Policies and Programs in the CDM

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1. Introduction

From the perspective of developing countries the purpose of the CDM is to contribute to national sustainable development and to the global stabilization of GHG concentrations in the atmosphere. It is evident that these goals cannot be reached on the basis of single isolated GHG reducing projects. If the CDM is to deliver its potential "development dividend", it must move beyond stand-alone project activities and be used to spur broad climate-friendly programs and policies.

During the last two months of 2005 the regulatory bodies of the climate regime took two separate but interacting decisions that open the door to CDM projects that could have an important effect on the growth trends in developing countries. This paper presents and interprets each of these decisions, then proceeds to define programs in the CDM, reviewing both the benefits and the challenges of this new approach to developing CDM projects. Finally the paper suggests guidance that the Executive Board of the CDM could consider for programs, to safeguard the environmental integrity of this type of project activity.

2. Eliminating the perverse incentive of the CDM

The UNFCCC recognizes that to achieve sustainable development, a country's economic growth, energy use and GHG emissions must be decoupled. Historic economic growth around the world has been based on increased fossil fuel energy consumption and consequent increased GHG emissions. Future economic growth particularly in developing countries must reverse this trend. While growth must continue, the efficiency of energy consumption must improve, and the carbon intensity of production must decrease. Achieving sustainable development in

developing countries depends on *decarbonizing* their economies. To move toward sustainability, developing countries reliant on importing fossil fuels must decrease the carbon intensity of growing production through enhanced energy efficiency, introduction of clean technologies, and development of distributed renewable energy systems. To a great extent the "development dividend" of the CDM can be understood as the CDM's contribution to the decarbonization of the growth of developing countries.[1]

Such decarbonization can only occur as the result of deliberate policies and measures, and yet ironically, over the past few years the CDM has acted as a perverse incentive for developing countries, motivating them to not undertake climate protecting policies and measures. Although it was never explicitly stated, for several years there was an underlying assumption that the existence or introduction of a climate-friendly policy or regulation in a developing country would make a project in the sector non additional, and thus not eligible for the CDM. For example, if a country instituted a renewable energy obligation of 10-15% of the generation mix, it hesitated to consider renewable energy projects that contributed to that mix as candidates for the CDM. If a country passed mandatory energy efficiency standards, projects that upgraded technology to meet the standard were considered probably excluded from the CDM. Thus countries actually delayed the introduction of proactive policies, to prevent those policies from being integrated into the baseline and thus disqualifying projects from the CDM.[2]

Fortunately this situation has been rectified. Concerned about the pernicious effects of such an interpretation, the Executive Board of the CDM, at its 22nd meeting celebrated 23-25 November 2005, clearly stated:

> "As a general principle, national and/or sectoral policies and circumstances are to be taken into account in the establishment of a baseline scenario, without creating perverse incentives that may impact host Parties' contributions to the ultimate objective of the Convention."[3]

The statement is made in the context of Annex 3, Further Guidance for the Treatment of National or Sectoral Policies in the Baseline. In the same Annex, the Executive Board proceeds to revise the previous differentiation between E-type policies and L-type policies. At its 16th meeting in October 2004, the EB had identified[4] four types of national or sectoral policies according to both the nature of the policy and its effect on emissions. The first two were not mandatory in nature but rather only the provision of incentives.

- Type E+: "Existing national and/or sectoral policies or regulations that give comparative advantages to more emissions-intensive technologies or fuels" (e.g. preferential loan programs for the construction of fossil fuel generation plants, that would not be available to renewable energy plants).

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[1] Another very important aspect of the "development dividend" is the effect of the project on the local community in which it operates. However, these local aspects are not contemplated in this paper.

[2] See [ ] for specific examples of policies that have been thwarted by the CDM.

[3] EB 22, Annex 3 "Additional Clarifications Regarding the Treatment of National/sectoral Policies and Circumstances."

[4] EB16, Annex 3 "Clarification on the treatment of national and/or sectoral policies and regulations in determining a baseline scenario."

- Type E-: "National and/or sectoral policies or regulations that give positive comparative advantages to less emissions-intensive technologies" (e.g. tax reductions for renewable energy generation plants, public subsidies to finance energy efficiency programs, incentives for reforestation, etc.)

The second two corresponded to legally binding regulations enacted by governments (as contrasted to the previous incentive-based policies).

- Type L+: "Sectoral mandatory regulations adopted by a local or national public authority motivated by the reduction of negative local environmental externalities and which incidentally prevent the adoption/diffusion of less GHG emitting technology" (e.g. a law to replace kerosene lanterns with diesel generators).
- Type L-: "Sectoral mandatory regulations adopted by a local or national public authority motivated by the reduction of negative local environmental externalities and/or energy conservation and which would incidentally also reduce GHG emissions" (e.g. a law that obligates the conversion of public transportation from diesel or gasoline to natural gas, or a regulation that requires the replacement of traditional wood-burning stoves with high efficiency wood stoves).

At its 16th meeting the Board ruled on the E-type policies and requested the Meth Panel to provide recommendations on the treatment of L-type policies. At its 22nd meeting the Board revised the above differentiation and eliminated the classification of L-type policies, thus abolishing the differentiation between mandatory and voluntary policies. Henceforth the treatment of national/sectoral policies or regulations (whether they are mandatory or incentive-based) in the baseline depends only on the effect of the policy/regulation on emissions. The new ruling differentiates between:

- National and/or sectoral policies or regulations that give comparative advantages to <u>more emissions-intensive technologies or fuels</u> over less emissions-intensive technologies or fuels;

- National and/or sectoral policies or regulations that give comparative advantages to <u>less emissions-intensive technologies</u> over more emissions-intensive technologies (e.g. public subsidies to promote the diffusion of renewable energy or to finance energy efficiency programs).[5]

The same Annex 3 regulates the consideration of these two types of policies in the definition of a baseline. To remove the temptation for countries to now or in the future institute harmful policies that would inflate the emission reductions claimed by project activities but be detrimental to the atmosphere, the EB rules that higher emission policies can only be taken into account when developing a baseline scenario if they were implemented before the adoption of the Kyoto Protocol in December, 1997. If such policies were implemented since that date, the baseline scenario of a project activity should refer to a "hypothetical situation without the national and/or

[5] EB 22, Annex 3 "Additional Clarifications Regarding the Treatment of National/sectoral Policies and Circumstances."

sectoral policies or regulations being in place". In the future countries may decide to enact fiscal or regulatory policies that are harmful to the environment- and they probably will-, but thanks to this ruling they will at least not do so for the benefit they could get out of the CDM.

By contrast, in the case of policies that encourage lower emissions, Annex 3 determines that the baseline scenario need not take these policies into account if the policy was implemented since the adoption of the CDM Modalities and Procedures in November, 2001 (i.e. the baseline scenario could refer to a hypothetical situation without the national and/or sectoral policies or regulations being in place). Finally closing the door to the perverse incentive of the CDM, this decision reassures developing countries that their CDM project activities will not be penalized due to climate-friendly policies that have been enacted by governments since 2001.

3. Providing an incentive for climate friendly policies

The above decision ensures that the introduction of the policy will not adversely affect the quantification of emission reductions in the project activity. This is a critical ruling in the progress of the CDM as an instrument of decarbonization in developing countries. However, removing the perverse incentive from the CDM is a necessary but not a sufficient condition for promoting decarbonization. In addition to the above ruling, the regulatory bodies should provide an inducement to foster the rapid adoption and implementation of climate friendly policies throughout the developing world. Fortunately, this inducement has come in the form of a decision from the recently celebrated COP/MOP 1 in Montreal. In the decision on Further Guidance Relating to the CDM, paragraph 20 states:

> "Decides 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 CDM methodological requirements are met.

In other words, the adoption of a policy or standard in and of itself cannot be submitted as a CDM project. This restriction is entirely justified. All too often policies, regulations or standards are adopted but are not implemented, due to lack of enforcement capabilities, lack of access to financing, or even absence of the appropriate technology. Such a vacuous measure, while well intended, cannot be granted CERs. However, there are cases where a program is put in place with specific activities to actually implement the policy. In such cases the program of activities can be submitted as a single CDM project activity if the resulting GHG reductions are real, measurable and verifiable according to the CDM procedures and modalities.

4. CDM Programs

A CDM program of activities is one in which emission reductions are achieved by multiple activities executed over time as a result of a government measure or private sector initiative. Examples include a program to implement an energy efficiency standard, a DSM program, a program to convert public transportation from diesel or

gasoline to natural gas, or a soft loan program to encourage the installation of renewable energy sources.

A CDM program of activities is similar to a traditional single-site CDM project in the sense that both must comply with all the procedures and modalities of the CDM, resulting in real emission reductions. A CDM program of activities, however, is different from a stand-alone CDM project in the following ways:

1- It is a deliberate program, which could be public or private sector based. Public programs could include an appliance labeling and testing program for the enforcement of an energy efficiency standard, or a public utility DSM program. Private sector based programs could include the substitution of inefficient wood-fired mud stoves with efficient biogas units, or a program to disseminate photovoltaic technologies for lighting or water heating in rural areas.
2- The program results in a multitude of GHG reducing actions occurring in multiple sites. The sites could be located within one city, one region or one country, depending on the design of the program. Were it not for the enactment of the program, these actions would not occur.
3- The GHG reducing actions do not necessarily occur at the same time. Although all actions respond to the same program, they can occur either simultaneously, or throughout the life of the program.
4- The type and the size of the emission reducing actions induced by the program may not be known at the time of project registration. However possible types and sizes of expected actions have to be identifiable ex ante, and all actions must be measured ex post, using approved baseline and monitoring methodologies, to ascertain the actual reduction achieved by the overall program. CERs are not issued based on the ex ante estimation, but rather on the ex post identification and verification.
5- While GHG reducing actions can be implemented by one or more entities, the program has one coordinating agent, responsible for designing the program and overseeing the execution of the various activities under the program. The coordinating agent must be one of the "project participants". CERs or CER revenues could be used to cover the operational costs of the coordinating agent and/or to provide financial incentives for the households/entities implementing the individual activities. The nature of the coordinating agent can be as varied as a public sector institution, a non-governmental organization, a private sector company, or a financial institution.

The COP/MOP 1 decision that allows programs in the CDM, also allows bundling of large-scale projects. The Executive Board has not yet provided clarification on the modalities for bundling of large-scale projects. Assuming for the time being that large-scale bundling might follow the same guidelines as small-scale bundling with the exception of the threshold limitation, bundling would be different from programs. The project activities included in a bundle must be indicated at the time of registration and cannot change over time. Each project activity remains a separate project activity and is only bundled for the purpose of reducing transaction costs. In a program of activities, the composition of GHG reducing actions resulting from the program may not be known at the time of submission, and in any case, they are not

registered as separate project activities. Rather, the program itself is the project activity.

It may be helpful to illustrate the characteristics of a CDM program with a few concrete examples. In the case of an appliance energy efficiency standard, the adoption of the standard- whether voluntary or mandatory- cannot be considered a CDM project, as there is no verifiable evidence that any GHG reducing action has actually occurred. However, if in addition to the adoption of the standard, a deliberate program for its implementation is put in place, this program could be submitted as a CDM project. The proponent needs to clearly identify the specific activities under the program, such as the labeling, testing, and quality assurance activities that are typical and necessary for the effective implementation of a standard. The GHG reducing actions that will result from this program are achieved by people purchasing new appliances that meet or exceed the standard and save energy when compared to the old inefficient appliances that existed in the marketplace prior to the standard and corresponding implementation activities. The substitutions will occur in a multitude of households, offices, and factories. They will not occur at the same time, but rather throughout a period of time determined by the regulation and the purchasing power of individuals or companies. Depending on the way the standard is adopted, it may not be possible to know at the outset exactly which appliances will be substituted. For example, if a standard is adopted for all refrigerators, it may not be possible ex ante to know with certainty the size of new refrigerators to be purchased. The level of GHG reductions will only be known once the appliances are purchased and functioning, and CERs are not issued until verification has taken place. The program will be directly or indirectly implemented by the labeling protocol, testing centers, appliance distributors, etc. Ultimately, each consumer who purchases the more efficient appliance (whether unknowingly or by choice) will personify the energy saving tracked by the CDM project. To be eligible as a CDM project, however, the program must have one coordinating agent, which could be the utility, the standards bureau, the energy efficiency agency, etc. That coordinating agent must be a project participant, must decide on the distribution of CERs, and must ensure the avoidance of double counting.

A DSM program for a particular city is very similar. The adoption of a national energy conservation act cannot be considered a CDM project, as there is no verifiable evidence that any GHG reducing action has actually occurred or will occur. However, if in addition to the act, a deliberate program for its implementation is put in place in a particular city, this program could be submitted as a CDM project. The proponent needs to clearly identify the specific program activities that will actually reduce energy consumption and peak loads, balancing energy supply and demand with maximum resource efficiency. Typically such a program would be built on a targeting (identifying the opportunities), financing (provide appropriate financing schemes) and installing program. The program would need information (e.g. load shape database, energy consumption and end user database, EE technology database, etc.), and a specific plan of action over time. The resulting GHG reducing actions could include installation of residential, commercial and/or municipal street high-efficiency lighting, installation of solar/LPG water heaters, and high-efficiency motor rewinding programs. The installations will occur in a multitude of households/buildings/streets, therefore in multiple sites. They will not occur at the same time, but rather throughout the period of time determined by the program. Depending on the way the

program is designed, it may not be possible to know at the outset exactly which buildings or which residences will adopt the new technology. The level of GHG reductions achieved will only be known once the new technologies are installed and functioning, and CERs are not issued until verification has taken place. The program could be directly or indirectly implemented by a multitude of stakeholders including the public entity responsible for energy efficiency in the respective region, private firms under contract to the program, the utility, the energy efficiency fund, etc. However, to be eligible as a CDM project, the program must have one coordinating agent, which could be the utility, the energy efficiency agency, etc. That coordinating agent must be a project participant, must decide on the distribution of CERs, and must ensure the avoidance of double counting.

The table below shows the characteristics of a CDM program of activities and how these apply to programs that implement either a national energy efficiency standard or a city wide DSM program.

CHARACTERISTICS OF A PROGRAM OF ACTIVITIES	**EXAMPLES**	
	Implementation of a national appliance standard	**Implementation of a city wide DSM program**
Deliberate program	Labeling, testing and quality assurance program	Targeting, financing and installing program
Multiple sites	Appliances covered under the standard will be located in households thus multiple sites throughout the country.	Installations in residences, buildings, streets, etc., thus in multiple sites with the city.
Not simultaneous	New efficient appliances will be purchased by individuals over period of time according to purchasing power.	Program must delineate a plan of action, as not all installations can occur at the same time.
Exact type and size of GHG reducing action may be unknown at registration	Cannot predict ex-ante what size appliance will be purchased. The level of GHG reductions will only be known once the appliances are purchased and functioning, and CERs are not issued until verification using approved B&M methodologies has taken place.	May not know which buildings/ residences will adopt the new technology. The level of GHG reductions achieved will only be known once the new technologies are installed and functioning, and CERs are not issued until verification has taken place. However an ex ante estimation of the maximum amount of ERs a program can achieve is possible and should be done.
One coordinating agent	Could be utility, standards bureau, energy efficiency agency. Responsible for distribution of CERs and avoidance of double counting.	Could be utility, energy efficiency agency.

5. Benefits of CDM programs

The recent opening of the CDM to programs has several important benefits. First, it promotes the relative participation of energy projects in the CDM. As can be surmised from the above examples, the structure of CDM programs lends itself particularly well to energy projects. Energy-related emissions account for 66% of developing country emissions (CAIT 3.0, WRI).[6] Moreover, two thirds of the future increase (up to 2030) in global energy-related emissions is expected to come from developing countries (IEA, 2004). Energy is a critical contributor to global warming, and hence energy also has to be part of the solution, including via the CDM. However, energy is underrepresented in the CDM. Only one tenth of current CDM reductions come from electricity generation based on renewables, and less than 2% can be attributed to energy efficiency measures.[7] The low global warming potential of CO_2, the long lead times of electricity projects, and above all the dispersed nature, small credit flows and high transaction costs of energy efficiency projects have made energy projects comparatively less attractive in the CDM market. The possibility of structuring energy-related projects as programs could significantly increase the representation of energy projects in the CDM market.

Second, it tends to "democratize" the CDM. Perhaps the two areas that will be most positively affected by the program approach are fossil fuel switching and energy efficiency. In these areas clean technology deployment does not typically occur on an individual basis but rather on a gradually collective basis as the result of intentional programs. These programs are able to reach large numbers of individual households and small industry, offering them cleaner technology (appliances, transportation fuel, motors, air conditioners, etc.) installed according to the client's purchasing power and willingness to pay.[8] Thus programs open the benefits of the CDM to many small users who heretofore have not participated in the CDM.

Third, a program approach promotes decarbonization of the respective sector. Traditional single-site projects tend to be individual efforts at a "carbon upgrade" within the limited boundary of a single facility or enterprise, and thus produce little to no transformational effect on the sector or economy. While such a project may well improve the GHG intensity of the facility, it makes little contribution – if it is the only of its kind implemented - to decarbonizing production or consumption patterns. By contrast, a program approach could promote the much-needed transformation in the energy trends of developing countries.

Finally, and perhaps most importantly, CDM programs mark an important step in the meaningful participation of developing countries in the global climate regime. By assigning a CER value to reductions achieved under a program of activities, the regime is providing an incentive for developing countries to adopt and implement climate friendly policies and measures. In the short term this could significantly increase the level of supply of CERs on the market for the period 2008-2012. In the medium term, it can help prepare developing countries for a broader participation in the future climate regime.

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[6] Excluding land use change and forestry emissions. CAIT 3.0, World Resources Institute

[7] CD4CDM website updated November 3, 2005

[8] Bundling is not appropriate for these cases where there could be various types of technologies and a period of time during which they are installed.

6. Methodological requirements for programs[9]

The decision to allow programs of activities in the CDM is explicit in requiring that these project activities comply with existing CDM modalities and procedures:

> "Decides 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."

A review of CDM methodological requirements shows that it is entirely feasible for programs to comply with the existing requisites.

a. Project boundary. The project boundary encompasses all anthropogenic emissions by sources of greenhouse gases under the control of the project participants that are significant and reasonably attributable to the CDM project activity.[10] The boundary is typically the physical location of the equipment involved and, if electricity is displaced, the grid supplying the project activity. In a program of activities, the boundary is the geographic region and/or set of entities where the energy efficiency, fuel switching, or other emission reducing actions are expected to be implemented. Even though the location of the individual GHG reducing actions may not be known at the outset, the boundary of a program can be delineated ex ante (e.g. a particular city, a region, the whole country) and considered fixed for the duration of the crediting period. The exact locations where actual emission reductions occur over time (e.g. households where new more efficient refrigerators displace old inefficient ones) can be determined ex post and constitute the project boundary, as in other CDM project activities.

b. Leakage. Leakage is the net change of GHG emissions outside the project boundary that is measurable and attributable to the CDM project activity.[11] A CDM project activity must estimate the associated leakage and deduct the net increase from the emission reductions achieved within the project boundary. The sources of leakage depend upon the nature of the project activity, be it a single-site project or a program of activities. Programs that cover an entire country could induce emission increases (or reductions) outside that country. In the case of an energy efficiency program, it is generally assumed that reducing the sales of less efficient equipment leads to an equivalent reduction in the production of inefficient models. However, it is of course possible for manufacturers to reduce the prices of inefficient models and sell more in other countries, or that the market for more efficient models expands beyond the country's borders. The occurrence of such scenarios would be very difficult to determine. If they were in fact to occur, it would not be feasible to measure and attribute the higher emissions in one country due to an energy efficiency program in

[9] This section draws from and adapts the work of Erik Haites and Edward Hoyt in Figueres, C., Haites, E. and Hoyt, E. Programmatic CDM Project Activities: Eligibility, Methodological Requirements And Implementation, World Bank Carbon Finance Business, 2005.

[10] Glossary of Terms used in the CDM Project Design Document

[11] Glossary of Terms used in the CDM Project Design Document

another country, so the higher emissions would not be considered leakage. In any case, it is the obligation of the project proponent to identify all potential leakages of the program, and determine whether they are measurable and attributable to the program. If so, these emissions must be subtracted from the reductions achieved by the program.

c. Baseline. The baseline is the scenario that reasonably represents the anthropogenic emissions by sources of greenhouse gases that would occur in the absence of the proposed project activity.[12] Paragraph 48 of the CDM modalities and procedures presents the three possible approaches to baseline determination. Using any of these three options, the project proponent must identify plausible and credible alternatives to the proposed project activity and then select the most plausible alternative as the baseline scenario.

In the case of programs, the more appropriate options are Paragraph 48(a) and/or (b). Paragraph 48(a) refers to "existing actual or historical emissions." A program often implements a government policy or regulation, or a private sector initiative. As discussed in Section 2 of this paper, the Executive Board has determined that a policy or regulation adopted after 11 November 2001 need not be taken into account in the determination of the baseline. Thus the baseline scenario could refer to a hypothetical alternative scenario without the national and/or sectoral policy or regulation being in place. One likely alternative for a program of activities that implement a post November 2001 policy could be defined as the policies/regulations in effect prior to that date.[13] For example, in the case of a proposed mandatory performance standard, the absence of such a standard would be credible as one of the baseline alternatives, as would the absence of an incentive in the case of an intended incentive program.

Using paragraph 48 (b), the project proponent could alternatively identify a plausible scenario that represents an economically more attractive course of action. If the implementation of a program needs an up-front investment that is so significant that it constitutes a barrier, it may be financially more feasible to not institute the program. For example, the cost of setting up a strict enforcement program for a mandatory regulation could be so high that the absence of the mandatory regulation is a credible alternative. In the case of a program to disseminate stand-alone renewable energy technologies in remote rural areas, a credible alternative scenario is the absence of those technologies (probably diesel or kerosene), since the cost of extending the grid is unreasonable.

The above approaches to establishing a baseline are no different than those used by traditional single-site CDM projects. Perhaps the only difference to be noted in the case of a program of activities, is that it is possible that a single program may result in various types of GHG reducing actions. The already registered Kuyasa energy upgrade program in South Africa is a good example involving the installation of insulated ceilings, solar water heaters, and energy efficient lighting. Each type of GHG reducing action is accompanied by the appropriate baseline and monitoring methodology (AMS.I.C, AMS.II.C, and AMS.II.E respectively). In a similar fashion, CDM

[12] Glossary of Terms used in the CDM Project Design Document

[13] The Board's current decision does not specify the period for which the baseline scenario would reflect the pre-11 November 2001 policies. At some point the date of the baseline scenario may have to be updated. This will be an issue for all CDM project activities.

programs that result in various types of activities will have to use various baseline and monitoring methodologies in one PDD.

d. Additionality. For a project to be "additional", the project participant must demonstrate that the proposed CDM project activity is not the baseline. The Executive Board has developed an optional additionality tool that allows project participants to demonstrate additionality by showing that:

- the proposed project activity is economically or financially less attractive than other alternatives without the revenue from the sale of certified emission reductions (CERs); and/or
- the proposed project activity faces barriers that prevent its implementation but do not prevent the implementation of at least one of the alternatives.

Additionality must be determined for all programs of activities. A program of activities may be financially or economically less attractive than other alternatives or face barriers that prevent its implementation. For example, a testing facility that can only be established with the revenue from the sale of the CERs, would prove the additionality of an energy efficiency program. However, the additionality of a program may not be sufficient to guarantee that all emission-reducing actions implemented are additional. Three situations are possible:

- The emission reduction actions implemented are by their nature additional. In the case of an energy efficiency program that implements a mandatory standard, the additionality is reflected in the difference between the average efficiency before and after the standard is implemented.
- The individual emission reduction actions are few in number but large in size, and some may not be additional. Then the additionality of each action implemented under the program could be assessed. A voluntary program to encourage fuel switching at industrial facilities is a possible example.
- The individual emission reduction actions are small in size and many in number, and some may not be additional. In this case, appropriate monitoring tools (e.g. in using a control group) must estimate the emission reductions due to "free riders", so as not to count those reductions.

e. Free riders. For certain programs, it is possible that some of the individual actions implemented might not be additional even if the program is demonstrated to be additional. For such programs, participation requirements can be designed to increase the probability of these actions being deemed additional. Nevertheless, some of the energy efficiency or fuel switching actions implemented under the program of activities might have been implemented in the absence of the program. The entities implementing those actions are called "free riders". Free riding emission reductions do not represent an emission reduction by the program since those actions would have been implemented in any case.

The emission reductions by free riders can be estimated using a control group, econometric methods, participant surveys, review of documents in business decision processes, payback comparisons, and engineering modeling.[14] Not all of the approaches are suitable for a given program, and the approaches differ with respect to their cost and the accuracy of their estimates. The fact that participants are not

[14] TecMarket Works Framework team, 2004, pp. 133-146.

known in advance also complicates the choice of methods.[15] A program of activities would need to specify the proposed approach used to estimate the emission reductions created by free riders as part of the proposed baseline and monitoring methodology.

f. Double counting. There is an understandable concern about double counting in the case of programs. Programs typically involve several entities or groups of entities: the producers of the technology, the intermediaries (wholesalers, retailers, utilities, etc.) the consumers, the entity that manages the financing, and the coordinating agent, if it is not one of the above. In theory, they could all claim that their particular action is crucial to the reduction of emissions and that they are entitled to CERs.

The Executive Board has recently requested public input on how to avoid double counting. All project activities, including programs, will have to abide by the guidance that the EB will provide based on the call for input. In the meantime, double counting in programs can be avoided by stipulating that the coordinating agent is the only project participant authorized to claim CERs for the program. The coordinating agent could use the income form the CERs to cover the costs of operating the program, or it could have agreements with other potential claimants indicating that they cede their claims to the coordinating agent in exchange for a share of the CERs issued or the value equivalent. That agreement could be either a separate agreement or it could be reflected in the agreement regarding the distribution of CERs, which must be submitted at the time of registration. In the cases where a public agency is the coordinating agent, potential double counting must be checked by the DOE.

g. Crediting period. The crediting period for a CDM project activity is the period during which emission reductions from the baseline can earn CERs. The project participant may choose between: (a) a fixed crediting period of ten years or (b) a crediting period of seven years which may be renewed at most two times, provided that, for each renewal, a DOE determines that the original baseline is still valid or has been updated where appropriate.[16] The crediting period may only start after the date of registration of a CDM project activity and may not extend beyond the operational lifetime of the project activity.[17]

In the case of a program of activities the crediting period can be determined at the time of submission for registration. In most cases the provisions for the crediting period are adequate. However, if the emission reducing actions have a relatively long life and are implemented over a long time, (e.g. if the actions had a life of 15 years and were implemented over 10 years) there would be a potential loss of CERs.[18] This

[15] A control group appears to be the most accurate way to estimate free riders. However, establishing a control group ex ante and excluding them from the benefits of participating in the program raises philosophical issues. As well, the ex ante control group may not be representative of the actual participants. A control group selected ex post from non-participants may be unrepresentative due to adverse selection bias; the behavior of non-participants may not be representative of that of participants.

[16] For afforestation and reforestation project activities the length of the fixed period is 30 years and the length of the renewable period is 20 years to a maximum of 60 years.

17 Project activities started between 1 January 2000 and 18 November 2004 can have a crediting period that begins before the project activity is registered, provided they have either submitted a new methodology or have requested validation by a designated operational entity by 31 December 2005 and are registered by the Executive Board by 31 December 2006 at the latest.

[18] If the start date chosen for the crediting period is the date at which the first activities reduce emissions, the reductions that are not counted are those for subsequent activities that will still yield

potential loss can be addressed by registering a series of separate projects each covering the actions implemented during a specified period, such as 1 or 2 years.[19] The baseline and monitoring methodology would be the same for each of the projects, so the administrative costs would be relatively low.[20]

The potential loss of CERs for emission reductions achieved when long-lived actions are implemented over a long period of time could also be addressed by establishing crediting periods for specific vintages of actions. For example, all actions implemented during a given period, such as 1, 2, or 5 years, would constitute a vintage with the same crediting period. Although it is not currently practiced, the Executive Board could agree to allow a program of activities to cover multiple vintages, identifying vintages for emission reduction actions that start during the program lifetime but not after termination of the (renewed) crediting period of the first vintage.[21] Vintaging has the further advantage that it may more closely mirror the relatively short lifespan of technologies typically used in e/g energy efficiency programs (solar water heaters, efficient lighting, etc.). Vintaging is currently not allowed in the determination of the crediting period, and it would be useful in the context of programs, but it is not critical, as programs can be structured so that they are not substantially disadvantaged by the existing provisions relating to crediting periods.

h. Monitoring. Every CDM project activity must use an approved monitoring methodology. A monitoring methodology details what data need to be collected to calculate the baseline emissions, the actual emissions and leakage. It specifies how each data item is to be collected and stored and discusses the uncertainty and the quality assurance/quality control procedures for each data item.

Each type of program of activity would need an approved monitoring methodology that covers the same topics. Small-scale programs are easy to monitor. In some cases, the only monitoring required covers collection of the number of small systems (PV, biogas) in operation. Where the program of activities involves implementing a few large actions, such as industrial fuel switching, the monitoring methodology could be the same as that for a similar single plant CDM project activity. Where the program involves implementing many small actions, such as motor replacement or appliance installation, an appropriate monitoring methodology would need to be proposed and approved.

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emissions 21 years later. The discounted present value of those emission reductions is likely to be relatively small.

[19] Assuming that each project covers the actions implemented during a two-year period, the program would consist of five projects each with its own crediting period. Assuming that each of the projects selected a 7 year renewable crediting period, the participants could renew the crediting period once to get CERs for 13 to 14 years of reductions from each vintage. The project participants could also decide to renew the crediting period a second time to get CERs for the remaining 1 to 2 years of reductions from each vintage.

[20] The project participants could choose between registering all of the actions implemented as a single project activity and renewing the crediting period twice to capture emission reductions for 21 years or registering multiple (5 to 10) projects each with its own crediting period that is renewed once and hence capturing the emission reductions for 13 or 14 years of the 15 year life of each action.

[21] The provisions relating to the crediting period are specified in the Marrakech Accords, so the use of separate crediting periods for "vintages" of actions as part of a single program of activities might require a COP/MOP decision rather than an Executive Board decision.

If the program involves many sites monitoring would typically not be implemented at every site. Rather, a sampling plan would be used to select participants to be monitored and to extrapolate the monitored results to the full program with a quantifiable level of statistical precision. Sampling is already part of the approved methodologies for some small-scale and regular CDM project activities. Depending upon the measures implemented, the energy savings, and hence emission reductions, may be monitored by combinations of metering and calculations, billing analysis, and/or use of models.[22] Each approach would have a different cost and level of accuracy. The project participants would have to propose a monitoring methodology they considered appropriate for approval by the Executive Board.

The experience with energy efficiency and demand-side management programs worldwide over the past fifteen years has produced a series of widely accepted documents that address the issues involved in monitoring the impacts of such programs.[23] They do not specify the "best" monitoring methodology for a given program, but they identify the monitoring issues, methods to address the issues, the strengths and weaknesses of monitoring options, sample design issues, metering options, and they provide guidance in the preparation of a monitoring plan. This extensive body of material should facilitate the development of sound monitoring methodologies for programs of activities.

7. Next steps

As can be seen from the preceding analysis of the methodological requirements for programs in the CDM, programs are in many ways similar to single-site project activities and can comply with all the methodological requisites of the CDM modalities and procedures. The provisions relating to the project boundary, baseline setting, additionality, leakage and double counting are perfectly suitable for programs of activities. The provision for the crediting period could be adjusted to the fact that not all actions under a program start at the same time, but it is not essential for the implementation of successful programs.

Without making any changes in the modalities and procedures established by the Marrakech Accords, the Executive Board could provide guidance on certain specific issues pertaining to programs of activities to ensure their environmental integrity:

- Requirement that there be one coordinating agent, who must be a project participant, and the only claimant of CERs resulting from the program. The coordinating agent may of course have contractual arrangements with other participants for the distribution of the claimed CERs.

[22] Here metering means meters installed to measure the performance of the measure installed, such as run time or energy use. Billing analysis means analysis of the gas or electric bill for the facility. Metering is more costly to implement, but yields estimates specific to the measures installed. Billing data is already available, but reflects changes in addition to the measures implemented, such as changes in the level of production as well as changes in the efficiency of the motors.

[23] See Hirst and Reed, 1991; Vine and Sathaye, 1999; FEMP, 2000; IPMVP, 1996-2004; ASHRAE, 2002; and TecMarket Works Framework Team, 2004.

- Indication that the type and size of GHG reducing actions be estimated ex-ante, but requirement that all actions be measured and verified ex-post prior to the issuance of CERs.

- In the cases where there are different types of GHG reducing actions, requirement that each type be quantified according to an appropriate approved baseline methodology, even if that means that several methodologies are included in the same PDD.

- In the cases where there are many small GHG reducing actions, requirement that the project participant propose appropriate sampling tools in the monitoring methodology.

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