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BACKGROUND PAPER TO THE 2010 WORLD DEVELOPMENT REPORT

# Enhanced Financial Mechanisms for Post 2012 Mitigation

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## Abstract

Despite the many calls to reform the CDM, its conceptual underpinnings are strong and it will most likely survive in the post-2012 climate regime. Some modifications may be considered in the short term to strengthen the effectiveness and transparency of the mechanism without modifying the Marrakesh Accords. In the medium term substantially increased mitigation efforts in developing countries may require a combination of three possible financial mechanisms:

the current activity-based CDM albeit improved, a second market mechanism that would seek to improve the long term emission trends of developing countries by promoting broad based emission reduction programs primarily in the private sector, and a third financial mechanism outside of the market which would be an incentive for the adoption of policy changes leading to a low carbon path, but where emission reductions would not be used as international offsets.

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# **ENHANCED FINANCIAL MECHANISMS FOR POST-2012 MITIGATION<sup>1</sup>**

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<sup>1</sup> This paper is a background paper for the 2010 World Development Report. It is an expanded and detailed version of “Evolution Of the CDM In A Post-2012 Climate Agreement” by the same authors in the *Journal of Environment and Development*, 2008.

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## 1. INTRODUCTION

The flexibility mechanisms of the Kyoto Protocol are the first ever attempt to create and regulate a global commodity market under the rules of an UN treaty. In fact, the two project- based mechanisms of the Protocol, the Clean Development Mechanism (CDM) and Joint Implementation (JI) are the only two market mechanisms managed by the United Nations. Whether and how they should continue serving the UN Framework Convention on Climate Change (UNFCCC), and which additional mechanisms could complement their mandate is the subject of this paper.

As we assess the current performance of the flexibility mechanisms under the Kyoto Protocol, it is tempting to be unsatisfied with the results. Concerns have been expressed about the slow start and little transaction volumes under JI (Korppoo and Gassan-zade 2008), but more repeatedly and vehemently has the CDM been in the crossfire of criticism: the administrative efficiency of the mechanism has been criticized (WWF 2008; CAN 2007; CMIA 2008) as much as its environmental integrity (Schneider 2007; Wara and Victor 2008), its inability to transform the production and consumption patterns in developing countries (Figueres 2008), and the incapacity to deliver the mitigation scale-up that is necessary post 2012 (Ward et al. 2008). However, hindsight is usually wiser than, and unfair to, foresight. Both JI and CDM came into being in 1997, based on the pilot experiences of the prior Activities Implemented Jointly phase.<sup>4</sup> The CDM was not regulated until the approval of the Marrakesh Accords in 2001,<sup>5</sup> and the first project was not registered until 2004. JI did not become legally operational until 2006 and crediting for JI projects was not allowed to start before 2008.

The officials from Foreign Offices and Environmental Ministries who gathered to negotiate in Kyoto and Marrakesh had no experience with creating and/or regulating an international market. When designing the CDM, negotiators relied heavily on the insight gained from negotiating financial mechanisms established under other multilateral environmental agreements as well as from creating and reforming the Global Environment Facility (GEF).<sup>6</sup> With the Executive Board for the CDM they created a body that shares many features with the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol and with the 'additionality' requirement under JI and CDM, a concept closely related to the incremental cost principle of Montreal Protocol and the Global Environmental Facility (Streck 2007).

However, the flexibility mechanisms of the Kyoto Protocol are more than simple burden sharing mechanisms where industrialized countries cover compliance costs of developing countries and offer

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<sup>4</sup> At the First Session of the COP, the Parties to the UNFCCC decided to establish a pilot phase for Activities Implemented Jointly (AIJ) among Annex I Parties and, on a voluntary basis, with Non-Annex I Parties that so request. The COP decided to create the AIJ as a pilot through a simple decision under the UNFCCC. Decision 5/CP.1 in FCCC/1995/7/Add.1.

<sup>5</sup> The Marrakesh Accords were adopted by the 7th session of the UNFCCC COP held in Marrakesh, Morocco, in December 2001 and confirmed by the 1st session of the COP/MOP in Montreal in December 2005 FCCC/KP/2008/8/Add.1 Decision 3/CMP.1 (Modalities and procedures for a clean development mechanism as defined in article 12 of the Kyoto Protocol), Decision 9/CMP.1 Guidelines for the implementation of Article 6 of the Kyoto Protocol.

<sup>6</sup> See GEF website at <http://www.gefweb.org>.

financial aid and technology transfer. Negotiators broke new grounds when they introduced two essential innovations in the design of the flexibility mechanism of the Kyoto Protocol: (i) project investment was linked to the creation of tradable emission certificates; and (ii) private entities were invited to participate in the mechanism, provided that such entities were authorized by State Parties. Consequently, the mechanisms provide an intrinsic incentive for investments in greenhouse gas (GHG) abating projects.<sup>7</sup> Emission reductions resulting from projects in developing or transition economies are awarded with the creation of tradable carbon credits that can be used for compliance with emission reduction targets adopted by industrialized countries or imposed on private entities in these countries. The rules of the Kyoto Protocol thus gave rise to the global carbon market.

Taking into account the pioneering character of the mechanisms, the CDM in particular tells a success story. The mechanism is expected to generate about 1.6 billion tons of CO<sub>2</sub>eq emission reductions by the end of 2012 (UNEP Risoe June 2009).<sup>8</sup> The private sector has embraced the opportunity and CDM and JI have attracted interest in industrialized and developing countries alike. In 2007 and 2008 alone, the CDM mobilized USD15 billion in primary CDM transactions (World Bank 2009). These transactions helped leverage significant financial resources, USD 45.9 billion (CDM) and 3.3 billion (JI) - predominantly from private entities - into clean energy deployment in developing countries in 2007 alone (UNFCCC 2008a). In comparison, the GEF - the single biggest environmental trust fund and the financial mechanism for four international environmental conventions - received in August 2006 USD3.13 billion from 32 donor governments for its operations between 2006 and 2010.<sup>9</sup>

The flexibility mechanisms are unique in regulating a market dominated by private players that depend on a United Nations committee to approve calculation methods and projects which create the market's underlying asset. Containing many commendable design features, they serve as a useful model for other emission trading and off-set schemes. The conceptual underpinnings of both CDM and JI are strong and it is likely that the idea of the mechanisms, in fact the mechanisms themselves, will survive the first commitment period of the Kyoto Protocol. It is therefore timely to review the strengths and weaknesses of the architecture of the flexibility mechanisms in the light of the post-2012 international climate treaty. A healthy and strengthened CDM and a robust JI could be complemented by one or several financial mechanisms that deepen the emission reductions in developing as well as developed countries.

This paper does not seek to analyze the advantages and disadvantages of the very broad array of possibilities that have been proposed to expand CDM/JI and create new financial mechanisms for a post 2012 climate regime. Instead, the paper attempts to discover the limited common ground that may be

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<sup>7</sup> GHGs covered under the Kyoto Protocol are carbon dioxide (CO<sub>2</sub>), Methane (CH<sub>4</sub>), Nitrous oxide (N<sub>2</sub>O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), and Sulphur hexafluoride (SF<sub>6</sub>). All GHGs can be restated in terms of CO<sub>2</sub>-equivalent (CO<sub>2</sub>eq.) by multiplying their quantity in tons with the 100 year global warming potential (GWP) of the respective greenhouse gas.

<sup>8</sup> The official forecasts for all projects having entered the CDM pipeline are at 2.9 billion CO<sub>2</sub>eq emission reductions, <http://cdm.unfccc.int/Statistics/index.html> on June 16, 2009. However, this does not take into account that many projects in the pipeline are still at the validation stage and run the risk of never being registered or delivering below expectations even if they are registered.

<sup>9</sup> GEF Forth Replenishment, relevant documents on <http://www.gefweb.org/interior.aspx?id=48> (accessed 18 June 2009).

found among the positions of all countries participating in the current negotiations. We do not endeavor to define the science of what could be technically possible for some, but rather to paint the art of what may be politically acceptable to all. We then elucidate the legal foundations that would have to be built to effectively support the implementation of the politically acceptable options.

The core of this paper is dedicated to investigating how a post-2012 climate treaty could incentivize greater emission reductions in developing countries. For the sake of completeness we will however start with describing the role Joint Implementation could have in such a regime. Moving on to the CDM, we will then summarize the current frustrations with the mechanism and review incremental modifications that could be considered by the Executive Board for implementation during the first commitment period, without requiring decisions by the COP serving as the Meeting of the Parties to the Kyoto Protocol (COP/MOP) or changes to the Marrakesh Accords. In a next step we explore a potential post 2012 scenario that combines three possible financial mechanisms to promote large scale mitigation in developing countries: the activity-based CDM as we know it albeit improved, a second market mechanism which in contrast to the current practice under the CDM would seek to improve the long term emission trends of developing countries, and a third financial mechanism outside of the market which would follow a scheme of payment for environmental services that are not commoditized and not used as international offsets.

## **2. JI : THE PROMISE OF NEGLECT**

Joint Implementation as defined in Article 6 of the Kyoto Protocol formalizes the continuation of the Activities Implemented Jointly adopted under the UNFCCC but expands the concept by adding a function that allows the transfer of emission reductions between the partnering Annex I Parties. Joint Implementation is thus looking back on a longer history than the CDM and still counts on less experience. The mechanism allows the crediting of project-based emission reductions among Annex I Parties and adds an important element of flexibility to the Protocol.

Yet, at the time of writing, there are only 208 projects in the JI pipeline, 173 are currently submitted for determination (the JI equivalent of validation) and six have been determined by the JI Supervisory Committee (JISC). In addition to the projects submitted to the JISC under the CDM-like “track II” procedure, 36 projects have been directly approved by the authorities of the host country and are being developed under the streamlined “track I” procedure. In June 2009, renewable energy projects made up 30% (8% share in terms of 2012 ERUs in brackets) of JI projects, industrial gasses like N<sub>2</sub>O and HFC23 14% (28%), avoidance of methane leakage from gas pipelines 11% (23%), methane capture from landfills, coal mines and oil extraction 23% (24%), energy efficiency 18% (15%) and fuel switch 5% (3%). Of the track II projects in the JI pipeline, the large majority is located in Russia (101), followed by Ukraine

(34) and Bulgaria (14). The track I projects are located in Germany, Hungary, Romania, New Zealand, France and Ukraine.<sup>10</sup>

The number of JI projects is dwarfed by those in the CDM pipeline, which in June 2009 contained 4,417 projects. The disparity in the numbers between JI and CDM projects is partially attributable to the fact that the CDM enjoyed a “prompt start” authorized by the Conference of the Parties (COP) to the UNFCCC which allowed the registration of projects starting in 2001. This means that the CDM’s Certified Emissions Reductions (CERs) obtained during the period between 2000 and 2008 can be used to assist in achieving compliance during the first commitment period. JI on the other hand can only generate Emission Reduction Units (ERUs) during the first commitment period, namely between 2008 and 2012. While the CDM is managed or administered on the international level by a governance structure that is largely independent from host country performance, administrative capacities and GHG accounting frameworks, JI depends on emission limitation targets, allocation of AAUs, registries and the functioning of almost all other elements of the infrastructure of the Kyoto Protocol. Carbon credits generated by JI are nothing but AAUs in disguise, authorized for private trade, but generated by the host country which converts AAUs into ERUs based on the evidence of verified emission reductions. As a result JI is environmentally more robust than the CDM, but institutionally more vulnerable. It is also highly dependent on the functioning of domestic institutions: in order to participate in JI, countries have to fulfill a number of accounting requirements and compliance has to continue throughout the implementation of a JI project. Countries have to elaborate project approval procedures and be able to account for ERUs as part of their AAUs. Participation in JI also depends on political will. Until June 2009 the Russian Federation has not approved a single JI project. These delays strengthen the feeling that Russian JI projects will not deliver timely ERUs (PointCarbon 2008b; GTZ 2008a), or at least not at the expected scale. Other countries like the Netherlands have decided not to host any projects as a matter of principle in order to avoid the export of emission reductions.

As a consequence of the relatively small number of projects, the international administration of the track II stream of JI is less burdened and remains comparatively efficient. The fire of criticism that has been opened on CDM does not, or to a much lesser extent, apply to JI. NGOs pay little attention to the mechanism since environmental integrity is less of an issue as ERUs are technically not offsetting any emissions. The relationship between project participants, JISC and accredited independent entities (AIEs) responsible for determination of projects and emission reductions (the JI equivalent of CDM’s validation and verification) is characterized by a cooperative spirit. Identified problems, such as the delays in the accreditation of AIEs, are relatively quickly solved once they have been identified.<sup>11</sup> If at all, JI is suffering from an unfortunate neglect, which may well change once its important role is fully understood in a post 2012 climate regime.

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<sup>10</sup> The data come for the UNFCCC website and the UNEP Risoe CDM pipeline.

<sup>11</sup> The JISC modified the rules for the accreditation of IEs at its 13th session in Poznań, Poland, to overcome a bottleneck in the accreditation which would have hampered project validation for years to come. The problems had been identified by project developers and IEs and triggered swift action of the JISC.

Jl has been described as a wallflower, mimicking its much more popular sibling, the CDM which acts as the “young debutante that swept the climate change world off its feet and is currently everyone’s darling” while Jl is “hoping to pick up some of the other’s charm, and not have to leave the ball alone” (Ratliff 2007). It is true that much of the public debate and international negotiations are absorbed by the discussion on the future of the CDM and, still, it is likely that Jl as a mechanism that broadens the scope and reduces the costs of compliance for those countries that have assumed emission reduction targets will continue to play a role in a post-2012 climate treaty. Over time, more countries will choose to assume emission reduction commitments for the whole of their economies (by graduating to become Annex I countries) or by assuming some type of sectoral emission reduction targets or implementing a cap and trade system.<sup>12</sup> There have already been several requests of countries to be included in Annex B of the Kyoto Protocol<sup>13</sup> and some countries may choose to adopt additional emission limitations or targets as part of the Copenhagen agreement. But even if they do not, targets and enhanced action will almost certainly be on the agenda for future climate negotiations, perhaps starting as voluntary, no-lose targets, and eventually become binding. The relevance of Jl or a Jl-like mechanism in this context is to incentivize private investment in GHG abating projects ahead or in parallel to government programs and its advantages include:

- The possibility to mobilize additional emission reductions:
  - Jl broadens the scope and reduces the costs of compliance and encourages a broad set of actors (in Annex I countries) to engage in mitigation of climate change even if no dedicated climate change policies are in place.
  - Jl mobilizes financing for projects and programs that have little or no access to international financing sources. Jl can also provide an efficient financing mechanism for related policy priorities such as renewable energy deployment, efficiency targets, or forestry policy.
  - Jl can complement domestic emission trading schemes by including offsets from sectors that do not fall under the emission trading scheme.
  
- Enabling the continuity of the legal framework:

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<sup>12</sup> Although Mexico is not an Annex I country, in December 2008 President Felipe Calderon announced the country’s intention to adopt caps on carbon emissions from cement and oil refining.

<sup>13</sup> Upon the request of the involved Parties, in 1997 COP3 decided to delete the name of Czechoslovakia from Annex I, and to include in Annex I the names of Liechtenstein, Monaco, the Czech Republic, Slovakia, Croatia and Slovenia. In April 1999 Kazakhstan stated its intent to accede Annex I to the UNFCCC. After long deliberations it was decided that Kazakhstan will remain a non-Annex I Party under the Convention but could become an Annex I Party for the purposes of the Protocol, including its intent of defining a quantified emission limitation or reduction commitment under Annex B of the Protocol. Belarus was included in Annex B of the Kyoto Protocol in 2006; in order for that change to take effect three quarters of the Parties to the Kyoto Protocol have to ratify the Belarus amendment. Malta has announced that it will request entry into Annex I at the upcoming COP in December 2009.



The GHG capped environment could increase over time should more countries eventually assume economy or sector wide GHG emission reduction targets. A JI mechanism would allow the rolling over of CDM project activities from an uncapped into a capped environment and thus provide certainty to existing CDM projects for the duration of the approved crediting period.

However, the current JI needs to be reformed to be able to accommodate future challenges, in particular the dynamic triggered by countries that could decide to move from the CDM to a JI environment by graduating to Annex I or by assuming targets for certain economic sectors.

- **Effectiveness and Efficiency.** The efficiency of JI can further be increased by revising a number of rules, in particular the concept of project additionality. Additionality in the context of AAU-backed JI projects has less relevance than in the case of CDM and it is thus possible to focus on emissions rather than project additionality. That means that the additionality of a project should not be measured by its economic dependence on revenues from the sale of ERUs, as is the practice in the CDM, but rather by its ability to deliver emissions reductions below a conservative emissions baseline. The establishment of baselines could be further streamlined by applying a number of commonly agreed international principles or host country national priorities.
- **Encouraging programmatic and sectoral JI.** Encouraging further development of programmatic and eventual sectoral JI projects will allow Annex I countries to achieve considerable quantities of emissions reductions in a cost-effective way, reaching areas and sectors not usually covered by domestic or regional emissions trading schemes. Programmatic JI has been pioneered by Germany under the Track I procedure.<sup>14</sup> At the 4<sup>th</sup> COP/MOP requested the JISC to develop procedures for JI programs of activities to be implemented under track II JI.<sup>15</sup>
- **Strengthen governance and legal framework.** The JI process would further benefit from a clarification of the roles of the JISC relative to the AIEs and the UNFCCC Secretariat, in particular where those roles differ from the corresponding allocation of responsibilities under the CDM. In order to protect the interests of private participants a set of strengthened administrative rules should guide the interaction of the JISC and the Secretariat with AIEs and project participants.
- **Graduation to Joint Implementation.** Negotiators have already been called upon to establish rules that allow the migration of CDM project activities to a capped environment of assigned allowances, either in the context of a sectoral emission limitation target or an economy wide (Annex I) target. Such rules would have to link CDM emission reductions to AAUs (or the

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<sup>14</sup> Three programmatic track I JI projects, all in Germany, have been determined at the date of writing (UNEP Risoe 2009).

<sup>15</sup> The relevant draft decision of CMP-4 reads: Para. 6. *Requests the Joint Implementation Supervisory Committee to develop, as soon as possible, definitions, forms, guidelines and procedures for projects under programs of activities implemented under the verification procedure under the Committee, bearing in mind the work of the Executive Board of the clean development mechanism in this area*”.

respective internationally assigned allowances) and to align the crediting rules and periods. An important question would be whether existing CDM projects in a country that becomes eligible for JI would convert to JI or remain CDM up to the end of the project's crediting period. In the first case AAUs will need to be cancelled for CERs generated for emission reductions from the project and in the latter case questions arise on whether the project is also eligible for Track 1.<sup>16</sup>

JI lacks the momentum and economic importance of the CDM. Many established CDM actors have little to no knowledge about JI and its functioning. Discussions on JI take place in small circles and so far the mechanism has not been able to shrug off the image of a tool for some niche players from Eastern European countries to play with. However, JI deserves more attention and care as a mechanism that may stimulate investments into GHG abatement projects in countries which have assumed binding or voluntary, enforceable or no-lose, economy wide or partial, emission targets. Review and reform of JI should therefore be firmly placed on the post-2012 negotiation agenda and lessons learned from implementing JI should be developed and disseminated, including to developing country negotiators.

### **3. CDM: THE EXPECTATIONS OF SUCCESS**

The IPCC has left no doubt that there is an urgent need to scale up mitigation to levels that go far beyond that which was intended by the Kyoto Protocol and its flexibility mechanisms. We now know that the CDM has fallen short of delivering the emission reductions needed to lower the emission trajectories of developing countries in the longer term. But the CDM must be recognized as a crucial starting point in developing country efforts to contribute to global emission reductions. The CDM was created in 1997 by Article 12 of the Kyoto Protocol. So much has been accomplished over the past decade that we have fallen into a permanent inflation of expectations, which obscures our memories with respect to the genesis of the instrument. The short 10-paragraph text of Article 12 that defines the mechanism and its two goals emphasizes that eligible "emission reductions resulting from each project activity" shall be certified on the basis of "real, measurable, and long term benefits related to climate change", and that reductions shall be "additional to any that would occur in the absence of the certified project activity".<sup>17</sup> Parties to the Protocol have since then elaborated the modalities and procedures for project activities and integrated the Executive Board (EB) as the operational decision making body, which is assisted by various expert panels and working groups. The EB has established the Methodologies Panel and the Accreditation Panel, Working Groups on Small Scale Projects and Afforestation/Reforestation, the Registration and Issuance Team, and designated 44 operational entities to validate and verify projects.<sup>18</sup> With the recent linking into the International Transaction Log the

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<sup>16</sup> FCCC/KP/AWG/2008/INF.3, Ad hoc working group on further commitments for Annex I parties under the Kyoto Protocol, 28 November 2008, Accra.

<sup>17</sup> Art. 12.5(b) and (c) of the Kyoto Protocol.

<sup>18</sup> For a description of all Panels, Working Groups and Teams see <http://cdm.unfccc.int/Panels/index.html>. For a list of operational entities see <http://cdm.unfccc.int/DOE/list/index.html>.

international operational structure for the functioning of the CDM is complete.<sup>19</sup> The volume of CER transactions more than doubled from USD 12.9 billion in 2007 to USD 32.88 billion in 2008 (World Bank 2009). In 2008 transactions of primary CERs (purchases directly from developing countries) declined by 12% over 2007 due to the credit crunch and uncertainties with respect to post 2012 market conditions, but the secondary market for CERs (spot, futures and options) transacted more than USD 26 billion, or EUR 18 billion, representing a five-fold increase in both value and volume over 2007 (World Bank 2009). The achievements of the past ten years cannot be underestimated: the CDM has in fact established a structure that facilitates a functional market by defining the standards and processes for creating tradable emission reductions, consolidating methodologies, streamlining procedures and reducing global mitigation costs.

Success breeds rising expectations. As the supply of CDM projects has grown, and as the need for increased mitigation in developing countries has become clearer, stakeholders clamor for “more, faster and better” from the CDM. The past two years in particular have seen a plethora of publications expressing frustration with the CDM. The main areas of discontent include:

- **Questionable environmental integrity.** The long term success of the CDM can be best measured in respect of its contribution to measurably mitigate the emissions of GHG. Such evaluation is not easy since the dichotomy in the mechanism’s design results in an underlying tension: unlike JI and emissions trading, the CDM creates “new tons” of emission reductions which can be used for compliance with the Kyoto Protocol targets and which lower the overall effort to reduce GHG emissions in industrialized countries. A stable supply of CERs leads to increased GHG emissions in industrialized countries and is thus not always and for everyone desirable. On the other hand, lack of demand deprives Non Annex I countries from needed investments and hampers the emergence of a robust and liquid market in carbon commodities, needed to eventually tag a price on GHG emissions globally (Streck and Lin 2008). In order to not dilute the environmental effectiveness of the Kyoto Protocol and its emission reduction targets, it is crucial that CDM emission reductions be “additional” to what would have occurred otherwise. The additionality concept of the CDM has been debated vigorously, some authors claiming that many registered projects would have occurred anyway (Wade 2006; Michaelowa and Purohit 2007; Schneider 2007; Watanabe 2008) while practitioners in the field and business associations complain that the EB is being excessively stringent in its assessment of additionality, particularly in its use of investment analysis as a litmus test (IETA 2008; UNFCCC 2007a<sup>20</sup>) In between both arguments there remains the inconvenient fact that additionality of individual projects is difficult to prove and even more difficult to validate, as the reference is by definition a counterfactual reality which can never be incontrovertibly argued or conclusively proven (Mueller 2009).

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<sup>19</sup> As a result the price spread between EU allowances and secondary CERs decreased substantially (Michaelowa and Vasa 2008)

<sup>20</sup> Call for Input on Non-Binding Best-Practice Examples on the Demonstration of Additionality to Assist the Development of PDDs, Particularly for SSC Project Activities. Some of the comments prove the dissatisfaction with the additionality tool.

- **Inefficient operation.** After a slow start, the CDM has seen an explosion of projects that was unimaginable in 1997 or even in 2004 when the first project was registered. Over the past five years the CDM has registered 1,665 projects and is gearing up for an additional 2,600 which are now in the pipeline.<sup>21</sup> After long delays the CDM system is now fully funded and the technical support provided by the Secretariat has grown to meet the demand. There have been copious complaints about year-long delays in the approval of methodologies (IETA 2008), about the 1-2 year time lag in the assessment of projects (Michaelowa and Purohit 2007; IETA 2008), and recently criticisms about the ineffectual operation of Designated Operational Entities (DOEs), which have become new bottlenecks to an efficient functioning of the CDM (Hoogzaad et al. 2008). All of the above are realities, and at the same time we must recognize that the CDM system has grown in the manner in which we so often recommend for healthy institutional growth: in response to demand. One of the consequences of demand-driven growth is the inevitability of the delay between appearance of the demand and response of the system. The question now is how to further improve the CDM so that it can effectively administer its current and future growth.
- **Insufficient contribution to sustainable development.** The CDM was created with two objectives: lowering the cost of global climate change mitigation and contributing to the sustainable development of developing countries.<sup>22</sup> However, as a market mechanism that gives monetary value only to emission reductions and searches for the highest volumes at the lowest price, the CDM has been more effective in reducing mitigation costs than in broad contribution to sustainability (Holm Olsen 2007; Sutter and Parreño 2007; Holm Olsen and Fenhann 2008; Nussbaumer 2008). In this criticism most authors assume a definition of sustainable development that focuses on local stakeholder participation, local job creation, and small scale renewable energy supply (Cosbey et al. 2005; Brown et al. 2004; Michaelowa and Umamaheswaran 2006). When demanding a revision of the sustainable development definition under the CDM, critics implicitly challenge the prerogative of the host country to define sustainable development. In addition, NGOs question the integrity of certain project classes, such as large or medium hydropower, landfill gas, industrial energy efficiency or afforestation projects and particularly criticize CDM funds going to destroy industrial gases in projects with little sustainable development benefits. Disregarding the stamp of approval which host countries have given to such projects, NGOs find flaws both in the general acceptance of such projects under the CDM as well as in the implementation in the concrete case.<sup>23</sup> From a climate

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<sup>21</sup> It has been shown that not all pipeline projects move forward to registration due to barriers including financing, regulatory risks, transaction losses, etc.

<sup>22</sup> Article 12 of the Kyoto Protocol.

<sup>23</sup> Just to list a few: International Rivers Network & CDM Watch, "The Good, the Bad and the Dammed Ugly, Status Note on Large Hydro and Clean Development Mechanism", 2003, available at <http://www.irn.org/programs/greenhouse/pdf/gbduirncdmwatch.pdf>; International Rivers Network & CDM Watch, The World Bank and CDM large hydros. Status Note for COP10, 2004, Buenos Aires, Argentina, available at <http://www.irn.org/programs/greenhouse/pdf/COP10hydrostatusnote.pdf>; News Release 27 March 2003, Brazilian groups urge

change perspective, one could however argue that it is much more worrisome that the CDM has not promoted sustainable development writ large: it has not moved developing countries toward low carbon development paths (Figueres et al. 2005; Wara 2007; Wara and Victor 2008) based on more sustainable energy production and consumption patterns and more sustainable forest management practices.

- **Weakness of the incentive.** The incentive of the CDM has been too weak (Sterk 2008) to foster the necessary type of transformation in the economy, without which emission paths in developing countries will continue to increase. The structure of the CDM has restricted the mechanism to a relatively small number of projects. The CDM was effective in quickly eliminating a substantial portion of HFC<sub>23</sub> and N<sub>2</sub>O industrial gases which gave an early spur to the market although they contribute little to sustainable development (UNEP Risoe 2008).<sup>24</sup> More recently, the CDM has shown that it can catalyze uptake of commercially proven technologies to capture waste heat and waste gases in carbon intensive manufacturing industries (iron and steel, cement, chemicals). Likewise, CDM has begun to support a wave of renewable energy projects, methane capture and use projects, and efficiency activities in coal mining, oil and gas exploration and distribution. However, NGO concerns, and even more importantly the relatively low price of carbon, have impeded the CDM from appropriately addressing the largest source of greenhouse gas emissions globally – coal fired power plants.<sup>25</sup> The single point practice of the CDM (until the appearance of programmatic CDM) has not supported any increased efficiencies in the built and household environments or transportation systems which comprise more than half global carbon emissions (IPCC 2007))and are the fastest growing sources of carbon emissions in the emerging markets (Pew Center 2002). Neither has the CDM supported sustainable livelihoods (e.g. improved cooking and lighting), or catalyzed energy access for the rural and peri-urban poor (Figueres and Newcombe 2007). The exclusion of deforestation emissions from the CDM has finally left the largest emission source of many tropical developing countries untapped by the CDM (Eliasch Review 2008).
- **Weak governance.** The CDM has failed to develop a due process to guarantee fundamental fairness, justice, and respect for property rights. The overwhelming majority of the entities trading in the CDM market belong to the private sector. The CDM is unique in regulating a market dominated by private players that depend on a United Nations committee (the EB) to

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EU companies not to buy carbon credits from eucalyptus plantation, available at <http://www.fern.org/pubs/media/plantarpr.htm> .

<sup>24</sup> The low number of HFC<sub>23</sub> (22) and N<sub>2</sub>O (65) projects are producing a large share, 17% and 9%, of all expected CERs from registered and CDM projects in the pipeline (at the validation/review stage).

<sup>25</sup> As energy demand growth in some developing countries currently is satisfied with coal fired plants, the introduction of ultra-critical coal-fired plants is both a promising and contentious issue. The first methodology for potential power plant energy efficiency and supercritical coal-fired CDM projects, AMCM13 was approved in 2007. The methodology determines its baseline emission factor according to the lower bound between the emission factor of the technology and fuel type that has been identified as the most likely baseline scenario and a benchmark emission factor of the top 15% performing power plants in the country that use the same fuel (EB39).

approve the calculation methods and projects that create the market's underlying asset. The credibility of the CDM market depends largely on the robustness of its regulatory framework and private sector's confidence in the opportunities provided by the mechanism (Streck and Chagas 2007; Meijer 2007; Streck and Lin 2008). There are mounting complaints about the continued lack of transparency in the Board's decision-making and the lack of predictability (IETA 2005; Stehr 2008). The governance structure of the CDM would have to be reviewed taking into account the need to supervise a rapidly growing market and to provide in particular private sector participants that are not represented in the COP/MOP, with due process, ensuring the conditions for fair and predictable decisions.

Not all of the above issues will ever be solved by the CDM, but there is admittedly ample room for improvement toward 2012 and evolution beyond 2013, and there has certainly been no lack of suggestions on how to change and improve the CDM. Here we do not undertake an in-depth evaluation of all those proposals. Rather we attempt to intuit the fine line of what may be politically acceptable to all Parties, given the facts that the financial mechanism(s) is/are intrinsically linked to the expected scale of mitigation post 2012 and that a 2009 Copenhagen agreement must occur within the constraints of the prevailing political realities.

#### **4. POLITICAL REALITIES**

There are three main political constellations that shape the potential consensus around a future climate deal. First, the US (until recently the largest national source of CO<sub>2</sub> emissions<sup>26</sup> and by all counts the most historically responsible) has made little attempt to reduce emissions. The new administration has assumed a more responsible position, and the expectation is that the US will soon undertake efforts that are comparable with other industrialized nations. In an address to Governors from around the world,<sup>27</sup> President Obama declared: "We will establish strong annual targets that set us on a course to reduce emissions to their 1990 levels by 2020 and reduce them by an additional 80 percent by 2050. We will engage vigorously in climate change talks despite the financial crisis". The cap-and-trade legislation sponsored by Representatives Waxman and Markey is making its way through the legislative process but it is unlikely that it will pass both House and Senate by December 2009. The political will has been established by the new leadership, but the procedural necessities take time. Even with all good will, the US will develop its domestic emissions regulations before it decides how to enter into a multilateral agreement. The consequence for the international agreement could be either that the 2009 Copenhagen COP/MOP may be suspended in December to be continued as a "COP-bis" in June 2010 (as was done with COP 6), or that the Copenhagen agreement, in close consultation with the US team, may have to be crafted as an architectural "docking station" where the major architectural design is set for the US to later "dock in".

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<sup>26</sup> China is believed to have overtaken the US in absolute national terms during 2006, see Gregg et al 2008.

<sup>27</sup> Governors' Global Climate Summit held in Beverly Hills, California, on November 18, 2008.

The second political reality is that among the industrialized nations only the EU and Japan have been clear about their intended post 2012 mitigation level. Japan announced a reduction target of 9% below 1990 levels, which lacks ambition and was hence not well received by the international community. Unlike the US where international commitments tend to follow domestic policies, the EU has had a practice of defining international targets first before deciding on how to attain those targets. Although the EU has been careful to differentiate its unilateral mitigation commitment (20% below 1990 levels by 2020) from an additional 10% reduction in case of a satisfactory (from the point of view of the EU) international agreement,<sup>28</sup> it is not guaranteed that member states would be willing to uphold the unilateral reduction level in the event of a failed international agreement. In fact, the Energy and Climate Change Package that was prepared for adoption by the European Parliament in December 2008 was hard fought by many European countries. Thus the EU is under major pressure on the one hand to keep its member states to the intended reduction commitments, and on the other hand, to bring both the USA and key developing countries into the tent, a priority that could, at least in the short term, take precedence over their desired global target and timetable.

The third political constellation is that of developing countries. They understand that the reduction in GHG emissions needed to avoid catastrophic climate disruptions cannot be undertaken by industrialized countries alone, even if those reductions reach 80 or 90% below 1990 levels. Thus the weight of closing the environmental gap falls on developing countries. However, developing countries' contribution to global mitigation must consider that:

- Developing countries will participate only once all industrialized countries (including USA, Japan, Canada and Australia) have demonstrably taken the lead and developing country action will depend on appropriate incentives and financial mechanisms.
- Developing countries are not a monolithic group: there is a broad spectrum of economy sizes, which has a direct bearing on both responsibility<sup>29</sup> as well as capability<sup>30</sup> to mitigate. A few emerging economies have felt the pressure to contribute to mitigation efforts in the near term due to their current rapidly increasing emission levels and growing economic development levels. China, India, Korea, Mexico, Brazil and South Africa have all come forward with first estimates of mitigation potentials (see Appendix 1 for a summary of these estimates). In addition, there is a group of middle-income developing countries that are under less pressure to assume targets now, but whose growth patterns could lead them, under a business as usual

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<sup>28</sup> The EU climate goal forms part of an energy and climate strategic package presented by the EU Commission on 23 January 2008, and endorsed by the Council on 4 December and the European Parliament on 13 December 2008. The reference line for reductions has been defined as 2005, as opposed to the previous 1990 levels, due to resistance of some member states. The Commission proposal is available at

[http://ec.europa.eu/environment/climat/emission/ets\\_post2012\\_en.htm](http://ec.europa.eu/environment/climat/emission/ets_post2012_en.htm).

<sup>29</sup> Responsibility could be proxied as either cumulative emissions or annual emissions, and either could be measured on a per capita basis.

<sup>30</sup> Capability could be proxied as either GDP or GDP per capita.

scenario, to relatively high GDP and emission levels over the next 20 years (e.g. Chile, South Korea, Argentina, Iran, Saudi Arabia, etc). For these countries the effort would be to reduce the carbon intensity of their economic growth. Finally the largest number of developing countries is comprised of small economies whose emissions are negligible now and in the future. They may continue to contribute to mitigation efforts, but most likely under little or no international pressure to curb their emission growth.

- Developing countries will not immediately enter into economy wide reduction commitments but rather may sequence their nationally appropriate mitigation actions<sup>31</sup> to gradually move up the stringency ladder. The emerging economies could start with a focus on climate-friendly development policies without explicit mitigation commitments, and transit over time, based on demonstrated responsibility and capability, to limiting emission growth and finally at some point in time, to adopting emission reduction or at least emission intensity targets (Figure 1). In order to uphold the integrity of the system, all mitigation efforts, whether based on climate friendly policies or eventually on targets, would have to be domestically measured and reported, and independently verified. In order to ensure fairness and equity, the gradual incorporation of developing countries could be linked *pari pasu* to industrialized countries' verified performance (e.g. in terms of both emission reductions achieved at home and the provision of financing for developing countries mitigation efforts). Moreover, an agreement would have to be reached on objective criteria for defining the thresholds that would trigger an increasing degree of incorporation of developing countries.
- As two thirds of future emissions will come from developing countries, they could potentially provide most of the mitigation needed for stabilization, but they cannot be expected to pay for it. As proposed by Spence et al (Growth Report 2008) this can be done by decoupling the payment for mitigation from the site of mitigation. As long as we assume that every country has to pay for the emission reductions achieved on its territory, developing countries will understandably argue that they cannot act on climate in a significant way because of inequity and their other development priorities which have to take precedence. Financial support for substantial mitigation in developing countries is made more palatable to industrialized nations by the fact that these are the most cost effective mitigation efforts. The UNFCCC Secretariat estimates that 68 percent of the mitigation necessary for stabilization is achievable in developing countries and costs 46 percent of the total global mitigation (UNFCCC 2007).

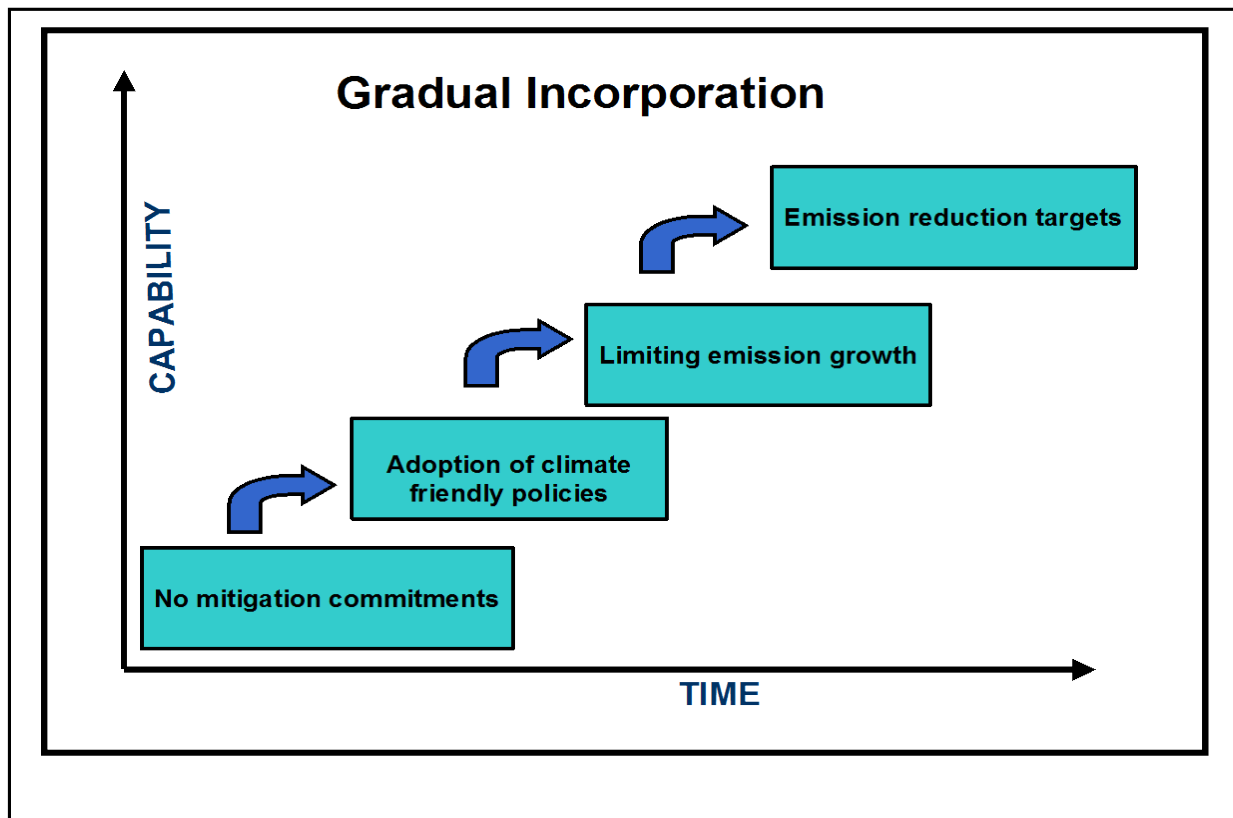
The conditional transfer of resources from the industrialized countries for purposes of underwriting part of the mitigation costs in developing countries is what is at the heart of the CDM and will likely continue to be the *modus operandi* of the financial mechanism(s) that could be devised for post 2012 mitigation.

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<sup>31</sup> The Bali Action Plan, Decision 1/CP13 envisages “[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 measurable, reportable and verifiable manner.”



Figure 1. A possible scheme for gradual incorporation of developing countries



Source: Figueres 2007b

## 5. SCALING UP EMISSION REDUCTIONS IN DEVELOPING COUNTRIES

One of the main challenges of a post-2012 agreement is thus to define a framework which creates incentives for developing countries to reduce emissions beyond those mobilized by the CDM. The current discontent with the CDM has led to a broad array of proposals on how to fix, enhance, expand, or evolve the mechanism. They include models under which emission reductions would be rewarded in relation to particular sectors or are built on various forms of targets, such as intensity, absolute or relative (action) emission reduction targets. Crediting of achievements could take place on the national level only or involve project activities, can be based on an initial allocation of allowances (cap-and-trade) or ex-post crediting (baseline-and-credit), and be linked or separated from existing carbon markets. Mechanisms that build on emissions trading can be directly or indirectly linked to Annex I carbon markets and can create credits that are not, partly, or fully fungible with existing carbon markets. Challenges of scaling up the current CDM to access broader emission reductions include:

- **Environmental Integrity.** Environmental credibility is a particular issue where emission reductions are credited as off-sets, thus not leading to an overall reduction but only to a

displacement of the emission reduction to a place of more cost efficient GHG emissions abatement. The current CDM is based on project-based crediting that is supported by rigorous checks and balances to ensure the correct number of credits are issued for eligible projects. These checks and balances include tests to make sure emission reductions are additional, and that any emission reductions are correctly monitored and verified. Environmental integrity of credits is seen as one of the key requirements of the CDM being able to be used to offset a portion of industrialized countries emissions. If the CDM is expanded to cover sectors instead of projects, environmental integrity depends on the accuracy of available data. Where sectoral approaches are based on baseline-and-credit system, the establishment of the baseline or reference emissions is crucial in determining the system's credibility.

- **Uncertainty over Demand.** As any market, the carbon market is based on the notion of scarcity. Incentives to innovate, seek low cost emission reduction options and invest in relevant technology are dependent on an environment where the circulating number of allowances and credits are below the actual level of emissions. Cap-and-trade systems involve a stable number of allowances that allow governments and private sector entities to optimize their operations taking into account the cost of generating emission reductions. Where cap-and-trade systems are linked to offsets generated outside of the system, such off-setting opportunities act as a price valve by allowing covered entities to access additional low cost abatement opportunities. However, the linking to any non-capped environment entails significant risk. The supply of too many credits that can be achieved at costs significantly lower than those within the system (the so called "flooding") may make the achievement of the systems primary goal of reducing emissions within the capped environment impossible. In order to ensure that credits remain scarce and prices high, the design of hybrid emission trading schemes normally involve limitations for the import of credits. In order to protect the EU Emission Trading Scheme from the flooding of CDM credits, for example, the market regulator has capped the number of CERs authorized for transfer.
- **Market vs Non-Market.** Any post-2012 international climate agreement will have to rely on a mix of market and non-market based mechanisms. Carbon finance and the private sector contributions to a future climate regime are essential to mobilize the required scale of funding while governments need to have access to stable resources to adopt and implement policies and programs that lead to GHG emission reductions. The carbon market has proven to be a successful way to involve private entities into treaty compliance. Any final design of a financing mechanism will have to be built on a careful modeling of the emission reductions that can be achieved, credits that should be issued, and market links that have to be established. Since it is unlikely that Annex I commitments can create sufficient demand for carbon credits to (i) ensure domestic reductions; and (ii) reward all reductions in developing countries with tradable carbon credits issued regardless of whether they have been achieved by private entities or by government policies, while simultaneously maintaining a sufficiently high carbon price, the demand for carbon credits will be limited.

Without minimizing the need for more effectiveness, it is probably not realistic to attain anything more than incremental changes to the CDM before 2013. While practitioners clamor for significant improvements, many countries are still learning the ropes of the instrument, and others are focused on the new agreement and tools for scaling up post 2012 mitigation. There is little political space and no energy to undertake immediate major revisions to the CDM before 2012, emphasized by the fact that developing countries have argued that most of those revisions would require an amendment to the Kyoto Protocol. Thus in order to organize the steps in a possible evolution, it may be helpful to distinguish among three levels of improvements/changes to the current CDM, which would ultimately result in three financial mechanisms, functioning in parallel and in a complementary manner to one another:

1. **The activity-based CDM.** Assuming the CDM will continue to operate within the general bounds of the Marrakesh Accords at least until the end of the current commitment period, there are incremental improvements that could be undertaken by the EB itself, some supported by a COP/MOP decision if it occurs, but not all dependent on that mandate. Changes undertaken now would presumably stay in place and some may only apply after 2012.
2. **A trend-changing market mechanism.** Given the need to scale up mitigation in developing countries beyond what can be delivered by the CDM, it may be necessary to create a second market mechanism, inside or outside of the current CDM, inside or outside of the KP, which focuses on impacting long-term emission trends particularly in large emerging economies. In principle it could be put into effect during the first commitment period, but it is likely to be used as a compliance mechanism only in the next chapter of the climate regime, and requires an explicit mandate of the COP/MOP if under the KP, or of the COP if under the Convention.
3. **A non-market mechanism.** In the context of the post 2012 regime, it may be necessary to limit the scope of the market and create a complementary financial mechanism to promote certain mitigation efforts in developing countries without creating international offsets in order to keep the global reductions and timelines within the ranges demanded by science. This would require a COP decision.

We discuss each of these possible mechanisms.

## 5.1 THE ACTIVITY-BASED CDM

Today's wisdom demands higher emission reduction levels than those made possible through a project based CDM, and many voices have understandably joined the chorus to expand the CDM (or create a similar mechanism) toward sector-wide mitigation efforts. However, it is likely that the CDM will remain an activity-based market mechanism, now and beyond 2012. By 'activity-based' we mean a mechanism whose logic is to measure tons reduced by individual projects rather than encourage a shift in emission trends (Figueres 2007a). In this system, baselines and additionality are determined at the individual project activity level, and the rules seek to differentiate those individual efforts that are better than the norm, rather than promoting a betterment of the norm.

The Marrakesh Accords flow from an activity-based logic. To change that logic the CDM Executive Board would need a decision of the COP/MOP, and there no political will to make such a shift, and certainly not before 2012. Guidance emitted by the COP/MOP to the EB since 2005 has focused on incremental adjustments to increase efficiency, consistency, predictability and transparency of the CDM. The guidance has not made any substantial changes to the system or to the rules.<sup>32</sup> Over the next two years negotiators are not likely to consent to material changes particularly if they could lead to higher CERs volumes, for the simple reason that the market is not dramatically short, even considering delays in registration and underperformance of registered projects. The latest estimate of the demand for Kyoto units is about 2.4 billion tCO<sub>2</sub>eq for 2008-2012 (UNFCCC 2008a). CDM projects in the pipeline have the potential to produce 2.9 billion tCO<sub>2</sub>eq by 2012,<sup>33</sup> although transaction bottlenecks and project underperformance seem to put the more realistic supply estimates in a range between 1.6 and 1.9 billion tons (UNFCCC 2008a).<sup>34</sup> Developing countries fear that a substantial change in rules could open a floodgate to supply which would overwhelm demand, tank prices, and cause environmental damage due to the offsetting nature of the CDM. Thus it is our sense that the CDM will not be subjected to any serious revamping during the first commitment period, despite the pressures from stakeholders desirous of change.

Furthermore, the CDM may continue to offer developing countries the opportunity to engage in activity-based offsets in the post 2012-regime. The operational structure that has been developed for the CDM, including the rules that apply to activity-based offsets, is only just coming into fruition. There are some countries that are not yet participating in the CDM and for which the current requirements of host country approvals remains a challenge. Most medium to large-sized installations in small countries can

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<sup>32</sup> Substantial changes to the CDM which were discussed under Article 9 negotiations at COP/MOP 4 in Poznan did not prosper and were deleted from the text, even before the entire Article 9 was dropped.

<sup>33</sup> <http://cdm.unfccc.int/Statistics/index.html> on June, 2009.

<sup>34</sup> The estimates do not yet take into account that the recent global financial crisis has decreased investment capital available to CDM projects that produce the supply of CERs, as well as slowed production in industrialized nations (thereby decreasing the demand for compliance offsets). Figures are sometimes dramatic: Corus, a UK-Dutch steel maker owned by Indian Tata, has announced a 30% cut in steel production by March 2009, resulting in a cut of by 8,1 million tons of CO<sub>2</sub> emissions. Other steelmakers have announced similar cuts according to PointCarbon, 2008a.

be effectively submitted as individual CDM projects, and micro technologies such as light bulbs and cooking stoves now have the option of being registered as organized programs of activities under the current CDM. The fact is, most developing countries do not *need* (and may not want) any other set of rules in order to supply their mitigation potential into the market. Small or least developed countries often do not have either the institutional ability to put in place complicated GHG accounting schemes, nor the eagerness to be distracted from more urgent development challenges. However, it is clear that in order to scale up mitigation in the larger emerging economies we must go beyond current CDM practices; this will be discussed below. Here we only emphasize that whether Parties decide to enhance the CDM post 2012 or to create another complementary market instrument, the option to participate in the offset market with activity-based projects will probably not be retracted.

This is not to say that the CDM is a finished product. It is painfully evident that in order to deal with the high volumes of projects already in the system, it should incorporate several key administrative improvements and the sooner the better. In the following we list (i) measures that could be undertaken directly by the EB without changing the Marrakesh Accords and without the need for a COP/MOP decision, (ii) improvements of the CDM requiring a COP/MOP decision that revises the Marrakesh Accords without touching the fundamental principles of the CDM. Any changes undertaken by the EB for the first commitment period would presumably stay in place after 2012, while reforms that require a more profound reform of the CDM would likely only take effect in 2013.

(I) Improvements that can be enacted by the Executive Board itself

- **Delegation to the Secretariat.** Assuming that the level of CDM submissions continues to rise and that nominations to the Board will, at least for the next three years, continue the current practice of part-time Board members who volunteer their time and do not have regulatory experience, it is inevitable that the Board delegate even more responsibility to the Secretariat than it has in the past. Over the past 2-3 years the Secretariat has been adding and training staff to support the various functions of the EB. This trend will probably continue. One specific task that could be delegated to the Secretariat relates to issues where clear guidance from the EB is available and yet not complied with in Project Design Documents (PDDs). Without triggering a request for review, the Secretariat could request these corrections as part of its completeness check, thus significantly decreasing the high volumes of requests for review.<sup>35</sup> Of course there are issues where EB guidance is not so clear and which need to be considered by the EB in its role of policy definition. The ultimate responsibility will certainly continue to reside with the Board, but project review could be shifted even further to the Secretariat, avoiding unnecessary delays and allowing the EB to focus more on policy decisions.

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<sup>35</sup> An analysis of all requests for review between EB32 and EB42 shows that 430 out of 750 questions from the EB to the DOEs are merely clarification requests. The procedure to request a review has thus been mis-used in over 50% for simple requests for clarification.

- **Distribution of work.** Outside of the work performed as members of Panels and Working Groups, the EB functions as a whole when it meets, and the agenda is always stretched beyond what can be achieved in the one-week time period. The EB could divide members into three groups or committees: one that reviews technical proposals on project approval for registration purposes, a second that reviews proposals on registration, and a third group that reviews methodologies. These committees would meet simultaneously with enhanced support from the Secretariat, and then report to the full Board for final approval. Taking into account concerns about accountability of the Secretariat (Streck 2008), such distribution of work and support from the Secretariat would have to go along with the adoption of clear procedural guidelines.
- **Review of the EB's Administrative Rules.** Currently, there are only a few formalized provisions governing the interaction between project proponents, the EB and its panels. Lack of clarity regarding communications, hearings and time lines often make processes cumbersome and opaque. From the perspective of project participants, there is a perception of insufficient and circuitous communication. At the same time, communication becomes unsatisfying, redundant and ineffective, when new queries are brought up in each round of review of a project and it is not clear how many of such review cycles may take place. As a result, there is an undefined period of legal and planning insecurity during which project participants have (i) to retain resources to answer an undefined and unlimited number of new questions, and (ii) have no indication on whether they can move ahead with developing the corresponding CDM project activities. Parties could consider the adoption of administrative due process rules governing communication amongst the various CDM actors (Streck and Lin 2008). The adoption of due process requirements would apply to any activities related to (i) the accreditation and withdrawal of accreditation of DOEs, (ii) the approval and review of baseline and monitoring methodologies; (iii) the registration, or rejection, of CDM projects; and (iv) the issuance, or refusal of issuance, of CERs. The objective of such rules would be that any person (DOE or project participant) with a direct and material interest in any of the abovementioned processes would have a right to participate by: a) expressing an opinion and its reasons, b) having that position considered, c) be informed about the rationale of a particular decision affecting its rights and, eventually, d) having the right to appeal (see below).
- **Role of DOEs.** The relationship between the EB and the DOEs requires urgent improvement. DOEs are the extended arm of the EB, charged with ensuring that any project submitted for registrations meet all CDM requirements. However, the reality is that DOEs have not been performing to expectations and are in fact paralyzed due to capacity constraints. The vicious circle of performance is caused by presenting PDDs that do not comply with all CDM requirements and then having to respond to numerous EB requests for clarification and information. The past 6-9 months have seen a dramatic escalation of projects under scrutiny,<sup>36</sup> decreasing market value of projects by delaying registration and issuance. In addition, DOEs are

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<sup>36</sup> For a graphic overview of the review history and trend see [http://www.cdmpipeline.org/overview\\_8.htm](http://www.cdmpipeline.org/overview_8.htm).

expected to perpetually catch up with EB decisions in order to understand the implications of those decisions for the projects they are validating or verifying. While the retroactive nature of decisions has fortunately been eliminated by COP14, DOEs have been required to retroactively apply different guidance adopted by the EB, adding to further delays and insecurities.<sup>37</sup> DOEs argue that they are understaffed and that it is difficult to find qualified people. This is a dramatic failure of the market. The EB argues that DOEs should learn from the published EB reports. This denotes a failure to understand the responsibility of the regulator. DOEs cannot stand outside EB decisions - they need to be incorporated more organically into the EB decision-making process. The recent approval of a Validation and Verification Manual should address the most pressing questions and insecurities. However, the EB reaches decisions with direct regulatory implications at every meeting and the DOEs should be the first to know and understand. Were the EB to clearly state the rationale for decisions on registration and issuance, DOEs and project proponents would be able to more effectively derive the lessons learned, and apply these in the preparation of future projects, over time improving the performance of DOEs. In turn this would allow the EB to refocus on strategic decisions, the provision of guidance and procedures and the general management of the CDM, refraining from project-by-project assessment of requests for registration/issuance, a practice not foreseen by the Marrakesh Accords. The project specific review needs to be replaced with a stringent and efficient accreditation and continuous assessment process resulting in well-trained DOEs. The EB has recently decided to undertake punitive measures for poorly performing DOEs and was supported in this direction by COP14, but this arguably leads to a further deterioration of a strained relationship. Conventional wisdom dictates that preventive measures are more cost-effective than curative ones.<sup>38</sup>

## (II) Improvements Requiring a COP/MOP Decision

The above issues could be considered by the EB or by Parties for the current commitment period. In addition, there are other elements which represent more fundamental changes to the CDM which are not likely to be considered for enactment before 2013 and would necessarily have to stem from a decision of the Parties.

- **Professionalizing the EB.** The current EB has been established as a United Nations committee, rather than as a professional regulatory authority overseeing the carbon market. This is not surprising, considering the roots of the CDM in international environmental treaty law. Nonetheless, the EB today is in the position of a de facto market regulator. In order to effectively fulfill this role, a first step in this direction would be to professionalize the EB (Streck and Lin 2008). Presently, the majority of its members have a background in international environmental negotiations, not in market regulatory work (e.g. work experience in financial or energy regulatory authorities). As a result, the considerations of the EB tend to be oriented

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<sup>37</sup> During the review period, in over 20% the DOEs were forced to take into account guidance which was not yet available at the time of validation.

<sup>38</sup> In this regard 3 of 11 DOEs applying for re-accreditation have been asked by the EB to improve their procedures (GTZ 2008b).

towards agendas raised during international negotiations rather than to the sort of issues related to the creation and maintenance of an efficient international market. The professionalization of the EB would require the recruitment of full-time salaried individuals whose collective experience spans the entire range of responsibilities (including project finance, law, business management, science) and is grounded in practical, project-level experience and knowledge of the CDM. The right of the various geographical constituencies to nominate EB members need not be affected, but nominations should be backed by the technical expertise and experience that the nominee can bring to the EB. Staffing the EB with professional staff will also help avoid conflict of interests since individuals are no longer made to serve several agendas and interests in parallel, and could devote themselves full time to the EB. To avoid conflicting interests before and after the time an individual serves on the EB, eligibility to the EB should be limited to individuals who did not hold a position that involved decision making on CDM-related matters for a defined period before serving on the Board and should be excluded from such offices for a time after they cease to be active EB members.<sup>39</sup>

- **Review Mechanism.** In addition, a review mechanism of the decisions of the EB could be put in place. It is a condition for a fair administrative procedure that those entities that are affected by the decisions of any regulatory body have access to a full and fair review of the decision. The COP/MOP decisions foresee a review procedure of some contested decisions when a decision improperly affects a Party's interest. The review is conducted by the enforcement branch of the Protocol's Compliance Committee.<sup>40</sup> These procedures however do not extend to non-Party participants in CDM projects. Under the existing guidelines, procedures and rules, the procedural rights of private parties are very limited. Affected project participants are afforded no opportunity for review of EB decisions. In order to strengthen quality and legitimacy of the EB's decisions, the COP/MOP could establish an appeal mechanism which gives standing to individuals that are granted rights and obligations under the CDM and guarantees a full review of EB decisions (Streck 2007; Streck and Chagas 2008).<sup>41</sup> Such mechanism would give project participants, and other entities with rights and obligations under the CDM, standing to appeal the decisions of the EB. It would thus increase the quality of the process as a whole.<sup>42</sup> For that purpose, a competent panel established by the COP/MOP and composed of a small number of individuals could be charged with the responsibility of passing a final judgment on the subject matter under dispute.

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<sup>39</sup> Rules could e.g. be modeled after those applying to the World Bank Inspection Panel.

<sup>40</sup> Decision 27/CMP.1, Annex, Procedures and mechanisms relating to compliance under the Kyoto Protocol, sections IX and X.

<sup>41</sup> An alternative remedy has been proposed by E. Meijer under which decisions of the EB would be open for review by national courts (Meijer 2008).

<sup>42</sup> An analysis of all requests for review between EB32 and EB42 found 88 projects where the question raised is either out of scope of a request for review, pertaining to guidance that was not available at the time of validation or simply a question based on wrong facts or erroneous interpretation of the relevant rules and guidance.



## 5.2 A TREND-CHANGING MARKET MECHANISM

The reductions achieved under the Kyoto Protocol will not make a dent in global emissions, and have had even less of an effect on emission trajectories. The decarbonization that the current CDM did not achieve in developing countries needs to be aggressively pursued in the post 2012 period. Historic economic growth has been based on increased fossil fuel energy consumption and consequently increased GHG emissions. Future economic growth particularly in developing countries must reverse this trend. While economic growth must continue and in fact accelerate, the efficiency of energy consumption must improve and the carbon intensity of production must swiftly decrease. Decoupling growth from emissions is the only way to pursue economic development and climate protection simultaneously, and this requires a radical shift in the policies that regulate the productive sectors.

Unlike the current CDM, the next chapter of the carbon market must play an important role in introducing and implementing the policy changes needed to put developing countries onto a low carbon path. Policies have had an evolving treatment in the CDM. Although it was never explicitly stated in any CDM modality, during the first few years of CDM operation there was an underlying assumption that the existence or introduction of a climate-friendly policy or regulation in a developing country would make a project in that sector non additional, and thus not eligible for the CDM. That perverse incentive was fortunately removed in 2005 by the EB with a ruling establishing that policies that encourage lower emissions need not take these policies into account in the baseline if the policy was implemented since the adoption of the Marrakesh Accords in November, 2001.<sup>43</sup> This decision effectively ensures that the introduction of a climate friendly policy will not adversely affect the quantification of emission reductions in the project activity. However, removing the perverse incentive from the CDM is a necessary but not a sufficient condition for promoting decarbonization.

It could be argued that programmatic CDM is a first step in the direction of promoting decarbonization by encouraging the enactment of climate-friendly policies. Indeed, that was the original intent. Stemming from the firm conviction that the market needs to promote climate friendly policies and not just isolated projects, proponents tried to introduce the eligibility of policies and standards in the CDM during the COP/MOP negotiations held in Montreal in November, 2005. The objective of the proposal was to broaden the scope of the CDM by expanding the eligibility to emission reductions resulting from the adoption of particular policies or programs that would achieve emission reductions in multiple points over a period of time. Opponents argued that the modalities and procedures established for the CDM only allowed the eligibility of activities themselves. 'Activities' need to be directly tied to the introduction of a specific technology in a specific site, and emission reductions need to be directly attributable to the new technology. The compromise that was reached is encapsulated in the COP/MOP-1 decision that gives rise to programmatic CDM:<sup>44</sup> *"A local/regional/national policy or standard cannot be considered as a clean development mechanism project activity, but project activities under a*

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<sup>43</sup> EB 22, Annex 3 "Additional Clarifications Regarding the Treatment of National/Sectoral Policies and Circumstances"

<sup>44</sup> Paragraph 20, Decision2/CMP1

*programme of activities can be registered as a single clean development mechanism project activity”.* The decision differentiates between the existence of a policy (not eligible) and its implementation through specific activities (eligible). The new registration option allows for the aggregation of an unlimited number of activities implemented over time and throughout a region that can be as broad as encompassing various countries. The unlimited aggregation begins to open the door to sectoral transformation. Nonetheless, emission reductions are still measured on the basis of specific activities (e.g. tons reduced by the installation of a particular technology), not on the basis of the improved overall performance of the sector (e.g. tons/kWhr in the electricity sector). The adoption of rules governing programmatic CDM was important for opening the CDM to projects in sectors that are highly dispersed over space and time (e.g. demand side energy efficiency, transportation, households, etc.). However, programmatic CDM continues to fall short of triggering the needed level of GHG emission reductions at the scale of whole economies.

The next chapter of the climate regime must be built around the active and deliberate promotion of climate friendly policies throughout the developing world. In fact, policies should be front and center of any and all financial mechanisms that are developed for the future. The new mechanisms need to be constructed around the challenge of continuous improvement in national carbon intensity and efficiency, with rules that seek to improve the norm rather than merely differentiating the individual efforts that are better than the norm.

Over the past few years a plethora of proposals has emerged suggesting options for making this shift. The proposals have surfaced both in the context of formal negotiation processes and as a result of the large amount of academic research, analysis and informal discussions on the future regime.<sup>45</sup> Here we highlight the subset of proposals that revolve around sectoral concepts, as they seem to have most political attention. While authors take various perspectives on what has become the ‘silver bullet’ and overly used term “sectoral”, there are basically two groups of proposals with varying degrees of elaboration: those that stem from an agreement among industries that operate in the same sector but are located across different countries, and those that evolve from a national government decision to implement a specific policy or measure.

### **Industry Agreements**

Arising from concerns over leakages and negative competitiveness effects associated with country-specific mitigation commitments (IEA 2008), industry has taken the initiative to establish transnational, industry-led networks that promote climate change mitigation policies involving different sectors in developed and emerging countries alike. A key purpose is to avoid that competitiveness gains could be obtained through regulatory arbitrage, a particular concern for trade-exposed industries such as cement, aluminum, and steel, which are so energy intensive that they alone represent a significant share

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<sup>45</sup> Cosby et al. (2007) describe 44 proposals which have been made within and outside of formal UNFCCC processes, and additional ones have emerged since then.

of emissions (Egenhofer and Fujiwara 2008, Höhne and Ellermann, 2008). Transnational voluntary policy co-operations exist for the aluminum sector (under the auspices of the International Aluminum Institute, IAI), for the cement sector (Cement Sustainability Initiative, CSI, under the auspices of World Business Council for Sustainable Development), for the iron and steel sector (administered by the Iron and Steel Institute, IISI) and in the form of multi-sectoral, public/private partnerships (Asia-Pacific Partnership on Clean Development and Climate, APP). Under the IAI Agreement major primary aluminum producers, representing about 60% of the global market share (half of which is supplied by producers in non-OECD countries), committed themselves to cut perfluorocarbon (PFC) greenhouse gas process emissions by 80% and to reduce energy intensity by 10% by 2010. The Cement Sustainability Initiative, in operation since 2002, has thus far largely focused on capacity building (data collection, benchmarking and monitoring) but seems prepared to move to a second stage of concerted action, dedicated to policies and the establishment of potential intensity targets. The first stage alone has produced modest results (namely a 100 kg CO<sub>2</sub> reduction per ton of production).<sup>46</sup> The IISI, representing roughly 200 manufactures from all over the world (including China, India and Russia), responsible for an output of 70% of global iron and steel production (and more than 2 billion tons of annual CO<sub>2</sub> emissions), instigated programs among its members to enhance energy efficiency and recycling, establish best practices, cooperate in the research of application of low carbon technology, and provide comprehensive measurement and benchmark tools. The IISI also supports the public/private partnership APP which brings together the governments of Japan, Korea, China, India, the US, Canada and Australia, with the energy supply and energy-intensive industrial sectors. The APP aims at capacity-building, the proliferation of technology, and regulatory reform. Despite the participation of governments and industry-wide representation, no national or sectoral ('top down') targets are set or envisaged by the APP; rather the Program has chosen a 'bottom-up' action-based approach.

The private sector approach to sectoral crediting has three major flaws. First, it would need to be based on firm commitments, and yet the participation in private sector agreements is voluntary by definition. Second, even though industry today confesses wholeheartedly to the objectives of sustainable development and has proved willing to engage in a range of private or public/private transnational agreements to that purpose, the level and quality of commitments taken are meager. Only one of the agreements and transnational programs mentioned above has taken up firm targets (the IAI agreement on aluminum production); and these targets are neither overly ambitious (the commitment to reduce PFC emissions by 80% from 1990 levels was taken at a time, in 2003, when industry had basically reached this reduction already)<sup>47</sup> nor overly obliging (the 10% energy intensity reduction promised for 2010 seemed very distant in early 2008).<sup>48</sup> Thirdly, voluntary commitments by private stakeholders are by definition outside the purview of the UNFCCC process where only states can enter into international

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<sup>46</sup> Climate Change Corp, Climate News for Business, 8 October 2008  
<http://www.climatechangecorp.com/content.asp?ContentID=5693>.

<sup>47</sup> IAI: Aluminum for Future Generations, Update 2007. <http://www.world-aluminium.org/UserFiles/File/fl0000189.pdf>.

<sup>48</sup> Reuters, 12 February 2008.

agreements. Agreements that are reached in the realm of the private sector could be complementary to, but cannot substitute agreements reached among governments within the UNFCCC process.

## **Government Actions**

Referred to by some authors as the “policy-based approach” (Sterk and Wittneben, 2005)<sup>49</sup> but by others as a form of a “sectoral” approach (Bodansky, 2007, Bosi and Ellis, 2005), this approach centers on the generation of emission reductions by developing countries that adopt binding or non-binding policies, voluntary or mandatory standards that measurably reduce GHG emissions. Under the approach originally proposed by Samaniego and Figueres (2002) developing countries would develop regional, sectoral, sub-sectoral, or cross-sectoral mitigation efforts, which would be the result of specific sustainable development policies, measure the attained reductions against a sector wide baseline, and sell those on the international emission reduction market. The mechanism would be comparable to the CDM, but covering a whole sector rather than a particular activity. The intervention would be accredited to a government policy rather than a CDM motivated investment, but the reductions could be achieved by private sector with the necessary compensation by government. Governments could negotiate upfront funding against future emission reduction deliveries just as under the CDM, allowing countries to make the necessary institutional and regulatory investments. Alternatively, developing countries could make commitments in the form of voluntary pledges of emission growth controls – e.g. as proposed by the South-North Dialogue (Ott et al 2007).

In order to assign some of the cost to developing countries and increase the net gain to the climate by not converting all reductions into offsets, some authors have evolved the above concept toward Sectoral No-Lose Targets (SNLTs). Under SNLTs developing countries would voluntarily propose a domestic interest crediting baseline over a commitment or ‘management’ period of time which would be below the business as usual projection and be negotiated internationally. The country would reach the crediting baseline through domestic efforts, and would then be allowed to sell any surplus emission reductions which are achieved beyond the crediting baseline, but would have no penalty for not achieving that baseline. Two variations have emerged under the SNLTs concept, one by the Centre for Clean Air Policy (Schmidt et al 2006) and the other by Ecofys/GtripleC (Ward et al 2008). In the CCAP version international benchmarks would feature explicitly as a negotiation parameter, i.e. to draw links with the performance of these sectors in industrialized countries for competitiveness reasons. By contrast, Ecofys/GtripleC have developed sectoral proposal templates, the purpose of which is to provide a standardized tool by which countries can prepare and propose crediting baselines without referring to international benchmarks.

Proponents of the SNLT mechanism propose that crediting baselines be negotiated at the same time as Annex I country targets for post 2012 in order to avoid the need for proving additionality. However, benchmarking has its own set of enemies, is very data-intensive and may not be realistic in some

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<sup>49</sup> Bosi and Ellis (2005 p.6) analyses as an option policy-based crediting.

countries or some sectors (Eggenhofer et al 2008, Ward et al 2008), particularly if the target date of agreement is COP15 at the end of 2009. Furthermore, SNLTs make sense for larger developing countries with a stable investment climate that seeks to significantly scale up private sector investment according to their sustainable development priorities, and where current carbon market policy tools, such as the various forms of CDM, are not considered adequate to the task (Ward et al. 2008). The aggregation of revenue potential could provide financial leverage sufficient to transform the sector over a 10-20 year period. Developing countries will however be careful to not accept any target that would operate as a cap on development. They are therefore likely to argue for setting baseline emissions on the basis of the national emission intensity of the sector in question. Having intensity baselines requires both the parameters in the numerator and denominator to be measurable - and measured, reported and verified, which will limit the applicability of SNLTs for some time (Ward et al 2008). Developing countries will also avoid any mechanism that is perceived as a back door strategy to push them into binding national targets. A notable exception is the discussion of a crediting mechanism for reducing emissions from deforestation and forest degradation (REDD), the most advanced of all negotiations on sectoral crediting, where the negotiations seem to take a direction towards a SNLT (UNFCCC 2007).

Given where we are in the international negotiations, with the USA still not on board and the other industrialized countries not agreeing to a 25-40% reduction by 2020<sup>50</sup>, it is unlikely that by the end of 2009 developing countries will agree to move into a crediting mechanism that is any more stringent than that based on the enactment of emission reducing policies or regulations which are aligned with their own sustainability goals, are domestically measured and can be independently verified. Such move would correspond to moving up one step in the previously discussed gradual incorporation scheme. This may not seem like much of a shift from business as usual, but in reality, empirical evidence shows that countries (developing and industrialized) are actually not implementing policies that lead to the decarbonization of growth. The climate regime could act as the necessary catalyst, with strong incentives and a transparent and predictable market mechanism as a financial basis for decarbonization in the South.

In order to be successfully implemented, the expanded mechanism would require major alterations to the carbon market as we know it, if only to safeguard the integrity of a system that will trigger mitigation efforts at a scale heretofore unknown. Taking into account the risk of driving emission reduction prices down by enabling high supply levels, the comparative advantages of market based against non-market based mechanism will have to be carefully assessed. Parties would decide whether this new market channel is created inside the CDM under the guidance of the EB (but with modalities different to those of Marrakesh), or whether it should have a separate structure and regulating body.

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<sup>50</sup> According to the Fourth Assessment Report of the IPCC industrialized countries need to reduce their emissions 25-40% below 1990 by 2020, in order to have a 50% chance to stabilize global temperatures at 2°C above pre-industrial levels.

In any case, the following issues would need to be addressed:

- **At the mitigation level**, the logic of the system needs to evolve from focusing on the project activity to focusing on the policy that spurs the emission reductions. Decarbonization will simply not occur without the necessary regulatory framework. Only regulatory certainty will stimulate an adequate and reliable new source of risk capital to finance technology shifts on the scale of whole economies. In addition to promoting activity-based emission reductions as in the traditional CDM, the next (or expanded) emission reduction mechanism must promote the necessary sector-wide transformation, attained by cost effectively channeling capital and know-how to decarbonize carbon intensive sectors such as energy, transport and infrastructure (Figueres and Newcombe 2007). The focus of the market would have to shift “from measuring tons to affecting trends” (Figueres 2007a).
- **At the financing level**, mitigation action needs to be appropriately rewarded reflecting the different strengths and constraints of private vs public financing. The conditions under which the private sector accepted the CDM as an international incentive mechanism include: (i) low exposure to host country risk, which in the CDM is limited to the issuance of a letter of approval; (ii) ability to control project risk and independence of carbon credit allocation to an individual project from broader policy failure; and (iii) despite all flaws, trust that the international governance structure will reward emission reductions with tradable carbon credits. Governments on the other hand rarely act as carbon speculators. They are unlikely to create budget lines on the basis of a future promise of carbon credits unless they receive a price guarantee and assurance that credits will actually be issued. Experiences with the establishment of AAU-backed Green Investment Programs in countries with an overallocation of AAUs in Eastern Europe have shown that trading of carbon credits by governments, even if they come in the form of allocated allowances as in the case of AAUs, raises issues related to state budget rules, sale of state assets, ownership of emission rights, constitutional limitations, predictability of funding, allocation of proceeds.<sup>51</sup> As a result, the sale of AAUs from these countries has been very limited. Turf battles among ministries and questions on a fair price of carbon have further paralyzed the sale of carbon credits on the state level. Lessons learned from this process could help in designing a post-2012 incentive system which takes into account the need for stable and predictable funding of government agencies.
- **At the crediting level**, governments could have the right to propose sectoral crediting schemes involving tradable carbon credits or opt for other negotiated and determined incentives (e.g. cash, loans, guarantees). Performance could be measured against an agreed and adopted baseline, a SNLT or any other performance indicator. The mechanism could foresee the allocation of tradable carbon credits based on a reduction of emissions below a certain baseline. In order to reduce the price risk governments could negotiate the sale of the credits in advance against a fixed price per ton of CO<sub>2</sub>e reduced. Annex I Governments would have to decide

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<sup>51</sup> The World Bank has funded GIS studies in Bulgaria (2004), Ukraine (2006) and Latvia (2007). *[Add link to the relevant studies and other sources]*

whether they will open private carbon markets to these credits; if not, other offtake agreements would be needed to give developing countries the assurance that there is demand for emission reductions. Alternatively, governments could also opt not to receive tradable carbon credits and negotiate a cash based reward system. This would spare governments the additional complication to manage and sell carbon credits, while at the same time reduce the supply of credits to international carbon markets. A private sector crediting scheme, the CDM or a JI-like mechanism, could be integrated into the system to attract private sector financing against the reward of tradable carbon credits. Double counting would have to be eliminated by deducting emission reductions that form part of an activity based crediting mechanism from government achievements.

- **At the administrative level**, an international regulatory body would have to administer the mechanism and any agreements concluded/programs approved. To ensure consistency among various mechanisms, the mandate of such regulatory body – either a reformed Executive Board or a newly constituted body- could include the management and supervision of an expanded, sectoral crediting mechanism. This body would have to be composed of professional regulators who understand and have expertise in the relevant sector. Technical experience should therefore be the governing criterion for the selection of relevant experts.

The participation of private sector entities in a sectoral crediting mechanism would require the establishment of administrative procedures that ensure a transparent, legitimate and fair process. This would imply the establishment of a due process based on administrative procedures on the international and relevant laws on the national level. Where carbon crediting takes place on the government level, laws would have to ensure that rights to emission reductions from a particular actor or activity are transferred to governments and that the initial holders of emission rights are duly compensated.

### **5.3 A NON-MARKET MECHANISM**

While the CDM has shown to be an effective vehicle for stimulating investment into emission reductions in developing countries (and the above trend-changing market mechanism would be even more effective) it encapsulates the major flaw of creating offsets which are used to cover emissions elsewhere, and hence do not contribute to limiting/reducing overall global emissions. That situation was acceptable during the first commitment period within a relatively low level of reduction effort, but it may not be environmentally tolerable after 2012 when higher reduction expectations will prevail.

Furthermore, while during the first commitment period demand and supply seem to be approximately in balance, in the post 2012 period supply may overwhelmingly dwarf demand. The demand for emission reductions by 2020 will obviously depend on the outcome of the current negotiations, but the update of the Investment and Financial Flows paper of the UNFCCC shows the below table summarizing four demand estimates, none of which surpasses 1.7 GtCO<sub>2</sub> (UNFCCC 2008a).

### Estimates of the potential annual demand for international offsets by 2020.

Source	Potential annual demand
New Carbon Finance <sup>52</sup>	twice or thrice today's levels (1,000 to 1,500 MtCO <sub>2</sub> e)
IDEACarbon <sup>53</sup>	500 to 1,200 MtCO <sub>2</sub> e
Point Carbon <sup>54</sup>	1,700 MtCO <sub>2</sub> e
Barclays Capital <sup>55</sup>	600-1,100 MtCO <sub>2</sub> e

The same paper assesses the abatement potential of the developing world at approximately 5 Gtons by 2030 in sectors currently eligible under the CDM, plus an additional potential of at least 1.6 Gtons in reductions of emissions from deforestation and degradation (REDD) (UNFCCC 2008a) which are not included in the current CDM. Obviously the full technical abatement potential will not be realized, but the mere order of magnitude evidences the striking imbalance between low demand from industrialized countries and much greater possible supply on the part of developing countries for the post 2012 period.

Leaving the environmental integrity of offsets aside for the moment, the above imbalance dictates a necessary restriction to the supply of carbon credits. Above we proposed one way which would aim at integrating market and non-market elements into the tool box available for funding emission reductions from a particular sector. Another way to reduce supply would be to extract certain sectors from the market and provide the needed financial support through specialized abatement fund(s).

If the decision is to exclude particular sectors from a market mechanism, the following ones would be possible candidates:

- Industrial gases.** Having completely dominated the early market, industrial gases (HFCs, PFCs and N<sub>2</sub>O) in June 2009 still represent 27% of the CER supply until 2012.<sup>56</sup> The role of the market in continuing support for industrial gas elimination post 2012 needs careful thought. As the cost of their elimination is quite small, the substantial capital flows to purchase these assets would

<sup>52</sup> New Carbon Finance (2008). "With an international agreement on climate change, the carbon market could be two to three times as large as today", Press release 28<sup>th</sup> January 2008.

<sup>53</sup> IDEACarbon (2008). "The long-term potential of the carbon market", Press release 29<sup>th</sup> February 2008.

<sup>54</sup> Point Carbon (2008). Carbon Market Transactions: Dominated by Financials?," Carbon Market Analyst (21<sup>st</sup> May 2008).

<sup>55</sup> Barclays Capital (2008). "So long to the longs", Monthly Carbon Standard (June 2008). This is the (annualized) estimate of the maximum potential demand.

<sup>56</sup> www.cdmpipeline.org



continue to divert from the tougher task of contributing to sustainable development by decarbonizing the energy sector and urban growth, a situation which is not recommendable in the long run. With the bulk of these gases now eliminated, most developing countries could be expected to require their continued elimination as a production standard. In addition the OECD could consider a grant program for the poorer countries that have such facilities to ensure that they have the incremental funds to install the required catalysts and incineration equipment and operate this as per the Multilateral Fund for phase out of Ozone Depleting Substances (Figueres and Newcombe 2007).

- **REDD.** Negotiations on a REDD crediting mechanism are more advanced than comparable negotiations in other sectors. This is the more surprising as REDD has been deliberately excluded from the CDM and the crediting of emission reductions and removals from forestry activities has been controversial throughout the history of climate negotiations (Streck and Scholz 2006). In 2005, Costa Rica and Papua New Guinea brought the topic back to the agenda when they signaled willingness to reduce emissions from deforestation provided an acceptable incentive mechanism would be put in place.<sup>57</sup> There is now an agreement to incorporate the sector in the next chapter of the international climate regime.<sup>58</sup> Disagreement continues however on the source for the funding, with some countries pushing for REDD to be included in the future market mechanism and other countries proposing the establishment of a specialized fund that would pay for the global environmental service of reducing deforestation emissions without creating international offsets. Given the fact that REDD is of such potentially high volumes, dependent on good policies and governance, Parties may consider an international funding mechanism that makes funds available in stand or in parallel to a market based approach (e.g. Norway has already pledged USD 1 billion to the Brazil Amazon Fund). Taking into account a history of government failures to reduce deforestation, it would however be desirable for an effective REDD mechanism to complement government funding with a private sector driven mechanism that channels funds into forest conservation.
- **Demand side energy efficiency.** While redirecting investments towards more efficient and low carbon technologies is crucially important, there is a very substantial amount of mitigation potential in energy efficiency in industries, buildings and transport systems. Indeed the findings of the IPCC Working Group 3 suggest that energy efficiency provides the greatest short-term mitigation potential and provides for one of the most cost efficient ways to reduce GHG emissions. A very substantial portion of the mitigation potential in energy efficiency measures is in buildings, industry and the transport sector. This is typically characterized by a very large number of small actions. While programmatic CDM will open the door for emission reductions from energy saving measures, recent studies (Hinostroza 2007, Figueres and Philips, 2007), point

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<sup>57</sup> FCCC/CP/2005/MISC.1

<sup>58</sup> The UNFCCC COP-13, held in Bali in December 2007, adopted a decision that officially confirms the intent of the Parties to address the issue of deforestation in a post-Kyoto framework and encourages the implementation of demonstration activities, FCCC/SBSTA/2007/L.23/Add.1/Rev.1. Decision 2/CP13.

to significant remaining constraints. Given these challenges it may be worth to devise non-market based mechanism to incentivize emission reduction by saving energy. One promising option could be the creating of a revolving loan fund that would finance investments in demand side energy efficiency and be repaid at a relatively fast pace through the energy savings achieved.

An alternative and potentially more nuanced approach to deal with a potential oversupply of carbon credits is to distinguish between different sectors and investment forms which determine the eligibility of various financial mechanisms. Project based investment could continue to generate tradable carbon credits, while policy change would be supported by alternative and more predictable funding sources. Participation of a country in a sectoral GHG abatement mechanism would gradually lead to a more involved participation in the longer term. Project activities could be implemented without any further delay, while the country prepares a strategic abatement plan covering the emissions of a particular sector. Funding for the successful implementation of policies could also be rewarded with carbon credits, cash or other financial incentives.

In order to contribute effectively to the scale up of mitigation, the non-market financial mechanism would, as in the case of the new market mechanism described above, have to operate on the sectoral level. In principle, the concept is not much different from the Sustainable Development Policies and Measures (SD-PAM) proposal originally suggested by Baumert and Winkler (2005), where they focus is on large-scale policies and measures, not individual projects. Developed countries would support the voluntary efforts of developing countries, both financially and through technology transfers, but not on the basis of the purchase of offsets.

Many questions remain unanswered by this non-market financial mechanism, but perhaps the most important is the actual appetite industrialized countries might have for such funding, considering there would be no emission crediting. Another question relates to the predictability and stability of any particular funding source. The details of the mechanism will have to be answered by the negotiations. However, industrialized countries could be reassured by the fact that any distribution of funds would be success based, rewarding only those emission reductions that have actually occurred, as confirmed by measurement, reporting and verification.

## 6. CONCLUSION

The gradual and incremental approach that has been outlined above is the “path of least resistance” to the next iteration of financial mechanisms for long-term (2013 and beyond) mitigation. As we continue with the international negotiations for the future climate regime, options that can be agreed to by all nations are constrained by the current political constellation. Some industrialized countries have been actively engaged in mitigation efforts over that past ten years, others with even more responsibility have been remarkably absent. The science requires both groups to reach a level of comparable effort of deep reductions, and to do so in a manner that is within the environmentally determined time urgencies. Developing countries are united in their expectations of leadership on the part of industrialized countries but are differentiated in terms of their own capacity to contribute to the solution. At a time in which rapidly emerging countries are focused on economic growth, the science requires them to initiate efforts to deviate from uncontrolled emissions, and to soon impose some type of emission growth restrictions. However, neither the North nor the South is racing to respond appropriately to the scientific evidence of climate change. Entrenched in their traditional defensive positions that reflect a deep lack of trust of the other side, both sides are currently only willing to contribute to a solution that represents the minimum common denominator, and is at best gradual and incremental. It would therefore not be surprising that the financial mechanisms which are devised for the immediate post 2012 mitigation in developing countries would reflect the incremental nature of engagement.

There is however one factor that could substantially alter the path forward, and that is the global financial crisis. A traditional interpretation of the crisis would foresee even less engagement on climate given the dwindling availability of capital. Ironically, it is also possible that this is precisely the pressure that is needed to radically shift the course of events. Over that past six months governments and public opinion have been convinced that the financial crisis is real, and that a solution is urgent. This conviction has unleashed unprecedented levels of public sector capital. The Bush administration invested USD 2.6 trillion, and the Obama administration added a stimulus program of USD 850 billion. These public expenditures are curative in nature and do not necessarily contribute to more sustainable financial structures.

In contrast, the financial flows study of the UNFCCC (2007) estimates that climate stabilization could be achieved for USD 200 billion/year, but those investments would substantially contribute not only to facing the climate challenge but also to long term energy security for all. There is a striking difference between the willingness to rapidly invest in the financial system and the willingness to invest, even in a gradual manner, in energy systems. It is not so much the profound implications of the impending climate crisis (the last three years have largely dispelled the myth that climate change is not real) but rather the lack of a conviction of urgency. Despite the increased level of discourse on the veracity of the situation, the challenge is still assessed for its long-term implications and not in its need for immediate changes in behavior and investment.

However, the financial meltdown is already being seen by some visionaries as a fortuitous opportunity to avoid a long-lasting climate meltdown. The low carbon agenda can act as an engine for job creation and economic recovery while at the same time increasing energy and climate security. Rather than approaching the climate challenge in a defensive and gradual mode, countries could make a strategic investment to dramatically improve efficiency in buildings and power, and to replace 19th century technologies that depend on carbon-based fuels with 21st-century technologies that use renewable fuels, all as part of a concerted effort to revive and redirect the economy in industrialized countries as well as in developing nations. Contrary to historical behavior, the challenge of solving the climate crisis could move us into the realization that we now live in a multipolar world, where solutions cannot be implemented only by a very few. The recent G20 meetings are a first evidence of what could be a profound shift in global power and influence. A new world order that incorporates emerging economies into the solutions group, albeit gradually, is a sound harbinger of durable frameworks.

We stand at a critical juncture in the evolution of the climate regime. We can either go forward with trepidation incurring the risk of doing too little too slowly, or push ahead with conviction, assuming the risk of having averted the major part of an impending disaster while setting the context for long-term global wellbeing. Necessity may be the mantle of opportunity.

## APPENDIX 1:

### NATIONALLY APPROPRIATE MITIGATION ACTIONS

In preparation for an agreement that will be based on the leadership of all industrialized nations, but will necessarily also involve participation of at least some developing countries, most of the fast growing developing countries have been internally analyzing their projected emission growth paths, in order to identify opportunities for cost effective mitigation over the next 10-20 years. In contrast to the European Union that has explicitly inserted its intended reduction commitment into the realm of the multilateral negotiations, developing countries have announced the results of their analysis as internal assessments, and have been cautious about prematurely inserting these into the international negotiations. Nonetheless, the preparatory work has been done in expectation of the political moment in which the rest of the industrialized nations come forward with their respective commitments.

**China** - China is already implementing a wide range of energy and industrial policies that, while not driven by climate change concerns, are contributing to climate efforts by slowing the growth of China's greenhouse gas emissions. China's 11th Five-Year Plan includes a major program to improve energy efficiency nationwide, including a goal of reducing energy intensity (energy consumption per unit of GDP) by 20% below 2005 levels by 2010. The government projects that meeting this target would reduce China's greenhouse gas emissions 10% below business as usual; researchers estimate about that over 1.5 billion tons of CO2 reductions would be achieved.<sup>59</sup>

**Mexico** - The 2007 National Strategy on Climate Change<sup>60</sup> acknowledges the importance of urgent and concerted action on climate change mitigation and adaptation. The Strategy emphasizes Mexico's willingness to engage in more ambitious climate change framework than that established by the Kyoto Protocol and its willingness to adopt long-term targets of a non-binding nature. The two sectors targeted for mitigation effort are energy and land use change and forestry. The 2007 Strategy identifies a total mitigation potential of 107 Mtons in the energy sector by 2014 (representing a 21% reduction from BAU over the next six years) from end use energy efficiency, increase in the use of natural gas, and increase in the cogeneration potential in the cement, steel and sugar industries. However the bulk of Mexico's mitigation potential comes from the land use sector. The Strategy identifies a mitigation potential that ranges from 11 to 21 billion tons CO2 in the land use and forestry sector by 2012, most of which will come from public reforestation and private planting, and will depend on the level of available resources.

**India** - In June, 2008, Prime Minister Singh released India's first National Action Plan on Climate Change (NAPCC) outlining existing and future policies and programs addressing climate mitigation and

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<sup>59</sup> Pew Center for Climate Change, Climate Change Mitigation Measures in the People's Republic of China, International Brief 1, April 2007

<sup>60</sup> Estrategia Nacional de Cambio Climatico, Secretaria de Medio Ambiente y Recursos Naturales, Mexico, 2007

adaptation. The plan identifies eight core “national missions” running through 2017 and directs ministries to submit detailed implementation plans to the Prime Minister’s Council on Climate Change by December 2008.<sup>61</sup> Emphasizing the overriding priority of maintaining high economic growth rates to raise living standards, the plan “identifies measures that promote our development objectives while also yielding co-benefits for addressing climate change effectively.” The missions include: tripling renewables to 10% of installed capacity by 2012; 500% increase in nuclear power (to 20GW) by 2020; decreasing 7% of coal plants by 2012 and another 10,000MW by 2017, and increasing energy efficiency in order to save 10,000 MW by 2012.

**South Africa** - In July 2008 the government of South Africa approved a progressive policy on climate change that puts the country on a low carbon economic development path.<sup>62</sup> The policy calls for emissions to peak at 546 megatons of carbon by 2025 and decline in absolute terms by 2030-35. One of the measures being considered is a carbon tax, introduced by the Minister of Finance in his Budget Speech in February 2008. The Cabinet has mandated the National Treasury to study a further carbon tax as a potential option. Other measures being considered are stringent vehicle fuel efficiency standards, the development of 10,000 gigawatt hours of energy from renewable energy sources by 2012, mandatory use of carbon capture and storage (CCS) for all new coal-fired power stations, and the increase in nuclear generation.

**South Korea** - Korea has not formalized its post 2012 intent in written form. However, in August 2008 Amb. Rae-Kwon Chung, chief climate negotiator for the country, announced that South Korea would adopt a national carbon reduction target next year. A few months later he called for the establishment of an international registry for developing countries to record their domestic emission reduction policies. Registering would be voluntary, but laying out a domestic policy would translate into an international commitment that could be monitored and verified.

**Brazil** - in October 2008 the Minister of the Environment of Brazil announced that Brazil could achieve a 10-20% reduction of emissions from 2004 during the period 2012-2020, presumably by reducing illegal deforestation rates. However, the government warned that these reductions are conditional to certain international prerequisites, which the Brazilian government will announce at a later date.

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<sup>61</sup> <http://www.pewclimate.org/international/country-policies/india-climate-plan-summary/06-2008>

<sup>62</sup> Scenario Building Team 2007. Long Term Mitigation Scenarios: Strategic Options for South Africa, Department of Environment Affairs and Tourism, Pretoria, October 2007.

## Comment

In the event of a political agreement that would harness the above contributions from developing countries, the operational challenge the regime will have to face is how to track and monitor the mitigation contribution of countries that operate with a variety of measurements. The issue is absent in the first commitment period of the Kyoto Protocol where the only metric is national absolute emissions with respect to 1990 levels. As can be seen, the various mitigation efforts intended by these countries for the post 2012 period have different metrics and different reference dates, making comparability a difficult task. And yet, measurement, reporting and verification (MRV) are critical elements of the regime, and have also been agreed to under the Bali Action Plan.

## REFERENCES

- Baumert and Winkler 2005: Baumert, Kevin / Winkler, Harald, SD-PAMs and international climate agreements, in Bradley, R. / Baumert, K. / Pershing, J. (eds.), *Growing in the Greenhouse: Protecting the Climate by Putting Development First*, World Resource Institute, Washington (2005).
- Bodansky 2008: Bodansky, Daniel, *International Sectoral Agreements in a Post-2012 Climate Framework*, Pew Center, accessed June 22, 2009.  
<http://www.pewclimate.com/docUploads/International%20Sectoral%20Agreements%20in%20a%20Post-2012%20Climate%20Framework.pdf> (2007).
- Bosi and Ellis 2005: Bosi, Martina / Jane Ellis, *Exploring options for "sectoral crediting mechanisms"*. Paris: Organization for Economic Co-operation and Development (OECD)/International Energy Agency (IEA), COM/ENV/EPOC/IEA/SLT (2005) 1 (2005).
- Brown et al 2004: Brown, Katrina / Adger, WN / Boyd, E. / Corbera-Elizalde, E. / Shackley, S., *How do CDM projects contribute to sustainable development?* Tyndall Centre for Climate Change Research, June 22, 2009,  
[http://www.tyndall.ac.uk/research/theme2/final\\_reports/it1\\_13.pdf](http://www.tyndall.ac.uk/research/theme2/final_reports/it1_13.pdf) (2004)
- Cosbey et al 2005): Cosbey, Aaron / Parry, JE / Browne, J. / Babu, YD / Bhandari, P. / Drexhage, J. / Murphy, D.. *Realizing the Development Dividend: Making the CDM Work for Developing Countries*. Winnipeg, Manitoba: International Institute for Sustainable Development (2005).
- Egenhofer and Fujiwara 2008: Egenhofer, Christian / Fujiwara, N.. *Global Sectoral Industry Approaches to Climate Change. The Way Forward*, Center for European Policy Studies, Brussels (2008).
- Eliasch Review 2008: Eliasch, Johan, *Climate Change: Financing Global Forests* (2008).

- Figueres 2008: Figueres, Christiana. Tuning the instrument. In: Financing Action on Climate Maintaining Momentum. UNEP publication (2008).
- Figueres 2005: Figueres, Christiana. Sectoral CDM: Opening the CDM to the yet unrealized goal of sustainable development. International Journal of Sustainable Development, Law and Policy, Vol 2. (2005).
- Figueres 2007a: Figueres, Christiana. "From Tons to Trends", chapter in Global Environmental Governance, Perspectives on the Current Debate, Lydia Swart and Estelle Perry eds., Center for UN Reform Education, New York (2007).
- Figueres 2007b: Figueres, Christiana, "The Bali Batik: Design Options for the post 2012 Climate Regime", Sustainable Development and Human Settlements Division of ECLAC, Santiago de Chile (2007).
- Figueres et al 2005: Figueres, Christiana / Haites, Erik / Hoyt, Edward, Programmatic CDM Project Activities: Eligibility, Methodological Requirements and Implementation. Study for the Carbon Finance Business Unit of the World Bank (2005).
- Figueres and Philips: Scaling Up Demand-Side Energy Efficiency Improvements through Programmatic CDM, ESMAP (2007).
- Figueres and Newcombe: Evolution of the CDM, 2012 and Beyond, United Nations Foundation (2007).
- GTZ 2008a: GTZ CDM Highlights No. 56. Accessed December 19th, 2008 at: <http://www.gtz.de/en/dokumente/en-climate-cdm-highlights-56.pdf> (2008).
- GTZ 2008b: GTZ CDM Highlights No. 64. Accessed June 22, 2009 at: [http://www.cdmindia.com/CDM%20Highlights\\_64.pdf](http://www.cdmindia.com/CDM%20Highlights_64.pdf) (2008).
- Gregg et al 2008: Gregg, Jay S. / Andres, Robert J. / Marland, Gregg, China: Emissions Pattern of the World Leader in CO2 in Co2 emissions from fossil fuel consumption and cement production, Geophys. Res. Lett., 35, L08806, doi: 10.1029/2007GL032887 (2008).
- Growth Report 2008: Spence, Michael, et al, The Growth Report. Strategies for Sustained Growth and Inclusive Development, Washington (2008).
- Hinostroza M, et al: Potential for broad based energy efficiency projects under programmatic CDM, UNEP Riso Cente (2007).
- Holm 2007: Holm Olsen, Karen. The Clean Development's Contribution to Sustainable Development: A Review of the Literature, 84 Climatic Change 1 (2007).
- Holm Olsen and Fenhann 2008: Holm Olsen, Karen / Fenhann, Jørgen, Sustainable Development Benefits of Clean Development Mechanism Projects. A New Methodology for Sustainability Assessment Based on Text Analysis of the Project Design Documents Submitted for Validation, 36 Energy Policy 2819 (2008).



- Hoogzaad et al 2008: Hoogzaad, Jelmer / Korthuis, Adriaan / Streck, Charlotte, A call to Reform. Carbon Finance, October 2008.
- A sectoral approach and technology transfer for the cement sector. Accessed June 22, 2009 at:  
[http://www.bafu.admin.ch/klima/index.html?lang=en&download=NHzLpZeg7t,Inp6l0N TU042l2Z6ln1ad1lZn4Z2qZpnO2Yuq2Z26gpJCFeYR6fGym162epYbg2c\\_JjKbNoKSn6A--.pdf](http://www.bafu.admin.ch/klima/index.html?lang=en&download=NHzLpZeg7t,Inp6l0N TU042l2Z6ln1ad1lZn4Z2qZpnO2Yuq2Z26gpJCFeYR6fGym162epYbg2c_JjKbNoKSn6A--.pdf)
- IEA 2008: International Energy Agency, Issues Behind Competitiveness and Carbon Leakage (2008).
- IETA 2005: Strengthening the CDM, Position Paper for COP 11 and COP/MoP 1', Position paper to COP12 COP/MOP 2 (2005). Accessed June 22, 2009 at:  
<http://www.ieta.org/ieta/www/pages/getfile.php?docID=1132>
- IETA 2008: State of the CDM 2008. IETA Geneva, accessed June 22, 2009  
<http://www.ieta.org/ieta/www/pages/getfile.php?docID=3111>.
- Korppoo and Gassan-zade 2008: Korppoo, Anna and Gassan-zade, Olga. Joint implementation Looking back and forward. London: Climate Strategies (2008).
- Meijer 2007: Meijer, Ernestine, The International Institutions of the Clean Development Mechanism Brought Before National Courts: Limiting Jurisdictional Immunity to Achieve Access to Justice' 39(4) NYU Journal of International Law and Politics 877 (2007).
- Michaelowa and Purohit 2007: Michaelowa, Axel / Pallav, Purohit (2007). Additionality determination of Indian CDM projects. Can Indian CDM project developers outwit the CDM Executive Board? London: Climate Strategies.
- Michaelowa and Umamaheswaran 2006: Michaelowa, Axel / Umamaheswaran, K., Additionality and Sustainable Development Issues Regarding CDM Projects in Energy Efficiency Sector. HWWA Discussion Paper No. 346 (2006). Accessed 22 June 2009:  
<http://ssrn.com/abstract=908824>
- Michaelowa and Vasa 2008: Michaelowa, Axel / Vasa, Alexander: "Uncertainty in climate policy – impacts on market mechanisms" forthcoming in "Dealing with Uncertainty in Climate Research and Policy" by Springer publishers (2008).
- Mueller 2009: Benito Mueller, Additionality in the Clean Development Mechanism: Why and What? Climate Strategies and Oxford Institute for Energy Studies, EV 43 March 2009.
- Nussbaumer 2008: Nussbaumer, Patrick, On the Contribution of Labelled Certified Emission Reductions to Sustainable Development: A Multi-Criteria Evaluation of CDM Projects, upcoming (Energy Policy) (2008).
- Ott et al. 2007: Ott, Hermann / Michel den Elzen / Niklas Höhne / Bernd Brouns / Harald Winkler (2007). Differentiation of Countries Future Commitments in a Post-2012 Climate Regime. An

- Assessment of the 'South-North Dialogue' Proposal. "Environmental Science and Policy" 2007 10(3):185-203 (2007).
- Pew Center 2002: Transportation in Developing Countries: An Overview of Greenhouse Gas Reduction Strategies. Pew Center on Global Climate Change. Arlington, USA. Accessed June 22, 2009 at:  
[http://www.pewclimate.org/docUploads/transportation\\_overview.pdf](http://www.pewclimate.org/docUploads/transportation_overview.pdf)
- Pointcarbon 2008a: Carbon Market Daily November 7th, 2008. Accessed June 22, 2009 at:  
[http://www.pointcarbon.com/polopoly\\_fs/1.1000904!CMD20081107.pdf](http://www.pointcarbon.com/polopoly_fs/1.1000904!CMD20081107.pdf) (2008).
- Pointcarbon 2008b: JI/AAU country ratings (October 2008). Accessed June 22, 2009 at:  
<http://www.pointcarbon.com/trading/cpm/analysis/hostcountryratings/ji/>
- IPCC 2007: Ribeiro, Kahn, S. / Kobayashi, S. / Beuthe, M. / Gasca, J. / Greene, D. / Lee, D.S. / Muromachi, Y / Newton, P.J. / Plotkin, S/ Sperling, D. / Wit, R. / Zhou, P.L: Transport and its infrastructure. In Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [B. Metz, O.R. Davidson, P.R. Bosch, R. Dave, L.A. Meyer (eds)], Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA (2007).
- Samaniego and Figueres 2002: Samaniego, Joseluis / Figueres, Christiana. "Evolving to a Sector-Based Clean Development Mechanism". Chapter 4 of the book Building on the Kyoto Protocol: Options for Protecting the Climate. World Resources Institute, Washington DC, (2002).
- Schmidt et al 2006: Schmidt, Jake / Helme, N. / Houdashelt, Lee, Sector-based approaches to the post-2012 climate change policy architecture, Center for Clean Air Policy (CCAP), International Future Actions Dialogue (2006).
- Schneider 2007: Schneider, Lambert. Is the CDM fulfilling its environmental and sustainable development objective? An evaluation of the CDM and options for improvement. Berlin, Oko Institut (2007).
- Stehr 2008: Stehr, Hans Jürgen, Does the CDM need an institutional reform, Perspectives 2008.
- Sterk 2008: Sterk, Wolfgang. From Clean Development Mechanism to Sectoral Crediting Approaches- Way Forward or Wrong Turn?, JIKO Policy Paper 1/2008, Wuppertal Institute for Climate, Environment and Energy.
- Sterk and Wittneben 2006: Sterk, Wolfgang / Wittneben, Bettinga, Enhancing the clean development mechanism through sectoral approaches: definitions, applications and ways forward. In: International Environmental Agreements: Politics, Law and Economics, Vol. 6, No. 3, September, pp. 271-287 (2006).
- Streck 2007: Streck, Charlotte, The governance of the Clean Development Mechanism – the case for strength and stability, in D. Freestone and C. Streck (eds), "The Kyoto Protocol – current legal status of carbon finance and the flexible mechanisms", Special Issue Environmental Liability Journal, vol. 15, Issue 2, p. 91 (2007).

- Streck and Lin 2008: Streck, Charlotte / Lin, Jolene, Making Markets Work: A Review of CDM Performance and the Need for Reform, 19 European Journal of International Law 409 (2008).
- Streck and Chagas 2008: Streck, Charlotte / Chagas, Thiago, The Future of the CDM in a Post-Kyoto World, Carbon & Climate Law Review, Vol. 1, No 1, CCLR 1/2007, p.53 (2007).
- Streck and Scholz 2006: Streck, Charlotte / Scholz, Sebastian. The role of forests in global climate change: whence we come and where we go, International Affairs 82 (5), p. 861-879 (2006).
- Sutter and Parreño 2007: Sutter, Christoph / Parreño, Juan Carlos. Does the Current Clean Development Mechanism (CDM) Deliver its Sustainable Development Claim? An Analysis of Officially Registered CDM Projects, 84 Climate Change 75 (2007).
- UNEP Risoe 2008: UNEP Risoe CDM/JI Pipeline Analysis and Database, June 2009.
- UNFCCC 2007: Investment and Financial Flows Relevant to the Development of an Effective and Appropriate International Response to Climate Change, 2007.
- UNFCCC 2007a: Call for Input on Non-Binding Best-Practice Examples on the Demonstration of Additionality to Assist the Development of PDDs, Particularly for SSC Project Activities, 2007.
- UNFCCC 2007b: Bali Action Plan Ad Hoc Working Group on Long-term Cooperative Action under the Convention Document FCCC/CP/2007/L.7/Rev.1 Accessed November 28th, (2008), Accessed June 22, 2009 at: [www.unfccc.int/files/meetings/cop\\_13/application/pdf/cp\\_bali\\_act\\_p.pdf](http://www.unfccc.int/files/meetings/cop_13/application/pdf/cp_bali_act_p.pdf),
- UNFCCC 2008a: Update on Investment and Financial Flows, December 2008.
- UNFCCC 2008b: EB 36 Agenda Item 5. Regional distribution of project activities. Accessed June 22, 2009, at: <http://cdm.unfccc.int/EB/036/eb36rep.pdf>
- Wara 2008: Wara, Michael. Measuring the Clean Development Mechanism's Performance and Potential, 55 UCLA Law Review 1759 (2008).
- Wara 2007: Wara, Michael. Is the Global Carbon Market Working? 445 Nature 595 (2007).
- Ward et al 2008: Ward, Murray / Streck, C. / Winkler, H. / Jung, M. / Hagemann, M. / Höhne, N. / O'Sullivan, R.. The Role of Sector No-Lose Targets in Scaling up Finance for Climate Change Mitigation Activities in Developing Countries, DEFRA (2008).
- Wara and Victor 2008: Wara, Michael / Victor, David. A Realistic Policy on International Carbon Offsets, PESD Working Paper, Stanford University, April (2008).
- World Bank 2007: State and Trends of the Carbon Market 2007. Accessed June 22, 2009 at: [http://carbonfinance.org/docs/Carbon\\_Trends\\_2007-\\_FINAL\\_-\\_May\\_2.pdf](http://carbonfinance.org/docs/Carbon_Trends_2007-_FINAL_-_May_2.pdf).
- World Bank 2008: State and Trends of the Carbon Market 2008. Accessed June 22, 2009 at: [http://carbonfinance.org/docs/State\\_Trends--formatted\\_06\\_May\\_10pm.pdf](http://carbonfinance.org/docs/State_Trends--formatted_06_May_10pm.pdf).

World Bank 2009: Karan Capoor, Philip Ambrosi, State and Trends of the Carbon Market 2009. Accessed June 22, 2009 at: [http://carbonfinance.org/docs/Carbon\\_Trends\\_2009](http://carbonfinance.org/docs/Carbon_Trends_2009).

WWF 2008: The Value of Carbon in China. Carbon Finance and China's Sustainable Energy Transition, 2008.