008a).
It is estimated that the CDM for renewable energy and energy efficiency projects (which were registered during 2007) resulted in 5.7 billion USD in capital investment. This is about triple the amount of official development assistance for energy and renewable energy projects in the same countries (World Bank 2008b).

Additionality is defined in the so-called Marrakesh Accords as follows “a CDM project activity is additional if anthropogenic emissions of Greenhouse Gases by sources are reduced below those that would have occurred in the absence of the registered CDM Project activity.”

Joint fulfillment is one of the four Kyoto flexible mechanisms and lead to the creation of the EU bubble during the commitment phase 2008-2012. The EU committed to cut its emissions by 8 percent with member states taking on different responsibilities.

Developed countries hold a 20% share in the world population but account for 46.4% of global GHG emissions. In contrast, the 80% of the world population living in developing countries (non-Annex I countries) account for 53.6% of GHG emissions. Based on the metric of GHG emission per unit of economic output, Annex I countries generally display lower GHG intensities per unit of economic production process than non-Annex I countries (UNFCCC, 2007b).

The unit of measurement for “mitigation potential” is expressed in cost per unit of carbon dioxide equivalent emissions avoided or reduced.

Singh and Fehrs (2001) found that wind and solar photovoltaics create 40% more jobs per dollar than coal.

Growth of solar and wind energy is often the result of comprehensive energy policy frameworks at national levels instituted through legislation. To increase the uptake of solar and wind power the Government in Germany adopted “feed-in tariffs” in 1990. Those provisions allow eligible generators to receive a fixed and transparent premium price for their renewable electricity sale. The term feed-in tariff is used both for a minimum guaranteed price per unit of produced renewable electricity to be paid to the producer, as well as for a premium that is added to market electricity prices for supplied renewable energy. As a result, Germany transformed itself from a country with sparse renewable resources 1990 into an international renewable energy powerhouse.

A recent study done by Deutsche Bank (2009) counted more than 250 climate change related policy developments between July 2008 and February 2009 by governments around the world.

Bill McKibben is author of numerous environmental books dealing with climate change, such as his book “Fight Global Warming – Now.”

No other environmental regulatory tool can reduce GHG Emissions with 100% certainty and at lowest costs possible than emission trading (Stern, 2006).
Post-Kyoto Climate Change Negotiations: The View from the Coalition of One Hundred

Mukhtar Amin

Introduction

The predominant analysis of international climate change negotiations has often framed the debate in terms of a North versus South divide. Arguments based on this analysis explain that during the UNFCCC negotiations and through the completion of the Kyoto talks, there has been a clear and fundamental divide between the two distinct groups of countries over how to respond to the challenges of climate change. On one end, were the developed countries who looked at climate change through the prism of mitigation. On the other end were developing countries who looked at the challenges of climate change from an adaptation perspective, and argued that historical as well as equity issues needed to be taken into account when designing an international agreement on climate change.

As a result of these two predominant views, proposals on how to bring about an effective post-Kyoto agreement tend to present either a Southern view or a Northern view (Kuik, Aerts et al. 2008). However, this type of categorization may not reflect the realities of the post-Kyoto environment. While some argue that the South is a distinct group of countries with a shared interest (Miller 1992; Williams 2005), others have pointed out the extraordinary variation of interests that exist with the South. From groups of countries that are oil producing to Small Island States and sub-Saharan African countries, the South is indeed quite diverse. While recognizing this extraordinary divergence of interests, this paper identifies and presents a proposal for a specific and significant group of countries within the South whose voices are increasingly being marginalized within the international climate change discussions.

In the post-Kyoto discussions, the position of the South is almost always presented by a small number of countries. Many in this small group are experiencing rapid economic growth and belong to the so-called G-20. This group of 20 countries includes China, India, Brazil, and Mexico, who are interested in articulating a common position for themselves, while framing such positions under the umbrella of developing countries interests (Williams 2005). The combined greenhouse gas emissions of these fast developing countries, as a share of global emissions, are rapidly becoming very significant. Indeed, the Bush Administration used the exclusion of these countries from the Annex I countries as the basis for refusing to ratify the Kyoto Protocol. In the post-Kyoto negotiations, this group of countries will most likely agree to take on some specific emission reduction commitments.

The group with which this paper concerns itself is quite different from the likes of China, Brazil, and India. The countries that are at the heart of this paper include Least Developed Countries, Landlocked Developing Countries, and Small Island Developing States. These countries, while diverse and different in many ways, share two main interests and goals within climate change discussions. First and foremost, they share a great sense of vulnerability to the adverse effects of climate change and have a low adaptive capacity. They are countries whose economies are fairly small and whose historical as well as current contribution to global carbon emissions is fairly limited. By virtue
of their underdeveloped economies, these countries are not able to take the necessary steps to protect their citizens from the impacts of climate change - impacts that they are already experiencing. Indeed, Small Island States are already losing precious land to rising sea level while many sub-Saharan African countries are experiencing a decline in their agricultural production (Barrios, Ouattara et al. 2008). Secondly, these countries share a strategic interest in advancing a global burden-sharing framework that is fair and equitable and that does not put undue burden on their long-term development goals.

Against this background, this paper argues that these countries should form a coalition of their own and put forward a proposal that clearly articulates their short-term as well as long-term interests. As a shorthand name, the paper refers to this coalition as the “Coalition of One Hundred” based on the fact that the number of developing countries that are most vulnerable to climate change is close to one hundred. The paper identifies three broad areas under which this Coalition can present its proposal, namely a) a per capita carbon emissions based international framework for burden-sharing, b) linking sustainable development and climate change, and c) new funding for enhancing adaptive capacity.

A. Creating a Rule-Based International Framework

A central piece of the Coalition of One Hundred’s proposal should be to argue for an international framework or rule by which countries take fair and appropriate action against the adverse effects of climate change. They should also argue that such an international rule should contain a threshold beyond which countries, regardless of what part of the world they are in, should commit to taking some concrete action by either reducing their emissions levels or by enacting relevant climate-friendly policy measures. Whether a country is required to reduce its greenhouse gas emissions to reach a specific target, or implements other “softer” policy measures would depend on how far above the threshold the country stands.

Previous multilateral agreements, and notably the Montreal Protocol on Ozone-Depleting Substance, have used clear and simple frameworks that set thresholds for taking action. The Montreal Protocol, negotiated in 1987, stipulates that developed countries should substantially decrease and eventually eliminate their consumption of chemicals that deplete the ozone layer, and do so in a relatively short time frame. This stringent requirement on developed countries was based on the fact that it was these same countries that were responsible for the release of those harmful chemicals into the atmosphere. In addition, these countries were seen as having the capacity to take immediate action. Developing countries, on the other hand, were given a longer time frame to take action. More specifically, the agreement set a threshold that was based on per capita usage of chemicals that deplete the ozone layer. Any country whose per capita usage of these chemicals was under 0.3 kg per was not required to take any specific action (UNEP 1994). In 1990, the Protocol was amended and the per capita threshold beyond which developing countries would be required to take action was lowered to 0.2 kg. This Protocol, along with its revisions, is therefore a good example of an international agreement that sets a clear framework for sharing the burden of solving a global environmental issue.
Carbon Emissions Per Capita

Much like the Montreal Protocol, the Coalition of One Hundred should put forward a burden-sharing system that sets a specific threshold for taking action against climate change. At the core of this proposal should be a rule that contains the concept of per capital carbon emissions. A formula that contains per capita emissions would ensure that a country's emission of greenhouse gases is accurately represented, without prejudice against those countries that have larger populations and low emissions per each of its citizens. In essence, these countries should argue that a system that is based on per capita emissions would bring clarity and fairness to the international negotiations on climate change.

Even before the Kyoto negotiations and certainly since then, different studies have offered various formulas by which countries could share the burdens of climate change related actions (Claussen and McNelly 1998; Waskow 2000; Ringius, Torvanger et al. 2002; Höhne and Blok 2005). In the post-Kyoto negotiations, the Coalition of One Hundred should be open to alternative and comparable formulas, but should insist that any international framework that sets a threshold should, at the bare minimum, include per capita emissions as a central tenant. Put differently, the goal of this Coalition should be to ensure that the concept of per capita emissions gets onto the international agenda, even if it is modified by some other criterion.

Without a reasonable baseline time period, the concept of per capita emissions can, of course, lead to an outcome that is ultimately unfair. Using the year 2000 as a baseline versus choosing 1950 would translate into widely different results in terms of responsibility. While keeping these limitations in mind, several alternative proposals that the bottom hundred countries should consider include:

a. Per Capita Carbon Emissions Combined with Per Capita GDP

The intention of this framework would be to consider a country's per capita emission along with its ability to take ameliorative actions. By multiplying a country's per capita emission with the ratio of its per capita GDP to the world per capita GDP, this formula determines the extent to which a country has the economic capacity to act. A country with low emissions per person, but with a relatively high income per citizen would have a responsibility to take global action against the adverse impacts of global climate change. One criticism of this formula could be that it penalizes countries that follow less carbon intensive development policies and achieve high levels of income per capita while keeping their carbon emissions low. However, the short-term problem that the world faces today has more to do with countries that have the capacity to act but are failing to take immediate action.

b. Carbon Emission Rights

Researchers at the Stockholm Environment Institute have introduced an effort-sharing framework that determines responsibility and capacity based on how much GHG members of the global population emit, regardless of which country they live in (Baer, Anthanasiou et al. 2007). This framework, which the authors call the Greenhouse Development Rights (GDRs), "combines a measure of responsibility (historic contributions to greenhouse gas pollution, excluding emissions associated with meeting basic necessities) with a measure of capacity (broadly, the ability to pay for mitigation and adap-
tation, without sacrificing necessities).” Much like the framework described above, this one also takes per capita emissions as a core principle, while also combining it with the responsibility and ability of wealthier citizens (and by extension, the countries they live in) to bear a higher share of the costs for adaptation and mitigation.

c. Differentiating Country Obligation Through Standard of Living, Emissions Responsibility, and Opportunity

Another alternative proposal that emphasizes the role of per capita emission in devising a global framework on sharing the climate change burden is a report produced by the Pew Center on Global Climate Change (Claussen and McNeilly 1998). The report argues that an equitable global burden-sharing scheme needs to be based on three elements: standard of living, responsibility for emissions, and opportunity. Standard of living, as measured by a country’s per capita GDP, gives a sense of ability to take immediate action. Developed countries, which have a relatively higher standard of living, have reached a level of economic development that they can forgo some level of economic growth in order to avert the serious threats paused by climate change. In the report, a country’s responsibility is based on its cumulative carbon emission since 1950, its present level, and its future emission projections. In each these phases, attention is paid to per capita emissions of a country as well as the total carbon emissions level. Through opportunity, the report calculates a country’s ability to limit its emissions according to its carbon emissions per unit of GDP. Overall, this framework emphasizes the role of per capita emissions, while combining it with ability and opportunity to act.

Pursuing per capita emission as a burden-sharing framework for an international agreement on climate change would be beneficial to the Coalition and to the post-Kyoto negotiations in general. One of the main reasons that progress on climate change negotiations has been slow has much to do with the apparent lack of agreement on how countries should share the costs of mitigation and adaptation. But as the scientific understanding of climate change becomes clearer and the potential impacts on human life look ever more catastrophic, the international community is realizing that it has to act fast. Inaction is no longer an option. In such an environment, if the Coalition of One Hundred is successful in putting the concept of per capita emission on the international agenda, it will not only make the Coalition a major player in the international discussions, but it will also bring real impetus to the stalling climate change talks. Among other benefits, a per capita based framework would bring predictability and equity into the negotiations.

• Predictability

Under the Kyoto Protocol, developed countries (Annex I) as a group agreed to reduce their emissions by an average of 5 percent below their 1990 levels during the commitment period of 2008-2012 (UNFCCC 1998). The rules of distributing responsibilities among these countries were, however, not based on any clear criterion or principle. In essence, the Kyoto negotiations distributed emission reduction responsibilities on the basis of an ad hoc process that ended up requiring some countries to cut their emission while others were allowed to increase their emissions. For instance, Spain was required to cut its emissions by 8 percent. Australia, on the other hand, was allowed to increase its emissions by 8 percent. Indeed, it was mainly because of the unprincipled and unpredictable nature of the burden-sharing framework under the Protocol that made many developing
countries remained on the sidelines during the negotiations. Many of these countries were deeply wary of engaging in discussions that could end up putting unexpected burdens on their capacity to develop. A system that gives countries a clear indication of the conditions under which they would be required to take specific actions would, therefore, make it more likely to bring about an agreement with a broader support.

• Equity

Multilateral agreements are more likely to be successful when participating parties perceive them as adequately fair and equitable. In the context of climate change, equity implies that the costs of climate change mitigation and adaptation should be shared proportionally. Countries whose economic activities have caused the current problem should have a moral responsibility to not only take on a higher proportion of mitigating the effects, but also should assist poor countries with adaptation costs. Proposing a framework that allocates responsibility on the basis of per capita emission would therefore be more likely to garner a broader agreement among negotiating parties.

Implementing the Framework

While it is beyond the scope of this paper to define the exact threshold that will trigger requirement to take action, it is important to discuss the manner in which this framework would operate. At a basic level, the proposed framework would create two different tracks of action for those countries that are below the threshold and for those that are above it. Countries whose emissions are above the agreed upon threshold will have legally binding emissions limitations targets. In addition, they would be required to help those below the threshold with adaptation efforts by setting aside funds. The idea would be to put due burden on those countries who have the responsibility and the capacity to take immediate action.

Countries whose emissions are below the threshold will implement specific policy measures that are aimed at dealing with climate change, but these policies would not be mandatory. As long as these countries are below the threshold, climate change would most likely not be their overriding national policy. But they will be encouraged to pursue national policy measures that would also bring about climate-friendly benefits.

The aim would also be to create incentives for these countries to take the necessary actions against a global environmental problem that does not respect boundaries, regardless of the source of the problem. The incentives for these countries would take two forms: a market-based scheme or providing direct financial assistance. In a market-based scheme, countries whose emissions are below the threshold would be allowed to sell their unused credits at an international carbon market. Countries who also take policy measures that reduce emissions will receive credit and will be able to sell those credits. Alternatively, these countries could choose not to sell those credits and instead opt to receive direct financial assistance that will go towards their adaptation strategies and policies.
B. Integrate Climate Change and Sustainable Development

One of the major reasons that most developing countries were on the sidelines during Kyoto negotiations was a fear that engaging in climate change talks in any meaningful manner would hinder prospects of their economic development (Najam, Huq et al. 2003). Indeed, some countries viewed the talks as a veiled attempt by the developed countries to slow down the economic development that some in the developing world were experiencing. Others, while realizing the ecological interdependence inherent in climate change and the potential negative impact it has on all aspects of human life, insisted that the causes of the current problem should not be ignored. They demanded that any international mechanism on climate change should take into account the fact that developed countries are mainly responsible for the unsustainable level of greenhouse gases currently in the atmosphere.

It was against this backdrop that developing countries successfully argued for the “common but differentiated responsibilities” principle. To developing countries, this principle in effect meant that while no country can escape the fate of a world fundamentally altered by climate change, and while all nations have a responsibility to be good stewards of the earth, those responsible for the current problem should take the lead in finding solutions. In practical terms, developing countries argued that industrialized countries should make deep cuts in their greenhouse gas emissions; since it is the development path they followed that is at the heart of the debate on who should act first. By extension, developing countries maintained that it would be unfair to ask them to forgo their ability to develop when no such limits were put on the developed countries during their industrialization phase.

Implicit in this debate was the assumption that sustainable development and climate change policy are mutually exclusive. From the view of the developed countries, developing countries’ insistence on “sustainable development” simply meant that those countries were not serious about confronting the challenges of climate change. Conversely, developing countries looked at climate change policy, and especially those policies dealing with mitigation issues, as being in contradiction with their priority policies on such pressing issues as poverty reduction, healthcare, education, and the like.

New Proposal

However, the reality is that the two issues are clearly and fundamentally linked. Whether it is mitigation or adaptation (the two main discourses within which the debate is framed), climate change touches on an array of development policies that range from agriculture and water availability to land use and urban development (Van Asselt, Gupta et al. 2005). Indeed, climate change already affects, and will most likely have even greater impact on the ability of poor countries to develop. According to the World Bank, “hundreds of millions of people in the developing world are likely to be displaced by [sea level rise] within this century, and accompanying economic and ecological damage will be severe for many” (Dasgupta, Laplante et al. 2007). Impacts on agricultural output, which tends to be the most vulnerable sector in most poor countries, is expected to be extensive with some countries facing reduction in yield of as much as 50 percent by 2020 (IPCC 2007).

The development pathway that nations follow has, and will continue to have, significant impact on climate change. In essence, climate change is simply a symptom of a certain type of development trajectory, i.e. the carbon-intensive economic development that today’s industrialized nations followed when they were developing. As the 4th report of the Intergovernmental Panel on Climate Change...
shows, the severity of climate change and the ability of countries to adapt to it, will depend largely on the scenario of greenhouse gas emissions the world follows (IPCC 2007). The report warns that unless drastic greenhouse gas emission cuts are made, global average temperatures would rise by at least 2°C by 2050, which could result in significant damages on human life (especially in developing countries). Despite these warnings, a recent report by the Global Carbon Project found that emissions are accelerating and are close to the highest scenarios considered by the IPCC (GCP 2008). Alternative development pathways that shift away from the current development, will therefore not only determine future emissions but will also have impact on the ability of countries to adapt.

Despite the fundamental interconnectedness of climate change and sustainable development, negotiators have treated them as two separate subjects (Huq, Reid et al. 2006). Indeed, some have argued that sustainable development has been increasingly marginalized within the international climate talks (Najam, Huq et al. 2003; Najam, Rahman et al. 2003; Najam 2004). At the same time, scholars have more recently started to study the links between sustainable development and climate change (Van Asselt, Gupta et al. 2005; Huq, Reid et al. 2006; Grist 2008).

The Coalition of One Hundred countries, who have much to lose from a delinked climate change and sustainable development policy, should put forward a proposal that clearly links the two. This proposal should have at least two main elements.

**a) Mainstreaming Climate Change into Sustainable Development**

Even if developed countries are able to cut their greenhouse gas emissions in a relatively short period of time, some adverse impacts of climate change are unavoidable. Indeed, many developing countries such as the Small Island States and sub-Saharan African countries are already suffering from the adverse impacts of climate change. In order to deal with the immediate and eventually unavoidable consequences of climate change, focusing on and devoting resources to adaptation will be necessary. As the IPCC has identified, adaptation is an “adjustment in natural or human system in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities” (IPCC 2007). As more research is done on adaptation, the consensus appears to be that enhancing the ability of vulnerable communities and countries to respond to current and future climate variability and change should be an essential aspect of international negotiations (Jerneck and Olsson 2008; Mackay 2008).

Mainstreaming climate change into sustainable development will mean that countries should integrate climate policy into their national development and adaptation policies. It means viewing climate change as fundamentally a development challenge. At the local level, this implies increasing the adaptive capacity of those most at risk. According to the IPCC report, poor communities with low adaptive capacity are most at risk when it comes to the immediate effects of climate change. A successful agreement would therefore have to link local adaptive capacity building projects with civil society development activities, projects of multilateral institutions (such as the World Bank), and the private sector. At a national level, it implies putting in place policies that are aimed at protecting the most vulnerable sectors. In most developing countries, the major sectors at risk include agriculture, coastal zone management, and water management. A post-Kyoto agreement should ensure that developing countries do not see climate change discussions as a means to hinder their economic development. In essence, it should emphasize that dealing with climate change and pursuing sustainable development are two sides of the same coin.
b) Land-use and Climate Change

From the outset, it is important to note that international negotiations on land use, land-use change, and forestry have become increasingly complex (Fry 2007). As the intersection between climate change and land-use becomes more understood, it is becoming even more obvious that land-use has tremendous implications for climate change. For instance, consider the fact that tropical forests contain more than 40 percent of the world's terrestrial carbon. How this forest is used, or misused, will have direct impact on global greenhouse gas emissions. In fact, as the population in many developing countries continues to grow and more pressure is put on fragile ecosystems, deforestation and other land-use activities are already contributing to more than 20 percent of the global greenhouse gas emissions.

Despite the magnitude of impact that land-use has on emissions, the international community has not been able to devise a clear mechanism that permits reduced emissions from land use to function as a means to achieve emissions targets or receive credits. Recent talks in Bali have made some progress in this area by recommending that efforts to reduce emissions from land-use should be “strengthened and supported.” However, the Bali Action Plan addressed this issue only within the context of voluntary actions. In other words, no country is obliged to recognize the avoided emissions that a country may accrue from a sound land-use management. The Coalition of One Hundred should push for an agreement that sets out a legally binding mechanism through which land-use management issues are brought into an international agreement.

C. New Funding for Adaptation

While estimates vary, it is well understood that climate change mitigation and adaptation will have a considerable cost. According to a report by the UNFCC, it will cost more than $200 billion annually for greenhouse gas emissions to return to current levels by 2030. This same report concluded that between $28-67 billion would be needed annually in order to enhance the adaptive capacity of vulnerable states (UNFCCC 2007). Most countries within the Coalition of One Hundred have little financial resources to dedicate to adaptation programs.

The UNFCC has to date created three funding mechanisms for climate change: Adaptation Fund, Special Climate Change Fund, and Least Developed Countries Fund. But one major problem with these funds is that they remain voluntary. It is also not clear if these funds are new and separate from the existing Official Development Assistance funds.

Against this background, possible sources of new funds that the Coalition could propose include:

- Expanding the CDM market, which by extension would increase the tax revenues from such projects.

- Introducing new tax on all “dirty projects.” The myriad not-so-climate-friendly projects that institutions such as the World Bank undertake would be taxed. As a means to encourage clean projects, the tax put on dirty projects would be higher than those on CDM projects.

- New and additional financial commitment by those countries whose emissions are well above the internationally set threshold.
Conclusion

In a post-Kyoto environment, analysis of global climate change negotiations cannot sufficiently be understood by the traditional divide between the North and South. As the economies of some major countries within the South become bigger and grow faster, their contribution to current global greenhouse gas emissions is becoming more significant. With increasing greenhouse gas emissions and the accompanying duty to take mitigation measures, the interests and strategies of these countries is increasingly becoming misaligned with that of the majority of other developing countries. A product of these misaligned interests is that the voice of most developing countries, which this paper refers to as the Coalition of One Hundred, has been marginalized. This paper has argued that the Coalition should put forward a proposal that speaks to their specific interests.

At the heart of this proposal should be three broad elements. First, any post-Kyoto agreement should have a clear framework through which burdens will be shared. A cornerstone of this framework should be the concept of per capita emissions as a way of allocating responsibility. If this group of a hundred countries strongly pushes for the inclusion of per capita emissions as a foundation, it will be difficult for the negotiators to ignore the voice of more than half of the world’s nations.

Second, the agreement should identify the linkages between sustainable development and climate change. Too often, climate change and sustainable development have been viewed as two opposing issues with developing countries fearing that climate change would hinder their development goals and developed countries being suspicious of discussions on sustainable development. The proposal of the Coalition should seek to strengthen the linkages between these two subjects. Finally, the proposal makes the argument that new financial commitment adaptation will be necessary to help vulnerable countries deal with the unavoidable challenges of climate change.

Virtually all countries, developing or developed, understand that the risks of climate change are too real, and that failure to act soon will substantially worsen the future impacts of global warming such as increased storms, rising sea levels and agricultural failure. As world leaders prepare to meet in Copenhagen to tackle the challenges of climate change, they would be well advised to listen to the voices and concerns of more than a hundred countries – countries for whom the impacts of climate change are already too real.
References:


From Kyoto to Copenhagen: 
Breaking down Barriers between the North and the South

Alexandra Zamecnik

I. Introduction

The debate about climate change between the North and the South is symbolic of a much larger conversation about development and sovereignty. The tension between rich and poor, colonizer and colonized is rife with historical baggage and mistrust and has resulted in major obstacles to a successful Kyoto Protocol. The North wants the South to commit to emission targets and the South wants the North to pay for centuries of economic growth spurred by burning oil and coal. This underlying mistrust has hampered the possibility of a truly global solution and has instead helped entrench each side in their position. The South, the G77, includes an unlikely array of partners; countries that are rapidly developing, tropical and forested countries, oil producers, small island states and the poorest of the poor. This tension has permeated every aspect of the negotiations and Protocol and has distorted the pathways toward promoting sustainable development and reducing emissions. In this paper I offer three recommendations for how the interactions between the North and South can be improved for the Copenhagen negotiations.

II. Tensions between the North and the South

Climate change has accentuated the differences between poor and rich countries and has provoked an uncomfortable dialogue on issues about poverty, vulnerability, levels of development and lifestyle patterns. Who is responsible for causing climate change and who will suffer the most from it have become central to the climate change debate and have slowed down the process of finding a solution. What has resulted is a division between countries from the North with those from the South, creating an environment of antagonism and suspicion. Compounding these feelings is the fact that the countries that are the least vulnerable, essentially the developed countries, are the countries that have contributed and are contributing the most to climate change. Understandably, developing countries are pushing for the developed countries to assume the bulk of the financial burden. They have proposed various initiatives, such as accounting for emissions in per capita terms, that promote equity and hold the North accountable for economic, social and ecological costs (Agarwal 2002, 375). The issue of equity has become central to the position of the countries of the South because of the risk they associate with climate change impacts, their vulnerability and the potential for increasing pover-
ty (Agarwal 2002, 376). Consequently, the debate has reached an impasse, with the North unwilling to compromise consumption patterns and lifestyle, and the South unwilling to have their development interrupted (Agarwal 2002, 377). In the mean time, the South is following the same development trajectory as the North and is missing the opportunity to adopt a more sustainable pathway (Agarwal 2002, 377). In order to overcome the barriers that the North and South have built between them, new forms of interaction, perception and partnerships must be pursued.

III. Contextual Changes

Although the schism between the North and the South has remained, perhaps even deepened, since the writing of the draft Protocol, the world around these negotiations has changed significantly. Politically and economically, the context couldn't be more different. The 1990s were characterized by the fall of Communism, the strength of capitalism, market solutions, and neoliberal ideals. Developed countries enjoyed a time of economic prosperity that coincided with a burst of technology and productivity - the rise and diffusion of personal computers and the Internet. Conversely, today, the negotiations for a post-Kyoto structure are taking place in the midst of a global recession and sub prime meltdown. There has been a resurgence of leftist thinking, a revival of government intervention and a general questioning of the wisdom and effectiveness of free markets. The optimism that characterized the 90s has been replaced by a sense of fatalism and conversation and debates that have Malthusian overtones. In addition and particularly relevant to Climate Change negotiations, there are two noteworthy changes: China has become the highest overall emitter; and the realization and acknowledgment that some level of climate change adaptation will be impossible to avoid. These specific changes, the different environment and the experience of having gone through Kyoto will affect how the North and South negotiate. In order to move forward and improve on the foundation established by Kyoto, the North and South will both have to compromise on their positions and be willing to give up something.

IV. Stating the Problem

Some of the weaknesses and reasons Kyoto has not been able to make headway in its objectives of reducing emissions and promoting sustainable development can be traced back to and reflect the North/South divide and their entrenched positions. I will focus on three problem areas where I think there is an opportunity to change the interaction between the North and the South and improve the effectiveness of a post-Kyoto instrument.

Obsolete categorization

The first, which is one of the underlying foundations of the Protocol, is the categorization of countries. This categorization is both a symptom and effect of the North/South divide and is a vestige of the 1990s. It is no longer relevant and does not reflect the needs of a climate Protocol in today's world. The current scheme places countries in three categories: Annex 1, OECD (Organization for Economic Co-operation and Development) 1992 member countries and former Soviet Union states, Baltic States, and several Central and Eastern European States (deemed economies in transition EIA) which are bound to emission reduction targets; Annex II countries, OECD countries that are bound to emission targets and must contribute financially; and Non-Annex 1 countries, made up, mostly, of developing countries. Categorization following 1992 OECD membership implicitly ties the Protocol...
to GDP and to “Western” ideals. Although subtle, the symbolism of the OECD aggravates the tension between the North and the South by reminding the South of their responsibility to provide an alternative voice.

Hampered communication

The second problem area is the limited opportunity countries have had to interact, discuss and find creative ways to share information and address emission reduction and sustainable development. In part, this is due to the fact that countries were so fixated on designing and negotiating the Protocol, that little time could realistically be committed to anything else. Unfortunately, the result has been a very rigid structure that has not been able to adapt to the complexity of the problem and that does not promote multi-directional and multi-dimensional information sharing. For example, the idea that the flow of information and technology should always be coming from the North to the South is a fallacy. Countries in the South have been leaders in adopting and testing new technology and embracing, often out of necessity, ideas core to sustainable development, like conservation and efficiency. Not only does there need to be more dynamism in the way information flows and the way problems are analyzed, there has to be other ways of creating dialogue and links between countries.

Adding to the distrust of the South is the fact that the majority of climate change science, including monitoring and modeling, has been conducted in developed countries with little input and participation from the countries of the South. As a result, there has been a tendency to focus on mitigation at a global scale, paying little attention to research at the local level. This has left developing countries without the knowledge of how to address climate change and ill-prepared for the related impacts.

Failing CDM

The third problem area is the Clean Development Mechanism (CDM), which, in theory, is intended to promote sustainable development and serve as a vehicle for technology transfer, in addition to involving the private sector and providing flexibility on how targets are met. CDM allows industrialized countries with emission reduction commitments the flexibility to implement emission reduction projects in developing countries and receive certified emission reduction (CER) credits, which can be used toward their targets. There has been a lot of controversy around CDM because it represents the section of the Protocol with the most interaction between the North and the South. The South feared that the CDM was a way for the North to circumvent their emission reduction responsibilities and were skeptical at what they perceived as an overly complicated mechanism (Streck 2004, 300), and the North, specifically the United States, was reticent to engage in technology transfer with rapidly emerging economies like China and India that were not being held to emission targets.

Although the CDM has only been operational since 2006 by most accounts, it has failed to contribute to global emission reductions or to catalyze sustainable development. There are several contributing factors to the problems with the CDM, including the rigorous registration and issuance process and high transaction costs, the single project structure, the incentives for least-cost carbon credits (Pearson 247, 2006) and its regional and country preference. Many of these weaknesses are results of a system designed to draw its incentives and reactions from market signals (an ironic concept given the objectives of the Protocol). The CDM shares the same rigidity and lack of dynamism previously described.
and seems to have lost sight of the forest for the trees. It has been unable to conceive of projects that actually transform and influence sectors and industries or diffuse clean technologies. Although it can be argued that the mechanism has been more of a disappointment to the South (especially the lesser developed of the developing countries), in the subsequent negotiations the North will have to confront its limitations and failures.

Ultimately, in order to address emission reduction and sustainable development, what has to emerge from a post-Kyoto Protocol is an instrument that is flexible and able to see and reduce emissions in a more holistic fashion. Emissions need to be understood for what they represent: the industries and markets they are tied to and the potential impacts on countries, companies and people. The more developed and complex a country becomes the harder it is to detangle and decouple emissions from their economy – the very basis of the argument for supporting sustainable development in developing countries. Unfortunately, as I have described, the negotiations and foundation of Kyoto was hampered by the mistrust, tension, and legitimately different objectives of the North and the South, an element that must be overcome in order for Copenhagen to be successful. In the subsequent section I propose three recommendations for how to address North/South pressure points.

V. Recommendations

In a sense, the North and the South are locked into a game of poker waiting to see who raises the stakes and who is bluffing. The recommendations I provide are an attempt to change this game and provide alternative paths and compromises that both “parties” might consider. In order to tackle a key obstacle of the post-Kyoto Protocol I propose recommendations that would change the nature of how the North and the South interact and negotiate. My recommendations – country categorization, communication, and CDM – include potential concerns and solutions for each side.

Re-categorization of countries

As mentioned, the current categorization reflects an obsolete view of the current global economy and key geo-political factors, not to mention a lack of correlation with the actual highest emitters. Re-conceptualizing a new category structure should involve ensuring that the categories are relevant to today’s world and that they make sense in terms of the Protocol’s objective. Although this seems like a simple solution, the restructuring of current categories presents the risk of reigniting North/South tensions and entrenching current positions. Keeping this in mind, my proposal calls for a revised configuration of the current system with two new categorical distinctions. Rapidly Developing Economies (RDE) would be a subcategory within Annex I while Most Vulnerable, Least Developed Economies (MVLDE) would be a subcategory to the non-Annex I category. Developing and using these two new categories would obviously entail changing the members of the current Annex I, Annex II, and Non-Annex I countries. In Figure 1, on the following page, I present a graph comparing countries according to four different criteria: the first column has current Annex I members, the second column has current OECD members, the third column has G20 members and the last column has the highest 20 CO₂ emitters. The purpose of the graph is to demonstrate the overlap between these groups and make an argument for moving RDEs into the Annex I category.
Figure 1 - Comparative Country Categorization

<table>
<thead>
<tr>
<th>Annex 1*</th>
<th>Current OECD**</th>
<th>G20***</th>
<th>Highest Emitters****</th>
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<td>Argentina</td>
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<td>United States</td>
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Sources and Data
* Kyoto Protocol
** www.oecd.org
*** www.g20.org
**** www.ucsusa.org Union of Concerned Scientists
The original Annex I category, countries bound to emission targets, was made up of OECD countries plus the former Soviet states and countries under the Soviet sphere of influence, EITs. With the exception of Belarus, Croatia and the Ukraine, the other EITs have joined the EU so the distinction between Annex I and Annex II is no longer very relevant. I propose having a similar distinction between Annex I and Annex II with the RDEs replacing the role of the EITs. This would mean that RDEs like Mexico, Brazil, China, India, South Korea, South Africa, and Saudia Arabia would be bound to emission targets but would not yet have the responsibility to provide financing. By using the same logic of defining Annex II categories according to OECD membership, Mexico and South Korea, OECD member countries as of the mid 1990s would, in theory, immediately form part of Annex I and Annex II categories. However, this brings up the question of countries like Brazil, India, South Africa and China, all of whom are part of the G20. Although I chose to use the G20 as an example, there are many other indices that categorize and define Emerging Markets and RDE, such as the Morgan Stanley Emerging Markets Index.

The G20 was established in 1999 and “together, [its] member countries represent around 90 percent of global gross national product, 80 percent of world trade as well as two-thirds of the world’s population. The G-20’s economic weight and broad membership gives it a high degree of legitimacy and influence over the management of the global economy and financial system.” (www.g20.org, About G20) The G20 highlights the role that RDEs are already playing in the global economy and demonstrates their established (and ubiquitous) status as a category. The last column shows the 20 highest CO₂ emitters. Again, the purpose of including this column is to demonstrate the correlation with the other three columns and to support the proposal of including RDEs in Annex I.

The new Protocol will require higher emission reduction across the board so countries with binding targets will have to find ways to meet their goals. By having the RDEs within Annex I, countries can use the joint implementation (JI) mechanism and in some regard, formalize the trend that has been occurring with CDM projects clustering in these countries. At the moment, these countries are reaping the benefits of CDM projects without having to compromise emission growth in other parts of their economy; this is especially troubling given the fact that China, India, and Brazil all rank within the top 10 highest overall emitters (www.ucsusa.org Union of Concerned Scientists). Diverting these big CDM projects toward JI and applying it toward Annex I binding targets, might actually begin to reduce overall global emissions and would allow the opportunity to improve and provide more flexibility for CDM projects, including the potential for South to South projects.

The other category that I propose creating, the MVLDE would build on the work that the United Nation Framework Convention of Climate Change (UNFCCC) is already doing with a group of 49 Least Developed countries and their National Adaptation Programme of Action (www.unfccc.int). Out of the 49 countries, only one is not a party to the UNFCCC (http://unfccc.int/cooperation_and_support/ldc/items/2666.php). The inclusion of this new subcategory would signal the heightened importance of adaptation as a climate change strategy and would also give a voice to the most vulnerable countries. The UNFCCC group of Least Developed Countries includes representation from sub groupings such as the Small Island and Land-Locked developing states (www.unfccc.int). This inclusion would also imply a real commitment from Annex II countries to provide financing for adaptation. Criteria would need to be established to differentiate foreign aid from adaptation funding as well as standards for what qualifies as adaptation. The current structure of financing and management, 2% of the share of proceeds
from certified emission reductions (CERs) and a governing board with assistance from the Global Environment Facility and World Bank could be a point of serious debate and negotiation (http://unfccc.int/cooperation_and_support/financial_mechanism/adaptation_fund/items/3659.php).

Although the two new categories fall within the same basic architecture as Kyoto, negotiating binding emission reduction targets for the developing countries, specifically the RD Es will be a challenge. The tension regarding this point was openly displayed at the Bali Talks when both India and the United States threatened the possibility of the deal; India wanted to ease the obligations of the developing world and the United States stood firm on its stance of wanting the developing world to lower its emissions. The culmination of the tension took place when the Papua New Guinean representative responded to the U.S.'s objection with: “we ask for your leadership. We seek your leadership. But if for some reason you're not willing to lead, leave it to the rest of us. Please get out of the way” (Harris, NPR 2008).

For the North, the issue of binding targets for developing countries is crucial and has been, in the case of the United States, a deal breaker. Parcelling out the RD Es from the other developing countries and holding them to emission reduction targets would be a success, especially if it then guaranteed that the United States would ratify. A potential sticking point for the North is how much they are willing to bargain and/or how much effort they are willing to invest in attempting to create different deals with multiple groups within the G77.

The South, on the other hand, is faced with significant trade offs and conflicting perspectives. If the G77 loses its cohesion, it loses the force behind its negotiating power; without China, India, Brazil and Mexico, it has significantly less leverage. Although the G77 stands to gain a lot in this particular negotiation, it does compromise its potential negotiating power in the future. The possibility also exists that in the future the opportunity to negotiate will not be as good. A sign that the time may be right is the rumbling of internal pressures and fissures coming from the G77. Can the G77 realistically still represent the interests of the least developed and most vulnerable to climate change, oil producing nations and emerging markets under one umbrella? And is it in their best interest to do?

As the highest overall polluter, China can no longer hide behind the excuse that it is not and has not contributed to this problem, which puts it directly at odds with other G77 members, such as Small Island developing states. This is especially awkward for China now that the least developed and most vulnerable states have been galvanized and are more vociferous about their demands for adaptation. Additionally, as China has emerged as an economic power, it has expanded its sphere of influence, economic reach, and foreign investment in least developed countries, often garnering a perception and reputation of a neo-colonial power. However, accompanying these negative feelings is the realization that China represents a country with a growing demand and market share, something on which many of these countries depend. This presents a paradoxical situation for the developing and least developed: they no longer view China as representing their needs or interests, but they also acknowledge that China has significant leverage.

The leverage point in the negotiation will come down to whether the developed countries can convince the developing, specifically the least developed, that they are committed to financing Adaptation and that they will reform the CDM mechanism so that it will actually function to deliver technology transfer for the purpose of sustainable development. The developed countries also have
to make a case for why incorporating the RDEs into Annex I and holding them to emission reduction targets is beneficial to everyone. The RDEs should take this opportunity to negotiate the best possible deal, including grace periods, phased approach, technology transfer, and enhanced JI.

**Enhancing communication through Working Groups**

The objective of the Working Groups is to cultivate information sharing that transcends the North/South divide, erodes the myth that information and solutions only flow from the North to the South and to focus conversations on the technical areas relevant to the negotiations and to promoting sustainable development and reducing emissions. By focusing on topics from the list of sectors, sources and gasses in the Protocol’s Annex A (such as solid waste disposal on land, waste incineration and methane), countries would be able to engage in conversations around the specifics of reducing emissions and would gain more information and expertise about each area (an important point for developing countries that are markedly less knowledgeable and have fewer resources to dedicate to research and preparation). The hope is that the Working Groups would lead to countries aligning themselves and negotiating according to what is actually important to them, instead of along pre-established blocks. Since it is unclear that the plenary presentations actually lead to improved negotiation, the Working Groups present another way of arriving at an agreement. Through smaller groups, countries would be able to explore and discuss topics that are important to them and tackle the issue of climate change in more digestible amounts. This would in theory move the process along so that countries don’t get stuck and waste time on arguing and negotiating over the use of semi colons and slashes (Harris www.NPR.org).

By talking about climate change solutions according to gasses, sources, and sectors, with groups of countries interested in those specific areas, the conversation and understanding of climate change solutions would naturally move in a more holistic direction that would reflect how countries interact in the global economy and the role of emissions within transnational supply chains. Countries would engage in conversations, for example, about methane capturing and discuss issues around waste management. This facilitated discussion would entail covering the technology around methane capturing, storage and transport, potential markets and uses for methane gases, and how to reform or work with local waste management systems. Since, in many developing countries, waste management overlaps with issues around informal labor, human rights, and health, South-to-South information sharing and technology transfer is crucial to finding appropriate solutions. As countries and cities start implementing sustainable development models, these working groups could also open the door for other types of partnerships and forms of information sharing, such as city-to-city partnerships.

The implementation of these working groups would have the biggest impact on the planning and proceedings of the Convention of the Parties conferences. Prior to the conferences, the planning committee would ask countries what topics (out of a list, perhaps from the very Protocol Annex A) they were interested in for the Working Group meetings. A selection of the most popular topics that are relevant to the negotiation would be chosen and then countries would have to decide which meetings to attend. The Working Groups would also open up the opportunity to have, on a limited scale, presentations and facilitation from non-state actors: specialists from academia, businesses, or NGOs. Since each Working Group would have the potential for smaller scale, topic specific negotiation, facilitation would be a key skill required of the presenter at each Working Group. In addition, the pre-
senter would have to keep in mind the other objectives of the Working Group, like information dissemination, creating new linkages between countries and generating greater understanding and new ways of seeing how to reduce emissions and how to address climate change solutions.

Since the working groups don't form part of the official Protocol, it would be up to the UNFCCC and the host country to incorporate the Working Groups and manage the hiring of the facilitators, choosing presenters and ultimately choosing the topics for discussion. These are all areas that would have to be planned out carefully in order not to cause more turmoil between the North and the South. Another aspect to consider would be whether the Working Groups would continue beyond the Conference and if they did, in what form? They could become repositories of information and try to collect best practices, but the drive to spend resources for this type of activity would have to come from the countries themselves.

**Reconfiguring the CDM**

One of the most difficult areas to negotiate prior to and at Copenhagen will be how to reform the CDM or if to keep it at all. As I've mentioned, the CDM represents the space in which the developed and developing countries interface, so it is going to be a topic of heated discussion and scrutiny. However, given the difficulty of multilateral negotiations and the challenges of creating, negotiating and ratifying Kyoto, countries might decide to keep this basic structure in place. What will be up for negotiation and revision will be what defines a CDM project and the administrative requirements, such as the definition of additionality, boundaries, and monitoring. Due to the likely higher emission targets, both the developed and developing countries will have an interest in expanding the number of projects. I propose reconfiguring the CDM by relaxing the administrative requirements and definitions, and making emission reductions along supply chains.

The concept of the CDM’s within a supply chain is an attempt to take a more comprehensive view of the projects vis-à-vis their place in the global economy and their impact on local environments. The supply chains would highlight the possibility for technology transfer or applying standards, as well as would enable the possibility of measuring rippling (positive or negative) effects. By using a supply chain “model,” transnational companies can be held accountable and their activities can be traced to ensure they are truly making an effort to reduce emissions and have positive social and environmental impacts. This would also help inform how and to what degree fossil fuels are integrated into the economy of developed and developing countries and what choices are possible in terms of substitution and for adopting a sustainable development model. Also, this sort of perspective is more and more popular as consumers are interested in knowing the life cycle assessments and “ecological footprints” of the products they are purchasing. By looking at the whole supply chain, the opportunity to measure impacts of projects on smaller businesses or on local populations with which they come into contact would be possible, and in contrast with industry focused emission reductions, supply chain emission reductions, would not penalize or disadvantage developing country enterprises. Supply chain CDM would also help in the transfer of technology because it would take place within a natural corridor with businesses helping businesses with which they already work and have a relationship. Again, unlike in the industry reduction model where technology transfer would happen horizontally, along supply chains, technology transfer would not have to be shared with competitors.
Although the overall requirements for CDM projects would be less stringent, projects would have to include an element that made them qualify as a “supply chain CDM,” either a clustering of businesses along a chain or a project that had effects that went beyond one business. Along these lines, I also propose that each project have a requirement of catalyzing change or promoting transformation. The intention of this requirement is to confront the problem of projects that are meaningless to the actual goals of CDM. Although these criteria might be hard to measure, it is important to keep the concept present so that the goal of the CDMs doesn’t get lost. CDMs along supply chains provide a much more dynamic model that actually reflects the real interaction between developed and developing countries and the complexity inherent in transitioning to sustainable development.

It is not immediately clear who would be in favor or against a proposal like this one. On the one hand, the North could argue that their multinational companies, the supply chains of which they form a part, would be unfairly targeted. However, it is not obvious that that would be a negative consequence. The South could also take the position that by focusing on the supply chains the CDM was once again failing to focus on sustainable development. Although there are weaknesses to this model, the advantage is that it really serves as a microcosm of the global economy and tests whether climate change actions, policies, and technology will succeed. It also reflects the complicated economic and social links between the developed and developing world.

The most challenging aspect of this plan will be establishing project boundaries and monitoring. The same problems (such as breaks in the supply chain and subcontracting) that confront projects hoping to establish standards or certification across supply chains would face these projects. The chaos of the supply chain would be a departure from the current rigid CDM system and could compromise its success.

In this paper, I proposed three methods for areas to improve the interaction, negotiation, and implementation of the post-Kyoto instrument. Ultimately, my proposal is hinged on breaking down the antiquated, albeit ever-present, North/South blocks and introducing new and creative ways of interaction. I presented a new way of conceiving the CDM that would go beyond the current rigid structure in both concept and practice. What remains to be seen is whether the North and the South are willing to put their differences aside in order to find common ground and together face the issue of climate change.
References


The Role of NAMAs in Developing Countries: Including a Registry and Carbon Credit Permits in the New Copenhagen Protocol

Kwanbo Kim

I. Problem Statement: Why New Proposal?

The growing widespread agreement of the scientific realities of climate change in the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) requires aggressive action on mitigation and the adaptation of measures against the prospect of climate change (Aldy and Stavins, 2007; IPCC, 2007; Mastrandrea and Schneider, 2008; Miller, 2008; Moomaw, 2008; Pachauri, 2008). The “Callendar Effect” (Moomaw, 2008), environmental diplomacy (Susskind, 1994; Putnam, 1988), and the IPCC’s synthesis report enables us to understand the impacts and response of climate change (CC) along with the importance and role of climate science. This knowledge allows us to intelligently design a new Post-2012 Kyoto Protocol to successfully achieve the goals of UNFCCC in the international environmental treaty making negotiation.

The question is: What form should the next post-2012 CC treaty framework take? The bottom-line should be how to create a robust and sustainable policy architecture that can promote broad participation and achieve a substantial mitigation of CC risks in a cost-effective way as Aldy and Stavins (2007) mentioned. The 1997 Kyoto Protocol was the first step in coping with the problem of CC and pursuing the goals of the UNFCCC. However, while Kyoto Protocol provided market-based institutions including broader coverage of emissions sources and sinks and some temporal flexibility (CDM, JI, ETS) in complying with emissions commitments, it generated very perverse and weak incentives for participation in the collective action on CC policy. For this reason, some developing countries and major emitters such as United States, China, and India have not joined the Kyoto Protocol (Aldy et al., 2003; Moomaw et al., 1999).

In this context, the purpose of this paper is to identify the incentive mechanism for developing countries to participate in the New Copenhagen Protocol or the Amendment to the Kyoto Protocol. The Bali Action Plan provides the source of how to draw such an incentive mechanism. Based on Paragraph 1 (b) (ii) of the Plan,

<table>
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<tr>
<th>ABBREVIATIONS</th>
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<tr>
<td>AAU</td>
<td>Assigned Amount Units</td>
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<td>CC</td>
<td>Climate Change</td>
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<td>CDM</td>
<td>Clean Development Mechanism</td>
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<td>CER</td>
<td>Certified Emission Reduction</td>
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<td>COP</td>
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<td>ERU</td>
<td>Emission Reduction Unit</td>
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<td>ETS</td>
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<td>EU</td>
<td>European Union</td>
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<td>GHG</td>
<td>Greenhouse Gas</td>
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<td>IPCC</td>
<td>Intergovernmental Panel on Climate Change</td>
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<td>ITL</td>
<td>International Transaction Log</td>
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<td>JI</td>
<td>Joint Implementation</td>
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<td>KP</td>
<td>Kyoto Protocol</td>
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<td>LDCs</td>
<td>Less Developed Countries</td>
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<tr>
<td>LULUCF</td>
<td>Land Use, Land-Use Change and Forestry</td>
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<td>RMU</td>
<td>Removal Unit</td>
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<td>UNFCCC</td>
<td>United Nations Framework Convention on Climate Change</td>
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NAMAs (Nationally Appropriate Mitigation Actions) are important self-governing working rules (Ostrom, 1990) for developing countries to participate in the New Copenhagen Protocol (or the Amendment to the Kyoto Protocol). Many developing countries are domestically taking NAMAs based on domestic environment and development policies without any recognition or benefit in the Kyoto Protocol and the UNFCCC. It is time to recognize the incentive mechanisms for enhancing the NAMAs of developing countries in next climate regime to overcome tragedy of the commons (Hardin, 1968; Ostrom, 1990, 2005; Prins and Rayner, 2007).

To do this, as incentive mechanisms, this paper proposes the Linkage Protocol of Registry and Carbon Credit Permit for NAMAs of Developing Countries (RCCP Protocol), which should establish simultaneously both the Registry System and Carbon Credit Permit System of NAMAs in the New Copenhagen Protocol.

II. Theoretical Characteristics of NAMAs for Incentive Mechanism

NAMAs can be diversely approached in domestic socio-economic development. Various national policies and instruments are available to governments to create the incentives for mitigation action. Their applicability relies on national circumstances and an understanding of their interactions. However, based on the experience from implementation in various countries and sectors, there are advantages and disadvantages for any given instrument (IPCC, 2007). Several characteristics of the NAMAs can be utilized to explore incentive mechanisms as follows.

1. NAMAs as Bottom Approach

NAMAs as a voluntary action play an important role in providing a bottom approach under the international climate regime. Reflecting on rule-configuration of multiple-level analysis (Ostrom, 1990), operational-level rule of NAMAs of each country can be affected by the collective-choice rule (Kyoto Protocol) and constitutional-level rule (UNFCCC). Currently, NAMAs of developing countries in the operational level are not being recognized internationally because the Kyoto Protocol does not require the commitments of GHG emissions reduction. Only the Protocol allows the actions to Annex I. Therefore, the NAMAs of developing countries should be recognized internationally by establishing the NAMAs in the New Copenhagen Protocol. Collective action problems could occur when a lack of motivation, and/or missing or asymmetric information generates incentives that prevent the NAMAs of developing countries from satisfactorily resolving a collective action situation, namely, climate change treaty negotiation and implementation (Bradshaw et al., 2000; Ostrom, 1990; Paavola, 2008).

2. NAMAs as Self-governing Working Rules

In the global environmental treaty, domestic rule can be considered as a self-governing working rule. NAMAs of developing countries are similar kinds of self-governing working rules (Ostrom, 1990; Paavola, 2008). Even if NAMAs of developing countries are not governed by the formal rules, that is, the Kyoto Protocol and the UNFCCC, they are being governed by domestic rules, which have been contributing to the efforts of GHG emission reductions under the intention of UNFCCC and Kyoto Protocol. In short, NAMAs as self-governing working rules can reduce the transaction cost of mitigation and adaptation activity in the climate change policy at domestic and international levels. There
has been a growing gap between the domestic real actions of climate change impact and existing international regimes. We need to fill this gap.

3. NAMAs for Partnership between Developing and Developed Countries

The Bali Action Plan demands NAMAs of both developing and developed countries. In order to enhance fairness and effectiveness of the climate regime under changing national and international circumstances, the key issue is how these NAMAs will reflect the principle of common but differentiated responsibilities and respective capabilities through the collaborative and cooperative partnership between developing and developed countries including the United States.

Historically, high power Parties like the 1996 United States position preferred distributive (competitive and coordinated) relationships to collaborative and cooperative relationships (UNFCCC and Kyoto Protocol) by many actors in the international environmental treaty making (Chester et. al., 2008; Larson, 2003; Najam et al., 2004; Roberts et al, 2004). However, these NAMAs will enhance collaborative and cooperative partnership between developing and developed countries.

III. Linkage Protocol of Registry and Carbon Credit Permit for NAMAs of Developing Countries (RCCP Protocol)

We identify the linkage proposal of establishing the registry system and carbon credit permit system of NAMAs, which is missing in the current Kyoto Protocol or the UNFCCC. Two systems of NAMAs should be simultaneously institutionalized in the New Copenhagen Protocol as incentive mechanisms for the participation of developing countries. In this section, each system will be developed in detail.

1. Establishment of a Registry System for NAMAs of Developing Countries

For the mitigation of GHG emissions, the New Copenhagen Protocol should establish a Registry System of NAMAs of developing countries.

(1) Rationales for the Establishment of a Registry System

There are several rationales for proposing the establishment of a Registry System of developing countries. First, developing countries are expected to take NAMAs based on Bali Action Plan (Paragraph 1(b) (ii)):

“(iii) Nationally appropriate mitigation actions by developing country Parties in the context of sustainable development, supported and enabled by technology, financing and capacity-building, in a measurable, reportable and verifiable manner.”

Second, these NAMAs should be recognized internationally for inducing participation and implementation of developing countries in the international CC regime. In order to be recognized internationally, these actions can be registered in a Registry of NAMAs. At the moment, NAMAs already implemented by developing countries are not recognized internationally as a mitigation action because they are conducted only in the context of domestic actions.
Third, the NAMAs that can be registered are voluntary and non-binding.

Fourth, the Registry System of NAMAs could serve as a basis of institutional framework of recognizing domestic actions of developing countries.

Finally, the Registry System of NAMAs can provide an incentive for enabling developing countries to participate in and implement the New Copenhagen Protocol.

(2) Scenario for the Operation of Registry System

a) Concept and functions of Registry System

The GHG emissions trading registry of developing countries should be an electronic database for the administration of emissions allowances of NAMAs. The registry ensures the precise tracking of holdings, issuances, transfers, cancellations, and retirements of emissions allowances and Kyoto or Copenhagen units. Also, the registry will enable developing countries’ companies to perform transactions such as trading allowances and retiring them at the end of the commitment period. With its domestic legal provisions, a developing country emissions trading registry will be jointly governed by an agency (governmental agency or a quasi-government organization, association, etc). The agency will be in charge of the management of registry and function as a contact point for national and international authorities. Also it will be responsible for the operational management of the registry and provide account holders with information and support.

b) Extent and Scope of NAMAs Registered

The extent and scope of NAMAs registered should be gradually and broadly considered based on national circumstances and domestic development policy through COP negotiation. Reasonable extent and scope of them can induce developing countries to participate in and comply with the New Copenhagen Protocol. One alternative is a “broad and moderate” agreement, which achieves moderate per-party mitigation and induces full participation among developing countries. NAMAs can include the following examples:

- National low carbon development plans that result in active deviations of emissions behavior from business as usual including, for instance, specific energy policies aimed at improving the carbon and energy intensity.
- Increased participation in the carbon market by sectoral trading and sectoral crediting schemes.
- Sustainable development policies and measures.

c) Basic Direction and Types for Operation of Registry of NAMAs

i) Basic Direction

The operation of Registry System established for developing countries in the New Copenhagen Protocol can be adopted from the current registry system under the Kyoto protocol. A registry system under the Kyoto Protocol is being currently operated for the developed countries as follows. The emission targets for industrialized country Parties to the Kyoto Protocol are represented as lev-
els of allowed emissions, or “assigned amounts” (Kyoto units), over the 2008-2012 commitment period. The ability of Parties to add to their holdings of Kyoto units (e.g. through credits for CDM) or move units from one country to another (e.g. through ETS or JI projects) requires registry systems that can track the location of Kyoto units (UNFCCC).

ii) Types of Registry

In the domestic level, like developed countries of Annex B, developing countries can operate national registries, containing accounts (i.e., operator holding account and person holding account) within which units are held in the name of the government or in the name of legal entities authorized by the government to hold and trade units. The developing countries’ emissions trading registry will be connected with the national registries of other Kyoto Parties including all Parties in the New Copenhagen Protocol with an emissions reduction commitment via the UN’s International Transaction Log (ITL), which keeps track of all issuances, transfers, and cancellations of allowances in the national registries.

In the international level, the following UNFCCC provisions can be applied to the New Copenhagen Protocol. The UNFCCC secretariat, under the authority of the CDM Executive Board, can implement the CDM registry for issuing CDM credits and distributing them to national registries of all Parties including developing countries. Accounts in the CDM registry will be held only by CDM project participants.

d) Monitoring and Reviewing of the Progress of NAMAs

Along with providing monitoring and reviewing rules in the domestic Registry Act at the national level, the ITL can review and monitor registry transactions of NAMAs, in real time, to ensure they follow the rules and procedures agreed under the current Kyoto Protocol and the New Copenhagen Protocol. The ITL can require registries to terminate transactions they propose that are found to infringe on the rules of Kyoto Protocol and the New Copenhagen Protocol. In verifying registry transactions, the ITL can provide an independent check that unit holdings are being recorded accurately in registries through the initialization of registry connections (documentation review, connectivity testing, functional testing). See Figure 1.

Figure 1. Registry system in the New Copenhagen
2. Carbon Credit Permit (Recognition) System for NAMAs of Developing Countries

The New Copenhagen Protocol should recognize the Carbon Credit System for the verifiable mitigations arising from the NAMAs of Bali Action Plan, Para. 1(b)(ii) (explained above) as a sustainable source of finance and technology transfer for mitigation actions of developing countries. Carbon credit for NAMAs can be established under the UNFCCC as one of the means of finance and technology transfer mechanism for the Bali Action Plan while the CDM under the Kyoto Protocol is basically a compliance mechanism for Annex I (developed countries). Revenue from the sales of the credits will link to financial assets and technologies necessary for the NAMAs of developing countries.

(1) Rationales for the Permit of Carbon Credit for NAMAs of Developing Countries

There are several rationales for proposing the carbon credit permit (recognition) for NAMAs of developing countries. First, a new climate change treaty calls for a sustainable source of finance and technology for the mitigation actions of developing countries based on Bali Action Plan (Paragraph 1(b)(ii)) as previously stated.

Public funding is not sufficient to cover all the financing and technology transfer costs of developing countries. So we need to scale-up or provide alternatives for financial resources and technology assistance for mitigation actions. To contribute to the financial underpinning of the new global climate change arrangement, the carbon credit permit is necessary.

Second, even if mitigation actions of developing countries (i.e., national low carbon development plans, increased participation in the carbon market) should be supported by financial flow and technology transfer, most of the financial resources and technologies are in the hands of the private sector. The governments of the Annex I Parties can play only a limited role in transferring financial resources and technologies. One of the crucial factors in up-scaling financial flows to mitigation actions in developing countries is to improve commercial viability of investments.

Third, this carbon credit permit system provides win-win incentives for mitigation actions of developing countries along with a deeper target for Annex I developed countries, encouraging developing countries in the NAMAs supported and enabled by technology, financing and capacity-building, in a MRV (measurable, reportable, verifiable) manner.

Fourth, the New Copenhagen Protocol should provide systematic incentives for the NAMAs of developing countries through the treaty making negotiation. What is lacking is not money and technology, but a climate regime which could improve commercial viability of investments for mitigation of developing countries.

Fifth, NAMAs can be taken even without the preparation of finance and technology if mitigations done in a MRV way could be awarded carbon credits. Current international climate treaty policy does not have an institutional mechanism to recognize and encourage such voluntary and unilateral actions. Many developing countries have been already taking NAMA to reduce GHG emissions. They could sell these credits and improve commercial viability of their investment in mitigation actions and would adopt appropriate policies and measures to create enabling environments, in particular for attracting domestic and international investment by scaling up finance and technology flow.
Finally, the carbon credit permit system is beneficial to Annex I countries by buying carbon credit at a cheaper price than the cost of domestic mitigation within Annex I. Annex I countries (industrialized countries) could accept additional deeper targets to create demands for the credits from developing countries. Annex I countries have already agreed to support mitigation actions of developing countries by transferring finance and technologies. Thus buying carbon credit is not new nor is it an additional burden.

(2) Scenario for the Operation of Carbon Credit Permit System

a) Concept and Functions of Carbon Credit Permit Systems

The carbon credit permit (recognition) system is to allow the credit holder of NAM As of developing countries to emit one ton of carbon dioxide. Credits can be awarded to countries or inter-groups (coalitions) that have reduced their green house gases below their emission quota in the international carbon market.

The carbon credit system has been currently ratified in conjunction with the Kyoto Protocol. Its goal is to stop the increase of carbon dioxide emissions. However, it is for Parties with commitments under the Kyoto Protocol (Annex B Parties), not for developing countries. Over the 2008-2012 commitment periods, the allowed emissions are divided into “assigned amount units” (AAUs). Emissions trading in Article 17 of the Kyoto Protocol allow countries that have emission units to spare to sell this excess capacity to countries that are over their targets.

Other trading units traded in the carbon market are a removal unit (RMU) on the basis of land use, land-use change and forestry (LULUCF) activities, an emission reduction unit (ERU) generated by a joint implementation project, and a certified emission reduction (CER) generated from a clean development mechanism project activity (UNFCCC; Table 1; Figure 2).

Table 1. Types of Various Emission Allowances and Possible Carbon Credit Permit

<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
<th>Source</th>
<th>Legal foundation</th>
<th>Possible Credit Permits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAU</td>
<td>Assigned Amount Unit</td>
<td>Unit of the total amount of allowed emissions under the KP</td>
<td>Article 3. KP</td>
<td>Emission Units</td>
</tr>
<tr>
<td>RMU</td>
<td>Removal Units</td>
<td>Increase in carbon sinks in the biosphere</td>
<td>Marrakech Accords</td>
<td>Emission Credits</td>
</tr>
<tr>
<td>ERU</td>
<td>Emission Reduction Units</td>
<td>Converted from AAUs or RMUs in JI projects</td>
<td>Article 6. KP</td>
<td>Emission Credits</td>
</tr>
<tr>
<td>CER</td>
<td>Certified Emission Reduction</td>
<td>Issued in the CDM Registry under the projects within the framework of the CDM</td>
<td>Article 12. KP</td>
<td>Emission Credits</td>
</tr>
</tbody>
</table>

Note: UNFCCC and KP
This carbon credit permit system can function as a mechanism of financing and technology transfer to developing countries (French, 2007). It could help to achieve equity (sharing of costs of action and effort-sharing) among developed and developing countries, efficiency (channeling scarce resources to key areas at least cost), and predictability of carbon market information produced and traded. ETS, which is carbon trading schemes for EU, is being reported to function efficiently in minimizing the costs of mitigation among European countries. In the same context, developing countries can be the driver of the global carbon market if they could generate carbon credits from their NAMAs done in a MRV way. In particular, a carbon market based on NAMAs by a carbon credit permit system will be more conducive to sustainable development because NAMAs will be taken in the context of sustainable development by developing countries.

b) Criteria and Methodologies of the Carbon Credit Permit for NAMAs

The operational criteria and methodologies of the carbon credit permit system should be gradually and broadly considered based on national circumstances and domestic development policy through COP negotiation. As one benchmark, the new operational rules of NAMA credits can be adopted from the existing project-based CDM rules, criteria, and methodologies (CER credit). Verifiable mitigations from NAMAs could be awarded carbon credits as part of a package for the Global deal to be finalized by the end of 2009.

Current CDM is already functioning as a carbon credit mechanism for developing country projects. However, the CDM in its current form of project-specific nature is not able to generate financial flows needed under a global deal. It is estimated that climate stabilization would require 20-70 billion US$ by 2020 and up to 100 billion US$ by 2030. The capacity of current CDM is about 400 projects registration per year and 6 billion US$ at current carbon prices (MOFAT, 2008).

Additional credits (RMU, ERU) can be awarded through the New Copenhagen Protocol or Amendment to the Kyoto Protocol by participation of the non-Annex 1 countries. The details of methodologies necessary for the operation of NAMA credit scheme could be continuously elaborated after 2009.
Necessary requirement is to only prepare project proposals for NAMA. Project proposals can be submitted to banks to get loans and initiate NAMAs. The loan would be paid back with the revenue from the sales of the carbon credit generated from NAMAs as in the case of unilateral CDM.

c) Linkage of Carbon Credit Permit System and Registry of NAMAs

To be effective, this carbon credit permit system should be linked to the Registry System of NAMAs for developing countries as proposed previously. Transfers and acquisitions of these units are tracked and recorded through the registry systems under the Kyoto Protocol and the New Copenhagen Protocol. An ITL secures transfer of emission reduction units between countries. New Copenhagen Protocol should focus on an agreement on one package of these two proposals for the incentives of participation and compliance of developing countries in the new climate regime, which will encourage the active efforts of NAMAs.

3. Expected Contributions of Linkage Protocol of Registry and Carbon Credit Permit from NAMAs of Developing Countries (RCCP Protocol)

The Linkage Protocol of Registry and Carbon Credit Permit (RCCP Protocol) will play an active role to contributing to the implementation of the Bali Roadmap action plan along with attaining the goals of UNFCCC and the Kyoto Protocol on CC policy.

First, the linkage proposal will encourage developing countries to actively participate in and comply with the New Copenhagen Protocol.

Second, if an appropriate share of proceeds from carbon credits from NAMAs to adaptation funds could be fairly allocated along with the registry system, the linkage proposal will make a significant contribution to coping with mitigation, finance and technology transfer, adaptation, and sustainable development issues rising from global CC treaty making negotiation. Also it could support LDCs by allocating proceeds for adaptation fund as in the case of CER from CDM.

Third, the linkage proposal will monitor and review, in real time, the progress of NAMAs in developing countries through the transparency of the Registry System. Finally, the linkage proposal with Annex I’s deeper target demands for credits will expand the global carbon market so that developing countries could play an active role in enhancing commercial viability of investments and scaling up financial flows for the mitigation in the form of NAMAs.

IV. Concluding Thoughts: Two-Tracks Negotiation for the Linkage Proposal Agreement and Implementation

To make effective and sustained implementation of the UNFCCC and to supplement the weakness of the Kyoto Protocol, the Bali Action Plan has identified adaptation as one of the five key building blocks (shared vision, mitigation, adaptation, technology and financial resources) for a strengthened future response to CC through long-term cooperative action (UNFCCC). As one strategy of the Bali Action Plan, this paper proposes the linkage package of Registry and Carbon Credit Permit Systems based on “Nationally appropriate mitigation actions” by developing countries for the New Copenhagen Protocol.
The linkage proposal of Registry and Carbon Credit Permit can be pursued through the two tracks of COP negotiation. One is the UNFCCC Track. In this track, the linkage proposal could be adopted in the New Copenhagen Protocol to the UNFCCC. In the New Copenhagen Protocol, all nations (Annex I+ Non-Annex I countries) should participate. No country can be an exception in doing proactive and reactive actions to cope with the impact of endless CC.

The second is the Kyoto Protocol Track. In this track, the linkage proposal could be adopted in the Amendment to the Kyoto Protocol by all countries nations including the greatest CO₂ emitters: United States, China, and India (Buchner and Carraro, 2006).iv, v

In short, 2009 is a crucial year in the international environmental effort to address CC, finalizing in the UNFCCC (COP 15) in Copenhagen, on 7th -18th December. We hope the Parties, in advocating these options, will bring about an ambitious and effective international response for agreement and implementation of the Linkage Proposal of the operation of Registry System and Carbon Credit Permit System for NAMAs of Developing Countries.

REFERENCES


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Notes

i (b) Enhanced national/international action on mitigation of climate change, including considera-
tion of ... (ii) N ationally appropriate mitigation actions by developing country Parties in the context
of sustainable development, supported and enabled by technology, financing and capacity-building,
in a measurable, reportable and verifiable manner.

ii Common or common-pool resource, such as a lake, an ocean, an irrigation system, a fishing ground,
a forest, the Internet, or the stratosphere, is a natural or man-made resource from which it is difficult
to exclude or limit users once the resource is provided by nature or produced by humans.

iii The Bali Action Plan specifies “(b) Enhanced national/international action on mitigation of climate
change, including consideration of (i) Measurable, reportable and verifiable nationally appropriate
mitigation commitments or actions, including quantified emission limitation and reduction objec-
tives, by all developed country Parties, while ensuring the comparability of efforts among them, tak-
ing into account differences in their national circumstances”(UNFCCC). Therefore this plan should
give the United States an opportunity which can nationally appropriate mitigation commitments or
actions like those of developing countries.

iv I have greatly developed the proposals in detail based on the basic ideas of Ministry of Foreign
Affairs and Trade, Republic of Korea (MOFAT, 2008). The limitations of original ideas were separate
and simple (only rationales). First, it does not have detailed information package of operation.
Second, it does not provide the linkage of two proposals. Carbon Credit Permit System of NAMAs
will be effective under the existence of Registry system of NAMAs in the international regime. I inter-
viewed with Director, Ki-Hyun Kim for further and detailed proposals which she expects from this
paper on Dec. 3, 2008 by international telephone.

v Reflecting on Aldy et al’s (2003) 13+1 common findings, this linkage proposal for NAMAs of devel-
oping countries can be compatible with alternative international policy architectures (Susskind and
Moomaw, 2007; Andresen, Steinar, 2007; Porter et al., 2000) for global CC to cope with the con-
straints of Kyoto Protocol: 1) provisions for increase developing countries participation over time, 2)
use of market-based instruments, 3) cost constraints through hybrid instruments, and 4) provisions
cope with the weakness of the Kyoto Protocol by using six criteria (the environmental outcome,
dynamic efficiency, dynamic cost-effectiveness, distributional equity, flexibility in the presence of new
information, and participation and compliance).
Revamping the Institutional Framework of CDM

Alejandra Maupomé Cagigal and Diego F. Osorio

1. Introduction

When signed in 1997, the Kyoto Protocol (hereinafter the Protocol) was hailed as a major international achievement towards combating a perceived future global threat: a warming of the globe’s climate brought about by anthropogenic emissions of heat-trapping greenhouse gases (hereinafter GHG). One hundred and eighty five countries signed onto the Protocol, with the aim of reducing, by 2012, the GHG emissions from signatory developed countries by 5.2% – relative to the emission levels in 1990. Of the signatory countries, 183 had ratified the agreement by 2008. Although the Protocol was unparalleled in its kind and is still largely considered a break-through in environmental diplomacy, it has a number of inherent weaknesses.

The weaknesses of the Protocol are the result of the complex political negotiations which took place among government representatives during the 1997 Kyoto Conference of Parties, and the emphasis put at the time on finding common ground among all countries. This was essential to establish a single international framework for reducing GHG emissions, and one that related to most of the world’s countries. The result was a set of GHG emission reduction targets for signatory developed countries, and a set of flexible mechanisms to allow both developed and developing countries to collaborate towards achieving the targets. In summary, the framework defined under Kyoto was as much the result of political negotiations aimed at attaining broad international acceptance, as it was the result of actual climate science.

In terms of science, in 1995 the Intergovernmental Panel on Climate Change (hereinafter IPCC) had just published its second assessment report that linked anthropogenic activities with climate change. A natural course of action was to attempt a reversal of this cause-effect relation, or put in other terms, to reduce those anthropogenic activities that emitted GHG.

Today, with the compliance period defined in the Kyoto Protocol having started in 2008, the con-

ACRONYMS

CDM  Clean Development Mechanism
CERs  Certified emission reductions
CO2  Carbon dioxide
DNA  Designated National Authority
DOE  Designated Operating Entities
EU  European Union
FAO  Food and Agriculture Organization of the United Nations
GHG  Greenhouse gases
IPCC  Intergovernmental Panel on Climate Change
JI  Joint implementation
MtCO2e  Million tons carbon dioxide equivalent
NGOs  Non-governmental organisations
SD  Sustainable development
UN  United Nations
UNDP  United Nations Development Programme
UNEP  United Nations Environment Programme
UNFCCC  United Nations Framework Convention on Climate Change
text surrounding future climate negotiations is different. This change in the negotiation context will come to full swing in 2009 when governments come together at the Copenhagen Conference of Parties to define or reject a post-2012 climate agreement. On one side the science of climate change has become more sophisticated and is more legitimised within the international community. The science offers refined forecasts of the effects of climate change, mitigation strategies to combat the change, and even suggests that tighter carbon dioxide (hereinafter CO$_2$) reductions can not fully reverse the Earth’s warming (In-class presentation by Professor Moomaw, 2008). On the other side stands a mounting international economic crisis and a reluctance of rising economies (primarily China, India) to take on targets when, at the same time, the United States is reluctant to take on targets without them.

At a minimum the results from the Copenhagen 2009 negotiations should reproduce the two objectives of Kyoto: recognise the input from science and set a framework that puts the mitigation of climate change on the international agenda. However, new objectives should be added to the centre-piece of the post-2012 framework, i.e. the implementation of technology and the empowerment of individuals (rather than companies and governments). The incentivization of renewable technologies and the improvement of the energy intensity ratio of everyone's consumption can be within the core of this post-2012 strategy (Gallagher et al, 2006).

In this paper, rather than proposing to create a new international instrument to address these objectives separately from preceding ones, we propose to build upon the structures existing within the Kyoto Protocol. With this aim, we analyse the possible expansion of the scope of the Clean Development Mechanism (or CDM, one of the flexible mechanisms established under Kyoto) to micro-level renewable projects.

We think that this proposal to empower the use of new technologies among new stakeholders in the climate-related markets might find grounds for a broad consensus among the negotiating parties in Copenhagen. First, its core aim is to promote technology and economic development among individuals rather than reducing GHG emissions per se. Indeed it attempts to direct international action to a more efficient use of energy without compromising economic development or imposing financial burdens on emitters. Secondly, because the CDM already has large international support and already incorporates aspects of sustainable development (hereinafter SD), it could find support both from developed and developing countries. Hence, this proposal which takes the aim of achieving SD one step forward, could find agreement between the negotiating parties for the post-2012 commitment period for GHG emission reductions.

2. The existing framework: the Kyoto Protocol and the CDM

2.1 Developed versus developing countries

The Kyoto Protocol set up the first international framework for addressing climate change. It brought to the attention of politicians worldwide the increasing concern among the scientific community about climate change, and it provided the right incentives to finance the scientific research that would legitimise the action that was estimated to be needed. Thus, the scientific community has been a pivotal instrument in negotiations, and one of the core drivers for the resulting proposed actions. The
IPCC has come out with four assessment reports in which it addresses different aspects of the climate change debate: from defining the existence of anthropogenic climate change to assessing the mitigation and adaptation potential and the associated costs of action. As a result, the climate change science is now well grounded and largely accepted at the international level.

The negotiations that brought about the Kyoto Protocol were not without their twists and turns. A key reason was that the scientific knowledge was not as comprehensive as it is now. This provided developed and developing countries with leveraging power to adapt the science to their political advantages. The United States, for example, argued that more scientific clarity was needed before taking on costly emission targets. Developing countries however argued that deferring or avoiding action by industrialised nations (whose anthropogenic emissions brought about climate change) could hinder their population's long-term livelihood and economic development. As a result of this polarisation, the scope and strength of the commitments reached under the Protocol was compromised. Although the United States signed the agreement, its future rejection to ratify it, along with Canada's negation of its acceptance and Australia's only recent ratification of the treaty all show that growing scientific knowledge and strong support from many are not enough to make climate-specific agreements strong and global. Governments and the populations they represent might agree more easily to treaties whose objectives are not specific to climate, but which encourage their population's economic development and reduced energy consumption (and, hence, emissions).

2.2 Sub-optimal results

The polarisation of the negotiations leading to the Protocol meant fewer commitments were reached, and commitments were in cases watered down to find broad agreement. This is the case, for example with the defining of the baseline year of reductions and the duration of the commitment period. For example, the definition of the baseline year of reductions ended up with Russia taking on a 0% reduction commitment relative to 1990 without really reducing its emissions or trading of “hot air.”1

At the implementation level, the short period of commitment raised concerns among participants in Kyoto-based markets, particularly among CDM and Joint Implementation (hereinafter JI) project developers and lenders, about the continuity of financial returns for their prospective investments after 2012. Without such certainty, the only option available to investors is to model their possible financial returns under the possible post-2012 scenarios, and make the best decisions given the available information (and for lenders the best decisions are often the least exposed ones, i.e., not backing CDM projects with uncertain revenue streams). This lack of vision represents an economic burden for the stakeholders, and distorts the flexible mechanisms' intended efficiency as it nurtures the problem of long-term market uncertainty.

The reduction targets and the flexible mechanisms that were framed in the Protocol influenced the dynamics of the climate world. The carbon markets that came together for the trading of credits generated from CDM and JI projects are very active and the number of transactions continues to grow. The trading of credits from CDM and JI projects increased from 1,745 MtCO₂e in 2006 to 2,983 MtCO₂e in 2007. The total value of the operations in the market grew from $31,235 million to $65,035 million in the same period (World Bank, 2008).
This implies a real shortcoming of the CDM process that makes small projects doubly hard to implement. Stakeholders in the planning of a CDM project include the Executive Board of the United Nations Framework Convention on Climate Change (or UNFCCC), the Designated National Authorities (DNA) for project approval and registration, project developers, project lenders, independent financial and management consultancies, and independent Designated Operating Entities (DOE) for emission verifications. The process involves a series of steps for project accreditation, verification, approval, registration and credit issuance. Despite the complex process to register a CDM project the CDM pipeline has 4,200 projects. The Board has already approved the registration of 1,243 of these, and at least 133 have registrations pending. In 2006, transactions of project based CDM accounted for 562 MtCO₂e and increased to 791 MtCO₂e in 2007, representing a monetary value of $12,877 million (World Bank, 2008).

These complex and lengthy procedures, however, forced the scope of the Protocol's flexible mechanisms to capture only projects that were (a) large enough to engender enough reductions of GHG emissions to see large profits in credit sales, and therefore balance out the expenditures of the registration process; and (b) projects with easily quantifiable and verifiable emission reductions so as to assure project approval.

Hence, reductions achieved at a small scale or at an individual level were left out. Such micro-scale emission reductions, although potentially large when grouped together, were as stand-alone “projects,” not profitable enough to outweigh the necessities of the project-by-project mechanism. The lack of a full bottom-up approach in the Protocol left it to governments to develop (in isolation) policies to incentivize individual action to lower emissions. Without international consensus, these policies, for example to promote energy efficiency improvements, were not at the forefront of policy makers’ minds and as such now range from adequate to inexistent. Thus the Kyoto Protocol failed to account for the potential of individual micro-level CO₂ reductions. Yet incentives to bundled-together clusters of micro-level reduction efforts will likely have a significant impact on the reduction commitments (The World Bank, 2007). The upcoming negotiations in Copenhagen provide a good opportunity to address this failure. Hence our discussion centres on our proposal that the CDM be fine-tuned towards a bigger scope of responsibility. This proposition is likely to be well received at the negotiation table, as developing countries will see in its content an invitation to improve their economic development and to increase their population’s welfare.

2.3 The CDM

The negotiation of the flexible mechanisms of the Protocol required intense dialogue between the negotiating parties. Hence, the political differences between developed and developing countries are reflected in the CDM’s double aim to achieve SD in developing countries and cost effective reduction of greenhouse gases (Holm Olsen and Jorgen Fenhann, 2008).

The original design for the CDM came from a proposal for a development fund. China and Brazil concurred in the negotiations leading towards the Protocol that a fund could be created from financial penalties imposed on Annex I countries that fell short of their compliance targets. The fund would then provide developing countries with financial resources to mitigate climate change (UNFCCC, 2000). Developed countries were however disinclined to the concept of a “clean development fund.”
The conceptual framework of the CDM as it stands today was born through an informal working group under Brazil’s leadership. The group worked behind close doors and finally reported to the conference delegates. The working group proposed a development mechanism. Conceptually, to insert SD in the financial mechanism was innovative. Nonetheless, the working group relied heavily in the proposal of the JI for the operational and procedural particulars of the CDM.3

In practice, the implementation of the CDM has put in evidence the deficiencies of the mechanism to achieve SD and to ease the process of accountability for emission reductions. The concerns with the procedural structure of the mechanism are centred on the heavy economic and administrative burden that it imposes on the project developers and on the CDM Executive Board, who have to prove and verify, respectively, the “additionally” of the reductions. Indeed the volume of credits issued for a CDM project are to be equal to the additional emission reductions made possible by the revenue from the credits’ sale, compared to the project without this additional revenue stream. (A frequent example is a new wind farm coming online instead of a typically more economic coal plant, owing to the additional cash inflow found from certified emission reductions (herein after CERs) sales). This formality, called “additionality,” has proven to be a major thorn. As a result, the procedure to register projects under the CDM is slow, expensive, and unreliable.

Other concerns with CDM, more substantial in nature, relate to the extent of its contribution towards SD and its equitable distribution of economic, social, and environmental benefits (Axel Michaelowa, 2005 and Karen Holm Olsen and Jorgen Fenhann, 2008). Indeed, recent publications agree that [if] left to market forces, the CDM does not significantly contribute to SD (Olsen, 2007 as referenced in Karen Holm Olsen 2008).

The heart of these deficiencies is a loophole that can be traced to the negotiations leading to the Protocol. As noted earlier, the ad hoc working group headed by Brazil innovated and re-crafted its clean development fund into the CDM so that the principle of SD be entrenched within the financial mechanism. However, they borrowed the procedures to implement it from the proposal of the JI mechanism, which doesn’t have SD at its core.

Additionally, the CDM was designed to articulate the trading of CERs between Annex I and Non-Annex I countries. This is theoretically inaccurate. Economically, SD is understood as non declining per capita utility for infinity (Neumayer, 2003); however, per capita utility does not decline with time. Therefore, the core objective of CDM can not be achieved by focusing on “reductions,” even when specified to “reductions” in GHG emissions.

Karen Holm Olsen and Jorgen Fenhann (2008) conducted a study of the SD criteria of 744 Project Designed Documents (documents required for CDM registration and which outline the proposed projects, their benefits to climate change mitigation, and their additionality) and the contribution of the projects to de facto SD. Their findings challenged the underlying assumption that the current CDM framework contributes significantly to SD. The study suggests that small-scale projects on average... deliver a slightly higher number of SD benefits with a higher socio-economic profile than large-scale projects (Holm Olsen and Jorgen Fenhann, 2008). This highlights the opportunity that lies in fine-tuning the CDM so that it recognizes small-scale bottom-up initiatives in renewable energy and energy intensity improvement, with such initiatives bundled together into larger-scale sets.
We now turn to developing the rationale behind our support for the CDM’s expansion to small-scale renewable energy and energy efficiency improvements. We then follow with a presentation of the framework of our proposal.

3. An area of opportunity

3.1 Why renewable energy and improvements in energy efficiency

The text of Article 2.1 of the Protocol linked investment in renewable energy and energy efficiency improvements with the commitments to reduce GHG emissions and to SD. The article however, emphasized efforts to change the sectoral composition of the economy, leaving reductions from small-scale projects out of the Kyoto-based emissions offset market:

Article 2.1[of the Protocol]… Each Party included in Annex I, in achieving its quantified emission limitation and reduction commitments under Article 3, in order to promote SD, shall: (a) Implement … policies and measures in accordance with its national circumstances, such as: (i) Enhancement of energy efficiency in relevant sectors of the national economy… (iv) Research on, and promotion, development and increased use of, new and renewable forms of energy… and of advanced and innovative environmentally sound technologies… (vii) Measures to limit and/or reduce emissions of greenhouse gases… in the transport sector.

Consequently, small-scale project development was undermined in the text of the Protocol and thus, in its implementation. This failure is substantial, as the main advantage of including small-scale projects in the emissions offset market is that smaller projects have higher contributions towards SD (Karen Holm Olsen and Jorgen Fenhann, 2008). These contributions include economic development, energy security and the democratisation of energy at the individual and local levels (Gallagher et al, 2006). This is not frequently achieved by larger projects aimed at GHG emission reductions.

3.2 A bottom-up approach to energy security

At a macro economic level, investing in large scale, renewable energy projects makes sense to avoid CO₂ emissions and to reduce countries’ dependencies on oil and gas to generate electricity (Karen Holm Olsen and Jorgen Fenhann, 2008). A clear example is Europe’s substantial investments in renewable energy in order to reduce its reliance on Russian natural gas, and hence increase the security of its fuel supply. However, the investments in renewable energy have been hindered by the high costs of installing renewable energy capacity in relation to the costs of building conventional coal- or gas-fired power plants. The following tables provide cost estimates for various alternative mitigation technologies in the power sector compared to a baseline of coal-fired power stations, and display potential reductions in carbon emissions for Annex I and non-Annex I countries:
Table 1: Cost estimates of alternative mitigation technologies in the power generation sector compared to baseline coal-fired power stations and potential reductions in carbon emissions to 2010 and 2020 for Annex I Countries

<table>
<thead>
<tr>
<th>Energy Source</th>
<th>Generating Costs (€/kWh)</th>
<th>Emissions (Gt C/kWh)</th>
<th>Cost of C reduction (€/t C avoided)</th>
<th>Reduction potential to 2010 (Mt C/yr)</th>
<th>Reduction potential to 2020 (Mt C/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PF+fgd, NOx, etc.</td>
<td>4.90</td>
<td>229</td>
<td>-10-40</td>
<td>103-156</td>
<td>55</td>
</tr>
<tr>
<td>IGCC and supercritical</td>
<td>3.6 - 6.0</td>
<td>190-198</td>
<td>18</td>
<td>103-122</td>
<td>103</td>
</tr>
<tr>
<td>CCGT</td>
<td>4.9</td>
<td>103</td>
<td>17</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>PF+fgd + CO2 capture</td>
<td>7.9</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>CCGT + CO2 capture</td>
<td>6.4 - 8.4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Nuclear</td>
<td>3.9 - 8.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Hydro</td>
<td>4.2-7.8</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Wind turbines</td>
<td>5.0-8</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Biomass</td>
<td>2.8-7.6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>PV and solar thermal</td>
<td>8.7 - 40</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

PF, pulverised fuel; fgd fuel gas desulphurisation; IGCC, integrated gasification combined cycle


Table 2: Cost estimates of alternative mitigation technologies in the power generation sector compared to baseline coal-fired power stations and potential reductions in carbon emissions to 2010 and 2020 for non-Annex I Countries

<table>
<thead>
<tr>
<th>Technology</th>
<th>Generating Costs (€/kWh)</th>
<th>Emissions (Gt C/kWh)</th>
<th>Cost of C reduction (€/t C avoided)</th>
<th>Reduction potential to 2010 (Mt C/yr)</th>
<th>Reduction potential to 2020 (Mt C/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PF+fgd, NOx, etc.</td>
<td>4.45</td>
<td>260</td>
<td>-10-200</td>
<td>103-122</td>
<td>85</td>
</tr>
<tr>
<td>IGCC and supercritical</td>
<td>3.6 - 6.0</td>
<td>190-198</td>
<td>18</td>
<td>103-122</td>
<td>103</td>
</tr>
<tr>
<td>CCGT</td>
<td>4.45-6.9</td>
<td>103</td>
<td>17</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>PF+fgd + CO2 capture</td>
<td>7.45</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>CCGT + CO2 capture</td>
<td>5.95-8.4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Nuclear</td>
<td>3.9 - 8.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Hydro</td>
<td>4.2-7.8</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Wind turbines</td>
<td>5.0-8</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Biomass</td>
<td>2.8-7.6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>PV and solar thermal</td>
<td>8.7 - 40</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

PF, pulverised fuel; fgd fuel gas desulphurisation; IGCC, integrated gasification combined cycle


The initial investment required shifting from generating electricity from coal or natural gas to renewable energy is high and in some cases prohibitive for entrepreneurs looking at large scale projects. However, this cost is higher in developed countries, where existing thermal capacity is typically sizeable enough to generate electricity to meet forecasted demand for years to come, and that have invested in electric grid infrastructures to connect urban and rural areas and populations. So far, European Union (hereinafter EU) member states, Japan, the United States and other industrialised nations have attempted to evade this technological lock-in through expensive renewable support schemes such as feed-in tariffs. Developing countries however, where support is not extensive, continue to measure the viability of renewable energy sources against that of cheap coal and natural gas.
However, at the individual level, resources to finance small renewable energy projects can be obtained through structures similar to those of micro financing grants that have been developed in the financial sector. Projects to install solar panels contribute to secure the provision of energy to individual households without investing in connecting them to the electric grid. This option is appealing especially for less developed countries that have little installed capacity for coal and gas electricity generation, and that have minimal electric grid infrastructure. If these small investments are encouraged within a CDM-like framework, less developed countries could leapfrog coal, gas and oil-based technologies for renewable ones, and could reduce their reliance on foreign provisions of fuel to generate their electricity. A good example of a suitable partner is Lebone Technologies (http://www.lebone.org/). The company is a specialist in delivery of off-the-grid electricity. In this way, the company seeks to end the energy and lighting crisis in Africa by identifying and harnessing emerging technologies, developing and adapting them for the African market. For example, Lebone Technologies carried a pilot project in Tanzania in using microbial fuel cell technology to provide direct power to cell phone chargers.

### 3.3 Democratization of energy production

A bottom-up approach to the CDM will recognise not only GHG emission reductions, but also the production of renewable energy or reductions in the energy footprint of individuals. At the core of this proposal, individual efforts will be rewarded with CERs through clusters of these actions, with such project clusters sanctioned for CDM status.

Small scale renewable energy projects and energy efficient initiatives naturally raise SD indicators. In rural areas, communities can take ownership of the projects and as such, the projects encourage the construction of social capital bonds and the sharing of resulting benefits among the community members.

Non-governmental organisations (hereinafter NGOs) already have experience implementing small scale renewable energy projects in developing countries. They rely on various sources to raise the necessary funds, including contributions from private donors or partnerships with governments. However, they could benefit from claiming CERs under the CDM for the emission reductions they generate, and potentially re-invest this financial gain in new projects. The activities of these organisations already include micro hydropower, cooking stoves, biogas plants and solar panels (Gallagher et al, 2006). Such types of projects, and new ones, could expand at a faster pace.

An example of this type of initiative is the Barefoot College in India. The organisation has developed a methodology to teach illiterate women to install and maintain solar panels in their communities. Currently, the Barefoot College has women trainees from developing countries spanning Asia and Africa. The trainees learn how to install and maintain a solar panel system that supplies their village with electricity. So far, women trained at the Barefoot College have installed solar panels in 350 villages in remote rural areas, thus covering a total of 12,000 households. Another example is the Grameen Bank in Bangladesh that now operates Grameen Shakti, which aims to help deliver renewable energy to rural households in Bangladesh (Gallagher et al, 2006).
4. Revamping the institutional framework of CDM

In Copenhagen we hope to assist the revamping of the institutional framework devised to address climate change. As explained before, the Kyoto process, although a step in the right direction, led to a set of institutions welded in many cases through political compromises or a diplomatic minimum common denominator. Therefore, the result has been less than satisfactory, as the lack of policy and effect coherence throughout the system remains to this day a constant. At the same time, in all fairness, from the perspective of institutional design, the Kyoto process has a lot to show in terms of progress. However, it is also clear that the whole framework is in need of major reform if it is to function effectively and meet its objectives in addressing climate change effectively.

If Copenhagen delivers what is expected and needed, the effectiveness of the framework to address the urgent issue of climate change will be improved. This could be the result of a complete redesign of the framework or alternatively, the result of a more staged approach aimed at adopting and absorbing the institutional knowledge and know-how that the Kyoto years have generated. This paper clearly supports the second option. Considering the political and diplomatic cost, it is not advisable to contemplate a complete revamping of the Kyoto system. Instead, it is better to conceive a solution that takes advantage of the institutional devices already included within the Kyoto Mechanism, seeking an internal redesign rather than a complete redrawing of the model.

For this reason, one must identify within the current Kyoto framework those concepts or institutional devices that could offer the possibility of marrying the need for greater and effective action without departing from the grand institutional lines that have shaped the Kyoto model until now.

The CDM clearly meets those criteria. The CDM, despite its fortuitous origin, is the component within the Kyoto’s institutional structure that shows the greatest unfulfilled potential and greater promise in terms of its ability to influence efforts to address climate change. The mechanism could reflect a new approach in the shape and functions that could adapt without straining to an intolerable level the diplomatic consensus that will likely be in short supply during those negotiations. The approach proposed here is then to use to a great degree what is currently in place, modifying, adding, or complementing using other tools and concepts already tested and functioning. For this, it considers that rather than creating all the necessary tools, it can rely on the notions of secondments, consortiums, and inter-agency initiatives – so common now in the United Nations (hereinafter UN) wider system – linking the actions suggested here with agencies already carrying those particular tasks.

Agencies such as the World Meteorological Organisation, the UNFCCC, the United Nations Environment Programme (hereinafter UNEP), the United Nations Development Programme (hereinafter UNDP), the World Bank, the Food and Agriculture Organization of the United Nations (hereinafter FAO), as well as regional development banks can work together to facilitate the emergence of a stronger CDM. This way, each one of the components can focus on their own comparative advantages. This can render the implementation of the set of measures suggested here surprisingly simple or cheaper than usually expected. The whole is to be presented as one single proposal package that could have a tangible impact in addressing climate change and that, ideally, will not require an unreasonable amount of political capital to be negotiated and adopted. The proposal does not aspire to be a panacea but rather a significant part of what can be achieved under the present condi-
tions and whose utility is linked to the overall set of reforms that will likely emerge from the Copenhagen summit.

The proposal is then to focus on five concepts that will determine the shape and functions of the CDM within the layers of international environmental governance and in relation to the wider international system, taking the bottom up approach as the main azimuth for the orientation that these changes will give to the CDM structure. On the basis of these concepts, it is expected then that the CDM would have a bigger influence and footprint at the national and local levels of governance.

In short, it is proposed then to redefine or enhanced the following:

4.1 Promote a robust funding strategy, to enable the CDM to have its own seed funding and project implementation capacity.

4.2 Promote key CDM conceptual measures such as shifting from the core idea of “additionality” towards sectoral baselines, emphasis on efficiency and novel transport approaches, etc.

4.3 Establish a policy unit and monitoring functions for the CDM, mandated to proactively pursue the CDM objectives.

4.4 Develop a wider access platform for an enhanced interaction process between different forces in society, so that in a sort of clearinghouse context, all type of stakeholders can collaborate.

4.5 Integrate the CDM structure within the wider international governance system.

The aggregate effect of addressing these five aspects in one package will facilitate the emergence of a rather powerful CDM that will ensure the adoption of a wider approach towards the normative and prescriptive tackling of rising carbon emissions, the need to promote efficient energy use, and to address the participatory gap between civil society at large and the leading efforts on tackling climate change. Each one of these components, along with the proposed measures is explained further down.

4.1 Promote a robust funding strategy

The CDM is strategically located at the right place to play an important role as a funding source and clearing house to stimulate and promote the objectives of the future Copenhagen process. Until now, the CDM acted as a processing and validation body, authorising a given project its transit through the crediting path. However, its vantage point remains under-utilised because it cannot promote alternative funding relations or allocate its own resources to facilitate projects. The CDM can certainly take on the role of funding mechanism for at least the medium and small size initiatives. This way, its unique vantage point, added to its policy role – see next point – and funding capacity will enhance its ability to bring change.

The funding mechanism for the CDM can be established on a model with different modes of absorption where one combines elements of microfinance, novel fundraising techniques, direct participato-
This funding mechanism can serve two main purposes: (a) support the implementation of CDM projects in the category of CDM policy-initiated and (b) facilitate the coordination of funding for CDM projects based on bilateral initiatives - see both below. In detail:

**a) Fundraising and Direct participatory lending:** The potential of civil society as a major funding source and engaged actor in the issue of climate change needs to be used. The CDM, using a grassroots mechanism coupled with digital technologies, similar to the system developed to fundraise on behalf of charities, can facilitate the creation of a funding mechanism to intervene and support in appropriate points of inflection. Like political parties, whose funding strategy can capture corporate donations as well as small households’ contributions, a potential funding section of the CDM will soon be able to catalyse efforts or support transfer of technologies, channelling the aggregate power of many small actors. The same applies to direct participatory lending, (i.e www.kiva.org ) where groups of independent actors decide which projects to support, independently of how small scale these are. The mechanism basically combines micro financing with matchmaking funds deposited by small investors. This way, people can lend small amounts from far away locations, counting on the support and coordination of a single structure. They can identify the projects via the current national CDM process.

**b) CER Crediting for Private Investors:** This will basically facilitate the participation of private investors directly into the CDM funding scheme, given that to this date, the process has been circumscribed to national governments and multilateral organisations. According to Michaelowa and Butzengeiger, this process has now been fixed, albeit slowly, for the EU. It would be desirable to extend this procedure to non-EU areas as well, by emulating the process created by the EU Linking of private directive (Zaman, 2008).

### 4.2 Promote key CDM Measures

Along with the efforts to facilitate access to the CDM process, there are some key substantial measures that should be included in any process of reform to ensure different policy and carbon reduction outputs. These are:

**a) Move from the core concept of additionality to baseline approach as the guiding principle for the approval of projects.** This will particularly offer advantages for medium and small size projects. Considering that the CDM will be able to play a more proactive policy role, it will be possible to establish sectoral baselines even at very local levels, based on cumulative data and sound policy analysis.

**b) Ensure financial support and an emphasis on energy efficiency and transport.** As the CDM develops its policy and project implementation capacity, it can use its own resources as well as preferential incentives to promote clean renewable energies, electricity and the most suitable transport options.

**c) Accept sector baselines and bundling projects.** Use instruments such as proper monitoring and lessons learned to keep sector baselines and bundling projects up to date.
4.3 Establish policy and monitoring function

The CDM, if given the appropriate tools, can play a much bigger role in addressing the policy gaps that will eventually arise in the post-Copenhagen period. As it stands now, the formulation of policies to address carbon reduction, energy efficiency, or the promotion of different types of collective actions is beyond the realm of action of the CDM. To fulfil this policy role, the CDM should acquire the human resources, technical tools and mandate to be able to formulate sectoral or punctual interventions in areas where it sees a need.

The policy unit of the CDM can build on the institutional experience established by UNFCCC, UNEP, the World Meteorological Organisation, and the Global Environment Facility. As a policy body, it will have to be able to connect the economic, scientific, financial, developmental and political perspectives of the climate change issue, liaising as well with national and sub national levels of governance. Staffed by a multidisciplinary team, it will have the ability to identify points of inflection where it can intervene, using its funding and technical branches to determine the best course of action. Furthermore, from its vantage point, it will be able to fulfil its role as coordinating clearinghouse for further promotion of carbon reduction initiatives of different scales among different partners.

With a new policy unit, the CDM will be able to:

a) Monitor in accordance with its objectives, the pursuit of carbon reduction efforts, or the implementation of energy efficiency measures, spotting encouraging or worrying trends and enable the smart use of resources to correct bottlenecks or support catalysing efforts.

b) Analyse and capture (analysis and databases) the set of best practices aimed at consolidating the group of “approved methodologies,” while promoting a standardisation of project submissions, which clearly will translate into efficiency gains at different levels of the process. Indeed, the process of approval will improve on the basis of lessons learned from past practices, sector approaches, the extent to which standardisation of project submissions is achieved and perhaps on the notion of bundling projects. Consequently, more projects and more cross learning will take place. It will be basically a process of learning from mistakes and shortcomings, ensuring that different approaches are tried out and the best get captured and shared at a global scale. Common standards will also facilitate the replication of projects in other areas.

c) Formulate projects where it sees fit. This policy role will also enable the CDM to promote collaboration between potential partners (whether North-North or North-South), fostering transfer of technologies and the massive adoption of novel and efficient solutions. This means that the CDM will have the ability not only of processing what is presented but will acquire a very proactive role in advancing its goals.

Another important consequence of a revamped and better informed CDM coupled with better access towards small size projects is the ability to manage the bundling of projects of small size. This can be accomplished, departing from current practices, on the basis of the standardisation of the approval process and the possibility of accepting reductions not from one single project but from a set of projects focused in one sector or geographic location. This means that as information on approvals and
validations from the case to case basis accumulates, the system will learn, developing an institutional knowledge – perhaps developing one, broad database from which accepted standards will emerge.

**4.4 Develop wider access platform**

It is important to render the CDM the main point of access for ensuring the wider degree of participation from different sectors in the global effort, given that in the field of climate change, there is a wide spectrum of actors in terms of size, power, reach, and capabilities.

For instance, under current arrangements, funding for projects is mostly the result of covenants between a certain group of parties of a given size (national governments, big economic interests, etc). This approach has delivered some results, but one should note that the medium and small size actors, if aggregated, also carry a major weight in the potential impact in reductions and energy efficiency (Figueres and Philips, 2008). The influence of these actors can be aggregated if the impact of the CO$_2$ reductions that stem from their small and medium size projects can be quantified in ways that reflect their collective effect.

Once approvals can be granted by sector, small and medium size projects can be submitted together for one single round of evaluation and approval. Not only their impact on the environment is quantified, but it allows a direct interaction between local initiatives and the global approach towards an improvement of the situation. As it has been mentioned before, the impact in CO$_2$ is not negligible, topped by the fact that these efforts can also deliver a great deal in terms of public opinion mobilisation.

**4.5 Integrate the CDM structure**

An important part of the approach here is that the set of proposals put forward do not have to be created from scratch, nor are they dependent on a major funding initiative from a group of governments or major corporate donors. In fact, all proposals made here reflect activities that are currently implemented by grassroots associations, UN agencies, The World Bank, NGO’s, or simply require a realignment of functions or mandates of institutions already carrying out part of the tasks that are herein proposed.

Focusing on the bottom up approach and relying heavily on the inter-agency and consortia approach, one can establish a support infrastructure around the CDM that will enable it to respond to this new task. Favouring this approach carries a great disadvantage, which is the massive amount of coordination needed. This certainly will require a great effort in terms of institutional design. On the other hand, the potential start up costs might be shared by many and the participatory index will also translate in gains in terms of popular support, transparency, and continued engagement.

**a) Funding and Carbon Trading:** Clearly, the CDM is to expand its technical and carbon trading expertise, so that it can be well positioned to take advantage of a redesigned function and ability. The fundraising and certification mechanisms established for massive charity fundraising pooling efforts in the United States and Canada (i.e. United Way International)\textsuperscript{11} can be complemented with the financial structure of microfinance institutions such as the Grameen Bank. In many cases, it will be possible to add the CDM Climate change initiatives to the flow of information and funds that these...
institutions manage already. This way, a local small size project in Bangladesh can be considered, analysed, monitored, and supported via access channels already in place. This does not discard the possibility that they might be part of a bundle of projects to be managed and processed using sector baselines or standards. The other way around, if the CDM determines that a particular intervention is needed, it will be able to provide its support via these local mechanisms or through bigger financial institutions (all determined by the particularities of the case).

**b) Policy and Monitoring:** UNEP, UNFCCC, UNDP and UN volunteers are already carrying a great bulk of these tasks, and the model of the Inter-agency consortium easily comes to mind. UNEP and UNFCCC already combine field, policy, and carbon mechanisms expertise that can be matched by the global presence (for global accessibility) and financial muscle (for delivery of funds) of UNDP. The CDM can also count on the UN Volunteers programme to develop the type of grassroots expertise that would allow them to increase their reach for monitoring and implementation of small and medium size projects.

**c) Mechanism:** The CDM should function by connecting its policy, monitoring, funding, and clearinghouse functions. In a way, it should be a far improved version of the current UNFCCC Bazaar (http://www.cdmbazaar.net/about.asp), which attempts to provide the clearinghouse function proposed here, but without the policy and proactive capacity that can render the CDM a far more effective mechanism. It is obvious that a complex mechanism that seeks to mobilise market forces to address the pressing need to reduce CO₂ emissions faces a great challenge.

Specifically, the CDM should be able to function as a funding mechanism, collecting resources that will be used to fund specific projects that deem strategic to facilitate further carbon reductions. The use of the funds might take place as joint ventures, matching funds or seed-money. Having this financial latitude, the CDM will be able to engage other institutions - in some cases financial, in other cases not - as disbursements facilities, and not relying merely on those registered traders of CER values. In a nutshell, the public should be able to interact with the CER facility in the same way that through different channels the general public can acquire or take part on different and variably complex financial mechanisms such as mutual funds, etc.

As its policy functions takes on a wider mandate, the CDM will have the ability to reconsider the function of the national validating authorities for CDM Project. Seeking standardisation and a clear path of approval, projects proposals will be invariably driven to respond to specific and regular criteria - standardised score cards perhaps - instead of relying on a process where projects were basically dependent on a procedure implemented on a case by case approach. Here it is not argued that the CDM should develop a far reaching ability to deal with projects globally, but that by relying in coordination and application of standards, it facilitates the process of application and implementation of projects via third parties.

Policy married to implementing capacity will mean that the CDM will be able to execute certain activities at different levels. The CDM will be able to rely on a well defined path, combined with local financial presence - via UN agencies or regional and local financial institutions - to facilitate the funding of local initiatives of variable size. As carbon reduction activities take place, the CDM can immediately respond by converting reduction efforts into funds that can be used to further support those efforts. As the funding mechanism shows a grass-roots nature to collect funds, it can show a
similar approach the other way around, allowing for funding incentives to reach small initiatives. This way, the CDM will expand on its initial function, but widening its approach for capture and disbursement of funds, complemented with its own ability to spend and to promote certain types of projects that respond to a certain criteria.

Clearly, in a process like this, the fundraising efforts of a small community will be able to translate into funding opportunities for carbon reduction initiatives across the globe, with fewer restrictions related to the size, the standards, or the real impact of an individual effort. As mentioned previously, the value of the aggregate reduction, complemented with the tangible results linked to public education and public opinion mobilisation can render these efforts quite effective.

d) Implementation: One of the main advantages of this proposal is the fact that this strategy builds on elements that are already in place within the Kyoto Protocol framework. Institutionally, there is room for reforms, but these do not require departure from the concepts that were accepted at the time of the Kyoto negotiations. It works on the ideas of modules that can be added to the structure of the Kyoto system, either by allowing the creation of new institutions or by establishing bridges with other institutions already in place. It relies on the assumption that is more politically viable to modify than to create anew. Conceptually, the changes proposed to the CDM are largely incremental and can be implemented in a way that does not require a major departure from what is agreed already. In fact, aside from the key measures mentioned before (EU linking directive, and allowing direct investment, as well as re-prioritisation of target areas), the CDM reforms can even be implemented by measures that are not dependent on the Copenhagen round. Furthermore, they can be absorbed into the structure currently in place partially or as a whole. Moreover, these reforms rely heavily on the idea of public participation, and engagement with the policy process in place to address the problem of CO₂ emissions. This way, the degree of success is linked to a widespread civic engagement at different levels. Assessing the current interest in the issue, it is safe to assume that this type of approach will likely be embraced by many sectors.

5. Conclusion

The Copenhagen round will offer an opportunity to address many of the shortcomings of the Kyoto framework, so that the set of institutions put in place can really address the issue of carbon emissions. There is a need for change and the gravity of the situation demands of all parties ingenuity and commitment. The CDM reform process can tackle that need for change and improve in an area that allows for simple and effective modifications. Adjustment to the CDM structure, mandate, and reach offers a great deal of potential in terms of what can be achieved, within a conservative estimate of the final outcome of the diplomatic negotiations. Furthermore, seeking to reform via the CDM will create the space to facilitate further transparency and greater participation from different sectors. Small efforts will be supported and local engagement encouraged, rendering the means of action accessible to the greater number. Hopefully, focusing on the CDM will ensure a better and more comprehensive approach towards a problem that demands immediate action and that threatens the future of present and future generations.
Revamping the Institutional Framework of CDM

References


Moomaw, Bill (William.moomaw@tufts.edu) (25-11-2008) Re article on bundling. Email to: Alejandra Maupome Cagigal (amaupome@llm09.harvard.edu).


Notes

1 The reduction targets were negotiated with respect to a baseline of 1990 emission levels of CO$_2$. During the negotiations, several options were discussed as prospective baseline years. The three sound options for baseline year were: 1. Proposal for a multiyear baseline between 1988-1992; 2. a 1995 baseline and 3. a proposal for a 1990 baseline (UNFCCC, 2000). Negotiations on the adoption of a 1990 baseline reached consensus with relative ease among the negotiators. The multi-year baseline option was rejected in part due to the incompleteness of emissions data prior to 1990 ... Chairman Estrada was also reluctant to entertain suggestions to use a 1995 baseline, fearing this would open up a whole new area of debate on one of the few issues that was enjoying early and broad consensus (UNFCCC, 2000). One reason that explains this consensus is that the 1990 baseline year did not represent a tight benchmark for reductions for some countries while it set a floor for reductions in other countries. In practice however, the baseline has not provided for a level field between annex countries.


3 The language within the proposed text of the informal working group led by Brazil had not appeared previously in the negotiations. The exceptions included the criteria for the certification of emission reductions (voluntary participation; real, measurable and long-term benefits; and additionality), which were similar to proposals put forward in the peer proposal of JI and were also derived from criteria for the AIJ [activities implemented jointly under the pilot phase] pilot phase. Provisions relating to “auditing and verification” and the participation of “private and/or public entities” also found resonance in earlier proposals on JI. (UNFCCC, 2000).


5 Email exchange with Professor William Moomaw (25-11-2008).

6 http://www.lebone.org.

7 http://www.barefootcollege.org/enroll1.htm

8 This EU Directive (Directive 2004/10/EC) seeks to create a linkage between the EU ETS and the Kyoto flexible mechanisms (Zaman, 2008).

9 This would include the thorny issue of the North South perspective.

10 Many small and medium scale projects do not qualify for a CDM approval given their relative small significance. Currently, the assessment of projects is done on a case per case basis or rather a one-to-one approach. Bundling will mean that several projects would benefit from being considered all at once - gain in size and significance-, and evaluated on the basis of their impact against a sectoral baseline.

11 http://www.liveunited.org/.
Strengthening the Kyoto Protocol: Accountability, Monitoring, and Enforcement

Megan Samenfeld-Specht

Introduction

Global climate change is one of the greatest threats facing the world today. There is international scientific agreement that if atmospheric greenhouse gas levels continue to rise unchecked, there will be catastrophic environmental changes around the world, including: rising global surface temperatures, ocean acidity levels, and sea levels, and significant loss of biodiversity. The short-term costs of mitigation and adaptation will be substantial, but they pale in comparison to the long-term costs of inaction. Nonetheless, few countries will be willing to risk the political and economic capital necessary to mitigate climate change without an effective and enforceable international agreement.

The Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC) has created an international forum for addressing climate change, but it has thus far failed to have a significant impact on global greenhouse gas emissions. As the Kyoto Protocol reaches the end of its first commitment period in 2012, there is an opportunity for the Parties to the Protocol (Parties) to reassess and redefine the agreement. This paper proposes a strategic approach to strengthening accountability under the Kyoto Protocol through the establishment of effective emissions reductions targets and timelines, an enhanced system of monitoring and enforcement, and a more inclusive approach to strategic problem solving within the Protocol. These proposed changes would help to create a stronger and more effective structure within which climate change policies and regulations can be developed and implemented.

Accountability & Framing

The UNFCCC provides the conceptual and practical framework upon which the Kyoto Protocol is built. Article 3, paragraph 1 of the UNFCCC states: “The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities.” While general, this statement identifies the basic principles of accountability upon which the Protocol is built - it holds Parties accountable to the global community as well as their own domestic populations, for both present and future generations. This broad definition should be relied upon as a conceptual foundation for the Protocol’s emissions reduction targets and system of enforcement.

The focus of most discussions on the Kyoto Protocol revolve around the costs of mitigation and the possible negative economic impacts of compliance on development goals. Individual nations are hesitant to bear the high costs of mitigation without assurance that other countries will act as well. An increased focus on accountability and enforcement can protect against this concern and encourage engagement by all Parties. By focusing on the responsibilities of the Parties to protect states, industries, and individuals from the harmful effects of climate change, a clear understanding of accountability can
help to frame the Kyoto Protocol as a tool for positive change rather than an obstacle to development. The guiding principles in the UNFCCC help to frame the Protocol as a call to action for protecting the global community rather than a series of commitments and restraints on nation states.

**Targets and Timelines**

The first commitment period (2008-2012) of the Kyoto Protocol established five-year emissions reduction targets for Annex I countries. The reduction targets were based upon political concerns rather than scientific analysis and have been critiqued as being both overly stringent and not ambitious enough. According to economist Robert Stavins, the Kyoto targets do “too little, too fast.” This paper proposes an alternative system for establishing emissions reductions commitments under the Kyoto Protocol that takes into account both scientific analysis and the political realities of the negotiating process.

The first step that negotiators must take when determining the next set of emissions reduction targets for the post-2012 Kyoto Protocol is to establish a long-term global goal. The short-term scope of previous negotiations has made it difficult to separate current economic positions from the long-term interests of the global community. In order to force negotiators to look beyond their immediate positions and work towards achieving shared interests, the negotiations must define the ultimate goals of the Protocol before assigning specific national targets and timelines.

**80% by 2050**

The Parties to the Kyoto Protocol should look to current scientific analysis to define the reductions necessary to address the problem of climate change. Scientists estimate that atmospheric carbon dioxide concentrations of 450 parts per million (ppm) is the upper limit of what current ecosystems will be able to withstand without irreversible changes to the global environment. Research and climate modeling has projected that in order to stabilize atmospheric concentrations at 450 ppm there must be a reduction in global greenhouse gas emissions of 80% by 2050 based on 2000 emissions levels. Establishing a definitive goal of an 80% reduction by 2050 would provide a stable long-term agenda for the Kyoto Protocol. It would allow decision makers to frame mitigation strategies that may have high short-term costs within the context of the long-term benefits of global mitigation efforts. Businesses and governments would thus be able to engage in long-term planning efforts in the most efficient manner possible.

Given the possibility of new scientific discoveries or assessments, Kyoto Protocol emissions reduction targets should allow for a reassessment of long-term goals based upon new scientific findings. A reassessment of the targets should not be undertaken lightly as it could disrupt the stability created by the long-term perspective of the 2050 goals. However, recognizing that over time there may be significant findings that could demand a change in the 2050 targets would help to ensure that the Protocol is sufficiently equipped to address the problem of climate change. It could also help to encourage agreement on long-term goals among members with concerns about the veracity of current scientific evidence.
The Montreal Protocol provides an example of a treaty that successfully renegotiated its targets after scientific evidence showed that the problem was more extensive than originally believed. Although there are a number of significant differences between the two Protocols, this example shows that such changes can be made to improve the impact of a treaty without major disruptions to the process of implementation. With that in mind, the Parties to the Kyoto Protocol should include a clause allowing for a revision of the 80% goal in the event of significant scientific evidence, supported by the Intergovernmental Panel on Climate Change (IPCC), that the 80% target is not appropriate to address the concerns of climate change. This caveat would allow for change in either direction, allowing for flexibility while still protecting the Protocol from frequent changes to the target based off of political or economic motivations.

The establishment of a target for 2050 would require strong leadership within the Parties to the Kyoto Protocol. Although it has not yet ratified the agreement, the United States would be a good candidate for this leadership role. President Barack Obama has called for significant changes in United States climate change policy. In June 2009 the United States House of Representatives passed the American Clean Energy and Security Act, which mandates emissions caps for aggregate greenhouse gas emissions in the United States. The Act calls for covered entities to reduce their emissions to “3% below their 2005 levels in 2012, 17% below 2005 levels in 2020, 42% below 2005 levels in 2030, and 83% below 2005 levels in 2050.” While, as of July 2009, the United States Senate has not yet passed the bill, it represents a significant change in climate change policy in the United States. If the goal of an 80% global reduction in emissions by 2050 were introduced in the 2009 round of Kyoto Protocol negotiations by the United States, the strength of this leadership could provide the momentum necessary to establish this goal as a binding target under the Kyoto Protocol. In addition, the promise of a global agreement to meet these goals, including long-term commitments from developing countries, could provide the leverage necessary to push the U.S. Senate to ratify the Protocol.

**Short-term Targets**

The establishment of a global emissions reductions goal for 2050 should be the first step in a series of negotiations required to define clear targets and timelines on a country-by-country basis. By creating agreement first on general, long-term goals before moving on to increasingly more specific, short- and medium-term targets, the negotiators would be able to limit the possible options for each successively more specific negotiations. While specific national targets and timelines would require extensive negotiations and technical expertise, a basic framework for the structure of these negotiations and the principles upon which they should be based are outlined below.

Member states should determine the country specific reductions necessary to reach the goal of a global emissions reduction of 80% by 2050. Different levels of development among member states will require varying national targets. On one extreme, some members may be allowed slight increases from their current levels by 2050, while others would be required to reach their goals through contributing to reductions in other countries. However, regardless of the level of development, all member countries must commit to specific emissions targets for 2050. This is in keeping not only with the commitment in the UFNCCC to “common but differentiated responsibilities,” but also with a practical recognition of different levels of development among members.
Once national goals for 2050 are determined, specific percentage goals leading up to 2050 should be established for each country. Targets should be set based on the trajectory necessary for each country to reach its final goal. While final proposals should be subject to approval, this approach recognizes that members will require different amounts of time to make their reductions in the manner that is most efficient for their particular economic and developmental situations. Some countries may be able to make dramatic cuts quickly, but might require a longer time frame to reach their final reduction goals, while other may not be able to make significant reductions at first, but once the capabilities are in place may be able to finish their commitments quickly. The ability to create national proposals would give members agency and provide an added sense of responsibility among the Parties. If each member were to determine its own timeline it would be more difficult for a member to later object that requirements were unfair or unrealistic.

**Enforcement: Reframing Membership**

A critical aspect of accountability in any international treaty is enforcement. International environmental treaties are known for having generally weak and ineffective enforcement mechanisms and the Kyoto Protocol is no exception. Without effective enforcement mechanisms, parties to a treaty are unable to hold one another accountable for failures to meet treaty commitments. Enforcement can also actively help to strengthen a treaty beyond implementation measures. Effective enforcement can help to “affirm the existence and primacy of a common normative community to which all treaty parties belong, including the violator.”xi In contrast, weak enforcement mechanisms not only fail to encourage accountability, but they also weaken the image and the normative foundations of the treaty itself.

Lack of strong enforcement mechanisms make international environmental treaties vulnerable to the problem of free riders – nations that do not follow through on commitments but are still able to benefit from the positive impact of the efforts of other parties. Free riders not only force other parties to bear disproportionate percentages of the costs, but they discourage other parties from taking action to avoid being taken advantage of by the free riders.

> Free-riding ... enables a country to avoid costly abatement, with only minor detrimental effects on global environmental quality. According to the theory of public goods, the result may be under-provision of abatement. An extreme scenario is that no country will act to reduce emissions, but a more likely scenario is that only a few wealthy countries act, resulting in sub-optimal provision.xii

The collective action problem faced by the member countries is exacerbated by lack of strong enforcement. Stronger enforcement mechanisms can help to avoid the problem of free riders and encourage more decisive action from all Parties.

**Current Enforcement Mechanisms**

The Kyoto Protocol currently has a Compliance Committee that consists of a facilitative branch and an enforcement branch. These two branches address compliance from complimentary perspectives: the facilitative branch provides resources to help members comply with treaty obligations while the enforcement branch determines when a party is not in compliance with its obligations and what the
consequences of a breach will be. While this structure has promise, it lacks compelling enforcement mechanisms to engender compliance. According to the UNFCCC website:

[W]here the enforcement branch has determined that the emissions of a Party have exceeded its assigned amount, it must declare that that Party is in non-compliance and require the Party to make up the difference between its emissions and its assigned amount during the second commitment period, plus an additional deduction of 30%.

If a member fails to meet its emissions requirements, there is little to suggest that a penalty of greater reductions will induce compliance. The enforcement branch is only able to use the tools available within the Protocol, and although the punishment of additional deductions to emissions may make a strong statement on the significance of a breach, it is unlikely to be powerful encouragement for compliance. While this structure has not proven to be effective in encouraging compliance thus far, it does provide a basic framework within which the enforcement mechanism of the Protocol can be strengthened.

New Enforcement Mechanisms

In order to be effective, an enforcement mechanism for a multilateral treaty must provide compelling reasons for nations to refrain from breaking their treaty commitments and to correct behavior that is found to be out of compliance. The World Trade Organization's (WTO) Dispute Settlement Body (DSB) is often identified as an effective system of enforcement in a multilateral agreement. Membership in the WTO provides benefits that members value, and the threat of losing these benefits provides the DSB with a source of leverage over noncompliant members. "When membership comes with valuable benefits... sanctions can be a credible deterrent." Thus, the DSB is able to effectively sanction members who are out of compliance by allowing injured parties to deny the noncompliant members the benefits of liberalized tariffs. This model provides insight into what elements are necessary to strengthen the enforcement branch of the Kyoto Protocol.

A revised enforcement mechanism for the Kyoto Protocol can be built within the current enforcement branch of the Compliance Committee. In order to strengthen enforcement, the Kyoto Protocol needs to create benefits of membership beyond climate change mitigation. New benefits would assist the Protocol in two ways: First, they would help to encourage countries to join the Protocol by providing an immediate and tangible benefit for member countries, as opposed to the long-term benefits of avoiding the catastrophic impacts of climate change. This could move the focus from the costs of compliance to the benefits, a conceptual shift that could help to reframe popular perceptions of the Protocol. The second way that added membership benefits would help the Kyoto Protocol would be by creating a set of valued benefits over which the Parties to the Protocol have control. These benefits could be removed in whole or in part as a form of sanction for noncompliance with treaty obligations and could help make membership a tangible, valuable commodity that can be lost.

Membership Benefits

To create a compelling system of enforcement, a network of benefits must be created within the Protocol that appeal to the wide variety of interests involved in the process. In order to reach this goal,
there would need to be several primary benefits, as well as a constellation of lesser benefits that can collectively appeal to the myriad needs of the different Parties to the Protocol. The following list outlines several proposals for key benefits to be included. While this list is by no means exhaustive, it does provide a framework for the types of benefits that may be effective. Although funding mechanisms will not be addressed in this paper, it is important to note that several of the proposed benefits will require funding from the Secretariat. While current funding is limited, the establishment of improved enforcement mechanisms may provide an avenue through which additional fundraising mechanisms can be developed.

**Kyoto Protocol Brain Trust**

A primary membership benefit for Parties to the Kyoto Protocol could come from a “brain trust” built out of the expertise of the IPCC. This brain trust would consist of a group of experts in fields such as alternative energy, engineering, and biotechnology. The trust would be a resource for member countries to use to support clean technology, green industries, environmental policy initiatives and other projects related to the goals of the Kyoto Protocol.

The brain trust would provide expert advice on technical issues surrounding clean development and green technologies. While access to the trust would be through member governments, the trust would supply support not only to government-sponsored programs, but also to a limited number of private initiatives, provided they are recommended to the trust by their governments. Each member to the Protocol would have unlimited access to the trust for government sponsored projects as well as limited access for an agreed upon number of private interests.

As part of its role in supporting Parties to the Protocol, the brain trust would also engage in research in areas of clean development that are not currently being addressed. Any information or inventions that result from this research would be patented and made accessible only to member countries. Although research is unlikely to produce immediate benefits, the possible value of any patents arising from this group of international experts could be significant.

**International Business Investment**

Another substantial membership benefit could be built through the creation of an international business coalition. A coalition of international businesses that agreed only to invest and grow their operations in countries that are parties to the Kyoto Protocol could provide a strong incentive for nations to join the Protocol as well as an incentive for Parties to comply with obligations. Investment funding and revenue streams from transnational businesses provide a significant source of income for many countries. According to the United Nations Conference on Trade and Development’s 2008 World Investment Report, foreign direct investment in 2007 was equal to 27.9% of gross domestic product (GDP) in developed economies and 29.8% of GDP in developing economies. To be effective, the business coalition would need to have the support of major transnational corporations. The membership of smaller businesses would benefit the coalition, but would not be essential. As long as the major players in any given industry agreed to take part, the deviation of smaller businesses would not pose significant competitive threats to the major corporations. The creation of this coalition would be dependent on the United States ratifying the Protocol, as it is unlikely that major corpora-
tions would agree to take part in a coalition that put an immediate, indefinite hold on all investment in the United States.

Although creating a businesses coalition would be a significant undertaking, many businesses have already expressed interest in helping to push for stricter global greenhouse gas emissions targets. CEOs of 99 large international companies, including BP, DuPont and Credit Suisse, have made a joint public statement to the G8 requesting clear regulations of greenhouse gases: “the CEOs requested a clear goal for reducing global greenhouse gas emissions (suggesting cuts of at least 50% by 2050), and a “paradigm shift to a low-carbon economy” that would use the marketplace to stimulate the value of carbon reductions and clean technology.” These companies recognize that a reduction of greenhouse gas emissions is necessary to prevent global warming and they are asking governments to produce clear targets and timelines for these reductions.

In addition to clear regulations, the coalition would provide strong public relations benefits for businesses that took part. As an incentive, businesses would be allowed to use their participation in the Kyoto Protocol coalition as a marketing tool in publications, advertising, and labeling. The growth in corporate social responsibility programs, as well as press campaigns to label companies as “green,” shows that corporations recognize the value that consumers place on eco-friendly practices. The Kyoto Protocol coalition would provide businesses’ green marketing programs with legitimacy through their connection with a recognized international effort to fight climate change. As the labeling of companies as part of the Kyoto Protocol became well known among the public, the lack of membership in the coalition could hurt businesses and would allow activists groups to easily identify companies to target in campaigns to encourage green practices. Thus, as it grows, the coalition would build a momentum of its own in the business community. To help to start this momentum, the Parties to the Protocol could provide special benefits to the founding corporations of the coalition. Such incentives could include extra carbon credits for the initial years of implementation.

Access to Adaptation Funds

Adaptation funding for Kyoto Protocol members could be used as an additional membership benefit. Providing members to the Protocol with preferential access to funding for adaptation related activities would provide many developing countries with much needed resources. This benefit would be contingent on the establishment of clear guidelines for adaptation related activities. Adaptation related activities should include not only activities to respond to imminent threats, such as building sea walls, but also activities that provide assistance to the new economic and social problems that climate change will create. Such projects may include promoting draught or flood resistant crops, creating new jobs for workers whose occupations were destroyed by climatic changes, and improving social services for workers with less stable sources of income and food.

Support for Green Jobs and Green Industry

The creation of a strategic planning resource to provide support to green industry could be another valuable membership benefit for Parties to the Kyoto Protocol. Green industry offers opportunities for economic growth. The Parties to the Protocol should create a strategic planning resource, similar in many ways to the research brain trust, which would provide expert advice to governments and busi-
necessities in member countries interested in promoting a green economy. By providing member countries with economic, strategic, and policy assistance in creating or encouraging the growth of green industry and green jobs, the Protocol could give member countries a competitive advantage. This resource would be created by IPCC experts meeting twice annually to review and provide feedback on questions and proposals. In addition, there would be a small, permanent staff that could provide parties with access to information and research in between the expert review sessions. As in the brain trust, each member to the Protocol would have unlimited access to the trust for government sponsored projects as well as limited access for an agreed upon number of private interests.

Extra Benefits

In addition to the benefits of membership, creating a benefit structure to reward members who exceed their obligations would create a positive incentive for deeper engagement of the Parties. Such additional benefits could include:

- Increased flexibility in the fulfillment of future obligations (a good faith agreement based off a member’s proven track record);
- Increased access to assistance funding;
- An increase in the percentage of obligations that can be fulfilled through the Clean Development Mechanism;
- A committee leadership position in the next Conference of the Parties.

These benefits would reward commitment to the goals of the Protocol and provide incentives and increased flexibility to those members that prove their engagement with the issues and their ability to meet and exceed their required greenhouse gas reductions.

Monitoring

Enforcement mechanisms rely upon an effective process for determining when a Party is out of compliance with their Kyoto Protocol commitments. To strengthen the current monitoring system in the Kyoto Protocol, independent third party organizations should play a role in monitoring and reporting on compliance and emissions levels in member countries. Such organizations would include non-governmental organizations (NGOs) and other civil society groups. Currently, the Protocol calls for Annex I Parties to have “a national system for the estimation of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol.”xviii This system requires Annex I Parties to submit reports on their greenhouse gas emissions. Expert panels review these reports, but it is the responsibility of the Parties to monitor and report on their emissions.

While there are clear benefits to internal monitoring and reporting mechanisms, (including strengthening internal reporting systems, encouraging member engagement with emissions monitoring, and distribution of costs across member countries) the current system has substantial problems. A 2003 report examining Annex I country reports of greenhouse gas emissions related to waste management showed that current emissions reporting systems are generally inaccurate and poorly structured. There was found to be no global standard for measurement or reporting and many of the calculations
and figures used by countries were inaccurate or misleading. In fact, out of 27 submitted reports on methane emissions, the study found that only four of these reports had figures that matched the study group's emissions audit.

The creation of an outside monitoring system, made up of independent organizations from around the world, could help to address many of the problems found in the current reporting structure. This system would be created by inviting independent organizations to participate in a voluntarily monitoring and reporting group. The monitoring group would be charged with providing an objective assessment of the compliance of various Parties. It would be authorized to report on any party at any time and to publicize its findings. To ensure standardization, the monitoring group would have to submit to the UNFCCC Secretariat the standards and methodologies used in its monitoring and assessment.

An independent monitoring group would not be constrained by requirements to monitor all parties. Instead, it would have the flexibility to monitor sectors or countries of particular concern. Independent organizations may have access to information sources beyond the scope of government information systems, giving a more well-rounded assessment of the realities of mitigation strategies in member countries. They may also be able to work more quickly than many government beaucracies that are burdened by heavy regulation and slow bureaucratic procedures. The monitoring group would be in the position of using the information they gather to put public pressure on members to comply with their Kyoto commitments. “‘Naming and shaming’ is not only an effective means of exposing treaty violations; it can also help deter non-compliance.”

The influence of naming and shaming campaigns, or the threat thereof, can be seen in a number of international campaigns, including initiatives to address the problem of conflict diamonds and anti-corruption efforts.

A monitoring body consisting of civil society groups could expect to encounter resistance from some governments and businesses around the world. Such resistance could be lessened through official sanction from the Protocol Secretariat and by encouraging a mutually beneficial relationship between civil society and governments. It could also be addressed through the creation of clear and transparent regulations for the monitoring group and its member organizations. Independent organizations taking part in the monitoring group should play a role in providing assistance to countries as they set up their monitoring systems. This would not only help countries with scarce resources and encourage the creation of consistent monitoring standards, but it would also help to build working relationships between these different sectors.

**Wider sense of Accountability: Involving other players**

Nation states are the primary actors in the Kyoto Protocol and as such bear the responsibility for ensuring that the goals of the Protocol are met. However, it is also important to recognize the stake that other actors have in the outcome of the Protocol and the role that they can and do play in achieving its goals. Given the enormous impact of climate change, the argument can be made that all actors, from individuals to regional associations of nations, have a role to play in addressing the problem. Cities from around the world have recognized their responsibility and formed the C40, a group of international cities collaborating on programs to address climate change. State and regional efforts in the United States are another example of the engagement of governments and organizations on
many different levels. Programs such as these should be encouraged and incorporated into national plans as member countries work to meet their Kyoto obligations.

Outside of government, the two primary actors in climate change mitigation are NGOs and businesses. Both groups have a lot at stake in the Protocol negotiations and both will play important roles in the grassroots implementation of mitigation efforts. The Kyoto process is controlled by sovereign states, and members are often hesitant to include outside groups directly in the negotiation process. However, the influence of outside groups is unavoidable. NGOs and private sector interests already impact the Kyoto negotiations through advocacy and lobbying efforts. By providing information, money or influence, they impact the positions of different member countries. Rather than attempt to shut out the voices of NGOs and business groups, the interests of the Protocol would be better served by including these groups in the process in a more structured manner. Including NGOs and business groups in the Kyoto Process would give them a greater stake in a successful outcome. Instead of acting as potential spoilers from the outside, these groups could help to contribute time and resources towards shaping an effective solution with the Protocol structure.

Roundtables

One way to directly incorporate NGO and private sector interests in the Kyoto Protocol would be to create a series of roundtable discussion groups based on different problems that Parties to the Protocol are working to solve. Each roundtable would be given a specific topic to address, depending on the negotiation or implementation issues being negotiated by the Parties to the Protocol. A roundtable would be tasked with recommending a solution to its assigned issues, including recommendations for specific guidelines and implementations.

The recommendations of each roundtable would be presented to the Parties for consideration. If a roundtable recommendation were accepted by the relevant authority within the Protocol structure, the roundtable participants would be included in the subsequent negotiation and implementation processes for their recommendations. The roundtable participants would not have a vote in final decisions, but they would be given a seat at the table for all follow up discussions, be allowed to participate fully in discussions, and be given full access to information and resources associated with the process. This would not only help to ensure that the process and decision take into account the diverse interests at stake, but it would also provide resources for member countries on complicated and often very technical issues.

Roundtable participants would be chosen specifically based on the topic to be addressed. Participants should represent the primary interests involved in an issue, from different backgrounds and perspectives. The goal of the roundtables would be to bring together the groups with interests at stake in a decision and task them with finding a realistic solution to the problem within the guidelines of the Protocol. If the roundtables do not create viable solutions, then the Parties to the Protocol would be in the same position they would have been in if no roundtable had been created, except that they would have access to the added resources compiled during the roundtable.

The inclusion of conflicting interests would be a critical component of the roundtable process. The issues on the table for the Kyoto Protocol are complex and many different groups have valid concerns
and perspectives. Incorporating these interests into the process would not only give them an opportunity to help craft a solution, but would also provide them with a better understanding of the interests of other groups and the constraints within which solutions must be created. The fact that participants would have to rely on their group in order to play a role in the Kyoto process may help to engender trust among participants and create added incentive for participants to engage in discussions of shared interests rather than individual positions.

A final benefit of the roundtable working groups would be to increase transparency, both within the Kyoto Protocol and in the private sector. The participation of businesses and NGOs in the negotiation process would provide added incentive for member countries to follow through on their commitments. Business interests and NGOs participation in negotiations would give them a clearer understanding of the goals and commitments of different countries, thus allowing them to better hold nations accountable to those commitments. Encouraging private sector groups to participate in roundtables may also help to encourage transparency and accountability among business interests. Open and honest discussions of interests and concerns may encourage businesses to be more transparent regarding the challenges they face in climate change mitigation. This transparency could help to facilitate the creations of policies, regulations, and implementation strategies that are more responsive to the barriers faced by mitigation efforts.

Conclusion

The proposals made in this paper seek to strengthen the fundamental mechanisms of the Kyoto Protocol. Clarifying the long-term goals of the Protocol and the roles and responsibilities of the Parties to the Protocol lays the basic groundwork upon which subsequent regulations and policies can be built. Building membership benefits into the Protocol not only helps to frame membership in a positive light, it also provides a means through which an effective system of enforcement can be created. Clear and reliable enforcement mechanisms deter noncompliance and strengthen the normative values upon which the Protocol is built. Improved monitoring systems ensure that commitments are being met and help to encourage standardization of a global emissions accounting system. Finally, providing increased opportunities for involvement of outside groups can bring new perspectives and resources to the Protocol's negotiation process.

In order to effectively address the problem of global climate change, action must be taken at all levels of government, from local to international. Changes must be made in individual lifestyles, business practices, market mechanisms, and government policies. The Kyoto Protocol is an important component of this change. It not only influences government policy on climate change, but it also makes clear that climate change is a global problem for which all nations must be held accountable. The Protocol provides a medium through which countries can hold one another accountable to clear and enforceable standards. The proposals above seek to strengthen the Kyoto Protocol to help it to successfully fulfill its role as a global agreement to combat climate change.
Notes


iv The UNFCCC website defines Annex I Parties as follows: “Annex I Parties: The industrialized countries listed in this annex to the Convention which were committed return their greenhouse-gas emissions to 1990 levels by the year 2000 as per Article 4.2 (a) and (b). They have also accepted emissions targets for the period 2008-12 as per Article 3 and Annex B of the Kyoto Protocol. They include the 24 original OECD members, the European Union, and 14 countries with economies in transition. (Croatia, Liechtenstein, Monaco, and Slovenia joined Annex 1 at COP-3, and the Czech Republic and Slovakia replaced Czechoslovakia.)” United Nations Framework Convention of Climate Change, Glossary of climate change acronyms (accessed on December 6, 2008); available from http://unfccc.int/essential_background/glossary/items/3666.php.

v Robert Stavins lecture at Tufts University Fletcher School on November 18, 2008.

vi William Moomaw, “The 3% Solution”, Tufts Magazine, Winter 2008 (accessed on December 6, 2008); available from http://www.tufts.edu/alumni/magazine/winter2008/features/co2_3percent.html. Although “The 3% Solution” does not cite a baseline year, the baseline of 2000 was chosen based off personal communication with the author.


viii Barak Obama, Recorded Speech for the Governors’ Global Climate Summit, November 18th, 2008 (accessed on December 6, 2008); available from http://change.gov/newsroom/entry/president_elect_obama_promises_new_chapter_on_climate_change/.


x United Nations, United Nations Framework Convention on Climate Change, 4.


xiv Ibid.
xv Yang, 1137.
xi Meier, 217.
xii Harvard Kennedy School PED 376: Civil Society and Development course discussions, fall semester 2008.
xxiii Another serious gap in the current monitoring structure is the fact that non-Annex I countries are not required to report on their emissions. Even if there is international agreement that non-Annex I countries do not need to reduce emissions immediately, there is a need for current updates on their emissions levels and they will need to report on their progress once they begin to take on emissions reductions targets. The Protocol should require all parties to create internal monitoring and reporting systems, with additional help and more flexible implementation timeline in place for non-Annex I countries that may have greater barriers to implementation such as weak infrastructure and lack of funding.
xxiv C40 Cities Climate Leadership Group, C40 cities: an introduction (accessed on December 6, 2008); available from http://www.c40cities.org/.
Forest Protection and Regeneration in the Post-Kyoto Era

William Smith

Introduction

Climate Change is happening (IPCC, 2007). The discussion no longer focuses on if and when, but what to do now. Short term solutions are only the first step. Every short term mitigation plan must be accompanied with steps for long term adaptation. Protecting and regenerating the world's forests could aid on both scales, if managed properly. Since Bali, into Poznan, and on to Copenhagen, proposals are being discussed about the role global forests will play in the post-Kyoto era of carbon sequestration. It seems likely that they will play a significant role, but the details are still being worked out. Political, financial, and social concerns must be addressed to make the strongest forest plan possible. Everyone agrees forests should be protected and regenerated if possible. The disagreements begin when determining how this will happen, where the funding will come from, who the funding will go to and what the verification process will be for how much carbon is actually sequestered by these protected forests.

In this paper I will outline the issues arising with the near term solutions being discussed, focusing primarily on REDD proposals (Reducing Emissions from Deforestation and Degradation) and including suggestions for how this may be improved. However, a long-term solution needs to be in place that will be more successful in responding to these issues and increasing developing countries climate change adaptation and mitigation strategies relating to forest protection and regeneration. This is why I suggest the creation of an International Forest Protection Agency. The second half of this paper outlines what its functions and responsibilities should be.

Background

Deforestation accounts for almost 20% of global carbon emissions - more even than the entire global transportation
sector (de Perthuis, 2007). The destruction of tropical rainforests causes the vast majority (see map) of this (IPCC, 2007) as developing nations and their people (whether legally or not) attempt to meet rising demand for competing land uses such as agriculture and ranching. The severity of the problem has reached such a level that “between 8 and 13 million hectares of forests are lost every year, an area equal to two to three times the size of Switzerland” (Bellassen and Schwartzmann, 2007).

Article 3 of the Kyoto Protocol makes provision for Annex I countries to take into account afforestation, reforestation, and deforestation and other agreed land use, land-use change, and forestry (LULUCF) activities in meeting their commitments. However, the focus of the Kyoto Protocol is solely on human induced changes in LULUCF. This is insufficient: “by considering only human-induced changes, the Kyoto approach discourages countries from accepting the responsibility and benefit of all carbon changes under their authority” (Plantinga and Richards, 2008). Since 1997, however, the lines have become increasingly blurred between what is man-made and what is natural. For example, a massive forest fire may have once been only the responsibility of nature, but today global human-caused climate change and human decisions regarding forest management play significant roles in the quantity and severity of fires and other natural disasters. The fourth IPCC report outlines the dangers of increases in the frequency and intensity of extreme weather events, such as forest fires, hurricanes, heat waves, and flooding (IPCC, 2007).

Kyoto offers neither a mandate for, nor a prohibition of, LULUCF being used for carbon credits. There is some guidance for proposed projects, but as of October 2008, only one forestry project had been approved as a CDM – not nearly the scale necessary to be effective against the carbon onslaught. Many involved in the post-Kyoto negotiations will attempt to ensure that forestry management becomes a viable tool in the toolbox of climate change solutions.

Steps were taken in this direction in December of 2007 when Papua New Guinea and Costa Rica, on behalf of the Coalition of Rainforest Nations – representing some thirty-plus tropical countries –
introduced a proposal known as REDD (Reducing Emissions from Deforestation and forest Degradation) which outlines the beginnings of a plan to vastly increase the use of forests in carbon sequestration. The basic idea REDD presents is that, in the post-Kyoto period, developed countries should pay developing countries to halt and, if possible, reverse the rampant deforestation occurring in the tropics for the further sequestration of carbon in one of the world's largest natural carbon banks: rainforests.

The size of the total global carbon pool in forest vegetation is approximately 360 GtC (gigatonnes of carbon), 600% more than annual global carbon emissions from industrial sources at barely more than six GtC (IPCC, 2000). However, three problems prevent an easy accounting forestry projects in a global carbon sequestration scheme: additionality, leakage, and permanence. Additionality refers to whether a project is additional or would have been undertaken anyway; leakage represents off-site effects of projects (the risk that forest protection in one area will just lead to deforestation in another unprotected area); and permanence describes the possibility of future carbon release from a project. A Harvard study examining potential carbon accounting methods “conclude(s) that project-by-project accounting, as under the Clean Development Mechanism of the Kyoto Protocol, is fundamentally flawed due to problems with additionality, leakage, and permanence” (Plantinga and Richards, 2008). They support using a national inventory approach instead to mitigate some of these risks.

In 2007, the UN reported broad consensus on the idea that countries managing to reduce their national rate of deforestation below a reference rate should get compensated in proportion to the corresponding amount of avoided emissions. What form should this compensation take? The Coalition for Rainforest Nations (a diverse group of around thirty countries from Latin and South America, Africa and Asia) wants carbon credits whereas Brazil would like voluntary contributions from developing nations in addition to their Kyoto commitments. India, on the other hand, would like credits for conservation already accomplished – an idea the Coalition supports but Brazil is not in favor of (Bellassen and Schwartzman, 2007). The solution may be a combination of both incentives and requirements.

Moving Forward

All carbon reduction schemes need to have an eye on the long term while dealing with short-term issues, but forest protection plans must be especially cognizant of long-term issues in their accounting. To successfully provide for forest protection and regeneration, blueprints must include smart plans for the near future and a broad, all-encompassing scope for the coming decades, and even centuries. In regards to the former, the REDD proposals must be worked out to ensure maximum efficiency, as well as equity. However, REDD is not the final solution. There must be a long-term, sustained commitment to forest protection and this may only be ensured through the creation of a body whose sole purpose it is to supervise and manage forest protection and regeneration at this critical point in earth's climatic history. In this paper, I propose that an organization known as the International Forest Protection Agency (IFPA) be created for this purpose.

Improving REDD

Before the IFPA can be formed and empowered, REDD is what we have to work with. That is what is being discussed in Poznan and a final version of REDD will appear in Copenhagen as the begin-
nings of forest protection in the post-Kyoto period starting in 2012. In the short term, this document must be as good as possible, taking into consideration the forested states of various nations and their needs. There have been many proposals tabled by both governmental and non-governmental organizations regarding these next steps. The Little REDD Book (Parker et al., 2008) was presented in the opening days of the Poznan conference by the Global Canopy Programme and does an excellent non-partisan job summarizing and comparing the various plans on the table. These come from all over the world, and each contains their own strengths and weaknesses. Additionally, there are some important issues that are not presently being considered which should be.

Capacity Building

The first step for REDD will be to address capacity building among developing nations in regards to their ability to manage and protect forests. The IPCC identified some of the critical factors that these countries must come up to speed on, including “institutional and technical capacity to develop and implement guidelines and procedures; extent and effectiveness of local community participation in development, implementation, and distribution of benefits; and transfer and adoption of technology” (IPCC 2000). There are several areas that capacity must be established in to ensure forest protection: Law Enforcement, Sustainable Forest Management techniques and Agricultural.

Forest Law Enforcement Governance and Trade (FLEGT) must play an increased role in the future of forest protection. With so much money flowing into the hands of developing countries, efforts must be taken to ensure that the money reaches the right hands and has a measurable impact on forest protection. The IFPA will include a law enforcement monitoring arm to ensure compliance with the international agreements. The governance part of FLEGT must ensure that indigenous people's rights are being protected as part of true sustainable forest management. “For successful FLEGT agreements, it is essential to start a political dialogue with producer countries focused on forest sector reform, increasing transparency, strengthening land tenure and access rights, and reducing corruption” (Parker et al., 2008).

With the increase in forest land that will result from these proposals, there may be increased pressure on current agricultural and marginal lands to produce enough food to feed the growing world population. Thus capacity must be built into these developing countries in regards to increasing their food supplies as a correlate of protecting their forest lands. This will include a combination of enhanced agricultural capacity education, as well as potentially the consideration of genetically modified crops that can thrive in marginal lands and produce more food per acre. REDD will no doubt have ripple effects in other sectors as well:

“Large-scale implementation of REDD could have implications for food prices, if it takes land out of food production. Higher food prices would positively affect net producers but would negatively affect net consumers. In addition, REDD may affect local commodity prices by increasing the price of land (with either positive or negative poverty implications, depending on the distribution and security of tenure) or by reducing the availability of non-timber forest products (for example, if people are excluded from forests conserved through REDD mechanisms)” (Miles and Kapos, 2008).
Thus capacity enhancement will need to be multi-faceted and cannot focus on forestry alone to protect forests. Developed countries must aid developing countries in comprehensive planning, including land uses for forestry, agriculture, and development. Restrictions on development into forested regions could have the beneficial side-effect of driving denser, urban development patterns which in turn could support transit oriented development (TOD) in these regions. Dense, transit-oriented urban developments release far less carbon emissions than sprawling suburbs or rural regions.

**Financing**

Capacity building will be expensive and will need to be part of the first phase of REDD. When the IFPA gets up and running, this will fall under the organization’s financial structure and management. Until then, and in order to make REDD effective, I suggest building capacity by creating a new fund which will consist of voluntary financial contributions to developing countries. Donations to this fund will reflect positively on a country’s reputation. As a vital component of forest protection, and thus carbon sequestration, these donations will be useable either as reduced-value carbon credits or as a form of CDM. This will increase the incentives to supply these needed funds. With reduced-value carbon credits, the donor does not receive a one-to-one value of carbon credits for his donation. Since it is only indirectly related to climate change, these funds can qualify for something like 40 cents on the dollar toward carbon credits.

Indigenous People’s rights must be considered. On Nov. 14, 2008 in Baguio City, Philippines, 25 indigenous peoples’ leaders gathered to discuss the REDD proposal and adopted a Global Indigenous Peoples Strategy on REDD, which is related to the UN Declaration on the Rights of Indigenous Peoples, and includes recommendations for governmental and other actors involved in the development and implementation of REDD activities. These debates and discussions continue into Poznan. In the rush for REDD funds, governments might move people, through force or removal of services such as schools and hospitals. Care must be taken to avoid this. One method possible will be to tie funding to observed compliance with the UN Declaration of Indigenous People’s rights. In a similar vein, access to funds could be tied to compliance with the Convention on Biodiversity (CBD) – historically an agreement which developed countries have not been very successful in complying with.

Forests have differing levels of CO₂ storage. REDD funds would be most directed toward those forests with higher levels of carbon storage and may result in a funding shift away from other areas where their value lies in watershed protection, rural economic development or biodiversity instead of CO₂ absorption. It will be important for other funding mechanisms to target the protection of those forests as well. Investments must be prioritized within and between countries to ensure that sustainable forestry management occurs or continues to occur across the board. REDD funds will likely have the effect of applying deforestation pressure to forests with less carbon storage (mitigation) value, but perhaps other types of high adaptation values (Miles and Kapos, 2008). When the IFPA is established, ensuring that all uses of forestland are protected will be an essential part of its mandate.

**Comparing Approaches**

The scope of the 33 governmental and non-governmental proposals described in The Little REDD Book agree that participation in REDD should be voluntary (Parker et al., 2008). With sovereignty...
issues reigning supreme throughout climate change debates, this will of course be the case. However, the incentives for participation must be strong enough to attract all, or at least a vast majority, of forested nations. If several opt out, the issue of international leakage will be greatly increased as displaced deforestation will make its way to the non-participating nations.

Most of those proposals argue for a baseline year to be established which their forest protection and regeneration efforts will be measured against, such as forest cover in 1990 or 2002 for example. The following chart establishes four types of countries depending on where they fall in their current level of forest cover and their current deforestation rates. Each quadrant has a different idea of how forest protection should be done in order to maximize the benefits to themselves and other countries similar to them. The final proposal must take all their concerns into account, while also maintaining the principles of equity. For example, why should those countries who have been deforesting heavily benefit more than those who have been so good at protecting their forestlands?

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<th>LOW FOREST COVER</th>
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<td>( &lt; 50%)</td>
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<td><strong>HIGH DEFORESTATION RATE</strong></td>
<td>Quadrant I</td>
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<td>( &gt; 0.22%/yr)</td>
<td>e.g. Guatemala,</td>
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<td></td>
<td>Thailand, Madagascar</td>
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<tr>
<td>No. of Countries: 44</td>
<td>Forest area: 28%</td>
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<td>Forest carbon total: 22%</td>
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| LOW DEFORESTATION RATE | Quadrant II      | Quadrant IV    |
| ( < 0.22%/yr)         | Dominican Republic, Angola, Vietnam | e.g. Suriname, Belize, Gabon |
|                       | No. of Countries: 15 | No. of Countries: 11 |
| Forest area: 20%      | Forest area: 13%   | Forest area: 13% |
| Forest carbon total: 12% | Deforestation annual 1% | Forest carbon total: 18% |
|                        |                    | Deforestation annual 3% |

(Source: Parker et al. 2008)

This proposal suggests that rather than considering the change based on some baseline forest cover, the yardstick used to measure forest protection and regeneration should be some percent of potential forested area that is actually forested. Countries will be ranked by where their percentage falls compared to other countries. If that rank increases, you get credits. This may incentivize the sabotage of other country's forest lands - not the desired outcome. An alternative would be to establish tiers with a country's percentage, which would place that country on a certain tier. If a country move up in tiers, that country gets more access to development funds.

Lower tier countries will have funds tied to forest development before they can use the money for anything else. Those with lower percentages have more ability to increase than those who have been historically good about preserving their forestlands, but it is that latter group who stands to benefit from this
scheme - as they should. To determine the amount of forest-able land a country has, researchers could use remote sensing, which has already been proven to work well for determining total forested cover.

With a baseline system, for example, Brazil would be held for reforesting up to and past what its forest cover was in some baseline year such as 1990. The percentage system would entail an assessment of Brazil's potentially forested area (let's say 1,000,000 acres) and then assess how much is actually forested (again, let's say 850,000 acres). This would put its percentage of forested area at 85%. If this is the 12th best percentage in the world and they increase their forested area percentage to the 10th best, they would get more money. Rather than a ranking though, the tier system would be set so that, say, countries with 90-100% are in Tier 1 and get a certain amount of money. Countries with 80-90% are in Tier 2 and get a little less, and so on. Thus Brazil in this example would have to increase to the next highest tier (minimum 90%) to get more money from the IFPA.

As REDD develops, there are a few pitfalls that must be avoided. As it is bound to ramp up slowly, there needs to be the right incentives in place to ensure forest protection. We cannot afford to create perverse incentives that may make it profitable for countries that won't be measured for a few years to cut forests down now. To do this we should rely on graduated assessment of forest cover since 1990, with heavier weighting on the near end. Any deforestation occurring after Copenhagen, but before REDD gets fully underway, counts against baseline.

As far as baseline is concerned, sub-national, project-by-project approaches may be valid in the early phases as national capacity is ramped up, but under full REDD, only national inventory accounting will be acceptable. The National Inventory approach was first suggested by Andersson and Richards (2001). This means that measurements are taken for each country as a whole, eliminating intra-country leakages. However:

"The problem of intercountry leakage to non-participating countries persists; however, this is not a problem particular to NI. Whenever there is less than full participation in an international treaty, there is the potential for unregulated actions by non-participating countries to counteract the treaty's objectives" (Plantinga and Richards, 2007).

There is also a third way to measure successful forest protection, beyond sub-national or project by project approaches: global accounting. This will not work if there are many non-participating nations, but could be a feasible tool to reward historically low emitting nations.

Finally, REDD needs to be an addition to, and not a substitute for, large cuts in a country's emissions. This could be enforced by requiring countries or companies to purchase equal (or some standard ratio) amounts of REDD and certified emission reduction (CER) credits and not all of one or the other as they develop. Forest protection and regeneration is only one piece of the climate change solution. An overload of forestry credits could decrease the efficiency of other efforts being worked on towards adaptation or mitigation. Perhaps the debates in Poznan will further clarify the structure REDD will eventually take. Hopefully, these concerns outlined above will be worked out in the final agreement to be determined in Copenhagen in 2009.
The most effective way to ensure protection of the world’s forests – for carbon sequestration as well as considerations of biodiversity, water issues, and local concerns – is to establish a single agency with that as its sole mission. This is too complex and important an issue to be divvied up amongst UN power players with funding coming from different sources and no unified vision. This agency will be known herein as the International Forest Protection Agency. The formation of such an organization allows for the correction of previous shortcomings within other international bodies.

The time is right – with the nations of the world coming together under the banner of finding solutions to climate change and with previously underrepresented countries and peoples forming coalitions and finding their voice – to establish an equitable approach to a resource that, though it may grow in one place or another, is truly a global asset and must be protected for all current and future generations.

The IFPA’s mission statements, management structures, and funding mechanisms are all tabula rasa – blank slate. This work represents a first attempt to establish the direction such an agency may take, and an expose of the varied and multiple benefits such an agency would bring to climate change solutions for both mitigation and adaptation.

The mission statement for the IFPA will state that forests are to be protected for their roles in carbon capture through sustainable forest management, biodiversity, water supply management, local economic development, and in consideration of the rights of indigenous peoples who dwell there. Some may want the IFPA to be primarily concerned with carbon capture, with the other goals as secondary concerns, but this must not be the case. The IFPA will also continue supporting capacity building efforts in forestry and related fields.

Beyond carbon sequestration, forests supply vital ecological services to their local environments, such as biodiversity conservation, livelihoods, and watershed protection (Miles and Kapos, 2008). “Deforestation leads to all kinds of environmental problems: biodiversity loss, soil degradation, water cycle disruption... and about 350 tons of CO$_2$ emissions per hectare destroyed” (Bellassen and Schwartzman, 2007). For decades environmental groups, politicians, and conservation-minded individuals have been striving to protect tropical rainforests for these reasons. Now their value has been recognized in the fight against climate change – and far more serious money will be spent on anything relating to climate change issues then on traditional environmental concerns. Linking the carbon-focused funding from whatever new source will arise with the actions additionally supporting these other co-benefits provided by the world’s forests will be imperative. This will a classic no-regrets approach and for this alone it could garner wide spread support.

Technology requirements

In order to fulfill its mandate, the IFPA must have rigorous methods of monitoring and verifying that forest protection has been accomplished. This will be the jurisdiction of the IFPA because many developing tropical nations (with the exception to some extent of India and Brazil (Skutsch et al., 2007)) do not have the capacity to regularly measure themselves. Considering that nations around the
world will all be simultaneously needing this service, the IFPA could be stretched thin. The most effective way to provide such monitoring is through remote sensing. There are currently several satellites in orbit which are capable of assessing, at some level, the forested acreage of each country. However, they have technological limitations which reduce the efficiency and accuracy of such measurements.

Aerial remote sensing, through LiDAR rather than optical measuring instruments, overcomes these technical limitations, but without the wide coverage that satellites offer. They can be very effective however. For example, an “airplane-mounted system, using dual cameras and collecting imagery that can be viewed in 3D, has been demonstrated to reduce costs of conducting forest inventories, particularly for highly variable, widely spaced, or inaccessible sites (Brown et al 2005, Brown and Pearson 2005) and for dense forests (Pearson et al 2005b)” (Gibbs et al., 2007).

On the short term, a combination of satellite big-picture imaging and aerial sampling can be performed to get a general idea of forest cover. However, this will be insufficient, carrying too much margin of error. Technological advancements are being made in regards to satellite LiDAR, however. NASA plans to launch a LiDAR capable satellite in 2014. NASA is, of course, an agency of the American government, and this could provide a conflict with those who may deem using it as another stranglehold the developed countries have on the developing countries. There must be transparency in its operation and usage – something the United States has experience with through other scientific programs such as Landsat. An assessment must be made as to its effectiveness and the scope with which it will be able to measure forest cover. If it is also deemed inefficient, the IFPA may need to generate support for further technological developments, possibly even creating a dedicated satellite resource for use in global forest monitoring.

Currently, NASA is partnering with the University of Maryland and the Friedrich-Schiller University of Jena (located in Germany) in a research venture to design a “Carbon 3-D” satellite. This bills itself as “an international mission for global 3-dimensional mapping of biomass for an improved understanding of CO₂ balance” (www.carbon3d.uni-jena.de, 2008) and would be an invaluable tool for any REDD or IFPA assessments. Currently, this venture is merely proposed, without funding. Satellite analysis alone will be insufficient. As with all remote sensing tools, there will be an additional ground-truthing requirement to ensure accuracy.

Management Structure

The management structure of the IFPA must ensure equitable representation from northern and southern nations, as well as developed, developing and potentially a third group as well (some combination of Newly Industrialized Countries and Emerging Markets). This will occur with an alternating secretary - two-year term for a developed nation representative followed by a two-year term for a developing nation representative followed by a two-year term for the third nation-type representative, and so forth. The council under the secretary will be composed of an odd number of nations for voting purposes. The least number of representatives (by one) will come from the nation-type representing the secretary’s seat at that time. In addition, indigenous people must be represented alongside those from the developed and developing nations on this council and potentially in the secretary seat.
Forests in Developed Countries

The 33 proposals in The Little REDD Book also agree that REDD funds should only be accessible to developing countries (Parker et al., 2008). However, developed countries, such as Russia, Canada and the United States, have vast forest resources that need to be protected as well. Russia especially has been seeing a recent increase in deforestation and there is high risk that Siberian forests may be significantly affected by the effects of climate change. American and Canadian forests are already feeling the burn, literally. Climate change is directly responsible for the heavy increase in forest fires in North America (Westerling et al., 2006; San Diego Declaration, 2006; Liu, 2006). Both countries have been hard hit by recent bark beetle infestations, also another side-effect of warming climates (Logan, 2003), resulting in hundreds of thousands of acres of beetle-killed trees just waiting for a lightning strike to set them off. This was further noted during the recent European Forest Week: “carbon emissions from forests from fire, storms, insect infestations and forest dieback (e.g. as is occurring in the Russian Federation) seem to be increasing, thus reducing the positive net carbon balance of the region's forests” (FAO and UNECE, 2008).

This REDD focus on developing countries will be a good starting point, especially due to the higher rates of tropical deforestation. However, in the long run, the IFPA must also consider these northern, developed country's forests at risk. Boreal forests can be just as good at sequestering carbon as tropical rainforests if managed properly.

With the developed countries, capacity building will not be the issue it is with developing countries, but their forests must still be protected under the authority of the IFPA. These promises to share aid among developed countries, after the first decade or two of REDD, in their attempts to protect their forests from development pressures and climate change induced catastrophes may appeal to the developing country's representatives in these early negotiating periods.

Mitigation and Adaptation

Forests serve both mitigation and adaptation functions. By the time the IFPA is established (hopefully before 2020), adaptation solutions will certainly be popular, but mitigation of further effects will still help. Carbon sequestration performs the prime form of climate change mitigation offered by biomass, while the protection of strong, diverse ecosystems that are more resilient to climate change forms the basis for adaptation strategies.

The goal of the UNFCCC, the Kyoto Protocol and all other legislation and negotiation to date has not been to reduce carbon dioxide in the atmosphere. That is just the means which they debate. The goal is to reduce the effects all that extra CO₂ and other GHGs have on the planet. This is why forestry is so vital. Not only can it reduce the CO₂, but forests can also help local communities adapt to some other negative effects of climate change, such as reduced water supply. The IFPA agency must be concerned with adaptation as much, if not more than, mitigation. Many mitigation efforts may be coming too late, but it's never too late to adapt. Countries that are most vulnerable to climate change would be among the most benefited by increasing their forest cover.
“Forest management measures that countries could take to facilitate climate change adaptation include favouring forest varieties and species that are adapted or adaptable to new climatic conditions, implementing forest management practices that reduce vulnerability to both incremental climate change and to extreme events such as storms and fires; intensifying fire management systems, and undertaking various in-situ and ex-situ conservation measures, and introducing spatial plans and corridors to help species migrate” (FAO and UNECE, 2008).

It will be up to the IFPA to ensure these adaptive strategies are adequately supported, both with financing and with management aid.

There are already several templates in place in Europe that the IFPA could model its adaptation efforts after. For example, the European Forest Fire Information System develops preventative activities against fires – efforts which surely will be increasingly needed as climate change continues to fuel the intensity and frequency of global fires. For financing they can look to the EU Solidarity Fund “which, among other things, provides support for the restoration of forestry production potential following natural disasters and fire” (FAO and UNECE, 2008).

Currently the adaptive capacity of developing tropical countries can generally be described as insufficient. Recent IPCC reports outline the increases in natural disasters, sea level rise and epidemic increases in the coming century. It is these developing tropical countries who are among those most at risk to suffer climate change’s consequences – and least ready to deal with them. Additional forests balance forests lost to these natural disasters, protect water supplies in the coming age of water scarcity and continue to provide income for forest-dependent stressed communities. These poorer countries will need the influx of cash that REDD forestry carbon credits can bring them. Just as important will be the know-how and capacity building aided by the IFPA on how to properly spend that money to protect even more forest lands.

Financial Mechanisms

“The United Nations Framework Convention on Climate Change (UNFCCC) is considering the introduction of a financial mechanism to reduce emissions from deforestation and forest degradation (REDD) in developing countries” (Miles and Kapos, 2008). Naturally, there is an active and intense debate surrounding the economics of these proposals. Anti-deforestation could be accepted as a financial mechanism in the post-Kyoto negotiations. Funds allocated must be partitioned into different categories to correlate with the different phases – capacity building, reducing deforestation, extending conservation. Beyond REDD, financing for the IFPA must be established. Financial investments in IFPA startup costs can be used as reduced-value carbon credits, but beyond that there will need to be a regular source of income for the organization.

The UK’s Eliasch Review released a report titled “Climate Change: Financing Global Forests” in October that was distributed in Poznan at COP 14. This report “assesses the impact of global forest loss on climate change and explores the future role of forests in the international climate change framework, with particular emphasis on the role of international finance.” Eliasch claims a market mechanism is the only way that this issue can really be paid for.
If a market-based carbon trading mechanism is established, this could lead to larger financial investment over a longer time frame than if a simple grant funding mechanism were agreed upon. CO₂ credits from forestry are already being traded on the global voluntary markets. As of mid-2007, forestry projects accounted for the largest share – about 36 percent – of the carbon credits sold on the voluntary carbon market (Hamilton et al., 2007) but that won't be enough. A mandatory system must be enacted. Anywhere from $1.2 billion to as high as $10 billion could be raised for forest conservation in this fashion – extremely high numbers considering that the World Bank only granted a total of $257 million for forest biodiversity conservation projects in 2002 (Miles and Kapos, 2008). However, this doesn't even come close to being competitive with forestry exports from the developing world which were worth almost $40 billion in 2006 (FAO, 2008). An agreement on REDD could establish a market for those who wish to protect their forests, and provide the financing to do so. Indonesia, for example, stands to earn billions of dollars if REDD takes effect due to their large areas of peat land in the country – one of the highest CO₂ absorbing ecosystems. If Indonesia could curb the burning of these lands, they could generate many tons of CO₂ credits to sell.

Additionally, the World Bank cannot be the organization controlling forest carbon credit trading. That institution must be a truly neutral, north-south venture and one that considers indigenous people's rights as well as carbon and other values of forests. The World Bank began positioning itself to be that institution by establishing the Forest Carbon Partnership Facility (FCPF) – a framework for trading REDD credits – prior to last year's COP13 in Bali. However, “NGOs attending the Bali summit called for the FCPF not to be launched, due to serious shortcomings with the Facility, including its flawed governance structure, lack of transparency, the lack of attention to the Bank's poverty mandate and over-reliance on market-based mechanisms to pay for REDD” (Alter-ECO. 2007).

The forested nations of the world, many too strapped for resources to adequately protect their woodlands, may soon be in a position to reap the financial benefits of climate change. For too long, the ecological services provided by global forests, both to the communities surrounding them and the world as a whole, have been undervalued. Establishing a value to these functions, measurable in a market and exchangeable for cash, invites much-needed investment. Here is an opportunity to both battle climate change and restore millions of acres worldwide to ecologically important forestland. This is an opportunity that must be capitalized on. The influx of Climate Change funds should be used in such a way that they protect and revitalize forests by maximizing the co-benefits provided by the forests in addition to sequestering carbon.

REDD funds may be used to support the principle of “equity” outlined in the UNFCCC and have great potential to contribute to rural economic development in developing countries as well as reduce GHG emissions. However, finding ways to distribute REDD funds equitably will be difficult, facing resistance from various interests. Perceptions of infringement on local sovereignty may result in political resistance to individual REDD schemes (Peskett et al., 2005). Information on the benefits must be distributed and well-communicated to avoid such issues.

Many municipalities and businesses have been on the leading edge of efforts to reduce climate change and its effects by instituting programs that appeal to the green-leaning attitudes of their stakeholders and citizens. They also represent an excellent supplementary source of funding potential for forest protection. Part of the new post-Kyoto agreement should contain language that encourages member
countries to create new laws or programs aimed at requiring (or incentivizing in some way) that all new projects assess their carbon footprint and purchase carbon offsets equal to or exceeding that impact. In this way, all new development could be carbon neutral.

On a small scale, this has begun to happen. The Massachusetts Bay Transportation Authority (MBTA), for example, submitted in 2003 its long-range capital planning document (the Program for Mass Transportation) which contained information for each planned project's projected percentage reduction in weekday CO₂ emissions.

If this requirement is instituted in just a few of the developed countries, it will vastly increase global demand for carbon offsets. By enabling forestry projects to count as carbon credits would flood the market with cheaper credits at a time they are needed most. This would bring the private investment to countries who are trying to increase their forested acreage, as a supplement to the individual country contributions flowing to the proposed IFPA for REDD through whatever other mechanism is enacted. Some are concerned that these cheaper forestry credits will reduce the level of funds available for pollution abatement from industrial sources. (REDD-Monitor, 2008) However, if anything is done right in the post-Kyoto period, there should be a vast increase in demand for carbon credits and initially this will not come from industrial abatement.

What about small-scale forest production? REDD funding mechanisms could adversely affect small producers and land-owners due to potentially high costs such as compliance or verification services: “concerted efforts are required to ensure equitable benefit distribution; robust systems of accountability; effective conflict resolution; and support for small-scale REDD” (Peskett et al., 2005). This could be addressed by forming coalitions or partnerships among these smaller interested parties within each country. Thus scattered small-scale forest protection becomes large-scale effective carbon sequestration. The IFPA will be responsible for aiding in the creation of such coalitions.

Further Considerations

Forests sequester carbon, and in the framework of the post-Kyoto negotiations, this is their prime value. What if a new technology arises in the next decade that vastly out performs forests when it comes to carbon sequestration? Suddenly, forest protection and regeneration as part of the solution to climate change becomes far less appealing. Certainly, this will not affect the importance forests have traditionally played in environmental negotiations (such as biodiversity, watershed protection and local economic development), but these co-benefits will lose a valuable ally if forests become less competitive as carbon banks.

In 2005, the IPCC estimated the economic potential of Carbon Capture and Storage (CCS) as being between 10% and 55% of the total carbon mitigation effort until year 2100 (IPCC, 2005). CCS would take place deep within the earth, the ocean or as converted to a solid in the form of mineral carbonates. Each proposal comes with its own set of risks. The most promising option would be deep within the earth, but it remains to be seen just how secure this would be. The world's oceans are already acting as a CO₂ store, and it is unknown what their maximum potential may be, not to mention what CO₂ sequestration in the ocean may do to this ecosystem. In its 2007 Carbon Sequestration Atlas, the National Energy Technology Laboratory (NETL) reported that North America has enough
storage capacity at our current rate of production for more than 900 years worth of carbon dioxide. While the potential may be there, the technological and financial limitations are currently still there as well.

No matter what scientists say about potential future developments in carbon sequestration technology, the value of forests in this role is indisputable. However, plans should not be made on the basis of a potential future development. Action against climate change needs to occur immediately, with an eye on the long-term future. Forest protection accomplishes this, whether new technologies emerge that do it better or not. At the very least, as long as forest protection for sequestration is linked to forest protection for the slew of other ecological services they provide, these post-Kyoto LULUCF proposals become a no-regrets decision both in the short term, and in the long run.

**Conclusion**

Much work still needs to be done to adequately protect forests, both in the developing and the developed worlds. The definitions of what is “good forest land” must be determined. Currently, the FAO includes monoculture plantations in its definition of forestry and these do not serve the interests of biodiversity. Will this be adequate? What other tactics can be used to enhance the value of forests as carbon sinks? Wood can be used as a substitute for other materials, such as metals and plastics, reducing the carbon impact of processing those materials and establishing long-term carbon retention within the wood product. Can this substitution be implemented successfully in a world of glass and steel skyscrapers? There are technological limitations to overcome: “some carbon sequestration activities are too costly to measure on a comprehensive basis, including changes in carbon stored in agricultural soil carbon and wood products” (Plantinga and Richards, 2007). Also, forest sector policy makers and climate change policy makers must put their heads together and ensure efficient and accurate communication and information sharing is established. The input of forest sector specialists must be gathered and considered – something which did not happen to any great extent under the Kyoto-protocol.

Forest protection and regeneration will play a role in the coming years as climate change strategies are developed. The extent of that role is still being debated, but their importance beyond carbon sequestration must not be overlooked. Not only can they serve successfully in that role, but they provide invaluable adaptive functions as well.

The biggest issue for policymakers and negotiators will be establishing the proper funding mechanism. If worldwide development projects ARE held accountable for their carbon footprints and the price of carbon does drop, REDD and IFPA carbon credits could be an invaluable immediate way to fulfill global demand. Judging by their popularity in the voluntary markets, the future for forest credits in a mandatory market is bright – and adding in the role they may be able to play as a source of income for poor countries makes their appeal almost boundless.

**NOTE:** The economic and ecologic merits of this plan have not been scientifically determined. This plan was arrived upon after examining the strengths, weaknesses and gaps in the multitude of other similar concepts being discussed (in Poznan even as this paper was being written) and hopes to provide additional food for thought on the issues as a climate neutral future is determined by our world leaders.
References


Pathway, Not Stopgap:  
Climate as a Down Payment on Sustainable Development

Kyle Glover

“We can only get people to behave in an ecological way – compatible with nature – when we give up the idea of making sacrifices and being ascetic. Egoism is one of the strongest forces in the living world.”
- Frederic Vester, biochemist and systems pioneer

I. Introduction

Most participants in the climate change debate agree that reducing carbon emissions will be costly. Mitigating climate change will require a massive overhaul of our infrastructure, the development of new technologies, and changes in the way that we consume resources. However, as some prominent economists and environmentalists have argued (see e.g. Stavin 1997; Esty 1994; Meadows 1971), the idea of new costs is deeply misleading.

The great wealth produced in the developed world over the past fifty years has been spurred by a wave of liberalized trade and increasingly integrated markets, allowing for greater specialization and the connection of high-demand consumption with low-cost products and resources. Extraction and production in exporting countries is increasingly rapid and efficient, while importing countries have seen a dramatic rise in levels of consumption. The long-term damage to the environment, however, is profound. Forests have been unsustainably chopped, fisheries have been severely depleted, and hills in commodity-exporting countries have been leveled while new hills of waste in importing countries have been erected.

In this larger context, the climate problem is better seen as another symptom of unsustainable development, rather than a standalone issue. Like forests and fisheries, the planetary balance of heat-trapping gases has been disrupted by increasing consumption of carbon-emitting products. The human race is in fact already paying the high cost of climate through rising temperatures and their impacts, and the science shows that the full bill will come due over the next 100 years (IPCC 2007). The potential cost is staggering, with projections on the order of 5-20% of global GDP loss (Krugman 2008, Stern 2006).

Consequently, the issue of costs should be reframed. Our task in responding to climate change isn’t deciding who will pay to avert a discrete crisis; it is rather to face our global responsibility to pay as we go.

If this sounds sensible, then one might ask why we haven’t been paying for externalities like climate all along. Several real hurdles have made this hard to sell. First, our inaccurate measurement and monitoring tools have made the task of determining and allocating a “price” for externalities very difficult. Though these tools have developed at a rapid pace over the last 50 years, a capacity deficit and a large degree of uncertainty will continue to stymie the process. Second, political difference of opinion about the level of acceptable anthropogenic change to the environment is difficult to resolve. Even if
our scientific measurements were perfect, society would still need to agree on the level of acceptable atmospheric change, deforestation, or fisheries depletion. Finally and most importantly, even if we were able to determine a price for emissions or other environmental damage, the problem of internalizing costs suffers from major collective action problems. Though the human race has a collective interest in internalizing the cost of environmental problems like carbon emissions, our multilateral competitive political and economic system spurs domestic interest groups to lobby for lower environmental standards (Esty 1994, 226).

The current environmental collective action problem resembles many aspects of the collective action problem facing the global trade regime prior to the 1940s. At this time, the multilateral, competitive trade environment created strong incentives for domestic interest groups to seek trade protection, even though the collective population had an interest in the efficiency gains from free trade. The result was a devastating tariff war during the Great Depression of the 1930s that left everyone worse off.

The collapse of the global trading system was a disaster, but it was also an opportunity that created one of the most effective multilateral systems in the world, the World Trade Organization (WTO). Daniel Esty, a prominent author and director of the Yale Center for Environmental Law and Policy, has joked that it would take a similar environmental disaster to mobilize collective action on the environment (Esty 1994). The climate issue is just such a “disaster” and should be seen, like the Great Depression, as an opportunity to mobilize collective action for real and fundamental change toward a more sustainable development pathway.

There are several reasons that climate should be used as an opportunity to merge environmental costs into our economic system. First, the problems of measurement and scientific knowledge have been resolved to a great degree. Though uncertainty about the impact of emissions remains, our tools are sufficiently accurate to determine a baseline of “normal” atmospheric levels and how discrete human activities contribute to raising or lowering it (see IPCC 2007). Second, debates over what level of anthropogenic change in the atmosphere is acceptable have been narrowed considerably (see IPCC 2007). Largely as a result of efforts by the Intergovernmental Panel on Climate Change, environmental NGOs, and prominent activists, climate change is a problem that has been recognized by virtually every government in the world. These same efforts have mobilized diffuse interest groups within many countries, providing a counterweight to polluters who would face higher costs. Most importantly, the present and future actions of every country will matter, so any solution will require global action.

Unlike perhaps any environmental problem before it, climate change provides the urgency and scope to mobilize global collective action. The incredible potential to mobilize around this problem should be used as an opportunity to begin to adapt our existing economic system to a more sustainable pathway, with action on climate change as the first step. In this paper I propose specific features of a new multilateral environmental agreement (MEA) that would both address climate change and set the stage for further collective action on sustainable development. These features include internalizing the cost of climate change, easing the transition of national economies to sustainable emissions, and shifting the burden from the poorest countries onto the wealthiest ones. Equally importantly, the framework for addressing climate change would be a model for solving other global environmental issues, serving as a first step on the road to larger sustainable development.
Specifically, I argue that a new global environmental agreement addressing climate change should have the following four features:

It should ultimately internalize the cost of emissions into the market through a global carbon tax on emissions, so that future market choices reflect those environmental costs;

By implementing a universal system of new “carbon standards” and “green milestones,” it should provide an incentives-based, transparent, and realistic path for industries in every country to become more sustainable;

By phasing commitments and requiring aid from developed countries to developing ones, it should seek to shift the burden of transition onto those most able to bear it; and

It should serve as a test model for solving other global environmental problems using the same method of internalizing costs.

In this paper, I seek to explain why these four goals should be at the core of the next multilateral environmental agreement (MEA) and to set forth their proposed implementation. The paper proceeds as follows. The main section of the paper (II) explains the model, outlining each core goal in greater detail and explaining how they will work together to create an effective system for mitigating climate change. Section II will also show what implementation might look like within a particular country. The following section (III) will look at the political landscape within the developed world, showing why key countries like the United States should advocate for this model. Though I also make a brief mention of developing countries, my focus here is on the developed world. I conclude by briefly discussing additional considerations not addressed by this paper, including adaptation and enforcement.

II. Common Responsibilities: a Global Standard for Carbon Emissions

(1) A global carbon tax on emissions.

The cornerstone of the model is a global carbon tax on emissions. The tax would eventually be applied to all global carbon emissions, raising the cost of those emissions to reflect their anthropogenic impact on the atmosphere while providing incentives for downstream consumers within the market to choose less harmful technologies and products.

How it would be developed. The carbon tax would be set globally, based upon a scientifically determined (and politically agreed upon) optimal level of global emissions. With current advances in our understanding of the effects of emissions on climate and our technology for measuring those emissions, the calculation of a global carbon tax is now within our technological capacity to determine. Scientists in the IPCC have determined with accuracy the average levels of carbon in the Earth’s atmosphere going back more than 650,000 years (IPCC 2007, 5), and these averages have been compared with current levels to determine the level of anthropogenic impact our activities are having. Combined with increasingly accurate and accessible means of measuring existing emissions (See e.g. ISO 2008; Baue 2007), it would be possible to assign a global tax on each firm based on the extent to which their current emissions contribute to a rise above pre-existing levels. Enabled by these scientific and technical tools, countries would need to then agree on a global carbon tax level based on our
desired level of total emissions - the “common” in “common but differentiated responsibilities.” Though internalization of costs for all emissions is desired over the long-term, however, flexibility would be built into the system at both the global and the national level. At the global level, deadlines for phasing in the carbon tax would be set for each country individually, allowing poorer countries more time to adapt and requiring developed countries to begin the process first. In addition, the MEA could initially limit the tax to particular industries, based on feasibility of adaptation, level of emissions, and considerations of the overall global emissions target. The resulting schedule would look something like the following:

<table>
<thead>
<tr>
<th>Country</th>
<th>Sector Targets (date by which carbon tax imposed)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Energy</td>
</tr>
<tr>
<td>United States</td>
<td>2015</td>
</tr>
<tr>
<td>China</td>
<td>2040</td>
</tr>
<tr>
<td>EU</td>
<td>2020</td>
</tr>
</tbody>
</table>

Figure 1. Example of a global carbon tax schedule. The above schedule sets dates by which a member country must have imposed the carbon tax on the sector listed. All dates would be determined in global negotiations, based on country and industry capacity balanced against the requirements for mitigation.

Within this internationally defined framework, each country would have the option to decide when and how it would begin to mitigate against climate change. Given the potentially catastrophic damage of climate change as well as the huge task of mitigation, this tax would likely be quite large, and countries and industries would be strongly motivated to take immediate action to reduce carbon emissions prior to the levying of the tax.

Advantages. Of all of the methods available to adjust to carbon emissions, a tax is the most integrated and efficient solution. Unlike top-down regulation or an emissions trading scheme, a tax integrates emissions costs directly into the existing economic structure, taking advantage of well-developed market mechanisms for regulating consumption. A global tax also has the benefit of working within the existing multilateral economic system, reducing the scope of conflict with existing trade rules and more easily winning support from free traders and economists (Esty 1994, 227). Moreover, a tax would be able to take advantage of existing domestic infrastructure, rather than spending limited resources to create a new system and a large bureaucracy to run it. This would also make a carbon tax easier to enforce and avoid the loopholes that would be present in any large new regulatory apparatus. Finally, a tax would be neutral, eliminating market distortions caused by regulation and subsidies (WSJ 2008).

A final advantage is that taxation will generate revenue, which can be used to fund adaptation efforts within the developing world and to mitigate against the potentially damaging effects of higher prices on the poor.

Disadvantages. Probably the largest traditional objection is that a tax would decrease competitiveness by raising prices. However, a universal global tax eliminates this problem by harmonizing the price
change in all countries. A second important objection is that a tax would be unduly burdensome for the poor and for industries with low profits, as rising prices make certain necessities unaffordable. This problem is partly addressed by features of the MEA, including time for sector to adapt and burden shifting onto developed countries. However, those at the margins will need to be protected from disparate impacts as prices rise, possibly in the form of a tax credit or exemptions in other areas.

Alternatives. One disadvantage of a carbon tax would be the abandonment of the emissions trading schemes set up by the Kyoto Protocol and within the EU, into which resources and time have already been invested. However, in addition to all of the advantages of a carbon tax listed above, there are several reasons why a global emissions trading scheme will not work. First, emissions trading on the global level would require a large apparatus to manage it – one that would be more unwieldy and open to abuse than a global tax scheme. Second, many developing countries, which could build upon existing infrastructure in instituting a tax, would have to start from scratch with emissions trading, which would be very problematic. In addition, the firm cap on emissions under a trading scheme is unlikely to appeal to developing countries like China, who would prefer a more flexible taxation system that would allow it to pay as it goes (Nader 2008). Finally, emissions trading, even if it were workable, would be a band-aid rather than a cure for our unsustainable economic system since it is less likely than a tax to work in other environmental contexts.

(2) A universal system of carbon standards and green milestones

A second cornerstone of the global MEA would be a universal system of “carbon standards” and “green milestones” (CSGM). In the short term, the CSGM would serve as an optional roadmap for firms who want to decrease their carbon footprint and build toward a sustainable development paradigm. Hitting the green milestones of the CSGM within a realistic timeframe would allow firms to enjoy emissions tax exemptions, benefit from an internationally recognized “green labeling system,” and put them on track to be competitive in the new sustainable economy.

How it would be developed. Using the global targets for industry set by international negotiations, the CSGM would provide a series of “green milestones” that companies could reach by achieving certain reduced levels of carbon emissions and meeting certain standards. By pursuing these milestones, private firms and governments would reduce their share of total emissions within a timeframe that balanced capacity with the need for real reductions.

Using the process for standards development created by the International Organization for Standardization (ISO), the MEA Secretariat (perhaps in collaboration with the ISO) would convene a roundtable of scientists and sector experts from its member countries for a technical consultation to follow immediately after the negotiations conclude. Guided by the science and the agreed-upon global targets, technical sub-committees of sector experts and scientists would set realistic milestones and timeframes for individual firms to reduce their carbon footprints.

What it would look like. Using the ISO’s generic 140001 system of environmental management as a starting point, each standard would set forth a series of realistic sector-specific green milestones for firms upon the path to a smaller carbon footprint. At minimum, there should be three green milestones, with some kind of labeling system distinguishing them – for our purposes blue, teal, and green. Firms that meet a particular milestone would benefit from a carbon labeling system that would allow
them to market to consumers as having met the “blue,” “teal,” or “green” standard of carbon sustainability. This labeling system would provide consumers with valuable information about the carbon footprint of the products they buy, creating one incentive for companies to pursue the path to standardization. Because the labeling system would be based on an international standard, moreover, firms anywhere in the world could qualify for a particular color standard and market themselves around the world that way.

In addition to the labeling system and series of milestones, the roundtable of scientists and experts would compile a menu of best-practices options for firms to pursue toward lowering their carbon footprint. This list of options could be updated on a regular basis (e.g. annually, biannually) as new approaches and new technologies within each sector become available.

Advantages The CSGM would supplement the carbon tax with a guiding, but optional, framework for individual firms to pursue sustainable development aims. While remaining optional, however, the CSGM would also tie each milestone to specific incentives, including product labeling privileges and tax exemptions, giving firms distinct rewards for pursuing a sustainable path.

A global system of universal carbon standards and green milestones would also solve important collective action problems and allow industries to benefit from economies of scale. By providing a universal framework, the CSGM would create a source of information for firms around the world to use as a guide in planning their own development. By updating best practices in the standard on a regular basis, the most up-to-date procedures and technologies within each sector would be available. In addition, the coordinated movement of similar types of firms along a single pathway would create a strong demand for technologies to facilitate reduction of emissions and generate desired innovation and jobs within the environmental goods and services (EGS) sector. Finally, harmonized carbon standards would improve the efficiency of monitoring and reporting emissions.

(3) Easing the transition to sustainable development and shifting the burden onto those who can most easily bear it

(a) Easing the transition

The task of easing the transition to sustainable development will be crucial to protecting the vulnerable elements of the global society and to creating the most efficient process possible. Once given the appropriate signal, systems need time to respond to change. By combining a phased tax with a set of carbon standards and green milestones, the model seeks to ease the transition of firms to sustainability. There are several reasons that transition time is necessary. An immediately initiated tax, while generating revenue and beginning to exert appropriate market signals, would be politically hard to sell and damaging to firms and the consumers who would bear the higher cost of carbon-intensive products. In addition, the necessary technology and capacity may be unavailable, leaving firms with no option to adjust. Finally, an immediate tax would penalize and reduce the funds available to firms at a time when we want them to be investing in new infrastructure, technology, and processes.

Instead, the carbon standards/green milestones system provides guidance for firms to begin to adapt on their own initiative in advance of the tax. Firms making this proactive choice are rewarded both
by specific incentives and lower carbon emissions, which ultimately reduces their exposure to the impending carbon tax. Though the carbon standards system is optional, the goal is to align incentives so strongly with achieving green milestones that most firms will aggressively pursue a policy of reducing their carbon footprint.

An example best illustrates how this would work. Note that the following example seeks to show how the combination of standards and taxes might work in practice, but that much of these decisions are left to the individual country to determine. The only requirements set internationally are (1) the deadlines by which a country must have implemented its carbon tax within each sector and (2) the specific requirements needed to achieve the different green milestones within the carbon standards system.

An illustrative example. According to the MEA, the country of Alba must have a fully phased in carbon tax within 20 years. In consultation with the MEA Secretariat’s energy sector experts as well as its own domestic energy sector, Alba determines that firms can and should achieve each of the blue, teal and green milestones within the carbon standards system within fifteen years, taking five years between each milestone. For this example, according to the CSGM, each milestone represents a further 25% reduction of a firm’s carbon footprint relative to the milestone before it, so that a “green” firm would be emitting 25% of the emissions of an unlabeled firm.

Based on these determinations, Alba then sets the following schedule for phasing in the carbon tax: In Year Five, 33% of the total carbon tax will be levied annually on all firms who have failed to achieve the blue milestone, while those who have achieved at least blue will remain tax exempt. In Year Ten, the tax for firms below the blue level will be increased to 66% of the total tax, while the tax for firms who have achieved the blue level but failed to achieve the teal level will be increased to 33%. In Year Fifteen, firms below the blue level will be taxed 100% of the total carbon tax; firms who have achieved blue will be taxed at 66%; and firms who have achieved the teal level will be taxed at 33%. Firms who have managed to achieve the green level will enjoy tax exemption for another five years, after which every firm in the sector will be taxed at the full 100%.

To illustrate how the system might work within Alba, we will look at a sample firm. Zelco Industries is an energy sector company whose current emissions would be taxed at $10.00 per year under a full carbon tax and who would fall below the blue milestone in terms of emissions. However, under the Alba policy, Zelco remains untaxed for the first five years. Furthermore, if Zelco is able to achieve a blue rating under the standards system by Year Five (when Zelco is emitting 75% or less of its original quantity), the teal rating by Year Ten (when it is emitting 50% of the original), and the green rating by Year Fifteen (when it is emitting 25%), Zelco will avoid taxes altogether, only being taxed in year Twenty, when its tax on emissions is no higher than $2.50. Not only is the new tax more affordable for Zelco than it would have been in Year 1, but the firm has had an opportunity to plan for the tax and to take advantage of new technologies that have developed in the interim. Because the tax is continuous with emissions, moreover, Zelco has an incentive to continue to lower its emissions as long as it is economically feasible to do so.

Now assume that Zelco makes some progress toward the blue milestone but fails to reach it by Year Five, reducing its emissions to 80% of original levels. Zelco would then be obligated to pay 33% of
the $8.00 that it owes. If Zelco fails to make any further progress, it will be taxed 66% of $8.00 in Year Ten and the full $8.00 in Year Fifteen. If Zelco redoubles its efforts and reaches the teal milestone by Year Ten, however, then Zelco would enjoy full tax exemption again. If Zelco manages to achieve blue by Year Ten, then it will avoid the increase to 66% but will still be subject to a tax of 33% on its emissions.

As this example illustrates, the CSGM provides a series of goals and a pathway for countries to follow, while the pending international carbon tax creates the incentive. Countries then create a plan domestically that maximizes the incentives for companies to make the transition while easing the process as much as possible. In the example above, Alba sets deadlines for industries to achieve each milestone and ties success to carbon tax exemptions. At the end of this development arc, most firms will have significantly lowered their emissions levels, so that by the time the full tax is levied it will reflect only a modest and bearable increase in price. Competition within the sector also drives firms to lower their emissions and seek new, greener ways of operating. Even if a firm can bear the cost of a tax, it will have to contend with firms that both avoid the tax (and are possibly able to offer lower prices) and benefit from a labeling system that communicates to downstream consumers that they are the more carbon-friendly choice.

In addition, since the set of standards is universally recognized and internationally administered, foreign competitors may seek to sell their products under the labeling system as well. Since each milestone is commensurate with a certain level of carbon emissions determined at the international level, downstream consumers, regardless of country, know that a particular label represents a particular carbon footprint.

Under this system, carbon taxes are not levied in order to be collected; rather, by keying each phase of taxes to the realistic green milestones that have been set by science and sector experts within the MEA Secretariat, the hope is that motivated firms are able to avoid the tax by seeking to achieve the green milestones set forth within the carbon standard. Firms, of course, have the choice of continuing their current level of emissions and/or proceeding more slowly toward reducing their emissions, as long as they are willing to bear the cost of the tax and can compete with firms bearing “greener” labels.

In any case, the question of how to use the tax revenues would undoubtedly be a sensitive one. In order to avoid the criticism domestically that a carbon tax is merely an attempt by the government to raise revenue for other projects, tax revenues should be pre-committed to providing funding for initiatives under the treaty; all or some substantial portion of the tax revenue should, moreover, be dedicated directly to helping developing countries, perhaps being placed in a globally administered fund.

An additional capstone to this system could be a policy of “green grants” paid for by the government, possibly using carbon tax revenues. Firms within each sector could apply for these grants by submitting a plan that outlined the steps that would be taken to achieve a particular milestone. Upon approval by the granting government, that company would be given money to facilitate movement toward a particular milestone. If the company is able to achieve that milestone within the expected timeframe, it would become eligible for further grant money. If it fails to reach that milestone, however, some system for penalizing that firm would need to be developed. Though this grant system would create additional bureaucracy to administer, it might go a long way toward enabling
firms to actively seek targets. For developed countries, it would ultimately depend on domestic political choices. For developing countries, some form of assistance like that described below would probably be required, using international funds.

(b) Shifting the burden

Another key component of any MEA would be provisions for shifting the burden of adaptation onto those who can most easily bear it. Domestically, countries will have to develop programs to protect their lower classes from rising prices, perhaps through some new tax structure or credit system. Internationally, the focus will be on shifting the burden from developing countries onto wealthier ones.

One primary means of shifting the burden for climate change onto wealthier countries will be through the sequencing of country obligations to implement the carbon tax. Though the tax will need to eventually be levied globally, the wealthiest countries will be required to phase in the tax first, followed by the poorer countries. This makes sense for two reasons. First, wealthier countries will be better able to bear the huge financial burden of internalizing the cost of climate change. The shift will be most expensive for the path-breaking countries, which must invent new technologies and move up the learning curve. Though this will have negative impacts on the consumption patterns of developed countries, it will be unlikely to have effects as disastrous as would be the case in the poorest countries. The second reason that developed countries should go first is that it will be more efficient in the long run. Developed countries like the United States and those in Western Europe generally enjoy a comparative advantage in innovation, so they should be the first to take on the task of developing cheaper and more efficient technologies. Finally, developed countries should take on the increased financial burden for equity reasons. This initial, greater cost borne by the developed world (including tax revenues generated) is part of the developed world’s “differentiated” (and greater) responsibility to address climate change.

Any country (or firm) may choose to adjust earlier than its obligations require, of course, and the product labeling system will be a continuing incentive for globally competitive larger firms within the developing world.

In addition to going first, developed countries will also need to provide meaningful financial and technical assistance to poorer countries for adapting to a sustainable system. That should include a program for fully sharing technologies, for subsidizing the export of environmental goods and services, and for funding adaptation efforts within developing countries themselves.

A program for fully sharing technologies. If poorer countries are going to benefit from the cheap, efficient technologies invented by developed countries, there needs to be some form of free or subsidized transfer of those technologies from developed country firms. The patent system in countries like the United States, which rewards firms for engaging in costly research and development (R & D) by granting them monopolies over new technologies, will need to be modified to allow the sharing of technologies. Developed countries should be obligated to facilitate the free transfer of technologies from domestic firms to developing countries but left to determine individually how this will happen.
To give an example of how this might work, developed countries that engage in subsidized funding for R&D within the green technology sector could require firms receiving funds to accept special conditions on new patents, e.g. limiting them to the country of production or shortening their duration. In addition, developed countries could financially subsidize the licensing of this technology in the developing world.

Subsidizing exportation of environmental goods and services (EGS). Another method for transferring wealth to developing countries would be for developed countries to subsidize the export of environmental goods and services. Having already moved down the learning curve in their home countries, the environmental goods and services sectors within developed countries will already have become more efficient, effective, and lower-cost. In this way, the burden of “going first” assumed by developed countries will have already yielded benefits for developing countries. In addition to these efficiencies gained by moving down the learning curve, the environmental goods and services sector may also need to receive additional monetary subsidies from developed country governments of technology and expertise exported to developing countries.

Additional aid will likely be needed. This aid could take the form of a traditional subsidy, effectively resulting in a transfer of wealth to the receiving state. One advantage of this is that it would simultaneously support domestic industries within developed countries, making it easier to sell politically. Another means of effectively subsidizing these efforts might be to offer tax exemptions or other incentives to firms who engage in capacity-building projects within developing countries.

Funding adaptation efforts. One component of the financial support should be the availability of funds for projects within developing countries. Projects should include not only efforts to move to a more sustainable economic paradigm, but also adaptation efforts that respond to the negative environmental effects of climate change (desertification, rising sea levels, etc.) and protect the poorest members of the population from the adverse impacts of rising prices.

Though elaboration on a complete funding scheme for developing countries is beyond the scope of this paper, some dedicated portion of carbon tax revenues collected by developed countries should be used for this purpose. The rest of the funding could be provided by obligating specific commitments from developed countries or by seeking voluntary donations from private enterprises and individuals from around the world. Within developed countries, tapping into small donors using the Internet could raise a potentially sizable amount of money.

Summary. The current proposal employs a number of methods to ease the transition for firms toward a sustainable carbon footprint and to shift the burden onto those who can most easily bear it.

To ease the transition of firms, countries have the option of phasing the implementation of the carbon tax within the framework of the larger MEA, giving firms time to adapt their practices. In addition, the carbon standard, with its series of green milestones, provides a realistic and attainable road map that - when tied to sufficient tax exemptions, labeling privileges, and grants - firms should be highly motivated to follow. Furthermore, the imposition of a uniform, global carbon tax and a global labeling system both ease fears that sustainability will hurt a firm’s competitiveness internationally. Though differences in global taxation will exist in the short run due to the staggered nature of coun-
try obligations, countries and firms may make plans to mitigate these competitive effects in the short-
term, knowing that any subsidy or belt-tightening will become less and less necessary as the world 
adapts to a uniform standard. In addition, the ability of a firm to tout its own small carbon footprint 
can help it compete with firms whose practices are less sustainable.

Finally, this shifts the burden of the response to climate change by obligating developed countries to 
bear more of the cost. First, developed countries must go first, bearing the costs of getting up the 
learning curve toward cheaper and more efficient sustainable technologies and effectively subsidizing 
the export of cheap environmental goods and services to developing countries. Second, developed 
countries must require their firms to share technologies, either through negotiating more limited 
patents or by paying their firms to license technology directly to the developing world. Finally, devel-
opled countries will be obligated to pay the revenues from their carbon tax into a global fund to assist 
developing countries, along with additional obligated funds.

(4) Serving as a model for other environmental problems

In addition to the other reasons discussed above, the provisions of this MEA should be seen as the 
first step toward a more sustainable economic system. As mentioned in the introduction to this paper, 
carbon is only one small part of the larger global problem of unsustainable growth, which is largely 
due to externalized environmental costs. As the “poster child” crisis for this problem, climate can serve 
as a catalyst to mobilize collective action around an international system. We should not waste this 
opportunity to move closer to a sustainable world.

For this reason, the system for dealing with climate change should be designed not only to integrate 
as easily as possible with the current economic system, but it should also be reproducible in other areas 
where environmental externalities are driving us toward unsustainable development.

In terms of ease of integration into the current system, a tax is widely recognized as one of the most 
efficient and straightforward methods. The potentially damaging effects of higher prices on the poor 
and on firms are mitigated by a phased implementation and help for firms to move toward a small 
footprint in advance of the tax. When the tax is imposed, society will have already adapted to a less 
carbon-intensive society, making the costs of the new tax bearable. A global standard eliminates 
Balkanization, thereby increasing simplicity and transparency, eliminating potential leakage effects, 
and allowing countries with more capacity to pave the way for countries with less capacity.

This approach may also be easily exported to other environmental problems involving global goods. 
Though assigning a value to resources will always be politically and scientifically fraught, the use of a 
tax scheme to internalize costs can be used in virtually any case to harness the power of the market 
without disrupting or further complicating the current international political system.

III. Differentiated Responsibilities: The Case of the United States

As mentioned above, the problems of easing the transition and shifting the burden are best addressed 
in part by having developed countries go first in assuming the costs of carbon emissions. The process 
of internalizing costs will be painful. This will be politically difficult for developed countries to accept, 
as evidenced by the low standards and notable defections from the Kyoto Protocol.
The notion that developed countries should assume a greater burden for climate change is not new. The idea was enshrined at the Rio Conference and validated by the Berlin Declaration, and the Kyoto Protocol represented an implicit acceptance of this principle. More importantly, the argument of developing countries that the developed world is responsible for most existing pollution and can afford to pay more has achieved the status of an international moral norm.

This is one concession the developed world will almost certainly make considering the normative value of that claim and the need to get developing countries on board.

In addition to going first, developed countries will have to make extremely costly commitments. Several factors, however, will probably make it easier for developed countries to accept. First, the science of climate change has progressed to the point where the scientists themselves are warning that action must be taken (IPCC 2007), and it has become harder to refute the enormous danger posed by climate change. Second, environmental NGOs, action networks, and activists have successfully raised public awareness and support for action on climate change in developed countries, pushing those governments toward action. Finally, many developed countries have already taken steps toward responding to climate change, including an EU-wide carbon trading scheme and carbon taxes in Scandinavia and New Zealand.

In the United States, perhaps the most important country to enlist in any climate regime, recent economic and political shifts have also made the assumption of obligations like those suggested in this paper more likely. The incoming Obama administration was elected partly on a pro-climate platform, along with promises to achieve energy independence and assume greater responsibility as a global citizen. Coupled with that, the United States legislature has a strong Democratic majority in both houses, with indications that environment and climate change will be important issues (see Broder 2008).

The current economic crisis, which some have argued will be an obstacle to progress on climate, may actually represent a unique opportunity for governments like the United States to take on new obligations to switch to a more sustainable carbon economy. First, the financial crisis has weakened important blocking actors. The U.S. automobile sector, for example, which lobbied against a government response to climate change in the 1990’s, is now at the mercy of the government. Consumers themselves, who would have resisted an obligation like climate change in good economic times, have been pummeled by economic crises. Many Americans now share a sense that the current system isn’t working properly and that reform on a massive scale is needed, even if it requires changes in their own consumption patterns. Finally and most importantly, the current economic crisis has created an opportunity for public funding on a scale that hasn’t been seen in decades. Prominent economists like Paul Krugman have compared the current crisis to the Great Depression and argued that only a massive government spending program can jumpstart the economy (Krugman 2008). In keeping with this, the Obama administration has promised an enormous stimulus package that involves investment in infrastructure, “green jobs,” and renewable energy (Baker 2008).

This U.S. plan to revitalize the economy could easily align with the adaptation to climate change proposed herein, and there are several reasons that the United States might support an MEA along the lines outlined above. First, an MEA could lock in U.S. obligations to invest in its infrastructure and help to counter domestic blockers. Second, the universal international standards developed by an MEA would facilitate the process of updating the infrastructure of U.S. industries, as described above.
Third, an MEA would ensure a long-term demand for environmental goods and services, which would protect the “green economy” that the current administration seeks to create. Finally, the idea of using market-based incentives would appeal to those within the United States who resist a command-and-control structure. The MEA, especially since its universal and phased-in nature alleviates concerns about competitiveness, would more easily win the support of free traders and fiscal conservatives in the United States.

In addition to winning support from the United States and other developed countries, the current MEA proposal would also appeal to developing countries for a number of reasons. First, the provisions for developed countries to go first and to provide aid are obviously advantageous. Second, a global tax would be relatively easy for developing countries to implement, would be a source of revenue, and would alleviate fears about competitiveness. Third, the creation of a single global set of environmental standards and a global environmental labeling system would help to eliminate policy Balkanization and make it easier for developing countries to sell products within developed country markets. Finally, this system would allow developing countries to leapfrog over the phase of high-emissions development with the help of developed countries, transferring valuable technology and providing for a cleaner environment.

IV. Conclusion

In this paper I have attempted to outline a plan that would internalize the costs of carbon emissions, provide incentives for firms to adapt, and create a universal environmental standard. I have also attempted to take the needs of poorer populations into account, while creating a system that could be used as a guide for further global environmental action. In doing that, the wider goal of this paper has been to think about how climate could be used as a first step toward creating a sustainable economic system that would appropriately value the cost of environmental damage and positively affect consumption.

Though I have sought to show how the basic elements of the proposal would accomplish this aim, further work is needed. The proposal would need greater elaboration than is possible here to address concerns that will undoubtedly arise in the details.

Additionally, a number of important considerations have been omitted from this discussion due to space considerations. These include the issue of sinks, adaptation of vulnerable countries to climate change, accountability and enforcement, and dealing with perverse subsidies. These would all need to be addressed in any MEA, though I leave elaboration of these to others.

The problem of climate change demands an urgent response. However, we should take care to avoid designing a system that addresses climate without any regard for the wider problems of our unsustainable economic system. Only by adapting the structure as a whole – by internalizing economic costs – can we start down the path to a system that is truly sustainable. Otherwise, climate will only be the first in a series of global crises.
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