The Bali Batik:
Design of the post 2012 Climate Regime

Christiana Figueres[1]

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Given the by-now indisputable fact that climate change is one of the greatest challenges humanity has ever faced, the Kyoto Protocol can only be recognized as preparation for the much deeper and broader engagement that will clearly be necessary after 2012. The Kyoto Protocol was never meant as the solution to the climate change problem. Limited in its targets, timeframe, and participation, the Protocol's most important success will not be in reaching its emission reduction targets - if they are reached- but rather in laying the institutional, legal, and technical groundwork for the future climate regime. While the first commitment period does not expire until 2012, it is probable that most of the learning opportunity afforded by the Protocol has already occurred. With a growing recognition of the scale of the challenge to be tackled, most countries are now turning their attention to the design of the future regime.

The increased of scientific evidence about the effects of climate change have lead to mounting pressure to make significant advances in international climate policy for the post-2012 period. However, following the tradition of the international climate change negotiations, discussions about the progress of the regime are occurring at two levels: the formal negotiations and the informal discussions. The formal negotiations have the character of official country/region positions and take place within the confines of the formally organized meetings of the UN Framework Convention on Climate Change (UNFCCC). These negotiations are inevitably cautious, conservative and slow, as the consequences of agreements at this level can be high. By contrast, the informal discussions that are typically organized by academic institutions or other non-profit organizations provide the opportunity to brainstorm more freely, without the risk of making any type of concession or commitment. These informal discussions are characterized by more "out of the box" thinking, and are more provocative than the official negotiations.

In reviewing the options for post 2012, this paper first presents the status of the guarded official negotiations, and then gives an overview of the two conceptual approaches (top down and bottom up) represented in the rich discussions that are occurring at an informal level, and identifies three points of consensus between the two approaches. Finally the author presents five design elements that could potentially form the backbone of the future climate regime, argues why these may be possible. The mandate for such a regime will be negotiated in Bali in December 2007. The design of the resulting new regime will not be as simple as the design of the Kyoto Protocol. Much as Indonesian batiks combine intricate geometrical and freehand designs, the new regime will have to combine a diversity of elements to produce a structure representative of the diversity of interests and capabilities of participating nations.

1- Formal negotiations

One of the main concerns of the countries participating in the Kyoto Protocol is that agreement on the post 2012 regime be reached in time to ensure that there is no gap between the end of the first commitment period of the Protocol, and the beginning of the next phase of the regime. In fact, Article 3, paragraph 9 of the Kyoto Protocol dictates that Parties must consider future commitments for Annex I Parties at least seven years before the end of the first

[1] The author is member of the CDM Executive Board. The views expressed in this paper are her own and do not represent the position or views of the Executive Board.

commitment period. Because of this provision the first session of the Conference of the Parties acting as the Meeting of the Parties (COP/MOP 1) held in Montreal from 28 November to 10 December 2005, became the starting point of the official post 2012 negotiations. COP/MOP 1 launched two processes for consultations on the post 2012 regime: one under the Protocol and one under the Convention. Both processes are running simultaneously and in parallel with each other.

A- Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol (AWG).

The AWG, also known as the "Protocol track", is the consultative process focused on increasing the emission reduction commitments of *only those Annex I Parties that participate in the Protocol*. AWG has had three sessions so far: in Bonn in May 2006, in Nairobi in November 2007, and recently in Bonn in May 2007. At its second session the AWG adopted a work program based on: (a) Analysis of mitigation potentials and ranges of emission reduction objectives of Annex I Parties, (b) Analysis of possible means to achieve mitigation objectives, and (c) Consideration of further commitments by Annex I Parties. The AWG decided to focus first on task (a). At its third session the AWG considered information from the recently released IPCC Fourth Assessment Report (AR4)[2] and the results of its Working Group on Mitigation, and deemed it very useful for deliberations. It agreed to continue the analysis of mitigation potential at its fourth session to be held in Bali, Indonesia, in December of this year and to analyze possible means to achieve mitigation objectives at AWG 5 in Bonn in June 2008. The analysis will be based on submissions of Parties regarding mitigation potentials of policies, measures and technologies already at hand. Finally the AWG agreed to develop a timetable to guide its work in order to avoid a gap between the first and second commitment period. Implicitly this obligates the AWG to come to some recommendation by 2008 or 2009 at the latest, since countries need time to adopt the recommendation and then ratify it through their domestic legislative processes.

It should be noted that the AWG is the only process that by definition, looks specifically at a continuation of the Kyoto Protocol. All other options considered in this paper point rather to a new agreement, that would complement or replace the Kyoto Protocol.

B- Dialogue on long-term cooperative action to address climate change by enhancing implementation of the Convention (Dialogue)

The 11th Conference of the Parties that initiated the AWG also launched the "Dialogue" or the "Convention track", with the purpose of consulting on ways for *all countries* to strengthen the regime, in addition to whatever would be negotiated as further steps for those countries bound by the Protocol. The aim of this process is to analyze strategic approaches for long-term cooperative action of all Parties. The Dialogue focuses on four areas: (a) Advancing development goals in a sustainable way, (b) Addressing action on adaptation, (c) Realizing the full potential of technology, and (d) Realizing the full potential of market-based opportunities. The Dialogue was planned to take place in up to four workshops, three of which have already taken place simultaneously with the first three first sessions of the AWG. The fourth and final Dialogue workshop will take place in Vienna at the end of August of this year. Upon the insistence of the USA in 2005, the Dialogue was launched as a "non-binding exchange of views"… "without prejudice to any future negotiations, commitments, or mandate". It remains to be seen whether the new announcements from the USA (see below) have opened some political space for the Dialogue to lead to concrete agreements.

In the meantime the Dialogue has indeed been an open exchange of views and a series of presentations highlighting the role of technology including carbon capture and storage,

[2] http://www.ipcc.ch/

energy efficiency, and sectoral approaches to mitigation. Though seemingly uneventful, this recurring exchange of views has helped to begin to identify some of the emergent common themes that could become building blocks for the future regime. Some of those themes are the importance of carbon markets, the possibility of sectoral approaches to mitigation (with some analysts predicting that key developing countries such as China and Mexico would be willing to consider "no-lose" targets for some sectors of their economies), and the need to take a far more serious approach to adaptation. After the last session of the Dialogue in August 2007, a report will be drafted for consideration by COP 13 in Bali. In the hopes that the Dialogue could lead to some clarity, South Africa has identified a variety of possible options for "moving forward" at COP 13, including a new agenda item that could lead to a possible mandate out of Bali, the equivalent of the 1995 Berlin Mandate that jump-started the negotiations on the Kyoto Protocol.

COP 13 will mark a defining moment for the negotiations for three main reasons: first, the Convention Dialogue – the only post-2012 track that is broad both in terms of substance and participation –expires at COP 13. Without explicit agreement in Bali, this track will not continue. Second, timing is such that a direction needs to be established this year in order to negotiate an agreement by 2009-2010, and have two years for the ratification in all countries. Third, the Gleneagles process of the G8, the Stern Review[3], the IPCC Fourth Assessment Report, and Al Gore's Academy Award-winning film on climate change[4] have generated an unprecedented media flurry and a rising public concern that will exert considerable pressure on negotiations in Bali.

2- Informal discussions

While the formal process remains at the level of exchanges of views, testing of the waters, and staking of initial positions, the informal discussions in the academic literature and in events organized and hosted by NGOs has been much more open for the obvious reason that the venue is non binding. There are at least 42 proposals of what the post 2012 regime could look like (for a complete listing see Drexhage 2007). Over time some of the more grounded ideas arising in the informal space will migrate over to the official sessions, thus the differentiation made in this paper is not a static one. As negotiations progress over the next few years, the boundary between the informal and the formal will become increasingly blurred, a reflection of the growing maturity of the negotiation process, and a sign that some bargained deal package could be within reach.

An analysis of the informal discussions shows that thinking has gravitated toward two different conceptual approaches to the structure of a future regime. The two approaches can be labeled as "bottom up" and "top down".

A- Bottom up approach

The bottom up approach is characterized by the fundamental belief that as a community of nations we are reaching the limit of what can be achieved in a unified global way. Advocates of this approach point to the fact that it is still uncertain whether the group of nations bound by the Kyoto Protocol will actually reach the targets of the Protocol, and even if they do, the targets are meaningless in the face of what actually has to be done. Furthermore, they emphasize the fact that the UNFCCC has particularly complicated features that differentiate it from other multilateral environmental agreements. Carraro and Galeotti (2003) note the following unique challenges: climate change control is a public good, which provides a strong motivation for free-riding; the long term nature of the problem necessitates intergenerational transfers of regulation and responsibility; contrary to the Montréal Protocol where there are

[3] Stern Review on the Economics of Climate Change, February 2007, http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/sternreview_index.cfm

[4] An Inconvenient Truth premiered at the 2006 Sundance Film Festival and opened in New York and Los Angeles on May 24, 2006. It is the third-highest-grossing documentary in the United States to date.

narrowly defined technological solutions to replace ozone depleting substances, greenhouse gas emissions affect all economic activities; climate change measures have strong interaction with other global parameters such as population and economic growth, and finally the issue is still couched in uncertainty, at least with respect to impacts and timing. Faced with these complexities, bottom up advocates argue that it is impossible to provide Parties with sufficient incentives to participate in a unified global agreement that would both share the burden and provide credible means of assessing compliance. Rather, they advocate solutions based on encouraging the major emitting countries/sectors to adopt climate friendly policies and then coordinate as "climate clubs" at a sub-global or sectoral level. Controversial issues, it is argued, are more easily resolved at the regional level than at the global level.

This approach proposes to move from the overall global regime to a "fragmented framework" based on several/many parallel (and not necessarily similar) agreements that would all contribute to creating a price signal for emission reductions. To be specific, e.g. on the challenge of how to deal with all the new coal that could be coming online in China, instead of obligating China into a global agreement or incentivizing China through market mechanisms, the fragmentation framework would encourage China to shift from coal to natural gas at the local level through goals and targets that would be adopted by China itself for its own benefit. Alternatively, China and the US could reach a bilateral agreement for emission reductions, which is presented as one of the most cost effective and simple ways to curb emissions in both countries. (Carraro and Egenhofer 2006).

One of the major existing examples of this type of agreement is the Asia-Pacific Partnership on Clean Development and Climate, announced in 2005 and launched in January 2006. The AP6 is an international non-treaty agreement lead by the United States and including Australia, India, Japan, China and South Korea. The weakness of the partnership is that the partner countries agreed to co-operate on development and transfer of technology, setting their goals for reducing emissions individually, with no mandatory enforcement mechanism. However, this partnership does include the US and Australia, neither of which are Parties to the Protocol, and India and China, both of which participate in the Protocol but are not yet required to lower their emissions. Enthusiasts of the partnership point to the fact that the six member countries account for 50% of the world's greenhouse gas emissions, energy consumption, GDP and population, and that unrestricted economic growth and emission reductions can only be brought about through active engagement by all major polluters.

Very recently the USA has underscored its preference for a fragmented approach to climate change control. In preparation for the June 2007 meeting of the G8 held in Heiligendamm, Germany, President Bush announced his proposal for voluntary goals negotiated by the world's 15 largest polluters based primarily on technological advances. If this proposal were to be taken seriously, it would need a long term agreement (at least 25 years) since technology development takes at least that long, and a concrete commitment on the part of the 15 highest emitters to undertake significant research and development of climate friendly technologies, the cost of which could be shared by the Parties to such a technology package. These Parties could choose to target technology efforts toward certain gases, sources or sectors. As each sector is different, it would be necessary to run several technology agreements in parallel to each other.

The strengths of such an approach center on the reduced number of Parties that would have to come to an agreement and its potential to stimulate R&D in clean energy technologies. However, it is clear that such an approach has no explicit environmental goal or target against which progress can measured. Sub global agreements are a good tool to implement coordinated national policies, but they are less suitable instruments to agree on international commitments, which by definition reduce national sovereignty. In addition, important developing country issues such as flexible mechanisms, adaptation and capacity building are difficult to address within such a fragmented approach to mitigation, and would possibly

require separate agreements for each of the issues, proliferating the number of agreements that would have to be negotiated, and minimizing the cross cutting impacts that could be derived from an all-encompassing agreement.

B- Top down approach

In contrast to the bottom-up approach, the top-down approach focuses on attaining a global agreement on a common target (the metric could be maximum temperature change, emission level, or per capita emissions, etc.) to which all countries would contribute, albeit in a differentiated manner and in sequential timing. This approach is the one exemplified by the Kyoto Protocol, which establishes quantified emission reduction targets for each of the participating Annex I countries, together with market mechanisms that allow non-Annex I countries to participate voluntarily, thus lowering the cost of the global abatement effort.

With respect to the post 2012 regime, the top-down approach focuses on the ultimate objective of the Convention: the stabilization of greenhouse gas (GHG) concentrations in the atmosphere to avoid dangerous interference with the climate system. The package would consist of a total carbon budget being agreed upon for a relatively long period of time and then allocated among countries to fit within a global emissions trajectory. The system would allow objective and frequent assessment of progress against pre-established benchmarks, and regular adjustments to ensure all emitters remain within the established trajectory. Under this approach it is recommendable that countries with the highest current GHG emission levels (and therefore mitigation potentials) undertake the largest share of emission reductions as early as possible, first as a voluntary pledge and then on a legally binding basis, with the necessary incentives. Lower emitting countries would be brought into the system once they reach previously agreed graduation thresholds. Other aspects such as adaptation, capacity building and market mechanisms can be comfortably integrated into this type of package.

The strengths of the top-down approach are that it is more likely to reach long-term environmental goals, and has a clear measurement system by which progress toward those goals can be measured. However, such a system is clearly more complex to negotiate and it would have to balance the rigidity of a long-term structure with the necessary flexibility to accommodate changing conditions in participating countries.

The top-down approach to the post 2012 regime is currently being spearheaded by the European Union. In March 2007 the European Union announced its intent to limit global warming to no more than 2°C above the temperature of pre-industrial times. The EU proposed a global agreement under which industrialized countries would cut their emissions to an average of 30% below 1990 levels by 2020. The EU will take the lead by autonomously committing to reduce its own emissions by at least 20% by 2020, and would increase its emission reduction to 30% if other industrialized countries agree to the global package. The proposal of the EU has not been met with enthusiasm by the rest of the countries. But it does represent a well analyzed position that will undoubtedly influence the shape of negotiations.

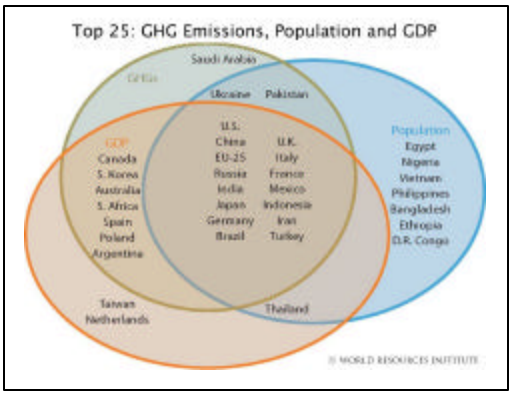
C- Three points of consensus

Despite their differences, both above approaches share at least three cornerstone realizations about the post 2012 climate regime.

(i) *Differentiation.* The principle of "common but differentiated responsibilities" is paramount to the Convention. Independently of the preferred approach, no stakeholder has suggested changing the modus operandi of Annex 1countries leading the way, given their higher historical responsibility in the build-up of GHG concentrations. The principle of differentiation is being further applied by both approaches in as much as both advocate a differentiation among developing countries, with the more developed

nations among them assuming increased responsibility earlier than the least developed countries. This differentiation is currently politically unacceptable to the G77 and China group, but it is probably one of the major linchpins in a post 2012 agreement.

(ii) *Broadened participation.* Both approaches emphasize that the next chapter in the climate regime must involve more countries than those currently participating in the Kyoto Protocol. It is certainly true that industrialized countries must lead, but it is equally true that the larger developing countries are quickly catching up in both emission and GDP levels. For the time being much attention is being focused on the "Plus Five" countries (China, India, Brazil, Mexico and South Africa), which together emit 25% of the world's GHG emissions. However, there is a substantial overlap among a larger group of countries countries with the highest GHG emissions (responsibility), population, and GDP (capacity to act). Twenty- five countries already account for 83% of GHG emissions, 71% of the global population and 86% of the global income (WRI/Pew Center on Global Climate Change 2005). It only stands to reason that most of these countries, if not all, need to be engaged in the global effort to curb emissions at some point in time and in some form. An effective future regime can only be built with the eventual additional participation of key developing countries for three main reasons:



- These countries are expected to account for more than half of global emissions by the year 2020, and maybe sooner (IPCC 2000).
- They currently provide the greatest opportunities for low cost emission reductions (IPCC 2001).
- They have the highest growth rates in energy demand. If they do not participate, escalating energy needs will be met with carbon-intensive energy sources. This would accelerate GHG emission trends, which will be increasingly costly to curb and will progressively complicate the entry of these countries into a carbon-efficient economy.

(iii) *More elements in the package.* The Kyoto Protocol limits its focus to mitigation in some sectors. Both the bottom-up and the top-down approaches recognize that the post 2012 agreement(s) will have to encompass more elements. Three additional elements are particularly obvious:

- Under mitigation, one of the most important sectors that was left out of the Kyoto Protocol is **avoided deforestation**, an element that is now being formally discussed in the international negotiations and which will most likely become an important part of the final package. The topic has made much progress over the past few years demonstrated by the fact that there seems to be consensus that reduction of emissions from deforestation needs to be included in the future regime. The open questions now revolve around appropriate funding and baselines.
- In addition to mitigation, **adaptation** will have to be woven into the agreement, a step which is particularly challenging since unlike mitigation, adaptation is seen to provide mostly local or national benefits. However, the known vulnerability of developing countries together with their limited resilience makes adaptation the first priority for these countries. A post 2012 regime will have to propose concrete steps

on how to support and help finance an increased adaptive capacity in developing countries.

- Finally, **technology transfer and capacity building** are elements that are not sufficiently promoted by the Kyoto Protocol and that are crucial to developing countries, as they reinforce the need to link climate protection and development. In particular, access to energy is a cornerstone of developing country needs.

On most other issues the bottom-up and top-down approaches differ from each other. On those elements over which there is no agreement, the following section outlines the biased but argued position of the author. In many respects, these design elements combine the concepts of bottom-up and top-down, thus offering a potential platform for agreement.

3- Potential regime design elements[5]

The Kyoto Protocol focuses on reducing emissions between 2008 and 2012. However, climate change is not a short-term problem. Given the scale of the challenge, whether we are effective in dealing with climate change will not depend on the number of greenhouse gas reductions achieved by the end of the first commitment period, but rather on whether we can affect the emission trajectories after 2012. While the Protocol centers on tons reduced in the first commitment period, the future regime will have to focus on lowering emission trends in both Annex I and non Annex I countries of both industrialized and developing countries.

This section identifies five possible design elements of an agreement that would not aim at reducing tons but rather at affecting long-term trajectories. The elements are not independent of each other, but rather interrelated and to a certain extent mutually dependent.

A- Long-term global goal

The targets of the Kyoto agreement were negotiated as a bottom-up exercise in which each of the industrialized countries estimated the level of effort they might be able to muster within their respective economic and political constraints. The Kyoto average of a 5.2% reduction of greenhouse gas emissions below the 1990 levels by 2012 was not defined as a preconceived goal, but rather emerged as the result of the various reduction commitments pledged by countries or region, in the case of the European Union. Given the novelty of legally binding reduction commitments in 1997, and the level of scientific uncertainty concerning climate change at the time, the bottom-up approach to emission limitation was the most reasonable strategy at the time.

However, ten years of experience with GHG reductions, combined with the overwhelming scientific evidence of climate change events already occurring around the world, may have dramatically changed the context of the next round of negotiations. Short-term targets can only affect discrete short term choices, but they cannot initiate structural changes. Short-term incremental reduction goals are no longer environmentally acceptable IPCC 2007) nor economically recommendable (Stern 2006). Given the long-term costs of inadequate action, the post 2012 climate regime should not be built on country-based estimations of their short-term ability to reduce, but must rather be based upon a global agreement of a long-term target that achieves the ultimate objective of the United Nations Framework Convention on Climate Change (UNFCCC): *"stabilize the concentration of greenhouse gases at a level that would prevent dangerous human interference with the climate system."*

[5] This section draws from "From Tons to Trends", author's chapter in the book Global Environmental Governance edited by Lydia Swart and Estelle Perry, and published by the Center for UN Reform Education, 2007.

There is still no concurrence on which concentration of GHGs would actually avert dangerous climate change. To some stakeholders, such as small island states witnessing the rise of sea levels, our current concentration of 370 ppm is already palpably harmful. Others, such as India and China, argue that emissions must continue to rise as their economies continue to grow. However, among those who propose a top-down approach, there is a timidly looming consensus that stabilization should occur somewhere in the range between 450 ppm and 550 ppm CO_2 equivalent, either of which will require a dramatic effort. Stabilizing at 450 ppm would require emission reductions of 60 to 80 percent below current levels by the end of the century. Even limiting concentrations to a *doubling* of pre-industrial levels (i.e., 550 ppm, which would likely entail significant adverse climatic impacts) would require global emission reductions to peak within the next few decades and fall below 1990 levels by the end of this century. The relationship between various emission concentrations and timing of global emission reductions are shown in Figures 1 and 2 based on data provided by the Intergovernmental Panel on Climate Change (IPCC).

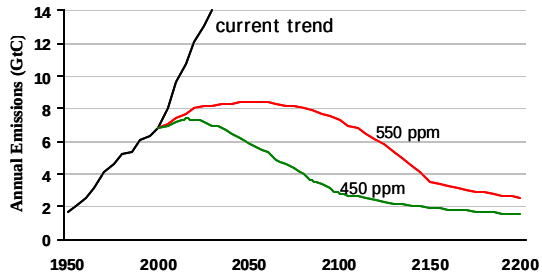
Figure 1. Pathways to Stabilization

CO_2 stabilization profiles	Year in which global emissions peak	Year in which global emissions fall below 1990 level
450	2005-2015	<2000-2040
550	2020-2030	2030-2100
650	2030-2045	2055-2145
750	2040-2060	2080-2180
1000	2065-2090	2135-2270

Source: IPCC.

The effort required to meet either the 450 or 550 ppm goal cannot be underestimated. Over the next hundred years, the global population is expected to increase by 40 to 100 percent, and economic growth (with concomitant emission effects) is projected to climb 10- to 20-fold (IPCC 2000). In the absence of concerted global action, atmospheric concentrations could exceed 1000 ppm - nearly four times pre-industrial levels - by the end of the century, with unpredictable effects on the planet. The stabilization challenge is formidable and unprecedented; meeting it will require moving beyond national short-term efforts to a global long-term commitment.

Figure 2. Stabilization Scenarios



Source: Based on IPCC.

B- Principle-based commitments

There are two different approaches to assuming commitments: pledge-based and principle-based (Baumert 2002). The Kyoto Protocol is pledge-based: industrialized countries pledged various reduction targets relative to their 1990 emission levels. This approach to commitment setting is based more on economic power and the political circumstances of the moment than on objective criteria. The alternative is a principle-based approach. Using this approach, countries first negotiate overarching principles and rules, which are then used to guide the adoption of respective emission reduction targets and timetables among countries. Should the future climate regime move from individually estimated levels of effort to an *a priori* agreement based on an aspirational global goal, the regime would probably also move away from a pledge-based toward a principle-based framework for the participation of countries.

Such a framework would of course have to be consistent with the basic tenets of the UNFCCC. In its Preamble and Article 3, the Convention spells out a set of principles, including:

a- All states have legal responsibility to prevent damage to the climate system;

b- States have sovereign rights over their natural resources but must not cause damage to the environment of other states;

c- All nations have a responsibility but not all nations should contribute equally to solving the problem;

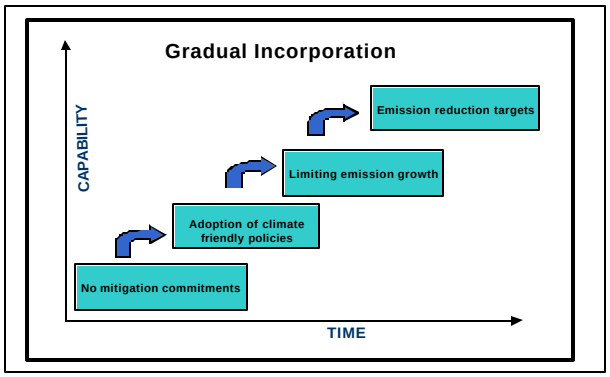
d- Scientific uncertainty is not a reason for inaction;

e- Every country has a right to sustainable development.

These principles will continue to be the cornerstone of any future legal instrument of the UNFCCC.

C- Gradual Incorporation

Given the necessary political will to arrive at a global long-term goal, countries could negotiate an agreement on stepped thresholds that would trigger increasingly stringent participation of all countries, even those not currently participating in the Kyoto Protocol. Metz speaks of a "multistage solution" whereby some developing countries would gradually move from no mitigation commitments, to the adoption of climate friendly policies, to limiting emission growth, and finally to absolute emission reduction targets. In order to be fair, the threshold could be formed by a combination of responsibility[6], capability[7], potential to mitigate[8], and population (Yamin 2006). In addition, the trigger for developing countries could be linked to the reduction achievements of industrialized countries. Developing countries would assume increasing obligations only if, and at a pace with, the increasing depth of emission reductions attained by industrialized countries.



This type of "linked trigger for gradual incorporation" would have the advantage of setting fair rules for all countries on the basis of objective and predictable timetables and progressive commitments. While Kyoto-bound countries would continue to take the lead, other industrialized countries would have to catch up, and developing countries- or at least the larger ones - would gradually enter. In order to ensure meaningful participation, a minimum level of participation could be established for developing countries that reach the first threshold. While the timing would be predictable, the nature of commitments could vary (see below Diversity of Targets section).

Gradual incorporation is clearly a departure (graduation?) from the Kyoto Protocol's simple bifurcation between Annex I and non-Annex I countries. Were countries to adopt gradualism as a design element of the post 2012 regime, it remains to be seen whether countries would be provided incentives to self select, or whether they could agree on objective criteria for the determination of the threshold. Furthermore, the negotiations would have to determine whether countries gradually assume increasingly stringent commitments on an individual level, or whether they do so as groups of countries, and if so, how many groups of countries would be formed. It is not unreasonable to think that there could be two groups of industrialized countries (those currently in the Protocol and those not now participating) and two groups of developing countries (the larger rapidly developing countries and the more slowly developing). While imposing an artificial structure such as this does not reflect the very diverse reality of

[6] Measured as cumulative CO2 emissions since 1990
[7] Measured as GDP per capita
[8] Measured as GHG emissions per capita

countries, a 2 x 2 structure is more representative of the reality (emissions, GDP, etc.) than the simpler bifurcation of Annex I and non-Annex I.

D- Diversity of targets

Under the Kyoto Protocol, each country listed in Annex B assumed absolute reduction targets that represented the maximum level of emissions the country will be allowed to emit during the 2008-2012 period. This type of fixed targets can ensure a particular environmental outcome (via a "cap" on emissions), but they are difficult to negotiate due to both the uncertainties over future emission levels and the costs of achieving any future emission targets. Although in Kyoto in December 1997, Annex B countries agreed to specific absolute targets, it is unlikely that all industrialized countries will again assume fixed targets under the post 2012 regime. The United States withdrew from the Kyoto Protocol in 2001, and it is questionable whether even a new administration would be able to agree to Kyoto-type targets for 2012. In addition, Japan has already stated its unwillingness to do so, preferring rather an intensity target.

It is even more improbable that any developing country would assume a fixed emission target in 2012. India continues to claim the right to per capita emission allocations. China has just announced its Climate Change Plan which includes a 20% improvement in energy efficiency by 2010 and more than doubling the use of renewable energy by 2020, but makes no commitment to a reduction target, despite the fact that the plan promises to "blaze a new path to industrialization."

These positions exemplify the fact that fixed targets are not the only type of commitment a country could assume in the future. Fortunately there is a wide variety of potential mitigation commitments. From a legal perspective they can be binding or non-binding. They can vary according to type of limitation: fixed emission targets (as in the Protocol), dynamic emission targets (varying according to GDP for example), emission targets with cost caps (to guarantee maximum cost of mitigation), intensity targets (tons emitted per unit of production), or sectoral targets (e.g. vehicles, cement production). They can also vary with regard to coverage: either gas-determined coverage (only CO_2 or all GHGs), or geographic coverage such as sector, region, etc. (Baumert 2002). Furthermore, mitigation commitments can be substantive (e.g. a requirement to achieve a certain target in a specified time frame or a requirement to adopt particular policies and measures); or they can be procedural (aiming to advance preparatory efforts e.g. through preparation of inventories) (Yamin 2004).

Future mitigation commitments are likely to abandon the simplicity of exclusively setting fixed targets and move in the direction of a basket of commitment types, where each country could assume the type and level most appropriate to its circumstances. The Report of the Pocantico Dialogue[9] states that emission targets "should remain a core element of the multilateral effort" but that "future targets could vary in time, form, and stringency." In addition to binding absolute targets, other types could include intensity, 'no-lose' or conditional targets" (Pew Center 2005). The report also proposes that developing countries could assume policy-driven emission reductions. The BASIC Project[10] suggests that Annex B countries could assume a combination of absolute emission limits, emission intensity limits, and financial payments,

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[9] In 2004-5 The Pew Center on Global Climate Change convened a group of 25 senior policymakers and stakeholders from 15 countries to discuss options and recommendations for advancing the international climate change effort post-2012. The conclusions are captured in the Pocantico Dialogue Report.

[10] The BASIC project is a two year EU supported project that aims at linking national and international climate policy for Brazil, China, India and South Africa. The project was commissioned to a multi-national project team in late 2004 and terminated in December 2006.

while developing countries could quantify the emission reductions achieved by their sustainable development actions, or adopt a sectoral or national non-binding reduction commitment, which could be either absolute or intensity based (Yamin 2006).

All these proposals point toward a structure of "linked fragmentation" where the participation of countries would reflect national circumstances. The challenge of a diversity of targets is comparability and measurement. In order to assess the various contributions, the regime would have to set a common metric that would allow the comparison and summation of efforts. With the purpose of ensuring that the trajectory being set is adequate to reach the long -term target, the regime would also have to schedule regular reviews of the collective action, assessing the adequacy and fairness of efforts.

E- Stronger market mechanisms

The CDM has been clearly successful in putting emission reductions on the market. The CDM has registered 700 projects that have a potential of delivering 1 billion tons of CO2 by the end of 2012. There are at least another 900 projects in the CDM pipeline (projects in preparation but not yet registered by the Executive Board of the CDM), with a potential delivery of an additional billion tons of CO2 by 2012.

However, the CDM has not significantly altered the energy pathways of developing country economies for two main reasons:

(i) The short time frame of the commitments did not allow the market to do much more than harvest the very low hanging fruit. Since the compressed timeframe to 2012 provided a short period to earn a return on capital, the projects that were most interesting in a market fraught with regulatory and performance risk were the non-CO_2 projects: HFCs, nitrous oxide and methane, due to their much higher global warming potential, and hence much higher per ton value as compared to a ton of CO_2. It is therefore not surprising that these industrial emission reduction projects account for 65% of the current emission reduction market.[11] Over the long run this market structure needs to change since growth in emissions is projected to come mainly from the energy and transportation sectors, and we will not see a serious process of decarbonizing energy and transportation until GHG reduction goals are backed by 20-30 year policy certainty.

(ii) The single point source or stand-alone traditional approach to CDM projects has precluded systemic transformation. For the most part CDM projects represent isolated opportunities to capture the additional income stream of the sale of emissions reductions, but they have yet to catalyze a decarbonization of the respective sector.

The recent decision to include programs of activities[12] in the CDM is an important first effort toward decarbonizing the growth in the south. If appropriately regulated, CDM programs could provide an incentive for developing countries to not just vacuously adopt but actually implement climate friendly policies and measures. In order to transition toward low carbon growth, the future market mechanism for developing countries must spur activities that are policy or technology-based and sector wide. The most obvious example would be the systematic phase out of inefficient and obsolete appliances and technology in developing countries, since end-use energy efficiency improvements account for two thirds of the energy-related abatement potentials (IEA 2006). Another example would be the conversion of the inefficient and contaminating public transportation systems in developing country megacities to cleaner more efficient systems that entice city dwellers away from their inefficient personal vehicles. The Executive Board of the CDM has just emitted the guidelines and procedures for

[11] www.CD4CDm.org, CDM Pipeline as at February 1, 2007

[12] Paragaph 20, Decision 7, COP/MOP 1

programmatic CDM.[13] Project proponents are now preparing this type of projects with much broader reach than the traditional CDM.

Beyond programmatic CDM that has already been approved for the pre-2012 period, Parties may want to consider an additional sectoral crediting mechanism for post 2012. Under this proposal, developing countries could voluntarily choose carbon intensive sectors and set sector-wide reference lines that represent the national interest in terms of energy consumption. These reference trajectories would be independently assessed by UNFCCC panels, just as the inventories of sources and sinks are independently assessed in Annex B countries. Developing countries would then design and present for independent assessment, programs comprised of additional policies and measures to reduce carbon intensity below the accepted line of domestic economic performance. These further reductions that are achieved for the "global good" would be eligible for international crediting via the sectoral crediting mechanism. Parties would agree to the forward sale of a proportion of the anticipated emissions reductions to help underwrite the low carbon development program. This latter provision is crucial to leveraging investment on a scale sufficient to make a difference to the underlying economics of more advanced zero carbon alternatives, and support aggressive fiscal policy instruments (subsidies, tax concessions, matching grant programs etc, etc.) that would otherwise place a heavy burden on domestic budgets.

This approach to the future market mechanism could enable the transformation of what will otherwise be carbon-intensive growth in the South. It would also result in a substantially increased volume in the supply of emission reductions on the part of developing countries, allowing industrialized countries to take much deeper reduction commitments in the future, as their demand for international reductions could be met at predictable prices. While the willingness of industrialized countries to pay for Certified Emissions Reductions (CERs) is not unlimited, the increased supply and demand could be the basis of a significant north-south transfer of funds to underwrite the switch from fossil fuel based to cleaner energy based growth, and complement self-financed efforts of developing countries.

4- Is a mandate for such an agreement possible?

The 195 countries that have ratified the UN Climate Change Convention will come together in Bali in December 2007 with the main purpose of agreeing on a mandate (akin to the Berlin Mandate of 1995) to negotiate the next chapter of the regime. While many stakeholders are despondent about the possibility of any agreement, the author is optimistic, for three main reasons. First there is an unusual political momentum. The publication of both the Stern Report and the Fourth Assessment of the IPCC gave an extraordinary push to both the science of climate and the compelling economics of acting in the short term. The G8 Gleneagles process in general and the Heiligendam meeting in particular was surprisingly successful in channeling President Bush's major emitter initiative into the UNFCCC framework, broadening its scope so as to include international policies, targets and plans[14]. The EU also managed to retain the UNFCCC meeting in Bali as the occasion to launch negotiations on a comprehensive post 2012 deal and maintain the vision of that deal coming to closure in 2009, when the Parties will meet in Copenhagen (EU territory) for the decisive COP15. By that time, the US will have a new administration.

Second, developing countries have demonstrated their reduction potential. There are 700 CDM projects registered and 900 more in the pipeline, with a combined delivery potential of 1.6 - 2 gigatons by 2012. This supply could actually be more than the market needs, since the demand from Phase II of the European Trading System (ETS) is estimated to be approximately 1.25 gigatons from both the CDM and Joint Implementation. Furthermore, if pre-2012 deliveries are

[13] Annex 38 and Annx 39 of EB 32

[14] Paragraphs 52 and 53 of the Heiligendam Agreement

2 gigatons, the remaining emission reductions from the same projects in their post 2012 crediting time could be as high as 8-20 giga tons under plausible scenarios and somewhat predictable prices. This volume means that the industrialized countries can adopt much steeper emission reduction targets than what is currently being discussed, as the risk of supply at reasonable prices is minimal. A successful post 2012 market mechanism would move significant capital from the north to the south with the purpose of underwriting the switch from fossil fuel based to cleaner energy based growth.

Finally, the new elements (particularly adaptation and avoided deforestation) that are slotted to be included in the next agreement allow for more flexibility in the package that is to be negotiated.

5- Implications for LAC

An agreement such as the one that has been outlined above has direct implications for the Latin American region. First and most importantly, a long term agreement that would support a decarbonization process would help the region improve the current trend in carbon intensity, which in contrast to the carbon intensity of the rest of the world, is still at the 1990 levels. To a great extent this is due to the fact that fossil fuel consumption continues to rise at a rate of 1.5% annually, and fossil fuel prices are kept artificially low (CEPAL 2007).

Second, the inclusion of avoided deforestation would allow countries in the region to participate in an important way in the regime. Tropical forests account for 80% of global deforestation, and 42% of tropical deforestation occurs in Latin America. The LAC region has been at the forefront of the efforts to include emission reductions from avoided deforestation in the climate regime. Reducing global deforestation rates by 50 percent over the next century will save an average of about half a billion metric tons of carbon every year, enough to account for as much as 12% of the total reductions needed to meet the IPCC target of 450 parts per million of carbon dioxide in the atmosphere by the year 2100. Furthermore, reducing deforestation as a means to cut emissions may be among the least-expensive mitigation options available. While there is no agreement yet, on whether these emission reductions would be a part of the market mechanism or form a parallel mechanism, at least there is an emerging consensus that these emission reductions should be incorporated into the next phase of the regime.

Third, the inclusion of adaptation in a meaningful way would speak directly to the palpable needs of not only of the Caribbean islands and the Central American isthmus, but also to those larger countries suffering the loss of glaciers and undergoing unprecedented weather shifts.

However, the most challenging LAC implication of the mentioned differentiation of the G77 and China group would be Brazil moving out of the current no commitment group into a group of countries that would pledge some type of measurable target, although that does not need to be a reduction target. This is not an easy task. Since 1997 Brazil has advanced the position that the emission levels of developing countries do not cause an increase in global temperature at the point in time in which their emission levels are similar to those of industrialized countries (approximately 2020) but rather not until that moment when the impact of their historic emission accumulations cause a temperature rise. This would not equalize industrialized and developing countries until the end of the century. While the G77 group has not officially supported this position of Brazil, it is clear that differentiating the G77 (which in addition to Brazil could affect China, India, South Africa, Saudi Arabia, Turkey and South

Korea) would be an extremely difficult political process, at the G77 level as well as at the LAC level.

Mexico is the other key country in the region, and it could also fall into the differentiated group, but Mexico is not in the G77. For years Mexico has been very open about its conviction to participate more fully in a global mitigation effort. Recently Mexico has announced its Climate Change Strategy which seeks to reduce 100 million tons of CO2/year with energy efficiency, renewables, and cleaner generation, plus an additional 17 million tons sequestered through land use. With these measures, Mexico takes the lead in Latin America, and jointly with China, leads the +5 Group in voluntary efforts. It remains to be seen what influence Mexico may have on the other emergent nations in Bali.

Were the political will to be successfully mobilized for an overall agreement, there is no doubt that the agreement has to, and will be, more complex than the current Protocol. Thus the final challenge of the post 2012 regime is the development of the governance mode and institutional structures that will effectively deliver a scaled up effort and more directly involve private sector and civil society, both elements necessary to a broadened effort. The challenge is daunting, but there are signs that the world may be reaching the "*tipping point beyond which political, business and civic leaders across the spectrum will begin offering genuinely meaningful solutions to the climate crisis."* (Al Gore)

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CONTACT: Christiana Figueres
Christiana@figueresonline.com
Tel. +1-202-294-4898