CDM INVESTMENT NEWSLETTER

Nr. 2/2007 A joint initiative of BEA International and the Climate Business Network

Programmatic CDM

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Editorial

The long-awaited new approach to undertaking project activities under a Programme of Activities (PoAs), expected to provide an entry point for project types that have hitherto been unable to make it into the CDM pipeline as single projects due to their individual small size and the comparatively high transaction cost, is having a difficult and lengthy birth.

As demonstrated at the recently-concluded EB (31st session) there are still divergent views on some of the remaining items in their guidance with most of the usual sticking points again raising their heads; additionality, boundaries, leakage, monitoring, baseline emissions and methodologies. In addition, the question of size for the individual projects (CDM project activities or CPAs) as well as limits on the PoA size, and number of CPAs in a PoA, caused the EB members not just problems in coming to an agreement but also in managing their pronunciation and the distinctions between the acronyms! There were also divergent views on which body should deal with small scale methodology 'adaptation' for inclusion in a CPA under a PoA (the SSc WG, the Meth Panel, or both jointly) with the term 'adoption' adding a new measure of confusion and a verbal stumbling block.

While the public will finally get a look at the draft guidance and procedures in an annex to the next EB meeting agenda at the end of June, these still cannot be used as they must be given a (hopefully) final review before being 'adopted'. Whether the EB will be able to come to final agreement, so that PoAs and CPAs can start after that meeting, remains to be seen. However, the EB is aware of the time constraints and some members tried to introduce a schedule for the different administrative elements (who would do what, when?) that would need to play a role in PoAs as well as in terms of complying with the COP/MOP request to finalize the guidance "… with utmost priority…".

What is doubtful, given the delays, is that there will be any PoAs and CPAs entering the official pipeline by Bali so experience will still be shaky to non-existent at that time, but hopefully there will be some side events that will allow an exchange of views on progress in addressing early "practicalities" in the process of PoA development; findings on implementation of CPAs under PoAs will still be some time coming.

In the meantime, this issue of the Newsletter may give readers some food for further thought; although we had hoped to have some final texts to present to our readers. There has been a relative flood of offers to prepare articles for this, what is now a 'bumper' issue. We have articles on the policy side that review the historical decision-making process on PoAs (page 3), suggest that the guidance and procedures do not go far enough (page 9) and that recommend including some of the 'clearer' procedures adopted under the new ISO 14064 standard (page 6). Articles have also been submitted from the technical perspective covering lighting (page 10), iron and steel (page 15), biofuels (page 17), and energy efficiency (page 20) while yet others cover different regional perspectives from Africa/South Africa (page 20), Asia/India (page 15), South America/Brazil (page 17), the Mediterranean region (page 24), and the JI 'region' (page 26).

Given the wealth of ideas that can be seen in this Newsletter, and the pending release of guidance, procedures and associated document formats, we feel that programmatic CDM will be a fertile area in the near future with lots of developments that promise much discussion with increasing potential for mitigation activities that will also provide an increase in 'ancillary benefits' beyond the emission reductions.

'Programmes of Activities' under the CDM: State of Play, by Michael Mehling, Faculty of Law and Economics, University of Greifswald, and Ecologic – Institute for International and European Environmental Policy, Berlin

INCLUDING 'PROGRAMMES OF ACTIVITIES' into the ambit of the Clean Development Mechanism (CDM) reflects an attempt to reconcile its twin aspirations of promoting sustainable development while facilitating compliance with greenhouse gas mitigation commitments.[1] As such, programmatic CDM echoes a story of reform, answering to dissatisfaction with the performance of conventional CDM and the realities of project implementation under its current regulatory framework. While the CDM is largely considered a success,[2] arguably the one aspect of the Kyoto Protocol that has 'taken off'[3] with 624 projects registered by 15 April 2007, the geographic distribution of project activities and a perceived bias for project types with few sustainable development benefits have prompted criticism and persistent calls for change.[4]

Entering onto this stage, programmatic CDM has been hailed as a potential solution; a means to *"promote a move towards low or carbon-free technology on a wide scale and in different locations across the world."*[5] Formally known as a 'programme of activities' (PoA),[6] programmatic CDM involves the aggregation of several smaller emission reduction activities and their submission as a single CDM activity, employing one set of methodologies for baseline determination and the monitoring of project performance. All this occurs with a view to reducing transaction costs by spreading the fixed outlay for project design, validation, and verification over a series of activities carried out in a specified period of time. Accordingly, programmatic CDM is ideally suited for small, but easily replicable activities in the areas of renewable energy and energy efficiency, explaining its attraction as a vehicle for achievement of the CDM 'development dividend.' The varied

contributions to this issue canvas a broad picture of the many ways in which programmatic CDM may eventually bear out in practice.

Given the efficiency benefits it offers, aggregation is no new phenomenon under the CDM, with methodological aggregation, for instance, visible in baseline methodologies applicable to comparable projects in a specified category.[7] Already, a number of registered projects describe themselves as 'programmes'[8] involving activities at different sites or through more than one sector, although these were not formally registered as PoAs. A growing number of projects in the CDM pipeline can be identified as potential PoAs,[9] however, evidencing the appeal of this new mechanism. And yet, in recent months, the earlier enthusiasm has partly waned, with one expert close to the policy process asserting *"a grave risk that programmatic CDM will wither on the vine as the window of opportunity for organizing CDM projects is closing fast."*[10] Uncertainties about the precise definition of PoAs and a confusing array of divergent proposals have unsurprisingly translated into strong demand for authoritative guidance, ideally from the very bodies entrusted with the formulation of binding rules and approval of project proposals. Rather than probe conceptual aspects or formulate policy suggestions, therefore, this article limits itself to an outline of recent documents adopted by the actors officially involved in the process of operationalising programmatic CDM.

ADOPTION OF A FORMAL DECISION on PoAs was one of the many notable outcomes of the first Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (COP/MOP) convening in Montreal, Canada, from 28 November to 9 December 2005. Negotiating in the labyrinthine venue of the conference, the *Palais des Congrès*, parties may have been influenced by their surroundings when they decided that

"a local/regional/national policy or standard cannot be considered as a clean development mechanism project activity, but that project activities under a programme of activities can be registered as a single clean development mechanism project activity provided that approved baseline and monitoring methodologies are used that, inter alia, define the appropriate boundary, avoid double-counting and account for leakage, ensuring that the emission reductions are real, measurable and verifiable, and additional to any that would occur in the absence of the project activity."[11]

Raising as many questions as it sought to answer, this decision was disparagingly likened to *"an empty letter"*.[12] And indeed, aside from introducing a distinction between PoAs and policies and standards, this passage has effectively deferred the framing of operational details to subsequent decisions, compelling the Methodology Panel to promptly suggest "*that it would be useful*" if the CDM Executive Board (EB) were to further "*define "programme of activities."*"[13] Based on a set of methodological issues identified in this request, the EB then asked the Methodology Panel to *"prepare a list of options"* for definitions, boundaries, monitoring and additionality requirements, and crediting periods, taking into account a number of responses to an earlier call for public inputs.[14] At its 22nd Meeting in September 2006, the Methodologies Panel responded with a draft proposal on definitions to distinguish between a bundle, a programme, and a policy, as well as alternative definitions of programmes.[15] After requesting that the secretariat 'refine' and subsequently revise the options presented by the Methodology Panel,[16] a process described by one observer as 'bickering' between the various actors,[17] the EB finally responded to an urgent request of COP/MOP2 to proceed with 'utmost priority'[18] by issuing further guidance at its 28th Meeting on 15 December 2006.[19]

In this short document, the EB sets out ten points containing 'basic guiding principles' for the registration of a PoA, which is defined as:

"a voluntary coordinated action by a private or public entity which coordinates and implements any policy/measure or stated goal (i.e. incentive schemes and voluntary programmes), which leads to GHG emission reductions or increase net greenhouse gas removals by sinks that are additional to any that would occur in the absence of the PoA, via an unlimited number of CPAs [CDM programme activities, which are project activities carried out under a PoA]."

According to the guidance document, each PoA must apply one approved baseline and monitoring methodology, involving one type of technology or measure applicable to all activities within the

programme. Both public and private entities may propose and coordinate a PoA, and are then responsible for avoiding double counting of CPAs under another PoA or project activity. They must also provide a clearly defined project boundary, specifying mandatory information for each CPA to ensure that leakage, additionality, baseline and baseline emissions, eligibility, and double counting are unambiguously accounted for. Addressing the contentious relationship of governmental policies and the CDM, the guidance document clarifies that a PoA addressing mandatory local, regional or national policies and regulations is only permissible to the extent that the latter are not adequately enforced. The physical boundary of a PoA may extend to more than one country, and its duration needs to be defined at the time of request for registration. Further activities may then be added over the entire duration of the PoA, with a crediting lifetime of ten years or up to three times seven years. Still, the crediting lifetime of individual CPAs is strictly limited to the end date of the PoA, whose lifetime may be up to 30 years. Accordingly, if a CPA is launched towards the end of the PoA, it can likewise be credited only for the remaining lifetime of the PoA.

While the foregoing principles have gone a long way to shed light on central features of programmatic CDM, actual implementation by project developers will invariably depend on further specification of the various stages in the project cycle. At the same time as it adopted the guidance document, therefore, the EB requested the secretariat to further refine a proposal on procedural modalities which the secretariat had submitted with the draft agenda.[20] After postponing the discussion of these revised modalities due to delayed inputs from the public, the EB addressed the evolving proposal – including a draft PoA design document and a draft CPA design document – at its 30th Meeting on 23 March 2007, but failed to reach agreement on several substantive elements.[21] Among other things, the EB was unable to achieve consensus on whether an environmental assessment and stakeholder consultations should be mandated prior to the PoA or to the CPAs; a further issue of contention was the renewal of the operating period of a PoA to allow for updated versions of methodologies and methodological tools that are applicable to that PoA within its 30 years lifespan.[22] Once again, the secretariat was mandated with presenting a new draft in time for the last EB Meeting, which was held from 2 to 4 May 2007.

IN ALL LIKELIHOOD, the actors in the foregoing process are painfully aware of the pivotal role occupied by programmatic CDM in mobilising the development benefits of the Kyoto Protocol. Indeed, the current chairman of the EB has gone so far as to suggest broadening the CDM to include national policies, adding to its function as a central incentive in *"any post-2012 climate change agreement"*.[23] Given the slow progress on programmatic CDM, it may be premature to look beyond the current architecture towards even more controversial alternatives. Despite the clear mandate conferred by COP/MOP2, which requested that programmatic CDM be afforded 'utmost priority', the EB proved unable to swiftly adopt essential guidance on its practical operation, being instead mired down by ideological differences and semantics. By limiting itself to a document outlining basic principles, but deferring the adoption of procedural modalities and further details on crucial aspects such as fees, CPA additionality criteria, and monitoring requirements, the EB may indeed have seemed willing to risk that programmatic CDM 'wither on the vine'. Against that backdrop, the EB moved into the 31st Meeting earlier this month with a growing burden of responsibility, and it remains to be seen whether its most recent decisions will finally operationalise the simultaneously promising and problematic topic of this newsletter issue: programmatic CDM.

1 See Article 12 (2) of the Kyoto Protocol to the United Nations Framework Convention on Climate Change, Kyoto, 10 December 1997, in force 16 February 2005, 37 International Legal Materials *(1998), 22.*
2 S. Gabriel, German Minister for the Environment, Nature Conservation and Nuclear Safety, in an interview with T. Forth, 'The Kyoto Mechanisms have been a Success', 4 JIKO Info Special (2006), 1-3.
3 W. Sterk, 'CDM Takes Off, EB Charts further Course', 4 JIKO Info (2006:2), 7.
4 For a recent overview of the discussion, see A. Cosbey, D. Murphy, J. Drexhage, and J. Balint, Making Development Work in the CDM (Pre-Publication Version, IISD: Winnipeg, 2006), 4-5.
5 Point Carbon, 'EB Decision Boosts "Programmatic CDM"', CDM & JI Monitor (10 January 2007), 5.
6 On the terminology, see J. Schmidt et al., 'Program of Activities' as CDM Projects: Implications of the Montreal Decision (Washington, D.C.: CCAP, 2006), 5-9.
7 Joint Implementation Network, 'EB Decides on Programmatic CDM', 12 Joint Implementation Quarterly (2006:4), 4.
8 Meth Panel, Report of the 21st Meeting, 21 June 2006, Annex 21: Issues Related to Implementing Project Activities under a Programme of Activities, 1.
9 Point Carbon, supra note 4, at 5.
10 A. Michaelowa, 'Viewpoint: How to Save Programmatic CDM', CDM & JI Monitor (1 November 2006), 1.
11 See Decision 7/CMP.1, Further Guidance relating to the Clean Development Mechanism, para. 20, U.N. Doc. FCCC/KP/CMP/2005/8/Add.1.
12 Michaelowa, supra note 13, 1.
13 Meth Panel, supra note 6, 2.

14 EB, Report of the 24th Meeting (CDM-EB-25), 21 July 2006, para. 37; the public comments can be found on the Internet at: http://cdm.unfccc.int/public_inputs/meth_def_pol/index.html (last accessed on 15 April 2007).
15 Meth Panel, Report of the 22nd Meeting, 13 September 2006, Annex 13: Draft Proposal on Definitions to Distinguish between a Bundle, a Program and a Policy as well as Alternative Definitions of a Program.
16 EB, Report of the 26th Meeting (CDM-EB-26), 29 September 2006, para. 34; Report of the 27th Meeting (CDM-EB-27), 1 November 2006, para. 28.
17 See Michaelowa, supra note 13, 1.
18 Decision 1/CMP.2, Further Guidance relating to the Clean Development Mechanism, U.N. Doc FCCC/KP/CMP/2006/10/Add.1, para. 16 (a).
19 EB, Report of the 28th Meeting (CDM-EB-28), 15 December 2006, Annex 15: Guidance on the Registration of Project Activities under a Programme of Activities as a Single CDM Project Activity, available on the Internet at: http://cdm.unfccc.int/EB/028/eb28_repan15.pdf (last accessed on 15 April 2007).
20 EB, Proposed Agenda of the 28th Meeting – Annotations, Annex 3: Draft Guidance on Registration of Project Activities under a Programme of Activities as a Single CDM Project Activity.
21 EB, Report of the 30th Meeting (CDM-EB-30), 23 March 2007, para. 56.
22 IETA, Minutes of EB 30 (2007), 2, 8-9; Point Carbon, 'CDM Market Briefs', Carbon Market News,26 March 2007.
23 See the interview with Hans Jürgen Stehr, 'In the Hot Seat' 8 Environmental Finance (2007:6), 36.

Can ISO 14064 Help the CDM and JI Processes? by Pierre Boileau – Manager, Climate Change – Canadian Standards Association[1]

THE CLEAN DEVELOPMENT MECHANISM (CDM) EXPERIENCE has demonstrated a certain variability of both process and documentation that has led to delays in approval of both methodologies and project applications. With the introduction of the ISO 14064 standard, an international, regime neutral, architecture now exists that can work in a complementary fashion to the existing CDM and emerging JI requirements. This article examines the existing CDM and Joint Implementation (JI) guidance to determine where requirements from the ISO 14064 standard may streamline the CDM or JI project development cycle. Examples where CDM or JI requirements can be superimposed on those of ISO 14064 in a complementary fashion to improve the overall efficiency of the CDM or JI application processes are also highlighted.

COMPARISON OF THE CDM AND JI GUIDANCE WITH ISO 14064 There are many components to the CDM or JI project cycle that could be streamlined to improve the efficiency of the processes. Some of these are within the control of the CDM or JI administration and others are within the control of the project developer. ISO 14064 focuses only on the technical requirements of greenhouse gas quantification, reporting and verification, and therefore can only contribute to assisting the project developer with those aspects of the project cycle.

The ISO 14064 standard contains three stand-alone sets of requirements, one to assist organizations in preparing their greenhouse gas inventories, a second to help project proponents calculate the emission reductions or removals from their projects and a third that explains to greenhouse gas verifiers how they should proceed to validate or verify any greenhouse gas claims. The focus of this assessment is to compare the ISO 14064 project-level quantification and reporting requirements and guidance with that of the CDM and JI. We have also looked at whether the ease of use of the ISO 14064 requirements and guidance could improve the effectiveness of how project proponents produce their documentation and have examined the areas where CDM and JI guidance adds value to the ISO 14064 requirements for project developers[2].

The specific documents reviewed for this article are referenced at the end of the article, comprising the latest guidance available on the UNFCCC web site as well as the March, 2006 version of the ISO 14064 standard. Although this was a qualitative review, it did highlight some key findings:

- The ISO 14064 requirements and guidance are comparable to those of the CDM and JI and can be used in a complementary fashion. In particular it is possible to
  - 'overlay' the requirements of a greenhouse programme, such as CDM or JI, on to those of the ISO standard
  - use decision-making criteria and procedures from existing 'good practice guidance', such as from CDM or JI, to maintain compatibility and minimize duplication of effort
  - fully document the project so that it is verifiable, no matter which greenhouse programme reporting requirements are selected;

- Because of the consolidated nature of the ISO 14064 requirements and the systematic approach taken to their presentation, a project proponent using this document is likely to find this approach easier to use than the existing CDM or JI requirements. In particular, the
  - lifecycle approach to initial selection of sources, sinks and reservoirs (SSR) for the project and baseline, followed by identification of which SSRs are relevant for quantification
  - categorization of all SSRs as either controlled, related or affected by the project, thereby creating a matrix of SSRs that define the project boundary
  - systematic approach to the identification and consideration of different baseline scenarios and the use of good practice guidance for the determination of which one is most appropriate
  - clear requirements for development of monitoring and data quality management plans along with a comprehensive set of documentation that ensure that project data and information are verifiable;
- The ISO 14064 requirements focus much more on 'what needs to be done' to quantify the GHG emission reductions or removals from a project rather than the 'how to do it'. The CDM and JI guidance will still need to be used in some areas to provide the 'how to' part of project-level quantification and reporting.

APPLYING ISO 14064 TO A CDM OR JI PROJECT The third finding highlights a potential drawback for a CDM or JI project developer to using ISO 14064 for their GHG quantification requirements. Although the ISO requirements may be clearer, additional guidance still needs to be accessed in order to effectively use the standard and ensure that the documentation produced is still compatible with the CDM or JI rules. At the end of the day, the project developer still needs to have two books open to ensure that they do the work properly.

The ISO 14064 drafters have taken this into account by including an informative annex that explains which additional guidance or requirements would need to be met to apply the standard to a CDM or JI project. It also includes the relevant web references to the CDM or JI rules and guidance. The annex points out that additional guidance is likely to be required in the areas of:

- Appropriate CDM or JI terminology;
- Applicable crediting periods for the CDM and JI programmes;
- Simplified modalities and procedures for small-scale projects;
- Special modalities and procedures for afforestation and reforestation projects;
- Format and content of the CDM or JI Project Design Document (PDD);
- Understanding how the CDM and JI concepts of 'project boundary' and 'leakage' relate to the ISO 14064 concepts of 'source, sink and reservoir selection' and 'affected sources';
- Specific CDM or JI requirements for determination of the baseline scenario;
- Use and application of the CDM additionality tool;
- Use of approved CDM Methodologies as 'good practice guidance' within ISO 14064;
- CDM and JI validation and verification requirements.

Finally, the ISO 14064 recommends accessing the most recent CDM or JI guidance in these areas to ensure that changes that may have taken place since the publishing of the standard are correctly applied for the CDM or JI project.

SITUATION/BENEFITS ANALYSIS Clearly this creates an additional dilemma for CDM or JI project developers. They are likely to ask themselves questions such as:

- If I'm used to the current CDM/JI documentation, why would I change?
- If I'm a new CDM/JI project developer, why would I start by using an ISO standard that may not have been approved by the CDM Executive Board or JI Supervisory Committee?
- If I have to access additional CDM/JI guidance as well as the ISO standard, why wouldn't I simply use all of the CDM/JI guidance (i.e. what additional benefits does ISO 14064 bring)?

These are all extremely relevant questions and must be factored into a project developer's rationale for incorporating the use of ISO 14064 into their project development practices[3]. Here are some likely considerations that a project developer might wish to incorporate into their decision making on this issue:

- The UNFCCC was an observer throughout the 3-year ISO 14064 development process and has expressed support for these standards by noting that they *"provide frameworks for assessing and verifying greenhouse gases at different levels. Applied broadly, they lessen the transaction costs to companies, for example, for those operating in several countries, the costs of understanding different rules and regulations would vanish"*[4];
- Completing the CDM or JI project application process requires consultation and understanding of several documents that contain varying levels of requirements and guidance. This guidance focuses very heavily on the processes of determining the baseline and establishing monitoring plans, while providing few requirements or guidance for key steps such as establishing the project boundary, ensuring appropriate data quality management or creating a comprehensive system of project documentation. These are all areas where the ISO standard is particularly strong;
- ISO standards are structured and written in a fashion to be interpreted literally with very concise text that avoids confusion (every word in the standard means something). Guidance on how to meet the requirements is usually kept separate in order to simplify the use of the standard. This helps ensure that users clearly understand what is required and also helps streamline the verification process by making each requirement a pass/fail assessment. The current CDM and JI documentation mixes requirements and guidance in the text, making the documents more difficult to use and requiring more interpretation at the verification stage;
- The ISO 14064 was crafted to enable the use of additional guidance and programme requirements in the areas of quantification and verification. The standard specifically states this in the Scope section. In addition, the informative annex of the standard helps users identify the additional guidance that is needed from the CDM or JI documentation. This makes the overlay of the CDM and JI guidance on to the requirements of the ISO standard more straightforward;
- If an organization or project developer already uses ISO standards, the structure and interpretation of ISO 14064 will be familiar to them. The ISO 14064 standards were also crafted to be easily integrated into ISO management systems and to accommodate ISO technical standards as 'good practice guidance' in their application.

CONCLUSION Can the ISO 14064 standard help the CDM and JI processes? This article, along with the previous qualitative assessment, demonstrated that there are areas where the ISO 14064 standard can help. Because of the policy-neutral design of the ISO standard, these areas are mainly focused on streamlining the technical requirements for greenhouse gas quantification, documentation and verification. There will still be a need to overlay the policy requirements of the CDM and JI programmes as well as incorporate the use of CDM and JI guidance on how to meet certain technical requirements (i.e. establishing the baseline).

ISO 14064 was conceived to accommodate these additional policy and programme requirements and to enable the use of outside guidance for meeting them. The standard also requires the use of 'good practice guidance' to enable the use of CDM-approved methodologies for quantification of greenhouse gas reductions or removals from specific project types.

The ISO 14064 standard provides an additional tool for project developers to streamline those aspects of the CDM or JI project cycle that they control. It provides a clear and concise set of requirements that are comparable to those of the CDM and JI programmes along with the flexibility to be adaptable to them. As with other new tools, they require an investment of time to climb the learning curve; however, project developers are likely to eventually save time and resources by applying the ISO 14064 standard for their project development needs.

References

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Guidelines For Completing The Project Design Document (Cdm-Pdd), And The Proposed New Baseline And Monitoring Methodologies (Cdm-Nm), Version 06.2, accessed from website: http://cdm.unfccc.int/Reference/Documents/Guidel_Pdd_most_recent/English/Guidelines_CDMPDD_NM.pdf on Feb. 21, 2007.

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'Bureaucratic' CDM constricts output of carbon credits, Environmental Finance, reproduced by the World Business Council on Climate Change, 12 Oct. 2006, accessed from website http://www.wbcsd.org/plugins/DocSearch/details.asp?type=DocDet&ObjectId=MjA4OTY on Feb. 23, 2007.

[1] The Canadian Standards Association (CSA) acted as the international secretariat to ISO for the development of the ISO 14064 standard between 2002 and 2006. CSA is a not-for-profit membership-based association. A leading developer of standards and, codes, CSA aims to enhance public safety and health, improve quality of life, facilitate trade and preserve the environment.
[2] This assessment was originally prepared for the workshop entitled Designing Effective Compliance Systems to Support Emissions Trading organized by the International Network for Environmental Compliance and Enforcement (INECE), May 8-9, 2007, Dublin, Ireland. The assessment can be obtained from http://www.inece.org/emissions/dublin/Boileau.doc
[3] Project developers should also note that they will need to purchase the standard from ISO or their relevant national standards body.
[4] UN's climate change senior official praises new ISO 14064 and ISO 14065 standards, Viewpoint, ISO Management Systems, Sept. – Oct. 2006.

Micro-Project Activities under the CDM, by Lucy Naydenova[1]

AS THE ONLY KYOTO INSTRUMENT FOR NON-ANNEX I COUNTRIES to contribute directly to combating global climate change, the CDM has been charged with the ambitious expectation of addressing a whole range of issues associated with the developing world, such as supporting sustainable development, know-how and technology transfer, as well as ensuring an equitable distribution of projects.

However, the CDM is also a market-based mechanism with high levels of fixed development costs and a complex approval process, leading to the bigger markets and larger project-types attracting more interest. If no measures are taken to balance this natural trend, the current disparities will increase and a whole range of potential mitigation activities will be lost. Therefore, there is a need for solutions that will anticipate market forces with an optimized performance of the CDM.

Micro-projects present one example of missed mitigation opportunities due to the very small scale of the activities and the limited potential revenues from CERs sales that cannot cover the Kyoto-related development costs[2]. This could be a serious burden for certain projects such as:

- Micro-generation of low-carbon or renewable heat and power with solar photovoltaics, solar thermal collectors, heat pumps, micro-wind turbines, micro-hydropower turbines, wood-fuel boilers and micro combined heat and power units;
- Energy-efficiency and conservation by for instance home improvements, fuel-switching in personal vehicles, switching to a fuel-efficient vehicle, use of energy-efficient appliances and installations for medium- and small-size companies.
- Managerial, logistical and design solutions that lead to energy conservation.

Such activities usually have a very high, sustainable, impact on local development and can also trigger behavioural changes in less tangible areas. In some cases, especially if the activities involve large-scale dispersion of a uniform measure, appliance or technology in an identifiable geographical region, the cumulative reductions can be sufficiently significant and measurable to consider CDM as the means of implementation. However, in order to accommodate micro-project activities under the CDM, certain provisions, definitions and requirements, as specified and interpreted by the Executive Board, need to be revised to cover a broader range of mitigation activities.

THE RECENT GUIDANCE ON THE REGISTRATION OF PROJECT ACTIVITIES UNDER A PROGRAMME of activities under the CDM could accommodate some project types (accumulations of replicated) of micro-activities, also in the least developed countries, but such programmes are likely to be less attractive than programmes of larger activities in larger, more developed countries.

In order to accommodate single micro-project activities and accumulations thereof, even more simplified modalities and procedures are needed. Such procedures should be user-friendly and

made applicable exclusively for micro-project activities, since less complexity may partially compensate for the impacts of market forces and make very small project sizes also attractive. Some peculiarities associated with micro-project activities are:

- The project site cannot always be identified (in advance), especially in case of sales or distribution of mobile devices, appliances and measures taken by households and services;
- In some cases (accumulations of replicated activities) the total number of micro-projects is not clear in advance, for example if voluntary acquisition is involved;
- Local individuals, NGOs, cooperatives, small- and medium-sized enterprises (the most likely initiators of micro-project activities) usually do not have the skills to identify and prepare a CDM project;
- Demonstration of additionality based on the current tool and the monitoring of accumulations of replicated micro-project activities are likely to require a disproportionate effort;
- It can be difficult to guarantee the project duration in advance;
- (Almost) no approved CDM methodologies are available yet for mitigation on the demand side, by services, through organisational and management solutions, by individuals and households, as well as in the private transport sector.

These and other difficult and complex issues stand in the way of picking the 'high-hanging' fruit, but given the need for much greater GHG reductions[3] to stabilize emissions to the atmosphere, it is never too soon to start thinking of how to get there.

SOME POSSIBLE SOLUTIONS ARE:

- Monitoring of micro-project activities based on the current practices for other CDM project types will be disproportionately expensive. Therefore approval of tailor-made monitoring methodologies for micro-projects should be free, quick and simple;
- For accumulations of such activities, random sampling might not always be a reliable option, therefore deposit and disposal in combination with reimbursement, also with a view to recycling, could be considered as a plausible and conservative monitoring alternative, especially for appliances;
- Development of user-friendly software, tools and templates to calculate reductions of micro-project activities and prepare PDDs without involvement of consultancies can reduce costs and make micro-CDM more accessible to the public;
- Host country governments could help by greater and more proactive participation in the design and implementation by providing country-wide baselines (e.g. sector-, product-, service- or function-specific) and perhaps by proposing lists of technologies that can be considered additional by default.

[1] This article represents the author's private views and in no way reflect those of the Dutch DNA!
[2] The Kyoto-related costs increase the total initial investment need with at least US$50,000 (Source: Worldbank REToolKit)
[3] More than the anticipated outcome of the first commitment period under the Kyoto Protocol

Let There be Light in the CDM, by Christiana Figueres and Martina Bosi[1] [2]

ONE OF TODAY'S GREATEST SUSTAINABLE DEVELOPMENT CHALLENGES is accelerating access to reliable and affordable modern energy services to the estimated 1.6 billion people in developing countries that have none, while addressing the threat posed by climate change (World Bank 2006). There is no silver bullet and a suite of measures and technologies will be necessary. However, improvements in energy efficiency are a fundamental part of the solution.

Energy efficiency can reduce the need for capital-intensive supply investments and is one of the most promising sectors for improving the adequacy and reliability of power systems, increasing energy security and reducing emissions. Unfortunately, these options are not common practice due to well-documented market failures and policy barriers. There are several end-use applications around the world where the CDM could help stimulate greater energy efficiency. This article focuses specifically on the efficient lighting sector[3] which has broad applicability throughout the developing world.

In the medium term, what is needed is a phasing out of the least energy efficient lighting techniques and systematic dissemination of the most efficient technologies, akin to the process under the Montreal Protocol. In the meantime, the Clean Development Mechanism (CDM) could channel carbon finance to cover the cost of some of the programmes that would eventually bring about the desired market transformation. However, the international emission reduction market has bypassed this opportunity. Out of the 1,783 projects currently in the CDM pipeline, 230 are energy efficiency projects (mostly – 86% - industrial efficiency), representing 7.6% of the expected annual certified emission reductions (CERs) of the market;[4] only 4 of these target end-use applications. This is possibly due to the fact that they typically involve a large number of users in different sites, compared to the more common discrete single-site CDM project activities that dominate the CDM pipeline. Fortunately, the COP/MOP 1 decision to include "programmes of activities" in the CDM has the potential to open the door to the implementation of more end-use energy efficiency (EE) projects in developing countries.

The purpose of the article is to show the complementarities and synergies between the implementation of energy efficiency measures and the CDM.

POTENTIAL AND BARRIERS Although frequently overlooked, the lighting sector is a major source of GHG emissions. World-wide, grid-based lighting is responsible for 19% of total global electricity consumption (IEA 2006a). By 2030 developing countries are expected to account for 60% of global lighting electricity demand due to new construction, ongoing electrification, and rising illumination levels.

The International Energy Agency (IEA) points out that there is a *"very large cost-effective potential to reduce energy demand and GHG emissions through more energy efficient lighting"* (IEA 2006a). It estimates that approximately 735 TWh and 456 $MtCO_2$ could be reduced in non-OECD countries by 2020. Lighting energy can be saved in many ways, including improving the efficiency of the light source, of the ballast, of the luminaries, improving the control gear deployed, and making better use of daylight.

Governments and multilateral institutions have been implementing EE lighting programmes since the energy crisis of the 1970's. Today all industrialized countries have various sorts of EE programmes for lighting, but this is not the case in developing countries.

INTEGRATING THE CDM INTO EFFICIENT LIGHTING PROGRAMMES There are several well-documented market failures and factors that impede the use of efficient lighting, particularly in the developing world.; The CDM cannot overcome all known barriers to EE, but as a financial instrument, it can help meet some of the financial challenges, since it creates a new asset (emission reductions) which has market value that can be converted into an additional income flow.

This second source of income is key to the dissemination of efficient lighting because it can help close the financial gap created by split incentives; those who invest in the system and want to keep upfront costs low are frequently not those who use the system and would benefit from efficient systems with low life cycle costs. Although CERs are the emission reduction equivalent of the energy savings, the income from their sale need not flow to those who benefit from the savings, but rather can be directed to the cost centers of the project. Several concrete examples can illustrate this: (A) Income from CERs could be used by producers of high efficiency bulbs and lighting systems to lower the net cost of production, thus diminishing the cost to distributors, retailers, and consumers; (B) Costs incurred by landlords and developers to improve lighting installations could be offset by CERs; (C) The steady income flow from sale of CERs could help fund incentive schemes for consumers to purchase and install more efficient equipment.

The COP/MOP 1 decision to include "programmes of activities" (PoA) opens the door to integrating the CDM into energy efficiency activities. An efficient lighting programme can qualify as a CDM PoA if it applies one approved CDM baseline and monitoring methodology across the entire programme. Currently the CDM Executive Board has only approved one large scale methodology for efficient lighting[5] (which has not yet been used).

At the core of the CDM modalities and procedures is the accurate quantification of emission reductions. CDM baseline and monitoring methodologies must address the following issues:

- *Project boundary* The boundary of an efficient lighting programme is the physical location of the targeted replacement or installation activities plus the grid supplying the electricity saved. The locations of the individual activities can be divided into several CDM

programme activities (CPAs) whose boundaries (area, city etc.) are clearly established in the baseline methodology. In some programmes the exact location of the individual activities is known at the outset (e.g. specific public sector buildings or municipal lighting systems). In other programmes, the geographic coverage is known at the outset, but not the specific location of the individual GHG reducing actions (e.g. a programme of incentives to improve public street lighting). In these cases, the targeted geographic coverage of each CPA is made explicit and is considered fixed for the duration of the crediting period. The exact locations where actual emission reductions occur over time (e.g. streets where lumens are increased) can be determined *ex post*;

- *Baseline* For purposes of the CDM, emission reductions are the difference between a counterfactual baseline emission level and the actual project emissions. The calculation of the respective baseline emissions is determined from a baseline 'methodology'[6].

  The lighting sector includes different types of energy efficiency programmes, but under the CDM each programme can have only one baseline methodology. That baseline shall be appropriate to the market in which the programme occurs: discretionary retrofit, planned replacement, and new installations (Arquit Niederberger and Spalding-Fecher, 2006).

  For discretionary retrofits (premature replacement of existing technology to improve energy efficiency), the baseline scenario would usually be the actual or historical emissions. The baseline emissions are associated with the energy use that would have occurred in the absence of the EE project. The baseline energy use can be derived through an energy audit of existing conditions or through baseline control groups. It is then multiplied by an emission factor determined with base year electricity use data and characteristics of the power plants supplying the electricity.

  The baseline of planned replacement projects (replacing existing technology at the end of its lifetime with high efficiency equipment) and new construction projects (installing high-efficiency equipment at the time of construction) must refer to the energy use – and related emissions - that would occur without the CDM projects, e.g. referring to cases similar to the CDM project but where the intended EE programme has not been performed (i.e. "common practice");

- *Additionality* must be demonstrated at both the level of the programme and of the CPA. In the case of discretionary retrofits, the sale of the CERs may be the only source of cash income to the project implementer so additionality of the CPA can be demonstrated by showing that, without the CER revenues, the entity implementing the programme would lack the resources to disseminate the efficient lighting equipment, or to establish the necessary controls to ensure that manufacturers are complying with the standards and labeling requirements.[7] In the case of planned replacement or new construction, the demonstration of additionality must again be seen from the perspective of those who fund and implement the programme. While efficient lighting is the least cost option for the energy bill payer, it is not so for the builders/developers and landlords who would make the investment;

- *Predictability of emission reductions* An issue that is often raised in the context of energy efficiency projects is how well *ex-ante* estimates of energy savings compare with the *ex-post* measurement of achieved savings. For CDM efficient lighting projects, comparison of expected emission reductions (forecast prior to installation of equipment and typically based on engineering calculations) with achieved reductions (based on post-implementation monitoring and verification) is required. The experience from energy efficiency industry should be useful here;

- *Free riders and positive spill over*[8] For certain CPAs, some of the individual actions might not be additional even if the CPA is demonstrated to be additional. These actions are considered 'free riders'. The energy efficiency industry has evaluated free riders, explicitly and implicitly (Wiel and McMahon 2005). Explicit evaluations can be made using a control group, econometric methods, participant surveys, review of documents in business decision processes, payback comparisons, and engineering modelling. Implicit evaluations are often made comparing the target users' behaviour to that in other regions or countries where there are similar baseline conditions and no programme in place (Wiel and McMahon 2005). Not all approaches are suitable for a given programme, and they differ

with respect to cost and accuracy of their estimates. A CPA needs to specify the proposed approach used to estimate emission reductions attributed to free riders as part of the baseline and monitoring methodology. All other emission reductions would be deemed additional.

Independently of how free riders are measured, in many cases they are more than offset by positive project spillover, i.e. additional energy efficiency impacts that result from the project, but are viewed as indirect rather than direct impacts. In these projects, actual reductions in energy use are greater than those strictly attributed to the project activity (Vine and Sathaye 1999, Quality Tonnes 2005). In efficient lighting programmes, positive spillover effects can occur through a variety of channels including: an individual hearing about the benefits of the efficient equipment and deciding to purchase it on his/her own ("free drivers"); or programme participants that, based on positive experience with the equipment, exchange additional equipment beyond the maximum allotted per user by the programme, or continue to purchase and use equipment with higher efficiency after the programme's end. Spillover is an unintended but welcome consequence of energy efficiency programmes, and could make free riders a non issue;

- *Rebound effect and suppressed demand* The rebound effect refers to increase in demand for energy services (heating, refrigeration, lighting, etc.) when the cost of the service declines as a result of technical improvements in energy efficiency. The argument is that because of the lower cost, consumers and businesses change their behaviour, e.g. raise thermostat levels in winter; cool their buildings more in summer; buy more appliances and/or operate them more frequently, thus eroding the savings from energy efficiency. There is a large body of literature suggesting that the rebound effect is indeed real in many situations, but that it does not usually wipe out projected savings. The rebound effect for residential lighting in industrialized countries has been shown to vary between 5-12%, while for commercial lighting it varies between 0-2% (IEA 2005:6). In the CDM, the energy savings of efficient lighting projects could be adjusted for the level of rebound effect (e.g. through an agreed default discount factor that could be the midpoint of the various estimates), thereby avoiding the cost of measuring the rebound in each individual project.

  However, in the case of many developing countries, it is important to recognize that any rebound effect resulting from projects improving energy efficiency is often linked to situations of suppressed demand due to insufficient supply. The CDM modalities and procedures stipulate that *"the baseline may include a scenario where future anthropogenic emissions by sources are projected to rise above current levels…"* (Para 46)[9]. In this context, it remains to be seen whether meeting suppressed demand through EE will be accepted in the CDM;

- *Double counting* Under the CDM, double counting of emission reductions must be avoided. Efficient lighting programmes involve various stakeholder groups, all of which, in theory, could claim ownership of the energy savings and the associated CERs, i.e. the: manufacturers of the technology; intermediaries (wholesalers, retailers, utilities, etc.); consumers (who may or may not pay the lighting energy bill); entity that manages the financing, etc. However, double counting can be avoided by stipulating that the entity running the programme is the only one authorized to claim CERs. it;

- *Leakage* is the net change of GHG emissions outside the CDM project boundary that is measurable and attributable to the CDM project activity. A CDM project activity must estimate the associated leakage and, if it occurs, deduct the net leakage from the emission reductions achieved within the project boundary. In efficient lighting programmes, any leakage would mostly come from the unauthorized recycling of still functioning lighting equipment that has been displaced by the more efficient equipment. Strictly speaking, in order to minimize leakage, programmes that replace equipment would need to include a monitored scrapping component to ensure that replaced equipment is not used by others[10]. However, from a scarce resources and development point of view, one might question the advisability of destroying functioning equipment in countries where there is evidence of unmet demand and elastic supply;[11]

- *Monitoring and verification* are key to ensuring that CERs correspond to actual emission reductions. Emission reductions from single-site projects are rather straight-forward to

monitor and verify. Efficient lighting programmes that typically involve a large number of activities at different sites over a period of time require a feasible - but still rigorous and effective - approach. For such projects, monitoring of each CPA can be done through statistically robust sampling techniques.

The vast experience with EE programmes worldwide over the past fifteen years has produced a series of widely accepted monitoring protocols.[12] Since energy savings are easily translated into the equivalent GHG reductions - using CO_2 emission factors for the relevant grid or source of power (e.g. ACM0002) - these protocols can be effectively incorporated into monitoring methodologies for CDM PoAs. The International Performance Measurement and Verification Protocol (IPMVP)[13] is perhaps the internationally-preferred approach for monitoring and evaluating energy efficiency projects. While the IPMVP is not detailed enough to serve as a CDM monitoring methodology, it does provide a common conceptual framework and terminology that can form the basis for specific CDM methodologies.

IN CONCLUSION, energy efficiency is one of the most promising sectors for making energy more affordable, improving energy security and reducing emissions in developing countries. End-use energy efficiency accounts for about 67% of energy-related abatement potential identified in IEA analyses such as the World Energy Outlook (2006) and the Energy Technology Perspectives (2006). It is hoped that the new option 'programmes of activities' in the CDM will open the door to implementation of numerous end-user energy efficiency projects in developing countries, serving as a learning ground for future energy market transformations.

Established efficient lighting practices can be used in new methodologies that comply with CDM requirements. The development of rigorous evaluation practices and protocols, along with years of experience in assessing the impacts and results of energy efficiency programmes, has done much to improve the ability to accurately estimate programme impacts on energy use. Experience has shown that the only effective way to accelerate the efficient use of energy is to combine the 'push' of minimum performance standards with the 'pull' from financial mechanisms. By integrating the CDM into energy efficiency programmes, the market value of the CERs can facilitate both the push and the pull.

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[1] This is a summary and update of a paper entitled "Achieving Greenhouse Gas Emission Reductions In Developing Countries Through Energy Efficient Lighting Projects In The Clean Development Mechanism" written by the same authors and published by World Bank's Carbon Finance Unit in November, 2006. (www.carbonfinance.org)

[2] DISCLAIMER This paper was prepared by Ms. Christiana Figueres (independent consultant) and Ms. Martina Bosi (World Bank Carbon Finance Unit). The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the view of the Executive Board of the CDM, the World Bank, or of the Participants in any of the carbon funds managed by the World Bank.

[3] *According to the IEA (IEA 2006b), lighting accounts for almost 1.9 Gt CO2 – more than Latin America's total 2004 energy-related CO2 emissions - and offers considerable potential for electricity savings. There are also other interesting energy efficiency opportunities in other sectors which need to be further examined.*
[4] *Calculated based on CD4CDM website updated April 1, 2007 (http://www.cd4cdm.org/)*
[5] *Distribution of efficient light bulbs to households (AM0046).*
[6] *A list and description of all approved CDM methodologies can be found on the UNFCCC website: http://cdm.unfccc.int/methodologies*
[7] *This reflects the reality of most developing nations that are just introducing EE measures. In countries that are already on the verge of market transformation such as China, the demonstration of additionality may need to take into account expected trends and barriers to further market penetration.*
[8] *For a more elaborate definition of these concepts, see, for example IEA 2003 (p. 160).*
[9] *Text of the 2001 Marrakech Accords (FCCC/CP/2001/13/Add.1) can be found on the UNFCCC website (www.unfccc.int).*
[10] *Ensuring safe disposal could address the environmental problem associated with the mercury content of light bulbs and waste material created by the destruction.*
[11] *On the margin, replaced equipment could replace even less efficient equipment.*
[12] *See Hirst and Reed, 1991; Vine and Sathaye, 1999; FEMP, 2000; IPMVP, 1996-2004; ASHRAE, 2002; and TecMarket Works Framework Team, 2004.*
[13] *http://www.ipmvp.org*

Iron and Steel Sector - Energy Optimization, by M.L.Baharani

ENERGY IN ALL ITS FORMS IS CENTRAL TO PROSPERITY, well being and comfort. Ten years have gone by since the Kyoto Protocol was forged in 1997 in response to concerns of the environmental impacts of energy conversion, distribution and usage. However, the pace of penetration of investments in energy efficiency, aimed at maintaining greenhouse gases emissions below 1990 levels by 2012, has been lower than required. There are operating energy-intensive plants that find attracting investments for *in situ* changes required for energy savings/conservation/ optimization as a risky business proposition. Steel, being the most recycled product contributing to our life style, is one sector that promises challenges and opportunities for investments through programmatic CDM.

The five decades of the post second world war era have witnessed substantial construction and rebuilding including increased well-being and comfort in our life style. This has led to over 1.1 billion ton per year steel production capacity worldwide with the prospect of continued growth. While the world's specific consumption of steel shows a downward trend due to higher population growth in the preceding five decades, the distribution constraints and economic considerations have been prohibitive to steel usage in rural areas of many developing countries. Thus there is room for further growth in the sector, possibly through decentralized finished product manufacturing/distribution.

Considering an average power requirement of 100 MW installed capacity per million ton capacity of steel plant (they vary depending upon process route, raw material, ash in coal, downstream facilities etc.), the 1.1 billion tons of capacity would require 110 GW of power; which is the total installed capacity of India that possesses one fifth of the world population. The specific energy consumption of steel production varies considerably between industrialized countries and developing/transition economies so there is room for optimizing energy consumption.

IN IRON AND STEEL MAKING PROCESS THERE ARE THREE MAJOR CONCERNS that could be considered for programmatic CDM:

- Technology/process options for enrichment of input materials and solid waste management in iron and steel industry;
- Upgrading drives and controls for operational process synergy and optimum power consumption; and
- Harnessing the waste heat from by-product gases of coke ovens, blast furnaces and basic oxygen furnaces.

It would be prudent to limit programmatic CDM to existing projects to start with; new projects can always look for the latest technology/process options with optimum energy consumption. As technologies for the core operations have a life cycle that runs to a few decades, focus is needed on short-term measures for programmatic CDM to succeed, so projects that could be implemented in six to nine months through viable schemes that attract investment should be looked at. These

may, however, require support from thematic trust funds for development of proposals as many may not otherwise be technically or economically viable.

While the iron and steel making units have been consuming considerable volumes of energy with old technologies, the finished product units in the steel sector have undergone improvements in short time intervals due to technological advancement, market requirements of changed products, qualitative improvements etc. Programmatic CDM would therefore best concentrate on the iron and steel making units (coke ovens, sinter plants, blast furnaces and basic oxygen furnaces) that represent a considerable share of consumed energy and from which by-product gases could save up to 10% of the total energy consumed in these units. Efficient recovery/alternative usage (other than burning in flare stack and discharges to the atmosphere) of this waste energy will enhance the competitiveness of iron and steel making, curtail the energy cost and serve Kyoto Protocol objectives. Also, as energy and waste management are areas of increasing concern in the sector today, both emanating from concerns of their environmental impact, the topic of harnessing energy from waste gases is examined further, even though all three areas would be attractive for investment and programmatic CDM.

IN ANY STEEL PLANT PROCESS CONFIGURATION when setting up green field projects, material, energy and gas balances are drawn up and agreed upon as protocol at the beginning. Technological units are identified and product gas produced (quantity and quality), user units of individual/mixed gases and gas balances are detailed. The issue is debated among the various experts and, based on the pre-agreed gas balance protocol the fuel requirement from alternative sources is finalized.

At the construction stage, the primary focus of the promoter is on the production units and the material balance gets first priority as it is directly linked to achieving production targets in the core business. The next priority is energy consumption (electricity, oil and gas, oxygen etc.,) as the bills are presented for payment at regular intervals. The last priority is accorded to the gas balance, after project implementation, as by-product gases easily find their way to the flare stack or atmosphere; this process neither adversely affects production targets nor increases power and energy bills. Another reason for the low priority given to gas balance is that harnessing waste heat from by-product gases calls for a critical examination of viable options (gas mixing, low calorific value fuel applications etc.). The gas balance is also dynamic depending upon the production levels and upon any new production/process units' addition in expansion programmes/product mix changes. Allocating more time, effort, expertise and funds for maintaining the gas balance and implementing new schemes is not part of the core business of the facility therefore, this becomes a least attractive issue to be addressed in operating iron and steel making units.

AS AN EXAMPLE IN INDIA, one of the iron making complexes (with 67 ovens, a 7m tall coke oven battery with a three-chamber coke dry cooling plant, a 180 square meter sinter plant, and a 1,915 cubic meter volume blast furnace) with a gas balance in favor of waste heat recovery, decided for power production using coke oven gas. Accordingly a 24 MW gas turbine was erected and steel-making units are now being constructed next to it thus changing the gas balance scenario.

In 104 years of Indian steel production, this plant is the only one to have ventured into gas turbine-based power generation from by-product gas from a coke oven. The coke oven gas is of low calorific value compared to the fuel normally fired in the gas turbines and has to be first cleaned to the required level then compressed to meet the design parameters for firing in the gas turbine. The main pollutants of concern are naphthalene, tar and dust. The naphthalene content could be reduced to the required level (=< 9 mg/Nm^3 at 8.3 Ata pressure and 45 degree centigrade temperature) by two-stage solar oil circulation in a low pressure scrubber, followed by a high pressure scrubber and coal scar filtration to remove solar oil and tar droplets before clean gas compression. The tar and dust are reduced through wet electrostatic precipitators to a level of =< 1.2 mg/Nm^3. Once the project, now under final stages of implementation, gets into the mainstream it can generate 24 MW of power. The earnings from sale/internal consumption of the power can substantially improve the plant's competitiveness and profitability besides reducing greenhouse gas emissions.

SUCH ENDEAVOURS PROMISE EXCELLENT RETURNS ON INVESTMENT besides serving Kyoto Protocol objectives. Similar opportunities exists in all three areas mentioned above, namely enrichment of input materials and solid waste management, drives and controls for operational

synergy and energy optimization/harnessing by-product gases. Operational iron and steel making units should find time and make an effort to obtain funding for such initiatives.

Given that the 1.1 billion tons/year of installed capacity at current levels require 110 GW of installed capacity of power, a 10 percent power saving potential would reduce the need for 11 GW. This saving of electricity alone, estimated at 4 cents/kWh (in most of the developing/transition economies) would mean US$ 4 billion/year cost savings. Saving electricity generated from fossil fuel would avoid burning 50 million tons of coal (calculated by taking an average of 500 grams of coal burned/kWh of power produced).

For such investment prospects to take off under programmatic CDM, the following are required:

- Confidence-building to take up energy efficiency in *in situ* projects through intricate schemes and innovative solutions that go beyond the core business;
- Motivation of the facilities' human resources to make extra efforts as currently most of the incentives/soft funding exists for technology alone;
- Institutional motivation to enhance competitiveness of existing units instead of facing the threat of closure;
- Motivation of finance institutions so that they do not consider energy saving schemes as risky business and to come forward with easy and soft funding options; and
- Carbon intermediaries/funds that would support development of viable schemes on shared saving/performance-linked business models. Just consultancy or advisory services may not help to achieve the Kyoto Protocol objectives.

Programmatic Biofuel CDM: A Brief Legal Assessment under Brazilian Law and Policies, by Rodrigo Sales & Bruno Kerlakian Sabbag, Trench, Rossi e Watanabe Advogados[1][2]

BRAZIL DULY ADOPTED THE CONVENTION ON CLIMATE CHANGE and Kyoto Protocol into its legal regime, and has since played a crucial role in developing and promoting the CDM.

With new perspectives now under discussion within the Executive Board regarding biofuels and programmatic CDM, Brazil has an important role to play and a special interest in promoting their design and implementation, due to the country's expertise and the significance of ethanol and biodiesel to the economy. However, some issues must still be elucidated by the CDM Executive Board and the Brazilian government to better promote environmental friendly legislation/policies and investments.

The objective of this paper is to explain how the Brazilian CDM market has been constantly evolving, as well as to present business opportunities for programmatic biofuel CDM and the main legal barriers stakeholders have been facing while developing project activities – such as some gaps in the additionality criteria and debates on ownership matters.

BRAZILIAN LEGAL REGIME ON CDM Brazil created its DNA (Comissão Interministerial de Mudança Global do Clima) in July 1999, with the main duties of analyzing proposed CDM activities against 'Kyoto Rules' and supporting the government (at the federal, regional and local levels) on climate change mitigation policies.

Although the DNA has so far been very active regulating CDM project submissions and analyzing proposed activities[3], the government, as a whole, has somehow failed to keep a consistent approach on climate change matters, as will be further discussed herein.

The DNA has so far enacted four Resolutions to regulate local CDM matters, and the Brazilian Central Bank has also enacted regulations providing specific proceedings for capital exchange market and foreign investments related to CDM projects. There is no specific tax treatment on CER revenues yet, but some bills of law intend to establish tax benefits applicable to them.

We wish to highlight the following three Brazilian policies that promote the production and use of renewable sources of energy that have been affected by CDM regulations: (i) Brazilian Ethanol

Program; (ii) Brazilian Biodiesel Program; and (iii) Brazilian Renewable Energy Program – PROINFA.

PROGRAMMATIC CDM AND MANDATORY POLICIES The opportunities for CDM biofuel activities in Brazil have been positively impacted by the evolution of the concept of Programmatic CDM and the preliminary guidance issued, which is further examined and explained by co-authors of this Newsletter.

Linking the EB28 Annex15 and EB26 Annex12 (guidance on double-counting in CDM project activities using blended biofuel for energy use) decisions, to Brazilian biofuel potential, one may anticipate significant business opportunities for CDM project activities, and as a result important contributions to mitigating greenhouse gases emissions. The latter regulates specific matters on biofuel CDM when both production and use are eligible while the former (para 3) provides that *"programme of activities addressing mandatory local/regional/national policies and regulations are permissible provided it is demonstrated that these policies and regulation are not enforced as envisaged. If they are enforced, the effect of the programme of activities is to increase the enforcement beyond the mandatory level required"*[4].

We will briefly explain the three Brazilian policies on renewable sources of energy and how they have been negatively impacted by the EB guidance on mandatory policies (as part of the additionality test) and by the Brazilian government's inconsistent approach to these policies.

In a previous publication[5] we advocated a different and more straightforward approach to foster these CDM opportunities as we believe that CDM biofuel opportunities must also be used as a tool to promote compliance with mandatory environmentally friendly legislation in developing countries, so to observe their right to sustainable development:

> *"…both the UNFCCC and the Kyoto Protocol state clear principles and objectives in support of GHG mitigation. Such principles and objectives (1) encourage Parties to develop and improve policies and programmes to minimize GHG effects, and (2) create mechanisms to foster sustainable development in developing countries … the set of rules and decisions issued … regarding additionality and baseline criteria for CDM projects has deviated from the principles and objectives … by considering compliance with legal requirements as part of the additionality test and baseline calculation. These decisions have perverse effects on the CDM, by inhibiting developing countries from enacting adequate policies and legislation towards GHG mitigation …"*

In our view, mandatory policies must be excluded from the additionality test, which would not impair the environmental integrity of the Kyoto system, but rather foster reductions of GHG emissions/concentration.

BRAZIL HAS BEEN VERY ACTIVE IN PROMOTING RENEWABLE SOURCES OF ENERGY in the international arena; Brazil and the US have recently entered into an ethanol agreement and high level contacts between the two governments are examining joint efforts to enhance this market on a global scale. The country has also executed such type of agreement with many other countries, and intends to become a key player in the international biofuels trading markets.

The recent moves of the European Community towards a larger use of renewables and the recent US Supreme Court decision in the case Commonwealth of Massachusetts v. EPA[6], present very interesting opportunities for CDM biofuel programmes of activities in developing countries, such as Brazil, that are rich in biodiversity. According to the Brazilian Ministry of Science and Technology, Japan has also been negotiating the purchase of Brazilian ethanol to (i) assist in its compliance with Kyoto targets and (ii) reduce its dependence on the volatile international price of oil[7].

Since the 1970's oil crisis, Brazil has promoted the production and use of ethanol as a matter of public policy to avoid dependence on the price of oil and protect the environment and currently is the largest producer of ethanol in the world. The public owned company PETROBRAS has been an important player in this effort that has resulted in the current addition of 25% ethanol in all gasoline commercialized in Brazil, as well as avoided emission of 644mt CO_2 from 1975 to 2005[8].

In addition to historical ethanol initiatives, Brazil has promoted other renewable energy sources, such as biomass, wind and solar more recently. The Brazilian Renewable Energy Program (PROINFA) was launched in 2002 to foster acquisition of 3,300 MW from wind, biomass and small hydroelectric plants. PROINFA intends to promote reduction of 2.5 mt CO_2/y over 20 years.

The Brazilian Biodiesel Program was launched in 2005, and established a minimum mandatory percentage addition of biodiesel to fossil-based diesel (2% by 2008 and 5% by 2013), and the government has declared its intention to link this Programme to the CDM. PETROBRAS will launch three biodiesel plants in Brazil in 2007 to produce 171 million liters of biodiesel per year[9].

We would now like to emphasize the two main legal barriers currently faced by project participants implementing biofuel CDM projects.

ADDITIONALITY AND OWNERSHIP BARRIERS The first barrier we discuss relates to EB29 Annex 5, that maintains mandatory policies as part of the additionality test in the 'Tool for the demonstration and assessment of additionality' (version 3). According to sub-step 1b of the Tool *" … the alternative shall be in compliance will all mandatory applicable legal and regulatory requirements … if the proposed project activity is the only alternative amongst the ones considered by the project participant that is in compliance with mandatory regulation with which there is general compliance, then the proposed CDM project activity is not additional … "*.

It is our view that this opinion of the Executive Board will not promote mandatory policies on the production and use of biofuels in developing countries, because such activities would not be registered as a CDM project activity. This approach must change otherwise developing countries will refrain from enacting many climate change mitigation policies. As already mentioned, the EB must use the CDM as a tool to foster compliance in developing nations with mandatory environmental requirements such as the Brazilian Biodiesel Program's minimum percentages[10]!

The other main legal barrier refers to ownership of the CERs generated from the Brazilian Renewable Energy Program. The government enacted a Decree in 2006 determining that all CERs from the programme would belong to the Federal Government, so overturning the economic benefits accruing to projects. The government argues that CER revenues should be used to reduce the price paid for energy by consumers, because the taxes they pay are used to support the programme, so it would be socially fair to have these revenues benefiting consumers and not project participants.

Project participants, that have both joined PROINFA and proposed CDM project activities, argue that the government's understanding is inconsistent with its own intention to promote production and use of renewables and foster the CDM, apart from many legal arguments under the Brazilian Federal Constitution that should prevent the government from claiming these CERs.

As a result of this debate, at least one legal claim has reached the Brazilian Supreme Court, whereby a project participant challenges government claims over the CERs. This litigation started in 2007 before the Brazilian Supreme Court in case Goiasa v. Brazilian Federal Government (Writ of Mandamus – MS 26236), but the Court has not yet ruled on the case. This decision will set a precedent for how CER ownership issues, with regards to Brazilian Renewables Program, will be handled in the future.

We believe that the Brazilian government must be consistent with its historical purpose of fostering both renewables and CDM project activities. Instead, it should promote even more production and use of renewables, perhaps through some kind of partnership with CDM project developers that would not jeopardize the potential of the CDM as an additional means to promote renewable energy in the country. After all, the government and Brazilian society will directly benefit from additional investments in sustainable development practices, in addition to promoting the goals and objectives of GHG mitigation. This "PROINFA precedent" should be urgently reviewed by the Brazilian DNA, in order to provide a consistent Brazilian policy.

Further, other infrastructure and investment programmes such as the recently launched Growth Acceleration Program (PAC) should also be informed by a single and consistent policy that supports the use of the CDM as a compliance and investment promotion tool.

THEREFORE, WE CONCLUDE AND ADVOCATE in this brief paper that (1) mandatory policies should not be included by the CDM Executive Board as part of the additionality test and that (2) Brazil (and other developing countries) must be consistent with its policies to promote renewables and the CDM, so not to claim ownership over CERs generated from renewable projects; instead, using the CDM potential of such programmes as one more incentive to promote compliance and attractiveness of investments in activities that are aligned with the country's criteria of sustainable development.

[1] *Associated with Baker & McKenzie International, Swiss Verein Brazilian Climate Change and Renewable Energy Practice Group*
[2] *The opinion of the authors herein presented does not necessarily reflect the opinion of their organization.*
[3] *The DNA has so far issued Letter of Approval to 132 CDM project activities, 45 projects remain under analysis with the DNA, and 97 Brazilian projects have been duly registered with the CDM Executive Board. CDM projects hosted in Brazil are expected to receive 16 million Certified Emission Reductions – CERs by 2012.*
[4] *Although this guidance represents an evolution on the understanding of the Executive Board by not considering non-enforced policies as part of the additionality test, we advocate a further reflection so to completely exclude mandatory policies analysis from the additionality test, since enforceability of environmental legislation is a matter of host countries' sovereign and should not be used as to refrain CDM opportunities.*
[5] *For further discussion on how mandatory policies should be excluded from the additionality test, see Rodrigo Sales and Bruno Kerlakian Sabbag "Environmental Requirements and additionality under the Clean Development Mechanism: a Legal Review under the UNFCCC, the Kyoto Protocol and the Brazilian Legal Framework on Climate Change" – in Yearbook of International Environmental Law, Volume 16, 2005, Oxford University Press, pages 235 to 257.*
[6] *In which the Supreme Court found that (1) greenhouse gases are air pollutants under the Clean Air Act and (2) EPA shall regulate CO2 for new automobiles unless it determines that greenhouse gases do not contribute to climate change or if it provides some reasonable explanation as to why it cannot or will not exercise its discretion to determine whether they do. Some scholars have alleged that this decision may cause the US to adopt the Kyoto Protocol in the future.*
[7] *See http://agenciact.mct.gov.br/index.php?action=/content/view&cod_objeto=31408, viewed on April 17, 2007.*
[8] *Pursuant to public information available at Petrobras's website at: http://www2.petrobras.com.br/portal/frame.asp?pagina=/Petrobras/portugues/perfil/per_EnergRenov.htm&lang=pt&area=apetrobras*
[9] *Pursuant to public information available at Petrobras's website at: http://www2.petrobras.com.br/portal/frame.asp?pagina=/Petrobras/portugues/perfil/per_EnergRenov.htm&lang=pt&area=apetrobras.*
[10] *The so-called "perverse incentive" applies not only to Brazil but to all developing countries in Latin America (Ecuador, Mexico, Colombia, Costa Rica etc), as constant inputs from the current Executive Board Member Ms. Christiana Figueres, co-author of this Newsletter. See C. Figueres - Sectoral CDM: Opening the CDM to the Yet Unrealized Goal of Sustainable Development (source http://jsdlp.mcgill.ca/en/content/2-1/).*

A Programmatic CDM Project for Energy Efficiency in the South African Industrial Sector, by Geoff Stiles, Marbek Resource Consultants Africa

INTRODUCTION This paper describes a new initiative to develop an energy efficiency-based programmatic CDM project for the South African industrial sector. Though still in a developmental phase, the project illustrates many of the potential benefits as well as pitfalls—technical, legal and administrative—which can affect the success of programmatic CDM.

BACKGROUND South Africa is among the world's largest emitters of greenhouse gases on a per capita basis, and among the top 15 in the world overall--due largely to the country's substantial dependence on coal both for generation of electricity and for raising steam and other uses in industry, as well as its unique dependence on coal for liquid fuels.[1] Overall, coal provides just under 80% of the country's primary energy supply, and 91% of electricity supply. The energy sector (including secondary uses) is the largest sectoral contributor to total GHG emissions at 78%, of which industry accounts for 18%; with industrial processes accounting for another 9% of the total.[2]

Recognizing the immense problems created by South Africa's reliance on hydrocarbon energy, the Department of Minerals & Energy launched a National Energy Efficiency Strategy (NEES) in 2005, targeting a 12% reduction in final energy demand by 2015, including a 15% reduction by the industrial and mining sectors. The Strategy has produced a unique business response; the National Energy Efficiency Accord, by which individual companies and business associations have committed themselves to achieving the national efficiency target through a variety of energy efficiency measures.[3] The Accord has in turn spawned a Technical Committee which has established methodologies for defining baseline energy use[4], developed standards for monitoring and verification of targets and published case studies of individual company efforts to achieve these targets.

While the NEES does not target greenhouse gas reductions specifically, it is clearly seen as a means to achieve this end. For example, Goal 5 of the NEES states that,

"Energy efficiency is one of the most cost-effective methods of reducing Greenhouse Gas emissions, and thereby combating Climate Change. Addressing Climate Change opens the door to utilising novel financing mechanisms, such as the CDM, to reduce CO_2 emissions."

In response, the Accord signatories have included GHG reductions as one of the variables to be measured by their M&V plan, and several companies are already reporting both efficiency improvements and GHG reductions on an annual basis.

The NEES and the Accord are part of a much larger national effort to incentivise both energy efficiency (EE) and renewable energy (RE).[5] For example, there are specialized training programmes, linked to new skills standards for energy-related jobs, as well as a national energy management programme and a national biofuels strategy. Energy efficiency improvements are also being targeted through introduction of a number of energy efficiency standards, including for:

- Selected domestic appliances through a labelling programme based closely on the EU programme;
- Commercial buildings, starting with a standard for artificially-ventilated buildings;
- AC electric motors;
- Steam pipe insulation;
- Industrial boiler efficiency;
- Solar hot water heaters.

These standards are all under development and review at present, though the timing of their passage through the approval system has been extremely variable, and only the buildings standard (SANS 204) is close to final approval.

CDM OPPORTUNITIES Most of the companies involved in energy efficiency improvements through the Accord should, in principle, be able to create CDM projects based on this work. This opportunity has been greatly facilitated by the development of a uniform energy and emissions baseline for the Strategy, and by the development of an M&V system which could easily be adapted for CDM verification.

To date however this has not happened, in part because the individual measures being implemented are typically quite small and in part because CDM remains a new and untried concept for many South African companies. The exceptions to this rule are found mostly among the larger (and mostly multinational) companies which have been able to mount large-scale projects involving activities such as destruction of industrial gases, substitution of natural gas for coal in boilers, and some waste heat recovery projects.

PROGRAMMATIC CDM: A SOLUTION? Recognizing the potential for CDM development inherent in the NEES and the Accord mechanism, a project has been developed to utilize programmatic CDM as a means of facilitating smaller energy efficiency improvements, which would otherwise be financially marginal, for the Accord signatories.

Programmatic CDM is new to South Africa, the only current example being the Kuyasa housing project which entailed a form of programmatic CDM using a community-based entity and application of multiple energy-efficient technologies to low-income housing retrofits.[6] Though important as a pioneering effort in this area, Kuyasa offers relatively few insights for the project discussed here, because it is extremely small in scale and would likely have been excluded from programmatic CDM had the procedures now being put in place been approved.[7]

Programmatic CDM is in fact better-suited to industrial-commercial sector projects where a specific technology—e.g. energy-efficient motors or variable-speed drives—can be applied across the entire sector, and a uniform methodology established for both baseline determination and monitoring. Another advantage of using programmatic CDM for industry rather than domestic sector projects is that the benefits (in CERs) accruing to individual project activities are likely to be much larger, providing a stronger incentive for participants and making the projects more attractive to potential buyers of credits.

The initial focus of the Accord project is to identify the potential for using one or more of South Africa's new industrial equipment standards to motivate a programmatic CDM project.[8] Initial reviews of programmatic CDM have suggested that energy-efficiency standards can indeed provide a programme focus, with objective reduction targets which can then be measured against pre-standards baselines. The recent Guidance from the CDM EB qualifies this somewhat by

suggesting that programmes based on *"…mandatory local/regional/national policies and regulations are permissible provided it is demonstrated that these policies and regulations are not enforced as envisaged."*[9] Since the South African standards are presently voluntary but may become mandatory, the Accord project will probably have to demonstrate that the programme either *"increase(d) the enforcement beyond the mandatory level required"*[10] or incentivised an earlier and more widespread adoption of the technology than would occur without CDM.

In short, using efficiency standards as a basis for programmatic CDM in South Africa poses crucial questions around additionality, which would have to be resolved in order for the project to gain EB approval. The initial methodology review for the project will fully identify these issues and will result in a decision whether to use this approach or another, less methodologically risky approach. This stage in the process will also involve choice of a single technology as the basis of the programme, which is to some extent influenced by the issue of whether or not to use standards.

Importantly, standards-based programmatic CDM was proposed for a project from Ghana submitted to the CDM Methodology Panel in 2004: NM0159, 'Activities to Increase Market Penetration of Energy Efficient Appliances in Ghana', which employed a new national standard for air conditioner efficiency and proposed using the CERs from this programme to finance the country's first test facility.[11] This methodology is now in its third revision, having encountered substantial criticism in earlier rounds.

Another methodology, 'Accelerated Chiller Replacement Program for India', was submitted in October 2006 and is linked to a new baseline and monitoring methodology: NM0197, 'Power saving through accelerated replacement of electrical equipment with variable load under a programme of activities'. As the title implies, this methodology is intended for a much wider application than the replacement of chillers, and may be applied to other kinds of electrical equipment, e.g. energy efficient motor replacement. Significantly, it is not based on the use of standards but rather on using CDM to accelerate the early replacement of inefficient equipment by more modern equipment meeting international (but informal) market standards. Approval of NM0197 is still pending, preliminary comments having been forwarded to the developers by the Methodology Panel and a "B" mark given to their latest submission in February 2007.

OTHER BARRIERS In addition to issues around the use of standards as a basis for programmatic CDM, there are a number of other potential barriers to implementation which the project will have to overcome, including:

- *Development of a programme entity* This is perhaps the most complex aspect of the process, since the 'programme' is effectively required to manage the constituent project activities, a role which may include *inter alia* development of methodologies, preparation of the PDD, accounting and general management, and distribution of the CERs to individual participants. As the Accord itself has no legal or institutional status, implementing programmatic CDM will require development of a special-purpose entity which will perform these functions on behalf of the Accord participants. It is expected that the members of the Accord Technical Committee and other interested participants will formulate this programme independently, and then develop a legal entity for delivering it, with appropriate allocation of key management responsibilities;
- *Ownership of credits* This issue must be resolved contractually, i.e. by formal agreement among the shareholders/participants. It is assumed that ownership will remain with the programme entity, but that eventual re-distribution of CERs to the participants will be required. A mechanism for doing this will be an essential part of the programme's functions;
- *Cost-sharing* The participants will be expected to bear certain costs of the programme, notionally including validation, registration and verification. Since entry to the programme will be voluntary and can happen at any time during the programme, this will be achieved through a levy on actual CERs earned, and the programme will require front-end financing to cover these costs, or pre-sale of the credits. Some of this financing has already been obtained through support from the Global Opportunities Fund;
- *Establishing additionality* The issue of additionality remains a complex one, and may prove to be a major barrier to programmatic CDM in South Africa. Apart from issues around use of standards noted above, there is a financial incentive available to promote energy efficiency in South Africa: a demand side management programme implemented by the national utility, Eskom. Eskom DSM provides a grant based on an assessment of the

potential impact of the activity (e.g. motor replacement, lighting retrofits, solar hot water, etc.) on demand, which involves use of a diversity factor to determine the effective (as opposed to maximum) demand impact. This can result in a subsidy of up to 50% for energy efficiency projects, and occasionally higher. Nevertheless, because of low electricity tariffs, the DSM grant is still insufficient to promote wide-scale implementation of some energy-efficient technologies. Demonstrating this, and elucidating the barriers which have prevented adoption even where such incentives are available, will be a key to proving additionality for the project;[12]

- *Preventing double counting* The programme will need to ensure that participants are prevented from seeking credits from the same technology independently, which will require a fairly stringent monitoring programme. As Figueres and Bosi have suggested[13], this can in principle be avoided "*by stipulating that the entity running the programme is the only one authorized to claim CERs for the programme, in order to defray the costs of running the programme. The other potential claimants would have to cede their claims to this entity in a separate agreement or in the agreement regarding the distribution of CERs."*[14] But as noted above, such agreements cannot preclude distribution of some portion of the CER benefits to the participants, since this is a key incentive for joining; and of course, such agreements do not eliminate the risks of double-counting through technical or methodological errors or omissions, and this will need to be addressed through a rigorous monitoring programme (see below);
- *Multiple baselines* A key concern in programmatic CDM projects is the possibility of multiple baselines. Although, as mentioned before, the Executive Board and Methodology Panel seem to be moving towards a definition of programmatic CDM which excludes multiple baselines, some kinds of replacement programmes—e.g. lighting or motors—may run afoul of this restriction, since replacement can be motivated by more than one consideration. As an example, an electric motor replacement programme could entail (i) replacement on a purely voluntary basis, i.e. only to improve efficiency; or (ii) replacement of equipment at the end of its operating life; or (iii) a decision to install energy-efficient motors in a new project instead of conventional motors. As Figueres and Bosi have shown, this could conceivably be viewed as requiring three different baseline methodologies, which in terms of the most recent guidance from the CDM EB would require three different PDDs covering three different project activities, and possibly three different programmes;
- *Monitoring* of programmatic CDM projects is inherently difficult because of the potentially wide separation of activities in both space and time. To deal with this, the programme will maintain a detailed register of project activities and will undertake periodic sample evaluations to ensure that the projects are being implemented and, once implemented, are producing the expected CERs. A detailed sampling framework will be developed for the PDD, as well as the specific methodologies for monitoring performance against the baseline.

[1] *This reliance on coal for liquid fuels is changing gradually with the introduction of natural gas from Mozambique.*
[2] *South Africa: Initial National Communication Under the UNFCCC, October 2000. The Second National Communication is now in progress and due for submission this year.*
[3] *The Accord has now been signed by 39 corporate entities, including all of the large emitters and heavy industrial users.*
[4] *The Strategy baseline year is 2000.*
[5] *The national White Paper on Renewable Energy was published in 2003 and sets a target of 10,000 GWh of renewable energy supply by 2013.*
[6] *Khuyasa was not of course registered as a programmatic CDM project, since the concept had not been approved at that time.*
[7] *The recent Executive Board "Guidance" on this subject requires that programmatic CDM projects focus on a single technology or measure and a single baseline/monitoring methodology, establishing a uniform mechanism to "ensure that leakage, additionality, establishment of the baseline, baseline emissions, eligibility and double counting are unambiguously defined for each CDM Project Activity within the Program of Activities."*
[8] *This aspect of the project is funded by the South African National Energy Research Institute.*
[9] *Guidance on the registration of project activities under a program of activities as a single CDM project activity, CDM Executive Board, Meeting EB28, Annex 15, page 1.*
[10] *Ibid.*
[11] *This methodology replaced an earlier methodology submission, NM072, which was withdrawn. As of February 2007, NM0159 has been reviewed and received a "C" status, requiring major modification.*
[12] *The Guidance noted in footnote 9 above proposes that the program must "demonstrate that net reductions (removals) in anthropogenic emissions for each (project activity)…are uniquely attributable to the (program)."*
[13] *Ed. See separate article in this issue of the Newsletter on page 10*
[14] *Achieving Greenhouse Gas Emission Reductions In Developing Countries Through Energy Efficient Lighting Projects In The Clean Development Mechanism, C Figueres and M Bosi, World Bank 2006.*

CDM in FEMIP Countries: Current Status and Opportunities,

by Alexandra Papadopoulou, Alexandros Flamos, David Moissis and Savvas Theodorou, Energy Policy Unit of the National Technical University of Athens (EPU-NTUA)

THE MAJORITY OF THE MEDITERRANEAN COUNTRIES possess substantial potential for the implementation of CDM projects, including under Programmes of Activities (PoAs). Abatement of GHG emissions can mainly be achieved through utilizing the abundant renewable energy sources in the region, implementing energy efficiency measures and substituting oil with natural gas in energy generation. However, with few exceptions, the majority of these countries have a limited track record with registration of CDM projects.

THEREFORE, THE EUROPEAN INVESTMENT BANK (EIB), supported the project "Study on Clean Development Mechanism (CDM) Project Identification in FEMIP Countries" to identify promising CDM projects that could be financed through its Facility for Euro-Mediterranean Investment and Partnership for Algeria, Egypt, Gaza/West Bank, Israel, Jordan, Lebanon, Morocco, Syria, Tunisia and Turkey (FEMIP). The project, implemented by EPU-NTUA and Montgomery Watson Harza-MWH, in Egypt, Tunisia and Morocco, aimed to:

- Investigate possibilities for carbon finance and crediting activities in the Mediterranean region, identify priority sectors and make recommendations;
- Identify a pipeline of concrete CDM projects or project concepts that the EIB could help finance;
- Promote close communication between the EIB and local actors within CDM-related institutions and those best placed to give credible information on upcoming CDM projects; and
- Establish an informal network of experts in the three target countries who can regularly exchange information.

In order to achieve quality results, several meetings were held in each of the three counties, during missions of project experts. The most interesting CDM project proposals were then presented to the EIB and discussed with local developers at a workshop held in Egypt. A brief analysis of the project findings for each country is presented below.

THE EGYPTIAN GOVERNMENT is one of the most active among the FEMIP countries in developing climate change policy and there are already 2 registered projects, 3 awaiting registration and 1 under validation; however none of them are programmatic in nature[1].

Their most important opportunities, at present, lie in the following sectors (in order of importance):

- Industry & services (4 projects identified);
- Energy (1 project identified);
- Waste / landfill management;
- Transport;
- Others (agro-forestry) (1 project identified).

Egypt has the following advantages that favour implementation of CDM Projects:

- The DNA (Egyptian Environmental Affairs Agency-EEAA) is well organized and staffed with capable personnel;
- Government interest in CDM and promoting specific development projects through it;
- State authorities are sensitized and interested in promoting CDM;
- Potential in several sectors is significant (energy, industry, etc.);
- An already developed pipeline (nearly 40 proposals);
- Approved methodologies for most of the projects proposed;
- Substantial interest of International Financing Institutions (IFIs), donors and funds in financing, providing technical assistance and grants for CDM projects;
- Experience and knowledge of getting projects registered can be exploited.

With respect to programmatic CDM, there is significant potential such as:

- In the residential and commercial sector, where no collective efficiency measures have been undertaken so far;
- A large number of small scale activities, that are not attractive to IFIs;
- Cogeneration in the residential and commercial sector, energy efficiency in power production and renewable energy in the industrial sector.

MOROCCO HAS DECLARED its determination to pursue sustainable development and is actively involved in climate change. However, no specific CDM law has been adopted yet but there was the 'CDM National Strategy' that covered the period 2003-2005. Currently, Morocco has 3 registered projects, one of which has programmatic CDM characteristics ('Photovoltaic kits to light up rural households in Morocco'). Three more projects are under validation[2].

According to the country study, there is a very substantial CDM potential; renewable energy (wind, solar, hydro, biomass), energy efficiency, rationalization of local transport, waste management and afforestation/reforestation all provide opportunities for GHG emissions reduction. The most significant business opportunities present in the Moroccan portfolio, lie in the following sectors (in order of importance):

- Energy (3 projects identified);
- Industry & services (5 projects identified);
- Waste / landfill management;
- Others (including agro-forestry and carbon sequestration) (1 project identified);
- Transport.

Morocco has the following advantages that favour implementation of CDM Projects:

- Early start and sensitisation of state authorities;
- Good organisation, with competent DNA (Ministry of Territorial Planning, Water and Environment);
- Local organisations, associations, NGOs interested in CDM projects;
- Trained and active local consultants in many sectors related to CDM;
- Substantial potential in several sectors;
- Abundance of financing sources for CDM;
- Experience and knowledge of getting projects registered can be exploited;
- No electricity subsidies with electricity prices sufficiently high to promote RE projects.

The following factors would favour a programmatic approach to CDM:

- A large number of potential CDM projects are too small to benefit from IFI funding;
- Several project activities in the portfolio have the required characteristics;
- Previous experience with one registered project;
- Recent policy developments, to motivate private sector industries to take voluntary action, for example, the change to the electricity law that allows electricity auto-producers to build up to 50 MW generation capacity (an increase from the previous limit of 10 MW) and to transmit electricity at a fixed tariff.

TUNISIA PLANS TO HAVE PROJECTS UNDERWAY that will save a total of 12,7 Mt of CO_2eq by 2011. Additional reductions of 16,9 Mt of CO_2eq are planned for the period 2012 to 2016. A strategy was devised in 2005 for initiating and approving CDM projects at national level and is now being implemented. Between 2006 and 2011, the strategy envisages the development of CDM projects at a target rate of at least 20 projects a year.

The Tunisian DNA (Ministry of Environment and Sustainable Development) has developed a portfolio of 47 CDM project proposals since 2003. It is noteworthy that a large percentage (~ 60%) of the most workable potential lies in small scale projects. There are currently 2 registered projects.[3]

A very significant GHG abatement potential can be found in renewable energy, especially wind and solar energy. Potential projects were identified in the following sectors:

- Industry & services (2);
- Energy (1);
- Waste / landfill management (2).

The country analysis resulted in the identification of the following parameters that favour CDM development in Tunisia:

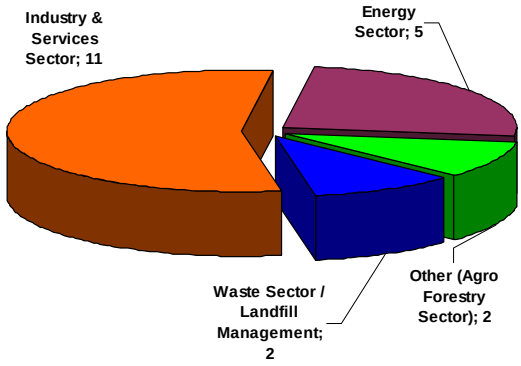
- Abundance of financing sources and technical support organizations;
- Abundance of renewable energy especially wind and solar;
- An existing and varied project portfolio;
- Two projects have already been registered;
- No electricity subsidies (prices are high to promote RE projects); and
- An early start and sensitization of state authorities.

Programmatic CDM might be applied as:

- A large number of potential projects are too small to benefit from IFI funding;
- There are incentives in the fields of energy efficiency, solar thermal energy and transportation;
- A large portion of the potential lies with SMEs, which could really benefit from programmatic CDM.

TWENTY PROJECTS HAVE BEEN IDENTIFIED by the project experts in the three countries. As can be seen in the figure, most opportunities have been identified in the industry & services sector; however, the other sectors also have significant potential to contribute to GHG abatement.

Figure 1: attractive projects identified for the three countries (by sector)



IN CONCLUSION, it can be stated that CDM potential in the FEMIP region is still in very initial stages of exploitation. This applies to several types of small-scale projects and also to larger programmes that could encompass many single actors. Such programmes would require intensive and extensive cooperation at the practical level by harmonizing strategies for common problems, designing and implementing common approaches, jointly seeking financing etc.

CDM potential is particularly rich in a number of sectors, notably fuel switching, energy efficiency improvements, solar and wind energy, and waste management. As is the case in most developing countries, exploitation of this CDM potential goes hand-in-hand with the achievement of other objectives, such as an increase in the standard of living, poverty alleviation, combating desertification and environmental improvement. Programmatic CDM is an option that may further boost the exploitation of this CDM potential.

[1] *UNFCCC 2007 (www.unfccc.int)*
[2] *Moroccan DNA (www.cdmmorocco.ma)*
[3] *UNFCCC 2007 (www.unfccc.int)*

The programmatic approach under JI, by S. Frenzel & A. Gruss FutureCamp GmbH[1]

THE PROGRAMMATIC APPROACH HAS EVOLVED under the CDM framework in recent years. A programme of activities (PoA), was defined by the CDM Executive Board as *"a voluntary coordinated action by a private or public entity which coordinates and implements any policy/measure or stated goal (i.e. incentive schemes and voluntary programmes), which leads to*

GHG emission reductions or increase net greenhouse gas removals by sinks that are additional to any that would occur in the absence of the PoA, via an unlimited number of CPAs" (CDM programme activities).[2]

In contrast to 'bundling' of CDM project activities, the number of CPAs included in a programme of activities is not defined at the time of project registration and is unlimited. New CPAs can be added to the programme at any time during the duration of the programme. Hence start and end date of the crediting periods of the single CPAs can differ. Whilst the duration of the programme itself can be up to 30 years, the crediting period for each CPA can only be 10 years once or 7 years with two possible renewals.

The programmatic approach has a high potential to draw single types of technologies (e.g. energy-efficient light-bulbs) or entire sectors (e.g. private households or transport) which are not yet regulated or included in the carbon market and have no possibility to monetarize emission reductions; they could thus achieve additional GHG emission reductions. Usually such projects involve technical or other measures at a large number of very small, direct or indirect, emission sources.

But there's not only potential under the CDM but also under JI. There are many small emission sources also in Annex I countries which are not included in the EU Emissions Trading Scheme. Incentives for such sources to reduce GHG emissions could be set under a JI programme of activities.

STATUS QUO OF PROGRAMMATIC JI The 2nd track of the official JI project stream had a very promising start in late October 2006[3]. According to the UNEP Riso Centre 156 projects are currently in the pipeline. As of today, 48 have been made publicly available for comments in the international stakeholder process or have already passed that stage and the first JI project reached the status of 'final determination' on March 26th 2007. All projects in the pipeline, except for one in Germany, are hosted by Eastern European countries. The total expected emission reduction of all 48 projects is approximately 18 $mtCO_2e$/year.

None of these projects follow a programmatic approach and no decision has so far been taken by the JI Supervisory Committee (JISC) on such an approach. Because of the lack of JI-specific regulations regarding such an approach and there being no relevant baseline methodologies approved by JISC nobody knows the exact potential for programmatic JI.

However, regulations or guidelines on programmatic approaches under the JI can be expected to emerge from national legislation. For example, in Germany the German Project Mechanism Act (Projekt-Mechanismen-Gesetz, ProMechG) was passed in 2005, setting the framework for the project-based flexible mechanisms of the Kyoto regime in the country and defining the Designated Focal Point (DFP), the Deutsche Emissionshandelsstelle (DEHSt); but so far, no specific regulations regarding programmatic JI have been included.

That seems to be the same in other countries. Clear guidelines would be useful for project developers considering the obstacles to a programmatic approach. First there are the general obstacles for all JI projects such as:

- Short secure crediting period (max. 5 years, 2008-12);
- Lengthy coordination and approval processes with many host countries;
- Avoidance of double counting due to the EU-ETS covering a large percentage of installations, but with different regulations in each country;
- State subsidies and similar mechanisms like feed-in tariffs, e.g. the Renewable Energy Sources Act (Erneuerbare-Energien-Gesetz, EEG) in Germany, that reduces the creditable emission reductions and therefore the earnings;
- No standardized quality criteria
    - No approved JI baseline methodologies by JISC leading to different quality requirements in different countries and by different validators
    - Different requirements for the approval process in each country;
- Problems of matching Track 1 and Track 2 countries (as host and investor countries) in the future;
- Country-specific rules can lower the amount of potential projects and host countries, e.g. in Germany there's the requirement of reciprocity (Germany, as host country, requires an

investor country to host JI projects, too, if not, incoming projects from that investor country are not approved.

There are additional, specific barriers and pitfalls for programmatic JI projects:

- At least initially they will require a relatively great effort for
  - coordinating a large number of project participants
  - creating complex calculation approaches and tools
  - monitoring the data of each remote participant;
- There are more complex additionality assessments because of the necessity to justify it on two levels, the PoA coordinator or investor and the CPA project participant;
- There will be new baseline and monitoring methodologies needed for many potential PoAs.

However the number of programmatic CDM projects under development shows that there is a potential and the business activities of FutureCamp acknowledge that trend as well. The next section deals with the potential, possible approaches to and examples of programmatic JI.

PROJECT POTENTIAL AND EXAMPLES FutureCamp, together with Schmack Biogas, developed the first programmatic project worldwide in 2001. Because the crediting period of JI projects only starts in 2008, this project was developed for Verified Emission Reductions (VERs).

The project was a pilot in more than one respect. First, a baseline and monitoring methodology had to be developed since – being early days of the Kyoto mechanisms – there were none available. Second, involving an undefined number of decentralized biogas plants in a programme of activities was a very innovative approach; it allowed individual farmers to turn their emission reductions into money, with the costly validation and verification processes being organized centrally by Schmack Biogas.

This programmatic VER project helps to:

- Make methane emission reductions from manure technically, ecologically and economically viable by bundling a multitude of decentralized biogas plants;
- Reduce the overall CH_4-emissions from manure in Germany;
- Advance the technology and deployment of manure-fuelled biogas installations; and
- Develop and gather experience with the programmatic approach.

Stock-breeding farmers are offered participation in the 'Fit-for-Biogas' Programme when they implement a new biogas plant that meets certain criteria. Samples of the various manure substrates, regularly delivered to Schmack, are tested in their laboratories with the results helping the farmers to improve operational efficiency of the biogas installations. Schmack is also able to monitor the methane reductions achieved on the basis of sufficient and reliable data. While farmers pay a fee that depends on their power production, Schmack is responsible for the VER verification, certification and sale. A certain percentage of the VER revenues then flows back to the farmers as part of the incentive to participate in the project. At the moment, FutureCamp is in the process of transforming this VER project into a JI one[4].

We believe that the main potential for programmatic JI projects in Europe lies in:

- Measures for energy efficiency and fuel switching in the housing sector and business enterprises;
- Measures for new heating technologies in the housing sector and business enterprises;
- Use of renewable fuels (bio diesel, vegetable oil) in the transport sector.

The programmatic JI projects in the German pipeline supported by FutureCamp confirm our opinion.

FutureCamp has developed three programmatic JI projects for conversion of heating systems by fuel switching, rehabilitation of buildings, and efficiency increase in heat production and use in the industrial/manufacturing and the private and commercial sectors. If approved by the German Authorities and the JISC (as we are using JI 2nd Track), all have the potential to be repeated by other actors – in Germany as well as in other countries.

In order to make these types of project attractive and successful for private companies, it is recommended that the owner of a programme combine it with other goals, e.g. the introduction of a new product or general marketing targets. If we are courageous and creative enough to apply the

programmatic approach in Annex I countries, it can help to overcome long-known obstacles to, for example energy efficiency. It is possible and it is time to do it.

[1] *FutureCamp has developed programmatic VER projects since 2001 (fuel switch, energy efficiency, building sector, small biogas installations etc.), turning towards programmatic JI since the legal framework has been implemented*
[2] *See EB 28, Meeting report, Annex 15, http://cdm.unfccc.int/EB/index.html*
[3] *http://ji.unfccc.int/ji_projects/verification*
[4] *. For further information please check the website: http://www.future-camp.de*

Readers that are interested in presenting their experience or activities are requested to submit an outline to the editors (newsletter@climatebusiness.net); details on type of content and the publication schedule can be found on our Web site http://www.climatebusiness.net. Please note that articles should not exceed 2,000 words!

Readers might be interested in the business news facility on CBNet's Web site http://www.climatebusiness.net which presents some of the recent and historical (last 3 years') electronic press 'cuttings' on the business aspects of climate mitigation activities. The items show the title and introductory lines as well as provide a link to the full article.

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