

# Options to enhance and improve the Clean Development Mechanism (CDM)



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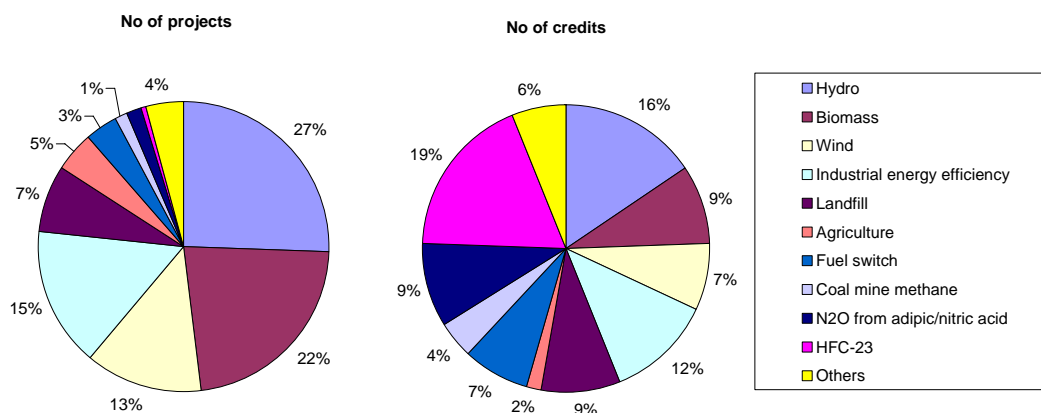
## 1 Introduction

The Clean Development Mechanism (CDM) under the Kyoto Protocol is a flexible mechanism that allows the crediting of emission reductions from greenhouse gas (GHG) abatement projects in developing countries. Under the CDM, Certified Emission Reduction Units (CERs) are issued for emission reductions achieved through the implementation of emission reduction projects or programmes in developing countries. CERs are purchased and used by Annex I countries or by companies covered under emissions trading schemes, such as the EU Emissions Trading Scheme (EU ETS), and by individuals, companies or public entities that want to offset their greenhouse gas (GHG) emissions.

Ten years after the adoption of the Kyoto Protocol, the CDM has become an immense global market, with a value of several billion Euros. There has been a tremendous growth of projects over past five years. The first project has been registered on 18 November 2004. By 1 September 2008, 1152 CDM projects had been registered which are supposed to deliver emission reductions of about 1.3 billion tons of CO<sub>2</sub>e up to 2012 (UNEP/RISOE 2008). Another 2,500 projects are in the pipeline. Point Carbon expects that the CDM will generate about 2 billion CERs for the first commitment period under the Kyoto Protocol from 2008 – 2012. This corresponds approximately to the annual emissions of all EU ETS installations.

The project portfolio has changed considerably over the past years. The destruction of high GWP industrial gases, such as HFC-23 from HCFC-22 production and N<sub>2</sub>O from adipic and nitric acid production, has attracted investors in the first place, given that the GHG abatement costs are very low and the projects are relatively straight-forward to implement. These projects still comprise about 28% of the CERs from all projects published for validation, but renewable power generation, waste heat recovery and the avoidance of methane from different types of waste have gained importance, as shown in Figure 1 below.

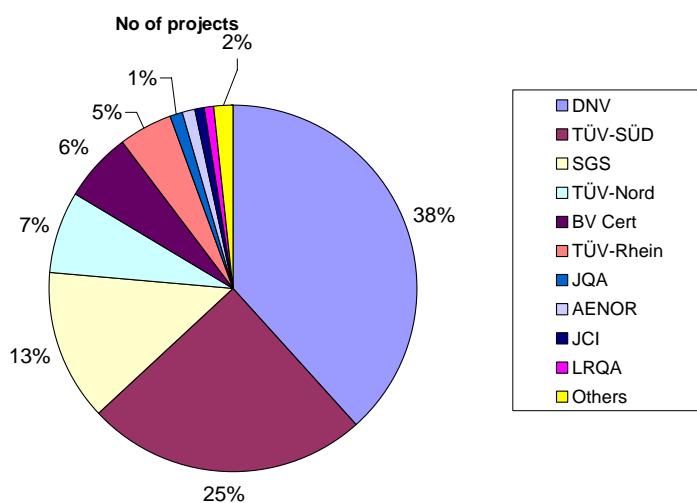
Figure 1: CDM project portfolio



Source: UNEP/RISOE (2008)

By September 2008, more than 100 baseline and monitoring methodologies have been approved, covering many project types and sectors. Three years after the endorsement of programmes of activities under the CDM, the first four programmes of activities are under validation. 17 Designated Operational Entities (DOEs) have been accredited and several others are in the process of being accredited. The largest market share of validation services has Det Norske Veritas (DNV), followed by TÜV-SÜD and Société Générale de Surveillance (SGS) (Figure 2).

Figure 2: Market share of Designated Operational Entities (DOEs) for validation services



Source: UNEP/RISOE (2008)

The market for project development and financial services has also seen a tremendous growth. The company Ecosecurities is with about 271 projects the market leader in the development of CDM projects, followed by Carbon Asset Management Sweden (121 projects). Several large utilities, such as EDF and RWE, have also started to build up a large portfolio of projects.

The rapid development of this new market illustrates that the CDM has been a success in developing a new and global market for GHG emission reduction projects in developing countries. The CDM is widely acknowledged as a mechanism that has changed emission trends in some industries and enabled entities in developing countries to participate in the emerging global carbon market. It has also contributed tremendously to raising awareness of public and private entities for climate change.

However, the CDM has also been criticised for various reasons. This includes the lack of transparency in the requirements and decision-making, inadequate governance structures, cumbersome procedures, poor environmental integrity, little contribution to sustainable development, an inequitable geographical distribution of CDM projects, its

character of an offsetting mechanism and its limited ability to address international competition concerns. These issues are being reviewed in a growing number of publications.<sup>1</sup> In the past two years, the CDM has also been heavily criticised in the media.<sup>2</sup> These research results and the criticism in the media have put in question to what extent the CDM is working properly and fulfilling its objectives and to what extent it is sufficient to address greenhouse gas emissions in developing countries in a post-2012 climate regime.

This report provides an overview on these challenges and outlines options how the CDM can be further improved and enhanced. The report focuses on issues that have been of particular interest in the recent research and that have been subject to discussions in formal and informal consultations on a post-2012 climate regime and the review of the Kyoto Protocol under its Article 9. The report first explores how the effective functioning of the CDM can be improved by improving the governance arrangements of the CDM Executive Board (chapter 2) and ensuring an effective validation and verification by Designated Operational Entities (chapter 3). Chapter 4 analyses how the demonstration of additionality – a key requirement for the environmental integrity of the CDM – can be improved and be based on more objective criteria. Chapter 5 analyses the contribution of the CDM to sustainable development and identifies options how the sustainable development benefits of CDM projects can be enhanced. Chapter 6 looks into sectors that are currently underrepresented in the CDM. Chapter 7 analyses how the CDM can be transformed to a mechanism with global atmospheric benefits for a post-2012 climate regime. Finally, chapter 8 provides conclusions and an outlook.

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<sup>1</sup> See, for example: Wara and Victor (2008), Streck and Lin (2008), Schneider (2007), Michaelowa (2007), Olsen (2007)

<sup>2</sup> For example: The Guardian stated in an article that “the CDM (...) has been contaminated by gross incompetence, rule-breaking and possible fraud by companies in the developing world, according to UN paperwork, an unpublished expert report and alarming feedback from projects on the ground” (Davis 2007). The Herald Tribune carried the headline “Flaws in the UN antipollution program” (Bradsher 2007) and the BBC (2008) reported that it had “uncovered evidence of serious flaws” in the CDM.

## **2 Improving governance arrangements of the CDM Executive Board**

The CDM Executive Board (EB) is supervising the CDM. The Board is composed of 10 members and 10 alternate members from Parties to the Kyoto Protocol who are nominated by the COP/MOP. While the COP/MOP is the ultimate authority of the CDM, the day-to-day supervisory work is undertaken by the EB.<sup>3</sup>

The success of the CDM as a market mechanism depends on the assurance in the procedures by the project participants. Transparency, consistency in decision making and impartiality in all levels are key premises for a fair and effective decision making by the CDM Executive Board. Whether these premises are achieved depends significantly on the governance arrangements of the CDM Executive Board. Moreover, the decisions of the EB play an essential role for any project participant.

This chapter describes a number of deficits of the current governance arrangements of the CDM and identifies different options for improving the governance arrangements. The individual Members of the board, the role of the board and the decision-making process are the main issues discussed in the following.

### **2.1 Competencies and conflicts of interests of members of the Board**

Individual members of the CDM Executive Board play an essential role in the governance of the CDM. Different roles and responsibilities are established in the existing rules of procedure and underline the need for a high level of independence and integrity. The rules require, for example, that “members, including alternate members, of the Executive Board shall have no pecuniary or financial interest in any aspect of a CDM project activity or any designated operational entity.”<sup>4</sup>

Any potential conflict of interests is to be avoided, whether these interests are of a financial, political, or personal nature. Members of the CDM Executive Board should act in their personal capacity and should not represent any country or constituency. However, in practice EB members often play multiple roles at the same time, including those of being UNFCCC/Kyoto protocol negotiators for their country, representing their country’s DNA for the CDM, or as managers of large government CDM purchasing programmes (Streck and Lin 2008).

In the beginning of each meeting the members of the board must confirm that they do not have any interest in any project or operational entity. Despite the various interests and roles of the members, it has very rarely happened that an EB member has de-

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<sup>3</sup> Art. 12(4) of Kyoto Protocol and Annex to decision 3/CMP.1, paragraphs 2 – 4.

<sup>4</sup> Annex to decision 3/CMP.1 paragraph 8 (f)



clared a conflict of interest at the beginning of a meeting: a conflict of interest is only noted in 4 out of 41 meeting reports of the CDM Executive Board.

Indeed, discussions within the CDM Executive Board are sometimes driven by national interests of the members of the Board. Florens et al. (2008) have empirically evaluated whether political-economic variables, including national interests, determine the decision making of the CDM. Based on an econometric analysis of EB decisions, they come to the conclusion that the EB is strongly committed to quality criteria but that, at the same time, political-economic variables also drive decisions. For example, membership of the country involved in the EB raises the chances for a project to be approved. Similarly, the involvement of powerful players, such as the World Bank, improves the probability of success.

Another concern is that it is not fully clear whether EB members have immunity under the Kyoto Protocol. This means that if the EB rejects a project, there could be a risk that the affected party seek compensation from the individual board members. As a result, individual Board members may be hesitant to take decisions that would affect third parties financially. This is particularly of concern in case of decisions on the registration of projects or the accreditation of DOEs or on the suspension their accreditation.

The qualification of Board members has been stressed as another concern (e.g. Streck and Lin 2008). Most members of the Board have a background from international climate negotiations and not in market regulatory work. Some members do not have a professional experience with the CDM at all. A number of options are currently being discussed to improve the independency of members of the CDM Executive Board:

- **Terms of reference for members of the Board.** To avoid conflicts of interest and clarify the responsibilities and required qualifications for an EB membership, the EU suggests in its submission on the review of the Kyoto Protocol under its Article 9 to supplement the existing rules of procedure with terms of reference for board members to reinforce these requirements. These TOR should include, for example, obligations
  - to declare all financial and pecuniary interests;
  - to resign from any association with a company involved in the CDM;
  - to act on a personal basis and not to take instructions from any party or external body;
  - to have at least 5 years of relevant experience in the area of climate change mitigation or the global carbon market.

Furthermore the EU suggests introducing new rules related to the nomination and election process. The EB should publish a “Code of Conduct” that require that

members publish their CVs, along with a statement of all financial and professional interests that may impact upon their impartiality with regard to any decision.<sup>5</sup>

- **Professionalizing of the EB.** Streck and Lin (2008) highlight that the Board has de facto the role of a market regulator but is established and composed as a United Nations Committee. A professionalizing would imply the recruitment of full-time salaried Board members with special technical and market expertise related to CDM. The Board members would then formally be hired as employees of the UNFCCC. A positive side effect of a full-time salaried board is the financial independence of the board members. This could help to avoid conflict of interests. To assure this, additionally the EB membership could be limited to individuals who have not held a position that involved decision-making on CDM related matters for a defined period before serving on the board. The proposal of professionalizing the Board is to some extent also suggested by the EU in the review under Article 9. The EU suggests electing the Chair and the Vice-Chair on a full-time basis and expanding their functions. In addition to their current function, preparing and chairing the EB meetings, they should act as ambassador for the CDM and manage external relationships with stakeholders and the public.

A professionalization of the Board would require additional financial resources. To cover the administrative expenses of the CDM (SOP-Admin), the project participants currently have to pay US \$ 0.10 per CER issued for the first 15,000 tonnes of CO<sub>2</sub> equivalent per year and US \$ 0.20 per CER issued for any amount in excess of the first 15000 tonnes of CO<sub>2</sub> equivalent.<sup>6</sup> Given that the number of projects and CERs is growing rapidly over the last years it can be expected that the SOP-admin levy could be used for financing a professional board.

- **Full immunity of members of the Board.** Several Parties, including New Zealand, China, Japan, Tuvalu, Australia and the EU, have stressed that a full immunity is a key prerequisite to assure the independence of the EB members.

## 2.2 Transparency, consistency and predictability of the decision-making of the Board

The COP/MOP has repeatedly emphasized that the CDM Executive Board should have a more supervisory role and should delegate work to the extent possible.<sup>7</sup> Nevertheless, the Board is still dealing with many case decisions. The increasing number of projects being reviewed and with it the number of case decisions lead to a high workload

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<sup>5</sup> EU submission on the review of the Kyoto Protocol under its Article 9, September 2008

<sup>6</sup> Annex 35 to the Report of the 23rd Meeting of the Executive Board, Additional Guidance Related to Registration Fee for Proposed Clean Development Mechanism Project Activities , available at: [http://cdm.unfccc.int/EB/023/eb23\\_repan35.pdf](http://cdm.unfccc.int/EB/023/eb23_repan35.pdf).

<sup>7</sup> Decision 7/CMP.1, paragraph 12, decision 1/CMP.2, paragraph 7 (e), decision 2/CMP.3, paragraph 9

of individual EB members. Although the technical assessment of projects has been largely delegated to the UNFCCC secretariat by now, EB members still have to deal with many individual reviews of projects and take final decisions on them. The discussion of individual cases often includes technical details and not only general policy-related issues. As a result of this situation, COP/MOP3 has also encouraged the Board to “ensure a balance in applying its resources between satisfying caseload needs and making general policy and system improvements”.<sup>8</sup>

Another serious challenge is a transparent, consistent and predictable decision-making process by the Board. Some market participants have criticised the decision making process of the CDM Executive Board for not being consistent and predictable. For example, several projects that increase the share of additives in producing cement have been registered during the first years of the CDM, while more recent cement projects have been rejected despite having a similar nature. In some cases, recent decisions of the Board are partly inconsistent with previous decisions, leaving it unclear how the different decisions should be interpreted together.

The decisions taken by the Board or its support structure are sometimes not clearly substantiated. Sometimes the participants in CDM projects are left on their own in trying to understand the underlying rationale and the reasoning for a case decision (Streck and Lin 2008). For example, the reasoning in meeting reports of the Board on the registration of projects is often vague, making it difficult for other market participants to understand the deficits of the projects. As a result of these concerns, COP/MOP3 requested the Board to “further improve the substantiation of its decisions to increase the understanding of the underlying rationale by users, facilitate broader public understanding and correct misconceptions as they arise”.<sup>9</sup> The procedures and decision-making process are also perceived as too lengthy and cumbersome (Streck and Lin 2008). For example, the approval of methodologies can take up to one year. Project participants have also raised concerns about the communication channels between project participants and the EB and its support structure. There is little direct communication between the Board and project participants.

The Board has also been criticised for its practice of meeting frequently behind closed doors. In general, meetings of the Board “shall be open to attendance, as observers, by all Parties and by all UNFCCC accredited observers and stakeholders, except where otherwise decided by the Executive Board”.<sup>10</sup> In practice, large parts of the meetings of the CDM Executive Board take place behind closed doors. This is due to a rising number of discussions on individual cases, such as requests for registration, requests for issuance or the accreditation of designated operational entities.

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<sup>8</sup> Decision 2/CMP.3, paragraph 11

<sup>9</sup> Decision 2/CMP.3, paragraph 15 (e)

<sup>10</sup> Decision 3/CMP.1, paragraph 16

A number of options are currently being discussed to improve the decision making process of the CDM Executive Board, including the following:

- **Enhanced delegation of individual case decisions.** As highlighted above, the CDM Executive Board is currently dealing with a large number of individual case decisions and only limited time is spent on general policy issues. A key means to take a more supervisory role would be a full delegation of decisions on individual cases to the support structure, including the UNFCCC secretariat, working groups and panels. This could apply to the registration, review and rejection of projects, the decisions on issuance of CERs, the accreditation or suspension of accreditation of DOEs and the approval, revision, rejection or withdrawal of baseline and monitoring methodologies. In order to ensure that the Board can still provide the necessary oversight on these decisions, the EU has suggested in its submission on the review of the Kyoto Protocol under its Article 9 that delegated matters should be considered approved unless three EB members request a consideration and that substantial new or general policy related issues are brought to the attention of the Board.
- **A systematic catalogue of EB decisions.** As a result of a request by COP/MOP, a catalogue of EB decisions has been developed by the UNFCCC secretariat. However, the current catalogue has the character of a search engine. So far, there is no systematic recording and indexing of decisions by the Board. To improve the documentation of decisions, all decisions could be indexed and recorded in a more systematic manner according to relevant areas. The system should clearly identify if new decisions by the Board overrule former decisions. Such a systematic approach would improve the access to and consistency of EB decisions.
- **Systematic justification of EB decisions.** The Board could adopt as an internal rule that all decisions should be accompanied by a proper justification. This justification could be attached to the decision and be made publicly available. This would facilitate a broader understanding of the rationales of EB decisions by all relevant stakeholders.
- **Appeals procedure.** Several stakeholders have suggested the introduction of a formal appeals procedure (e.g. Streck and Lin 2008). An appeals procedure could help to ensure due process in decision-making by the EB. The appeals procedure could be open to individual case decisions in which established rules by the CDM Executive Board or the COP/MOP are applied, whereas general policy and rule-making decisions could be excluded from an appeals procedure. A key question is the composition of an appeals chamber. In order to ensure independency and integrity, the members of the appeal chamber should not consist of the same people who have previously taken the decision in question. Secondly, clear and transparent procedures and legal knowledge of the members is necessary to ensure a due process. Thirdly, the necessary technical expertise to assess the case needs to be available to an appeals chamber, e.g. through independent technical review. Finally, it needs to be ensured that the appeals chamber will not be flooded with cases. This could be achieved through certain costs for requesting an appeal and through a pre-screening of appeals.

## **2.3 Conclusions**

Several stakeholders have raised serious concerns with the current government arrangements of the CDM Executive Board. As part of the review of the Kyoto Protocol under its Article 9, the current governance arrangements could be substantially changed. Given that the CDM has grown to multi-billion dollar market, the CDM Executive Board is de facto a market regulator. To take on this role, the EB, with its non-permanent members, should move to a truly supervisory committee and delegate decisions on individual cases to a professional support structure. The current processes should be improved, in particular with regard to the documentation and justification of decisions and possibilities for the parties involved to appeal against decisions.

### **3 Improving the validation and verification process**

Designated Operational Entities (DOEs) are independent private sector entities that are responsible for the validation of CDM projects and the verification of emission reductions. In validating projects, the DOEs check whether all requirements by the COP/MOP and the CDM Executive Board for the registration of a CDM project activity have been met. At the end of the validation process, the DOE either accepts the project if all requirements are met and outstanding issues are solved, or rejects the project. If accepted, the DOE requests the registration of the project to the CDM Executive Board. In verifying emission reductions, the DOEs check whether the CDM project activity has achieved the emission reductions claimed in monitoring reports. The CDM Executive Board automatically accepts requests for project registration or requests for issuance of CERs – unless at least three members of the CDM Executive Board request a review.

DOEs are accredited by the CDM Executive Board according to accreditation standards adopted by the Board. However, they are paid by the project participants for their validation and verification services. The effective functioning of the validation and verification process is key to ensure the environmental integrity of the CDM. DOEs are regarded as the extended arm of the CDM Executive Board, as they should check whether all requirements are met by the project participants. In the following, the current functioning of the validation and verification process is assessed and options for improving this process are explored.

#### **3.1 Quality concerns about the validation and verification process**

The overall quality in the validation and verification process and the performance of some DOEs have raised concerns about the integrity of the CDM. The most visible indicator of the problems with the validation process is the large number of projects that are validated positively by a DOE but that are reviewed and partly rejected by the CDM Executive Board. Until September 2008, out of the 1400 projects that were submitted to the CDM Executive Board, 200 projects that were validated positively by a DOE triggered a review by the CDM Executive Board and about 70 projects were rejected by the CDM Executive Board.

These high rates of projects being reviewed and rejected were not expected by most stakeholders and not foreseen in the negotiations of the Marrakech Accords. Parties agreed in Marrakech in 2001 that CDM projects should be registered automatically after a positive validation by DOEs, unless three members of the CDM Executive Board request for a review. Clearly, the idea was that the CDM Executive Board should only intervene in exceptional cases and that DOEs have the main responsibility for ensuring that CDM projects meet all requirements. However, the Board spends currently considerable time of its meetings on the assessment of individual requests for registration and a considerable support structure at the UNFCCC secretariat is dedicated with the assessment of projects that were already validated positively by DOEs. This problem has also been recognized by COP/MOP3 which encouraged the Board to “take action that

allows it to further emphasize its executive and supervisory role by, inter alia, (...) strengthening the role of designated operational entities” and to “ensure a balance in applying its resources between satisfying caseload needs and making general policy and system improvements”.<sup>11</sup>

The large number of projects that are reviewed or rejected indicates that the DOEs do not perform or document the validation in the way the CDM Executive Boards expects them to do. Indeed, spot checks undertaken by the CDM Executive Board at various DOEs revealed serious shortcomings. Several non-conformities of DOEs were identified, including those with regard to:

- “competencies to perform validation and verification functions”;
- “quality assurance and quality control mechanisms”;
- “compliance with CDM requirements”;
- “procedural and operational requirements, such as its management and operational structure, contract control, assurance of competencies to perform validation and verification functions and compliance with its own stipulated procedures”.<sup>12</sup>

In 2006, the Methodological Panel under the CDM Executive Board assessed how the “tool to demonstrate and assess additionality” was applied in practice and came to the following conclusions: “From review of available documentation it appears that current methodological guidance from the Board is either not applied or, if applied, is not always documented. (...) Validation reports for some registered CDM projects indicate that efforts to corroborate additionality claims were undertaken, other cases with no such indications were found. (...) The available documentation provides little evidence of external validation by DOEs of key assumptions and data used for additionality assessment, though such evidence may exist elsewhere.”<sup>13</sup> In February 2007, the Board stated that “the experiences gathered recently in validation and verification work by DOEs as well as the accreditation process including spot-checks, re-emphasises the need for the DOEs to work towards the best practices of validation and verification”.<sup>14</sup> Similarly, COP/MOP3 encouraged DOEs to “continue to build their capacity to perform their functions under the clean development mechanism”.<sup>15</sup>

Independent assessments also question the quality of the validation and verification process. Schneider (2007) evaluated systematically 93 projects that were registered before 18 July 2007 and found that some validation reports hardly contain any information on whether and how issues have been examined. The non-governmental organiza-

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<sup>11</sup> Decision 2/CMP.3, paragraphs 9(a) and 11

<sup>12</sup> Paragraphs 17 and 20 of the report of the twenty-ninth meeting of the CDM Executive Board

<sup>13</sup> Meeting report of the twenty-third meeting of the Methodological Panel

<sup>14</sup> Paragraph 12 of the report of the twenty-ninth meeting of the CDM Executive Board

<sup>15</sup> Decision 2/CMP.3, paragraph 14

tion International Rivers Network (IRN 2008) even comes to the conclusion that “DOEs have repeatedly shown themselves willing to rubberstamp project documents containing unverifiable and highly dubious claims”.

Altogether, this shows that there are considerable problems in the validation and verification process. Systematic improvements to this process are needed to fulfil its objectives. The problems with the validation and verification process have several reasons:

- **Lack of detailed validation and verification instructions.** For several years, DOEs did not have detailed instructions by the CDM Executive Board how validation and verification functions should be fulfilled. The modalities and procedures for the CDM and available guidance by the Board were relatively general and vague. Finally, nearly two years after a request by COP/MOP, the CDM Executive Board adopted a Validation & Verification Manual (VVM) in November 2008. The VVM provides instructions to DOEs as to how they should perform validation and verification functions.
- **Competition among DOEs.** DOEs are paid for their services by the project participants. This competition avoids high prices for validation and verification services. However, it also creates an inherent conflict of interest, as DOEs serve the CDM Executive Board by checking that all requirements by the Board are fulfilled, but are paid by the project participants who have an interest in a positive outcome of the validation or verification. Project participants can deliberately choose any DOE. In doing so, they have an interest to keep validation and verification costs low, want a fast validation or verification process and a positive outcome. This can put considerable pressure on DOEs. If DOEs want to maintain or increase their market share, they have to offer their services at low costs, have to carry out the validation or verification quickly and can thus only spend limited time on the validation or verification. These market conditions do not favour a high scrutiny in validation and verification services. Moreover, project participants can contact several DOEs to validate their project. If one DOE refuses to validate a project due to concerns whether the project meets some requirements, the project participants can still hire other DOEs. If DOEs want to maintain a high market share, this puts considerable pressure on them to accept projects which may otherwise be accepted by their competitors.
- **Ineffective sanctions for DOEs.** Despite the problems with the performance of some DOEs, the CDM Executive Board has up to November 2008 not applied any sanctions to DOEs, other than conducting spot checks. In cases where spot checks were undertaken, the names of the DOEs were not made public. This questions to what extent DOEs have to fear financial consequences if they do not perform according to the expectations of the CDM Executive Board. In November 2008, the CDM Executive Board suspended the accreditation of DNV, the largest DOE, and made the names of DOEs public that were subject to spot checks.



- **Lack of adequately trained personnel.** Some DOEs have reported about difficulties to hire and keep qualified personnel. Currently, many market participants urgently search CDM experts and DOEs have to compete with project developers and banks which may be willing to pay higher salaries.

Based on this analysis of the current shortcomings, the following chapter explores options for improving the validation and verification process.

## **3.2 Options for improving the validation and verification process**

### **3.2.1 Verification and Validation Manual (VVM)**

As a result of the quality concerns described above, COP/MOP3 requested the CDM Executive Board finalize the validation and verification manual (VVM) as its highest priority. A first version of the VVM has finally been adopted by the CDM Executive Board in November 2008. The VVM should provide a standard for DOEs and clarify what exactly the Board expects them to do in validations and verifications.

### **3.2.2 Trainings and exams for personnel of DOEs**

To enhance the knowledge of the personnel involved in validation and verification, the CDM Executive Board could request the UNFCCC secretariat to develop training programs for the personnel involved in validation and verification services at DOEs. This could include on-line courses or even regional trainings in host countries. Similar trainings and courses have been developed by the UNFCCC secretariat for experts reviewing GHG inventories and national communications. Experiences from these courses could be used to develop trainings for DOEs. In a longer-term perspective, the participation in such trainings and the successful completion of exams could become a prerequisite for validating projects and verifying emission reductions.

### **3.2.3 Selection and payment of DOEs by UNFCCC**

Several stakeholders have proposed that DOEs be selected and paid by the UNFCCC secretariat instead of the project participants. This would avoid the current conflict of interests that DOEs are serving the CDM Executive Board but are paid by the project participants. The UNFCCC secretariat could receive the necessary resources by increasing the existing administrative share of proceeds that is charged to the issuance of CERs or by directly charging the project participants a validation fee. In this way, the validation and verification would still be financed by the project participants, but the DOEs would be contracted by and be accountable to the UNFCCC secretariat.

The overall costs for validation and verification would not be increased. Small-scale projects would benefit from a payment of DOEs through the administrative share of proceeds, since large projects with many CERs being issued would contribute over-proportionally to the overall financial needs to pay for validation and verification.

A challenge of this option is the development of a fair and simple procedure for selecting DOEs. The selection could be based on a simple bidding process that considers the costs for the service, the experience of the DOE with the specific project type and the previous performance of the DOE.

### **3.2.4 Sanctions in case of non-conformities**

The CDM Executive Board has not applied any sanctions to DOEs so far. The modalities and procedures for the CDM allow the suspension or withdrawal of the accreditation of DOEs. However, it is not clear in which cases a suspension or withdrawal should be triggered. Moreover, a set of weaker sanctions could be applied. In July 2007, the CDM Executive Board announced the development of a “specific policy framework to address non-compliance issues by DOEs in a systematic manner”.<sup>16</sup> However, up to now, the EB has not adopted such a framework, published a draft or reported on any further work on this matter.

The development of a policy framework to address non-compliance by DOEs could provide considerable incentives to DOEs to implement internal procedures that ensure that validations and verifications are undertaken as required by the CDM Executive Board. Such a framework could include rigorous criteria for suspension or withdrawal of the accreditation. For example, a DOE could be suspended automatically if it failed three times to meet a key requirement of the CDM. A spot check at the DOE could be triggered automatically if one or three reviews have been requested by the Board. The CDM Executive Board could also introduce financial penalties for DOEs if they fail to meet requirements.

### **3.2.5 Enhanced liability for DOEs**

The modalities and procedures for the CDM provide for a procedure in which DOEs have to replace CERs issued in excess if the CDM Executive Board has identified significant deficiencies in the validation or certification report and if the accreditation of the DOE has been suspended or withdrawn. In the case of programs of activities, a similar provision applies, however, the withdrawal or suspension of the accreditation is not a prerequisite for the replacement of CERs. Instead, the CDM Executive Board can directly decide to exclude an activity from the programme if an error has been identified that disqualifies the activity from inclusion in the programme. In this case, the DOE has an immediate obligation to replace the CERs.<sup>17</sup>

A similar approach with a stronger liability for DOEs to replace CERs could also be envisaged for the project-based CDM. For example, there could be a general require-

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<sup>16</sup> Meeting report of the 33rd meeting of the CDM Executive Board, Paragraph 12

<sup>17</sup> Paragraphs 12, 13 and 14 of the „procedures for registration of a programme of activities as a single CDM project activity and issuance of certified emission reductions for a programme of activities“, included in Annex 39 of the thirty-second report of the CDM Executive Board.

ment for DOEs to replace CERs issued in excess if non-conformities in the validation or verification process are detected after the registration of the project or after the issuance of CERs. As validation and verification is undertaken by different DOEs, this would require a clear identification whether the non-conformity is related to the validation or verification of emission reductions and instructions on how the verifying DOE should deal with requirements that were not met at validation.

### **3.3 Conclusions**

The varied performance of DOEs is a key bottleneck of how the CDM is functioning. To improve the environmental integrity of the CDM DOEs need clear instructions and economic incentives to undertake validation and verification functions thoroughly and in full compliance with the requirements by the CDM Executive Board. Next to the introduction of the Validation & Verification Manual (VVM), several other measures are necessary, including mandatory trainings for the staff of DOEs and sanctions in the case of non-compliances. Should these measures not show the necessary improvements the conflict of interest of DOEs in their function of serving the CDM Executive Board but being paid by project participants should be addressed by paying DOEs through the UNFCCC secretariat.

## 4 Objective criteria to demonstrate additionality

The demonstration of the additionality of a CDM project is a key requirement to qualify for the CDM. The modalities and procedure for the CDM define that a CDM project is additional if “anthropogenic GHG emissions are reduced below those that would have occurred in the absence of the registered CDM project activity”.<sup>18</sup> The meaning of this sentence was further specified by the CDM Executive Board in two tools that can be applied to demonstrate the additionality of a CDM project: the “Tool for the demonstration and assessment of additionality” and the “Combined tool to identify the baseline scenario and demonstrate additionality”. These tools require that the proposed project would not be implemented without being registered under the CDM. In other words: demonstrating additionality means showing that the project can only proceed with the incentive from the CDM and would not be implemented anyhow.

The demonstration of additionality is a key requirement to maintain environmental integrity. If a CDM project is not additional but nevertheless registered as a CDM project, this results in an *increase* of global GHG emissions: the CERs from the project then allow Annex I countries to increase their GHG emissions whereas the emission reductions from the project in the non-Annex I country would have occurred anyhow.

How to demonstrate the additionality of a CDM project is a controversial issue and has been discussed since the establishment of the CDM. The fundamental challenge is that the question as to whether a project would also be implemented without the CDM is hypothetical and counter-factual – it can never be proven with absolute certainty. This makes the assessment of additionality difficult, subjective and uncertain. The challenge is to find transparent and objective criteria that avoid a high number of non-additional projects and do not result in a high number of “lost opportunities” (projects that are additional but do not meet the requirements used for the additionality test).

In the following, first an overview of the practical experiences with demonstrating additionality is provided. Then recent action by the CDM Executive Board to improve the assessment of additionality is summarized. Finally, alternative approaches to demonstrating additionality are highlighted.

### 4.1 Practical experiences with additionality demonstration

Baseline and monitoring methodologies contain a procedure to assess the additionality of the proposed CDM project. More than 100 methodologies have been approved by the CDM Executive Board. Most large-scale methodologies refer to one of the two available tools to demonstrate additionality. Small-scale methodologies use a barrier analysis. The tools and most methodologies use the following three generic approaches to demonstrate additionality:

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<sup>18</sup> Paragraph 43 of decision 3/CMP.1

- A *barrier analysis* requires demonstrating that barriers exist that would prevent the proposed project from being carried out if the project activity was not registered as a CDM activity.
- An *investment analysis* requires demonstrating that the proposed project activity is economically or financially less attractive than at least one other credible alternative.
- A *common practice analysis* requires an assessment of the extent to which the proposed project type (e.g. technology or practice) has already been deployed in the relevant sector and region.

Essentially, the current approach to demonstrate additionality requires project participants to demonstrate under which conditions they would be able to proceed with the project activity. This approach has been criticised as “intention-based” and “highly subjective” by some stakeholders. For example, the International Emissions Trading Association (IETA 2005) stated in a position paper for COP/MOP1: “Proving intent is an almost impossible task that is clear-cut only in rare cases (...) Business perception is that in its current form the test for additionality (...) exposes every project to a highly subjective assessment of its CDM eligibility and allows for second-guessing by the EB.” Industry representatives raised concerns that the current approach results in a situation where good story-tellers can get a project registered whereas bad story-tellers may fail even if the project is really additional.

The practical experiences with the current approaches suggest that they are not distinguishing additional from non-additional projects in a reliable manner. Schneider (2007) has systematically evaluated how additionality was demonstrated in 93 registered projects. The report concludes that there are serious problems in the way in which additionality has been assessed over the first three years in which CDM projects were registered. In many cases barriers used to demonstrate additionality were very subjective and not very credible. Many projects used general financial or policy risks, such as, for example, the “risk of currency exchange rate” or the “risk of possible future decrease of feed-in tariff”. Often barriers were very subjective: In some projects the management itself was declared unable to manage a project; others just stated that the “project would go bankrupt without CERs”. Many projects used “costs” as a barrier, sometimes without indicating the magnitude of the costs or ignoring revenues from the project. Also the application of the barrier that a project is “first of its kind” was found to be problematic. Sometimes the project technology was defined so narrowly that the project is declared to be the “first of its kind” although many similar plants have already been constructed. In many cases, no evidence for the barriers was mentioned or provided in the project design documents.

Several stakeholders have also criticised that projects are still being registered which started operation many years ago and which did not make any attempt to get carbon credits for a number of years. For such projects it seems not credible that the CDM was seriously considered in the decision to proceed with the project.

Several reports indicate that a significant number of projects are not additional. In a Delphi survey, 71% of the participants agreed with the statement that “many CDM projects would also be implemented without registration under the CDM” and even 86% of the participants affirmed that “in many cases, carbon revenues are the icing on the cake, but are not decisive for the investment decision” (Cames et al. 2007). In their analysis of 52 Indian registered CDM projects, Michaelowa and Purohit (2007) came to the conclusion that at least two registered projects were clearly not additional. 19 projects were assessed in more detail and five out of these “provide doubtful arguments that should have triggered rejection by the validators”. Based on a comparison of investment costs and revenues from CERs, Ellis and Kamel (2007) come to the conclusion that “for many project types, CER revenue is more likely to be the ‘icing on the cake’ than the reason for undertaking the CDM project in the first place”. Schneider (2007) estimates that for roughly 40% of the projects that were registered from the start of the CDM until July 2007 the additionality is unlikely or questionable. Victor and Wara (2008) come to the conclusion that “much of the current CDM market does not reflect actual reductions in emissions, and that trend is poised to get worse”. In interview with the Guardian<sup>19</sup>, Victor estimated that “between one third and two thirds” of the CDM credits do not represent additional emission reductions. All in all, the available reports suggest that there have been considerable problems with the way how the additionality of CDM projects is assessed in practice.

## 4.2 Recent actions to improve the additionality assessment

Over the past year, the CDM Executive Board has taken several actions in order to improve the assessment of additionality, including:

- the adoption of the validation & verification manual (VVM) which contains general guidance for DOEs how validation and verification services should be undertaken as well as specific guidance on how the assessment of additionality should be validated;
- the adoption of guidance on how the investment analysis should be applied, including how the calculation should be performed, what data should be used and how the benchmarks should be selected;<sup>20</sup>
- the adoption of guidance on how it should be demonstrated that the CDM was seriously considered in the decision to proceed with the project activity.<sup>21</sup>

These decisions are important to improve and clarify the current approaches to demonstrate additionality. As a result of these decisions, a number of banks and market analysts have adjusted their expectations of CER delivery until 2012 downwards. This

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<sup>19</sup> The Guardian, May 26, 2008

<sup>20</sup> Meeting report of EB39, Annex 35

<sup>21</sup> Meeting report of EB41, Annex 46

further supports the doubts on the additionality of some of the CDM projects in the pipeline.

### 4.3 New approaches for demonstrating additionality

Many stakeholders, including Parties, environmental non-governmental organisations and industry associations, have called for more robust and objective criteria to establish additionality. COP/MOP1 requested the Board to consider, based on a public call for inputs, new proposals to demonstrate additionality and proposals to improve the “tool for the demonstration and assessment of additionality” and encouraged project participants to submit new proposals to demonstrate additionality to the Board. Similar requests have been reiterated by COP/MOP2 and COP/MOP3.

Despite the encouragements by COP/MOP, no new approaches to demonstrate additionality have been submitted to the CDM Executive Board for approval up to September 2008. However, recently the CDM Executive Board adopted for the first time the use of an emissions benchmark to demonstrate additionality in a methodology for introducing efficient appliances.<sup>22</sup> The methodology uses as benchmark the lower value between the historic efficiency of appliances produced by the manufacturer and a market benchmark for the efficiency of appliances sold in the country based on the top 20% performers in the market. One single benchmark is used for both the baseline emissions and the demonstration of additionality. The benchmark of the top 20% performers has been defined in the modalities and procedures for the CDM and is already used in a number of other approved methodologies for the determination of baseline emissions – but not yet for the demonstration of additionality. The cement industry is also preparing a methodology that uses emission benchmarks to establish additionality and to determine baseline emissions.

More objective approaches to demonstrate additionality are also being discussed in the literature. For example, Kartha et al. (2005) discuss market penetration rates as more objective approaches to demonstrate additionality. Benchmarks or market penetration rates would provide simple and transparent criteria for CDM eligibility and avoid the subjective and counter-factual analysis of the specific investment circumstances of a project. However, establishing benchmarks or market penetration rates is challenging. Firstly, the ambition of the benchmark or penetration rate is an arbitrary policy choice. It requires a careful balance between the number of free-riders and the lost opportunities. Moreover, the use of benchmarks and market penetration is methodologically challenging. The data to establish benchmarks is often not available or confidential. The definition of the installations or technologies to be included in the benchmark or market penetration analysis is in some sectors difficult. For some sectors that undergo rapid transformation, benchmarks based on historical data may not be very reliable. In some sectors, it is difficult to use benchmarks at all. For example, in the electricity sector a

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<sup>22</sup> Approved methodology AM0070: „Manufacturing of energy efficient domestic refrigerators“

grid emission factor as benchmark is clearly insufficient to address additionality, since this would apply that all renewable power installations would automatically qualify as being additional.

#### 4.4 Conclusions

The current problems with the demonstration of additionality are substantial and increasingly recognised. Given that the CDM has grown to a global multi-billion dollar market with about 1.5 to 2 billion CERs being issued up to 2012, a significant amount of non-additional projects can considerably harm the overall integrity of the Kyoto system. Improving the environmental integrity of the CDM is also important because most Parties want the mechanism to continue and play an important role in a post-2012 climate regime. This has been recognised by Parties in the post-2012 negotiations by requesting that “in considering possible improvements to the mechanisms, due attention should be paid to promoting, inter alia, the environmental integrity of the Kyoto Protocol (...)”.<sup>23</sup>

A combination of approaches is necessary to achieve this objective. Firstly, clearer guidance is necessary how the current approaches to assess additionality should be interpreted and validated by DOEs. The guidance on application of the investment analysis adopted by the Board provides a good example. Secondly, DOEs need clear incentives to validate the assessment of additionality in a critical manner (see chapter 3). Thirdly, the current approaches should partly be replaced by more objective approaches. It seems, for example, questionable whether a barrier analysis is a reasonable approach to distinguish additional from non-additional CDM projects, given that practically all projects face some barriers to their implementation. This applies in particular to very large investments where costs play a major role and where barriers to these investments can be easily reflected in costs. Benchmarks and possibly penetration rates, if chosen in a cautious and conservative manner, could for some sectors be more objective means to decide on the eligibility for CDM credits.

However, even with more objective criteria, such as benchmarks or penetration rates, a number of projects that would happen anyhow will qualify under the CDM. Whatever the procedures and criteria to demonstrate additionality, a certain amount of “free-riding” projects will always be part of the CDM. In practice, it is impossible to fully comply with the additionality requirement. As a consequence, the environmental integrity of a full offsetting mechanism is always lower than for cap-and-trade systems. The current problems with additionality can thus be improved but not be solved. This should be kept in mind when discussing the role of the CDM in a post-2012 climate regime.

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<sup>23</sup> Analysis of means to reach emission reduction targets and identification of ways to enhance their effectiveness and contribution to sustainable development. Draft conclusions by the Chair. FCCC/KP/AWG/2008/L.2



One way to tackle the lower environmental integrity of the CDM compared to cap-and-trade is to move the CDM beyond an offsetting mechanism by crediting only part of the emission reductions (see chapter 7). The replacement of the CDM by other mechanism, such as cap-and-trade systems and sectoral approaches, could be another way to deal with the problem. Under a sectoral CDM or sectoral no-lose targets the counterfactual and hypothetical assessment of the additionality of individual projects could be circumvented with the establishment of a baseline for the whole sector and the inclusion of all applicable installations in the mechanism.

## **5 Improving the contribution of the CDM to achieving sustainable development**

One of the two objectives of the CDM is to assist developing countries in achieving sustainable development. Different from other provisions under the CDM, the assessment whether a CDM project contributes to sustainable development is the prerogative of the host country government and not under the supervision of the CDM Executive Board. The Designated National Authority (DNA) of the host country – the institution designated by the host country government with the governmental approval of CDM projects – has to confirm in its letter of project approval that the project contributes to achieving sustainable development. In the negotiations towards Marrakech, the host countries argued that each country has its own priorities for sustainable development and that consequently criteria to assess this objective can not be agreed upon at UNFCCC level.

### **5.1 Current practice of host countries in assessing projects**

Many countries have established and published criteria to assess whether a project contributes to sustainable development. The criteria and procedures to assess projects vary from country to country. In most countries, the criteria include in some form environmental, social, economic and technological aspects. Some countries emphasize particular aspects, such as the contribution to poverty alleviation, the reduction of unemployment, technology transfer or benefits for rural population. Other countries have only limited requirements. For example, Chile requires only that the project complies with all laws and regulations Chile.

Despite rather ambitious criteria for sustainable development in some countries, it can in practice not be observed that projects are rejected by a DNA for not contributing sufficiently to sustainable development. It has only been reported in very few cases that a project was rejected by a DNA for its lack of contributing to sustainable development. Apparently, host countries do not prioritize projects with high sustainable development impacts by rejecting projects with little or no sustainable development impact.

An illustrative example is India. India's sustainable development criteria include many ambitious aspects, such as, inter alia, the contribution of the project to poverty alleviation, the impact of the project on resource sustainability and resource degradation, biodiversity friendliness and on human health. Nevertheless, all types of projects, including the destruction of HFC-23 and N<sub>2</sub>O, have been approved by the host country so far. Apparently, projects do not need to comply with all or the majority of the criteria, but only with one or few of them.

The current situation in which host countries approve practically all CDM projects has resulted in a situation in which the CDM project portfolio is mainly determined by the economic attractiveness and potential and risk of the mitigation options. In a global CER market, host countries may indeed be reluctant to reject projects with little or no

positive impact for the sustainable development, as this will lower their overall CDM market share and thus result in less income for the country.

## **5.2 Is the CDM contributing to sustainable development?**

Several studies have analysed to what extent the CDM is fulfilling its objective of achieving sustainable development in developing countries. They all arrive at a similar conclusion: the current contribution of the CDM to sustainable development is very low. Olsen (2007) has evaluated the sustainable development benefits of the CDM by reviewing the literature and comes to the conclusion that “left to market forces, the CDM does not significantly contribute to sustainable development”. She identifies as a key problem that the objective of sustainable development is left out of the market. The benefits for sustainable development are only rhetorically mandated in the Kyoto Protocol, but not monetised and therefore play a limited role in directing investments. As a consequence, a trade-off between the two objectives of the CDM has been observed in several studies (Kolshus et al. 2001; Sutter 2003; Olsen 2007). Projects with cheap emissions reductions are preferred over more expensive projects with a higher contribution to sustainable development. Olsen and Fenhann (2008) conclude that “at the heart of the CDM’s inability to achieve sustainable development is the existence of trade-offs between carbon benefits valued in the carbon market and non-carbon benefits such as sustainable development benefits that are not monetized in the carbon market”.

Similarly, Michaelowa and Michaelowa (2007) conclude that “projects addressing the poor directly are very rare and that even small renewable energy projects in rural areas tend to benefit rich farmers and the urban population”. However, a number of projects have indirect benefits for the overall economy, as many projects create employment, indirectly improve the infrastructure or at least provide CER revenues to the economy. Sutter and Parreño (2007) have evaluated quantitatively the sustainable development impact of the 16 projects that were registered by August 2005, using the contribution to employment, the distribution of the CER returns and the improvement of local air quality as criteria for achieving sustainable development. They come to the conclusion that only 1-2% of the CERs come from projects that are likely to have a contribution to sustainable development. They have also identified another type of trade-off: Projects for which it is more likely that the emission reductions are additional have lower benefits for sustainable development, whereas the additionality is more unlikely for projects that have higher benefits for sustainable development.

In conclusion, the current contribution of the CDM to sustainable development appears to be low. However, recently, projects with a potentially larger contribution to sustainable development, such as energy efficiency improvements in rural households or rural renewable electricity generation are gaining some importance. The implementation of

CDM programmes of activities could potentially help towards achieving this objective.<sup>24</sup> Nevertheless, as long as the contribution to sustainable development is not given any market value, the trade-off between the two objectives of the CDM – cost-effective emission reductions and achieving sustainable development – will not be addressed.

### **5.3 Approaches to improve the sustainable development benefit of the CDM**

#### **5.3.1 Premium markets**

Premium markets for projects with high benefits for sustainable development can help to give an additional value to sustainable development benefits, as buyers of CERs have an interest in purchasing high quality projects. The “Gold Standard”, a quality assurance label for CDM projects and credits endorsed by 44 NGOs from all around the world, is currently the only established label for high quality CDM projects. It contains particular requirements to ensure that projects actually have sustainable development benefits.<sup>25</sup>

CERs from Gold Standard projects are being sold at higher prices than CERs from other projects, thereby giving projects with high sustainable development benefits a higher market value. The Gold Standard Foundation said that Gold Standard CERs had been trading at a 15-20 per cent premium compared to normal CERs in the past but that the price difference is shrinking recently (Point Carbon 2008a). A number of companies are specialising in the development of Gold Standard projects. Nevertheless, the market for Gold Standard projects is with 9 registered projects and 20 projects in the development stage still rather small, but developing rapidly.<sup>26</sup> The Gold Standard Foundation estimates that there is potential for about 9 million Gold Standard CERs from 102 CDM projects (Point Carbon 2008b).

#### **5.3.2 Development of a methodological standard for assessing the sustainable development benefit of CDM projects**

Some authors have proposed the introduction of an internationally agreed methodological standard for the assessment of the sustainable development benefit of CDM projects (Olsen and Fenhann 2008). The need for such a standard arises from the lack

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<sup>24</sup> Under a programme of activity (PoA), a coordinating entity implements many dispersed CDM programme activities (CPAs). In contrast to single project activities, PoAs are particularly suitable for projects which are dispersed, have high individual transaction costs, small generated amounts of emission reductions and a medium- to long-term perspective of implementation, such as energy efficiency projects in households. Small countries that have not yet benefited from the CDM because they do not own large emitting facilities could implement PoAs which involve many small users.

<sup>25</sup> For more information, please see: [www.cdmgoldstandard.org](http://www.cdmgoldstandard.org)

<sup>26</sup> Status: 10 September 2008

of a commonly accepted methodological approach to evaluate benefits of CDM projects for sustainable development. Several methodological approaches have been proposed in the literature (e.g. Sutter 2003, SouthSouthNorth 2004; Olhoff et al. 2004, Olsen and Fenhann 2008). Most of the approaches use check-lists, multi-criteria assessments or a combination of both (Olsen 2007). Check-lists are simple but do not allow for a quantitative evaluation of the contribution to sustainable development. Multiple criteria require the selection of specific criteria and indicators and a weighting of the indicators in order to arrive at an overall score of a project activity. The most elaborated approach for a multi-criteria assessment is the multi-attribute assessment methodology (MATA-CDM) developed by Sutter (2003). Olsen and Fenhann (2008) have developed a qualitative methodology based on text analysis of PDDs and proposed this methodology as the basis of an international verification protocol for DOEs. They applied the methodology to 744 PDDs and ranked project types according to their benefits to sustainable development. However, as the methodology is qualitative, it mainly determines how CDM projects contribute to sustainable development and not how much.

A key challenge of this proposal is agreeing internationally on one methodological approach to assess the contribution of projects to sustainable development. Apart from methodological challenges, it could be politically difficult to endorse such a standard at UNFCCC level, given that developing countries have insisted in UNFCCC negotiations that preferences for sustainable development should be the prerogative of the host country governments.

### **5.3.3 Exclusion of projects with less benefits for sustainable development**

In this regard, an alternative approach to introducing an internationally agreed methodology for assessing the sustainable development benefits could be the negotiation of a list of project types that are regarded to have higher benefits for sustainable development and that receive some form of preferential treatment. The Gold Standard Foundation followed this approach by limiting the standard to renewable energy generation projects and demand-side energy efficiency projects.

Despite the prerogative of the host country to determine whether a project contributes sufficiently to achieving sustainable development, there is less disagreement what project types have little or no benefits for sustainable development and what project types have high benefits. The different approaches to assess the sustainable development benefit of CDM projects show similar trends: in most studies, demand-side energy efficiency and renewable energy generation projects rank high and industrial gas projects rank low. Industrial gas projects, such as the destruction of HFC-23 from HCFC-22 production or the destruction of N<sub>2</sub>O from nitric or adipic acid production, do not have ancillary environmental benefits (e.g. reduction of air or water pollution, saving resources, avoiding the degradation of soils, increasing biodiversity, etc), little or no social benefits (e.g. no significant employment opportunities) and use mostly state-of-the-art technologies that do not have any spill-over effects for technological innovation.

Excluding these project types from the CDM could be a simple way to increase the share of projects with a higher benefit for sustainable development. However, given that these projects provide for GHG abatement opportunities with very low abatement costs, it should be ensured that these gases are abated through other incentives and not emitted to the atmosphere.

The exclusion of other project types from the CDM could be more controversial. This holds in particular for project types that can have substantial positive or negative implications for local stakeholders, such as forestry projects or hydro power projects.

#### **5.3.4 Discounting of CERs from projects with less sustainable development benefits**

As an alternative to excluding project types with fewer benefits for sustainable development, projects with high sustainable development benefits could be favoured over projects with few benefits by discounting emission reductions from projects with less benefits for sustainable development (see also chapter 7). This would lend projects with higher benefits for sustainable development a higher market value and consequently change the project portfolio due to reduced supply from less sustainable projects. At the same time, all types of projects could continue to benefit from the CDM.

As for the exclusion of some project types, this option would require that Parties agree on which projects have high benefits for sustainable development and which have less benefits.

#### **5.3.5 Quotas for projects with sustainable development benefits**

As a similar option, all or several Annex I countries could commit to purchase a minimum quota of projects with high sustainable benefits in their portfolio, for example, by requiring that X% of the CERs portfolio come from projects with high sustainable development benefits. Such a quota could result in two different CER prices, a higher price for CERs that can be used to fulfil the quota and a lower price for other CERs, thereby giving projects with high sustainable development benefits a higher market value.

### **5.4 Conclusions**

The CDM has two objectives – achieving cost-effective emission reductions and achieving sustainable development in the host countries – but has been designed as a market mechanism that only gives GHG emission reductions a monetary value. This has resulted in a trade-off between the two objectives, with cheap emission reductions being preferred over projects with high sustainable development benefits. Under the current scheme, host countries do not have incentives to reject projects with fewer sustainable development benefits as this lowers their revenues and overall market share. In the literature, the overall contribution of the CDM to sustainable development is commonly considered as low.

The sustainable development benefits of the CDM can be enhanced most effectively if projects with high sustainable development benefits have a higher market value. This could be achieved through different mechanisms, such as a differentiated CER discounting scheme, quotas for industrialized countries or even the exclusion of project types with few sustainable development benefits. However, all these instruments requires a political agreement how the sustainable development benefits should be assessed or which project types are regarded to have higher benefits.

## 6 Addressing sectors and countries that are underrepresented in the CDM

The current CDM project portfolio is dominated by few project categories (see Figure 1). Power generation is the largest category, with mainly renewable power generation but also natural gas power plants and waste heat recovery projects. Other projects mainly destroy industrial gases (N<sub>2</sub>O and HFC-23) or reduce methane emissions from organic wastes (landfill projects, waste water treatment projects, manure management projects) and from coal mines.

Some sectors with large emissions and a large mitigation potential have not attracted CDM projects. This applies in particular to energy efficiency of appliances and buildings and the transport sector, despite the large GHG abatement potential. The fourth assessment report by the IPCC, for example, has identified buildings as the sector with the largest mitigation potential globally (IPCC 2007). Nevertheless, only very few CDM projects address GHG emissions from this sector.

Similarly, the geographical distribution of CDM projects favours few countries. About 2/3 of the CDM projects and CERs come from China and India. The remainder of the projects are mostly developed in emerging economies, including Brazil, Mexico, Chile, Thailand and South Korea. About 2% of the projects come from Africa and even less from Least Developed Countries.

There are many different reasons for the current geographical and sectoral distribution of the CDM project portfolio. Ellis and Kamel (2007) assessed barriers to the implementation of CDM projects and identified several reasons for the current distribution of CDM projects.

The regional distribution of CDM projects is strongly related to the GHG mitigation potential. As the CDM has been designed as a market mechanism, it searches for the cheapest emission reductions – and not for geographically balanced mitigation opportunities. The largest abatement opportunities are indeed in China and India and in this regard it is not surprising that most CDM projects come from these countries. Whether the development of CDM projects is attractive in a country depends also on the general policy and legislative framework for investments and on the specific framework for the approval of CDM projects. Without an established DNA and transparent criteria and procedures for the approval of projects, investors face a high uncertainty whether their CDM project will be approved. Moreover, the international rules and limitations for the CDM projects favour some countries over others. Clearly, countries with a large potential in the LULUCF sector can not fully benefit from the CDM, as it is has been limited to afforestation and reforestation for which the demand for credits is low due to their temporary nature.

The distribution of CDM projects across sectors partly related to methodological reasons and has partly to do with the limitation of the CDM to a project-based mechanism or programmes of activities where the implementation of policies can not be directly credited. Economic reasons play also a role. Some project types have particularly low



GHG abatement costs (e.g. HFC-23 from HCFC-22 production and N<sub>2</sub>O from adipic and nitric acid production) and are therefore favoured over other project types. The calculation of emission reductions and the demonstration of additionality are straightforward for these project types. Projects in the transport sector or energy efficiency improvement projects face considerable methodological challenges. It is, for example, often difficult to distinguish the emission reductions as a result of the project activity from other factors, such as changes in energy prices, that affect emissions but that are not under the control of the project participants and thus not a result of the project activity. In addition, many dispersed emission sources exacerbate the monitoring of emissions. Moreover, the additionality of some project types is questionable, in particular in the transport sector, where public investments in transport infrastructure are in most cases driven by other factors than the CDM.

## 6.1 Addressing underrepresented countries

Overcoming the barriers which result in an underrepresentation of some countries is challenging due to the various factors affecting the geographical distribution of CDM projects. The issue has been extensively debated before and at COP/MOP2 and resulted in a COP/MOP decision addressing the issue through several requests to Parties and the CDM Executive Board and in the adoption of the Nairobi Framework.

The Nairobi Framework was initiated by the United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP), World Bank Group, African Development Bank, and the Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC) with the objective of helping developing countries, especially those in sub-Saharan Africa, to improve their level of participation in the CDM. A number of activities have started under the Nairobi Framework, in particular in the field of capacity building, promotion of CDM projects and information sharing. Two years after its adoption, the framework has not yet changed the overall picture; however, a number of African countries saw their first CDM projects at validation, including the Congo, Ivory Coast, Madagascar, Mauritius, Mozambique, Mali and Senegal. However, projects have only been registered in South Africa, Tanzania and Uganda so far.

While capacity building for CDM in sub-Saharan African countries and least developed countries has increased and shows some effects, the CDM could also be promoted in these countries through other, partly fundamental changes to the mechanism:

- The access to CDM could be limited for more advanced developing countries. This would automatically increase the share of CDM projects from sub-Saharan African countries and least developed countries. The reduced CER supply could result in higher CER prices which make the development of CDM projects economically more attractive.
- Discounting of CERs from other developing countries is another option (see chapter 6). This would give emission reductions from sub-Saharan African countries and least developed countries a higher value in the market and thus favour project development in these countries.

- Industrialized countries could commit to purchase a minimum quota of CDM projects from sub-Saharan African countries and least developed countries. This could potentially result in a higher market price for CERs from these countries, thereby favouring the development of projects.
- The rules for projects in sub-Saharan African countries and least developed countries could be further simplified, including the financing of validation and verification through the UNFCCC secretariat or the development of further simplified baseline and monitoring methodologies for these countries.

## 6.2 Addressing underrepresented sectors

The CDM has some limits in overcoming the barriers to implementation of CDM projects in currently underrepresented sectors. At COP/MOP1 in Montreal, programmes of activities were allowed under the CDM with a view to enable CDM projects in sectors with dispersed emission sources. However, it took considerable time – about one and a half years – before the CDM Executive Board agreed upon rules for programmes of activities. Several programmes of activities are currently being developed; however, even three years after the decision from Montreal no programmes has yet been registered. One barrier to the development of programmes of activities is the requirement that the selection of the baseline, the demonstration of additionality and the calculation of emission reductions has to be performed for each individual activity separately. In practice, programmes of activities are very close to a bundle of CDM projects. So far, this has not facilitated the development of projects with dispersed emission sources significantly. This development is unfortunate given that initially several project developers proposed new programmatic baseline and monitoring methodologies which handled methodological challenges on a more aggregated level. However, these methodologies were rejected by the CDM Executive Board, as the Board did not want to introduce a new type of programmatic methodologies. One option to promote projects in this area could be a review of the rules governing programmes of activities, with a view to address key methodological requirements, including the selection of the baseline, the demonstration of additionality and the calculation of emission reductions on a programme level.

In some sectors, a sectoral approach, such as sectoral CDM or sectoral no-lose targets may be better suited to address GHG emissions. This applies in particular to sectors with many dispersed emissions sources and to mitigation opportunities where policies and regulations are key to reduce emissions. The introduction and implementation of energy efficiency standards could, for example, be promoted through such a new mechanism.

## 6.3 Conclusions

The current distribution of CDM projects among countries and sectors has several different reasons. Most of them are difficult to address within the current framework of the CDM. The CDM has been designed as a project-based global market mechanism and

can as such not achieve multiple objectives and only address emissions in some countries and sectors effectively. Efforts to improve the distribution of CDM projects among sectors and countries will therefore have strong limits. Other means to address emissions in currently underrepresented sectors or to help sub-Saharan African countries and least developed countries to cope with climate may be more effective. Focussing on adaptation and mitigation opportunities with large co-benefits for sustainable development is a priority for sub-Saharan African countries and least developed countries. A market based mechanism, such as the CDM, may not be the most effective instrument to achieve these objectives. Similarly, in some sectors, such as transport and buildings, policies and regulations are key to reducing emissions. Such policies may be implemented in the context national mitigation efforts of developing countries or within a sectoral crediting mechanism.

## 7 Transforming the CDM into a mechanism with net atmospheric benefits

The current CDM is an offsetting mechanism. This means that emission reductions achieved through CDM projects in developing countries enable industrialised countries to increase their emissions above their assigned Kyoto targets. In this regard, the CDM does not reduce global GHG emissions but is, in principle, a zero sum game to the atmosphere. The CDM contributes only indirectly to global climate mitigation by lowering the mitigation costs of Annex I Parties. However, given that GHG emissions of developing countries have already exceeded emissions from industrialised countries, a pure offsetting mechanism, such as the current CDM, has considerable limits in addressing GHG emissions in developing countries.

Transforming the CDM into a mechanism with net atmospheric benefits could be one approach to further enhance global climate mitigation beyond given targets by industrialised countries. With such a reform to the CDM, the emission reductions achieved through the CDM would not be fully used to allow increased emissions in industrialised countries; rather a share of the emission reductions would not be credited. For example, for a project that brings about two tons of emission reductions, only one CER may be issued. The use of the CER allows an Annex I country to increase its emissions only by one ton, resulting in a net benefit of one ton for the atmosphere. In this way, the implementation of CDM projects would directly provide for a global emission reduction.

Another argument for introducing a CDM with atmospheric benefits is the inherent problem of an offsetting mechanism of demonstrating the additionality of individual projects (see chapter 4). In this context, a reduced crediting of emission reductions from CDM projects could be seen as applying a conservative adjustment to address the uncertainty involved in assessing the additionality of CDM projects.

Several stakeholders have called for a CDM with atmospheric benefits in a future climate regime: The EU has stressed at UNFCCC negotiations that moving the CDM beyond an offsetting mechanism should, next to new types of carbon market mechanisms, be a key element in a post-2012 agreement. During consultations under the UNFCCC on a post-2012 climate regime, South Korea has proposed the discounting of credits as part of a new mechanism to credit “nationally appropriate mitigation actions” by developing countries (Chung 2008). Chung had earlier proposed a CER discounting scheme as a key element of a post-2012 climate regime to engage developing countries (Chung 2007). Meng (2007) has proposed a “value-added CDM” where part of the emission reductions are discounted and retired to the atmosphere. The German emissions trading association BVEK has proposed a CDM discounting scheme where the level of discounting depends on per capita emissions and per capita gross domestic product of the host country (BVEK 2008). Schneider (2008) has assessed implications and options of introducing a CDM with atmospheric benefits. The Climate Action Network, a network of environmental non-governmental organisations, has pointed out in its position paper for the COP/MOP3 in Bali in December 2007 that it is “imperative to ensure that the CDM in the future moves beyond offsetting and in fact yields a proper

net reduction in global emissions and does not permit developed countries to evade emission reduction responsibilities and obligations” (CAN 2007).

In the following, first two options to introduce a CDM with atmospheric benefits are explored: discounting of emission reductions and setting baseline below the level of business-as-usual emissions. Then implications on the carbon market are summarized and conclusions are drawn.

## 7.1 Discounting emission reductions

Discounting emission reductions implies that not all of the emission reductions achieved by a CDM project can be used in the carbon market but that a part is not credited, providing a net global GHG emission reduction.

Discounting can be implemented on the supply side or the demand side of the CDM:

- On the supply side, only a certain percentage of the calculated emission reductions are issued as CERs. For example, with a discount rate of 50% for two tons of emission reductions by a CDM project activity, only one CER is issued.
- On the demand side, only a certain percentage of the CERs can be used for compliance purposes and the remainder must be “retired to the atmosphere”. For example, with a discount rate of 50%, an Annex I country or company would need to demonstrate that for each CER used for compliance purposes it has transferred another CER to a cancellation account.

In the case of the supply side, the discounting would automatically apply to the whole CDM market. This option would require an agreement at UNFCCC level. With discounting on the demand side, different users (e.g. different regional emissions trading schemes) could potentially also choose different discount rates. This would complicate the linking of emissions trading schemes considerably.

Another key question is whether discount rates should be varied between projects types or whether one discount rate should be applied to all projects. A differentiation between project types has been proposed by Chung (2007) and in the negotiations under the AWG-KP.<sup>27</sup> The main advantage of one single discount rate would be its simplicity and the avoidance of any market distortion between project types. A strong differentiation between project types could reduce the cost effectiveness of the CDM as some GHG emission reductions are favoured over others. Besides, one single discount rate is much easier to negotiate than many differentiated discount rates.

A variation of the discount rate between project types would have the advantage that some project types could be politically favoured over others. If the favoured project types have a lower discount rate than others, they have larger CER revenues and it becomes economically more attractive to develop them. This will then increase their

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<sup>27</sup> See Option M in FCCC/KP/AWG/2008/L.12 and FCCC/TP/2008/2

market share in the overall CDM portfolio. For example, Chung (2007) has suggested a heavy discount rate for HFC-23 projects in order to improve the competitiveness of renewable energy or energy efficiency CDM projects. Similarly, lower or no discount rates for projects with large benefits for sustainable development could help to address the problem that the CDM currently does not contribute significantly to sustainable development. Lower discount rates for such projects would make them economically more attractive than projects with fewer benefits for sustainable development (see chapter 5). However, a variation between project types could be very challenging to agree upon at UNFCCC level. In addition, it is currently the prerogative of the host countries to determine which projects contribute to sustainable development.

Similar to the differentiation among project types or sectors, the discount rates could also vary between countries. As for the differentiation among project types, an argument against such a differentiation is that the cost effectiveness of the CDM would be reduced if the value of emission reductions differs between countries. Moreover, a differentiation among developing countries is politically sensitive and difficult to negotiate.

There could be different rationales to differentiate between countries: The capacity and responsibility to mitigate GHG emissions varies among the group of developing countries. Higher discount rates for more advanced developing countries could reflect this responsibility and capability. For example, Chung (2007) views different discount rates for country groups as a way to address the principle of common but differentiated responsibility under the UNFCCC. He suggests that CERs from high-income developing countries could be substantially discounted while those of low-income countries could be discounted at a minimum rate. Similarly, BVEK (2008) proposed to base the discount rates on the per capita emissions and per capita gross domestic product of the host country as an indicator for the responsibility of the country. Another rationale for differentiating between countries could be to address the current regional distribution of CDM projects (see chapter 6).

Since a differentiation within the group of developing countries will not be achieved easily, a simple approach could be to make use of the only established differentiation under the UNFCCC: the differentiation of the group of Least Developed Countries. For example, discounting could be introduced for all developing countries except for the group of Least Developed Countries.

Determining the level of discounting is a key challenge. The choice of the discount rate(s) is arbitrary and clearly depends on policy preferences. One rationale for introducing a CDM with atmospheric benefits is the need for enhanced global mitigation action. From this perspective, one could try to arrive at discount rates in the light of the necessary contribution of a CDM with atmospheric benefits to global climate change mitigation. Such an approach would be based on many assumptions that are uncertain, including the level of binding GHG mitigation targets by industrialised countries, the level of emission reductions from “nationally appropriate mitigation actions” by develop-

ing countries, the extent to which the CDM and possibly other mechanisms will and can be used<sup>28</sup> and the extent to which such emission reductions are real, measurable and additional. At the very least, different scenarios could be developed and modelled to assess the global mitigation contribution of the CDM for different discount rates. Another rationale for introducing a CDM with atmospheric benefits is addressing the fact that the additionality requirement can never be fully complied with in practice and that a certain amount of “free-riding” projects will always be part of the CDM. From this perspective, one could try to arrive at estimates of the level of free-riding projects in the CDM. Discount rates above the higher end of the uncertainty range would provide reasonable confidence that the CDM actually moves beyond offsetting and provides net atmospheric benefits.

## 7.2 Setting baselines below business-as-usual emissions

Selecting baselines that are below the business-as-usual level of emissions could be another way of transforming the CDM into a mechanism with global atmospheric benefits. If a lower baseline emission level than the emissions that would occur without the CDM project activity is assumed, then a part of the emission reduction achieved by the CDM project activity is not issued as CERs but provides a net benefit to the atmosphere.

This option would work in a similar manner to the discounting of emission reductions. The difference is that discounting reduces the amount of credits issued for a given abatement effort, i.e. the difference between baseline emissions, project emissions and any leakage sources, whereas a lower baseline only affects the baseline emissions. A practical implication is that the calculation of leakage effects is not affected by this option, whereas leakage emissions would also be discounted for the option of discounting overall emission reductions. This could potentially punish projects with larger leakage emission sources and favour projects without leakage emission sources.

Another difference is that the level of discounting of emission reductions can be based on policy preferences, whereas the level of baselines below business-as-usual may be based on more technical criteria, such as the performance of certain technologies or practices that go beyond what is common practice in the market.

For some sectors, it can be difficult to determine a reasonable baseline below business-as-usual. In the case where only two technologies are available – a low carbon technology and a business-as-usual technology – it would be difficult to find a rationale for a baseline that is between the two technologies. If the low carbon technology is used as baseline, no carbon credits would be generated at all. If the business-as-usual

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<sup>28</sup> This depends on constraints for the demand of CERs (supplementarity) and constraints for the supply of CERs due to various factors, including, inter alia, the eligibility of host countries to use the CDM (see option J in FCCC/KP/AWG/2008/L.12), the potential of the CDM and the available of baseline and monitoring methodologies

technology is used, the objective of choosing a baseline below business-as-usual is not achieved. This situation applies to many sectors, including, inter alia, the replacement of incandescent lamps by energy efficient light bulbs, landfill management (either recovery of CH<sub>4</sub> or no recovery), waste water treatment (either anaerobic or aerobic), waste heat recovery in the industry (either recovery or no recovery).

Moreover, defining new baselines could be technically more complicated and administratively more cumbersome than discounting emission reductions.

### 7.3 Implications for the carbon market

Introducing a CDM with atmospheric benefits would have considerable implications for the carbon market. It would affect the CER supply, the level of GHG abatement in industrialised and developing countries, the price of allowances in the carbon market, the global costs of GHG abatement and the rents from suppliers and users of CERs.

Schneider (2008) has analysed these effects qualitatively for a carbon market without any limitations on the use of the CDM and a carbon market where the use of the CDM is limited to adhere to the principle established in the Kyoto Protocol that the use of the mechanisms shall be supplemental to domestic action. Key results of the analysis are:

The three cases show that the effects on carbon market prices and the level of global GHG abatement are slightly different. However, the three cases have several important aspects in common, in particular if compared to the situation where a CDM with atmospheric benefits is introduced in a carbon market without any limitations on the use of the CDM:

- The introduction of a CDM with atmospheric benefits can considerably enhance the global GHG mitigation. However, *where* the enhanced GHG abatement occurs depends on several factors but most importantly on whether the use of the CDM is limited in the carbon market. In a carbon market without any limitation on the use of the CDM, the enhanced GHG abatement occurs mainly in industrialised countries. In contrast, in a carbon market with a limitation on the use of the CDM, the enhanced GHG abatement occurs mainly in developing countries.
- The introduction of a CDM with atmospheric benefits increases the global mitigation costs. These increased costs are financed by the users of the CERs (i.e. industrialised countries) through the purchase of CERs at higher prices and increased domestic GHG abatement. The rents of CER suppliers (i.e. project developers and host countries) are not affected strongly in a carbon market without any limitation on the use of the CDM and may even increase in carbon market with a limitation on the use of the CDM.
- The introduction of a CDM with atmospheric benefits results in higher prices for CERs. As a consequence of higher CER prices, the volume of the CDM market may not be reduced significantly and may even increase if a CDM with atmospheric benefits is introduced in carbon market with a limitation on the use of the CDM.



## 7.4 Conclusions

Introducing a CDM with atmospheric benefits could be an option for a post-2012 climate regime, and is already under discussion. The introduction of a CDM with atmospheric benefits would increase the global GHG abatement efforts. Transforming the CDM into a mechanism beyond pure offsetting could also help enhance the environmental integrity of the CDM, which has been identified by Parties to the UNFCCC as a key objective for any reforms to the CDM.

An important advantage of a CDM with atmospheric benefits is that it allows for the continuation of an established mechanism with an established public and private infrastructure. The voluntary nature of a CDM with atmospheric benefits and the financing of the enhanced GHG abatement through the carbon market could make the introduction of this instrument in 2013 politically acceptable for many developing countries. However, the users of the CERs, i.e. industrialised countries, have to be willing to accept higher prices for allowances. A considerable practical challenge is achieving a policy agreement on the level of crediting emission reductions from CDM projects and whether and how differentiation between countries, sectors and projects should be introduced.

Among the options discussed, discounting of emission reductions appears the most promising approach. It is technically easy to implement and it also allows for key positions of Parties under the UNFCCC for a reform of the CDM to be addressed, such as the prioritisation of projects with large benefits for sustainable development or addressing the unequal geographical distribution of CDM projects.<sup>29</sup>

If introducing a CDM discounting scheme, the level of discounting should be sufficiently high to ensure a net benefit to the atmosphere, taking into account that a certain amount of projects qualifies for the CDM but would happen anyhow. The introduction of a CER discounting scheme should preferably be agreed upon at UNFCCC level. This avoids the introduction of different discounting approaches by different emissions trading schemes or industrialised countries which would create market distortions and hinder the linking of company-based emissions trading schemes. The level of discounting could be differentiated in a simple manner between countries. The same level of discounting could be introduced to all developing countries, except for the group of Least Developed Countries (LDCs) which could be exempted from discounting. This would favour project development in LDCs and help to address the concerns with the geographical distribution of CDM projects. A differentiation between projects types appears promising in terms of achieving some key interests of some Parties to the UNFCCC, but is difficult to negotiate. In the light of the emphasis in UNFCCC negotiations on improving the sustainable development benefits of the CDM, the possibility of introducing a lower discount rate for projects with large co-benefits for sustainable development seems most promising.

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<sup>29</sup> See options K and L in FCCC/KP/AWG/2008/L.12

Clearly, a CDM with atmospheric benefits has considerable limitations and can therefore be regarded only as one potential building block in a future climate regime. In particular, it should be further assessed in the light of other reforms to the CDM that are discussed in international negotiations, such as positive and negative lists to address additionality, limitations in the eligibility to use the CDM, the introduction of a sectoral CDM or sectoral no-lose targets and the introduction of new project categories<sup>30</sup>, which lies outside of the scope of this paper.

A CDM with atmospheric benefits can hardly be regarded as a “nationally appropriate mitigation action” by developing countries, as envisaged in the Bali Action Plan, because the mitigation costs are still fully paid by the users of CERs. In a longer term perspective, even a CDM with atmospheric benefits will not be sufficient to address GHG emissions in developing countries. It also does not address concerns about carbon leakage as a result of international competition. Other mechanisms, such as company-based emissions trading or sectoral no-lose targets, may thus be more suitable approaches in some sectors.

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<sup>30</sup> FCCC/KP/AWG/L.12

## 8 Overall conclusions and outlook

The CDM has, unexpectedly, grown to one of the most important instruments of the Kyoto Protocol, with more than 1,000 already registered projects and many more in the pipeline. This is a great success but has also posed considerable challenges on the functioning of the mechanism.

The lack of financial resources at the start of the CDM and, as a consequence, a limited support structure for the CDM Executive Board was a clear bottleneck getting the CDM started. In practice, the envisaged “prompt start” of the CDM resulted in a rather slow take-off which has gained a lot of speed later on. The CDM Executive Board still faces a growing work load requiring an effective support structure and delegation of its decision-making. In the development of the CDM rules, the independent validation and verification by Designated Operational Entities (DOEs) was considered as a key means to ensure the environmental integrity of the mechanism. In practice, this approach has not yet worked: as a result of serious concerns with the performance of some DOEs, the UNFCCC secretariat re-assess all projects that were already validated positively by a DOE and a large fraction of projects are undergoing a review by the CDM Executive Board. The concept of additionality was already debated controversially in the negotiations of the Marrakech Accords. Several reports have questioned the additionality of many CDM projects. This re-opens the debate how the environmental integrity of the mechanism can be maintained. Evaluations in the literature came to the conclusion that the CDM does currently not fulfil its objectives of helping developing countries to achieving sustainable development. The geographical distribution of projects has been of concern to least developed countries and sub-Saharan African countries which merely benefit from the CDM. Finally, some publications have criticised the CDM more fundamentally for its design as a market mechanism and for using neoliberal market approaches to address the challenge of climate change. These different critics to the CDM have resulted in many calls for reforms to the CDM, with sometimes rather diverging suggestions.

The call for reform is a consequence of many expectations that were placed on the CDM. The Kyoto Protocol already defines several objectives, including that the CDM should contribute to the ultimate objective of the Convention, that it should reduce the costs of achieving emission targets, that it should assist developing countries in achieving sustainable development and that emission reductions credited should be real, measurable and additional. In designing the mechanism, Parties to the Kyoto Protocol have formulated further objectives, including that the mechanism should contribute to technology transfer, that it should work in an efficient and transparent manner, that there should be a – not further defined – geographical balance in the distribution of the CDM projects around the globe and that the CDM should preferably address emissions in all sectors. It is obvious that there are trade-offs in achieving these diverse objectives. Hence, next to reforms to the CDM, one could also call for a review of the objectives of the CDM and think about whether other instruments may not be more suitable to achieve some of the objectives of the CDM.

As a project-based offsetting mechanism, the CDM has strong limits. Firstly, as an offsetting mechanism it does not directly result in global emission reductions but only enables a more cost-effective achievement of emission reductions. Secondly, a crediting mechanism will never fully solve the problem that the determination of the baseline scenario and the demonstration of additionality are a hypothetical and counter-factual exercise that results in considerable uncertainty. Whatever the procedures and criteria to demonstrate additionality, a certain amount of “free-riding” projects will always be part of the CDM. Compared with a cap-and-trade system, any crediting mechanism has limits in its environmental integrity. Thirdly, it is difficult to address emissions with a project based mechanism in sectors where policies and regulations are more effective tools to address emissions.

While the CDM can be further improved through several adjustments, including those highlighted in this report, it is also important to explore new mechanisms and approaches for a post-2012 climate regime. This could include sectoral mechanisms which may be better suited to address mitigation potentials in sectors that are currently underrepresented under the CDM. Sectoral mechanisms avoid the hypothetical assessment of the additionality of individual projects but have a several other challenges, including the availability of reliable data, the uncertainty of business-as-usual emissions in the sector and the question how incentives to reduce emissions are given to the private sector. Experiences gained with the emerging company-based emissions trading schemes around the world can help to address these issues. For some objectives, such as achieving sustainable development and the transfer and deployment of innovative technologies, other instruments outside the carbon market could be explored.

Should the CDM still play an important role in the future, several reforms should be envisaged. Some improvements could be implemented already during the first commitment period of the Kyoto Protocol and be decided upon in the ongoing review of the Kyoto Protocol under its Article 9. This includes improvements to the governance of the mechanism, a strengthening of the framework for Designated Operational Entities (DOEs) and more objective criteria to assess the additionality of CDM projects. Other reforms could become effective after 2012. A CER discounting scheme could provide for more ambitious global GHG mitigation efforts. It could potentially also help to improve the sustainable development benefits of the CDM, the regional distribution of CDM projects and the contribution of the CDM to technology transfer, by differentiating the discount rates between countries and project types.

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