

The UNEP project CD4CDM

A Primer on CDM Programme of Activities



Primer On CDM Programme Of Activities

developed for the UNEP project 'CD4CDM'

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A Primer on CDM Programme of Activities

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Preface

The Programmatic CDM is a natural evolution of the mechanism to address issues of asymmetries of participation, especially in very small-scale project activities in key areas, sectors and countries with considerable potential for greenhouse gas emission reductions that have not been reached through the traditional approach of the CDM; mainly due to low volume of reductions against high transaction costs. Putting theory into practice, however, is taking longer than expected, due to a lack of full understanding of the complexities and limitations in the early versions of the official guidance, which has recently been improved¹ and updated by the CDM Executive Board, among other issues.

The CDM "Program of Activities" (PoAs) was officially introduced during the first meeting of the parties of the Kyoto Protocol (COP/MOP1) in 2005. Since then, the CDM Executive Board has been working extensively to make this new modality operational. In 2007 the CDM EB adopted procedures, at its thirty-second meeting, regarding the registration of a PoA as a single CDM project activity and issuance of certified emission reductions for a PoA. At its thirty-third meeting, the EB approved the basic forms for Design Documents (PoA-DD; PoA-CPA-DD, the SSC-PoA-DD and the PoA-CPA-SSC-DD). Due to low progress on submissions of PoAs, as a result of some regulation barriers, by its forty-seventh meeting the CDM EB launched a more comprehensive and clear version of the guidance. This new version considers fundamental methodological barriers that seemed to be acting as main barriers for mobilization of a critical mass of PoAs, and has been used as a fundamental document to prepare this Primer on CDM PoAs.

The purpose of this Primer is to shed light on the basic aspects of designing, developing and implementing GHG emissions reductions under the concept of Programme of Activities (PoAs). In close resemblance to what happened during the early days of standard and small-scale CDM, this modality requires considerable efforts on capacity building to trigger a critical mass of programs that can gather enough learning points to positively feedback all stakeholders involved (DOEs, CDM EB, DNAs, Carbon Companies, etc.).

Continuing with its efforts to contribute to developing capacities for the CDM, the UNEP Risø Centre is pleased to present this latest add-on publication to the series of CDM guidebooks produced as part of the activities on analytical support to the CDM (Capacity Development Programs), particularly the CD4CDM project. It is meant to contribute to the understanding of the concept and the different methodological, technical, legal and financial issues involved for an audience interested in the programmatic approach of the CDM.

This publication has been produced in collaboration with experts from the public and private sectors. Special appreciation and thanks go to URC colleagues from the Energy and Carbon Finance team: Jørgen Fenhann, Xianli Zhu Chia-Chin Cheng, Mauricio Zaballa and Sandra Bry for contributions, insightful comments and suggestions from early conceptualization until the final version.

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¹ at the time of writing this Primer: September 2009.

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Glossary

The terms listed in the glossary apply to the different kinds of CDM project activities.

A/R	Afforestation and reforestation project activities
SSC	Small-scale project activities
SSC A/R	Small-scale afforestation and reforestation project activities

The acronyms for types of Programme of Activities (PoA) are as follows:

PoA	Programme of Activities
A/R-PoA	Afforestation and reforestation Programme of Activities
SSC-PoA	Small-scale Programme of Activities
SSC A/R-PoA	Small-scale afforestation and reforestation project activities

The acronyms for types of CDM programme activity (CPA) are as follows:

CPA	CDM programme activity
A/R-CPA	Afforestation and reforestation CDM programme activity
SSC-CPA	Small-scale CDM programme activity
SSC A/R CPA	Small-scale afforestation and reforestation CDM programme activity

The readers are encouraged to use this glossary together with the latest guidance on CDM project activities and CDM program of activities available at <http://cdm.unfccc.int/index.html>. Senis augueriurero essi.

I. Introduction

During the first meeting of the parties of the Kyoto Protocol (COP/MOP1) a new CDM modality was introduced: "Programme of Activities" (PoAs)². The aim was to broaden the CDM field to replicable projects with low and physically spread GHG emissions reductions activities that would have been difficult and time-consuming to develop on a project-by-project basis. One of the most important issues addressed by P-CDM is the relationship between policies and programs. Programs that stem from mandatory policies and regulations are permissible provided that it is demonstrated that these policies and regulations are not systematically enforced. If they are enforced, the program must provide proof that it increases the enforcement beyond the mandatory level required (Annex 38, EB32).

By its thirty-second meeting, the CDM's Executive Board (EB) agreed on the basic rules for programmatic CDM. By its thirty-sixth meeting, the EB approved the official templates for Project Design Documents suitable for Programme of Activities (PoA-DD), its constituent activities (CPA-DD), and issued procedures to register PoAs and issue CERs. It also amended Small-scale CDM methodologies to make them suitable for programmatic activities. Since then, eleven PoAs are in the CDM Pipeline, nine under validation process and two have requested registration to the EB. After its forty-seventh meeting, an improved updated version of PoAs guidance was published³.

2 Dec 2005 "The CMP at its first session 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 net anthropogenic removals by sinks and emission reductions are real, measurable and verifiable, and additional to any that would occur in the absence of the project activity."

3 In May 2009, EB launched a report of its 47 meeting which includes five annexes of high relevance to P-CDM implementation:

Annex 29 - «Procedures for registration of a programme of

To understand the advantages of a programmatic approach from the perspective of a project developer, consider an initiative to reduce GHG emissions in a given business sector. In many business sectors, there are different levels of maturity and willingness to join or promote such an initiative. Under programmatic CDM, early adopters can join immediately, while slower movers can join as it establishes itself.

One of the main selling points to enroll companies in a program will be that the individual project concept has been validated and that a big part of the regulatory risk has already been taken care of by the Managing Entity, which registers the program before the enrolling process begins.

In a similar way to buying a franchise (i.e. a registered and proven business model that works), if a company wishes to implement a validated project concept (the CPA promoted by the PoA) without distracting itself from its core business, they should comply with all the eligibility requirements to join the PoA and implement a recognized CPA. In practice this means that, once the PoA is registered, the Managing Entity will provide the project concept and specific recipe to companies who want to undertake additional emissions reductions activities framed by such a program.

So far, opportunities for this novel way of creating carbon value are arising in business sectors that encompass small and medium sized enterprises (SMEs), are geographically and/or temporally

activities (PoA) as a single CDM project activity and issuance of CERs for a programme of activities» (version 03)

Annex 30 - «Procedures for review of erroneous inclusion of a CPA» (version 01)

Annex 31 - «Procedures for approval of the application of multiple methodologies to a programme of activities» (version 01)

Annex 32 - «Guidelines on the de-bundling for SSC project activities» (version 02)

Annex 27 - Draft General Guidelines on Sampling and Surveys (call for Public inputs until 1 July

dispersed, and have a large number of project owners among whom the number of committed PoA members is unknown.

This is often the case in Asia and Latin America, where opportunities such as residential lighting, fuel switching, upgrading or replacing small to medium size boilers, small landfills, water treatment systems, small hydropower stations and reforestation PoAs may proliferate, thanks to Programme of Activities. In the particular case of Africa, where CDM has not fully tapped into its potential, PoAs can catalyze GHG mitigation in activities that bring enormous sustainable development benefits yet lead to small amounts of GHG reductions (such as biomass, solar energy, connection of isolated electricity systems, biogas, etc) that are not enough to pay back CDM transaction costs and to take projects beyond the break-even point.

This document starts clarifying some common misconceptions about CDM Programs (PoAs) and differentiating this novel modality from its close cousin "Bundling". Once the main differences are identified in the first chapter, the second chapter introduces the latest rules applicable to PoAs, which were revised at the forty-seventh meeting of the EB. The details of the current rules and how to apply them will be the subject of chapter three. The fourth chapter presents the basics of PoA structuring, including recommendations for the identification of stakeholders and contracting.

We hope that this Primer will contribute to enrich the reader's understanding of what it takes to deliver certified emission reductions from PoAs.

II. The Basics of P-CDM

During the first meeting of the parties of the Kyoto Protocol (MOP1) a new CDM modality was introduced: "Programmes of Activities" (PoAs). The aim was to broaden the CDM field to replicable projects (i.e. CPAs) with low and physically spread GHG emissions reductions activities that would have been difficult and time-consuming to develop on a project-by-project basis.

By its thirty-fifth meeting, the CDM's Executive Board agreed on the basic rules for programmatic CDM. It approved templates for project design documents suitable for Programmes of Activities (PoA-DD), its constituent activities (CPA-DD), and issued procedures to register PoAs and issue CERs. It also amended Small-scale CDM methodologies to make them suitable for programmatic activities.

DEFINITION AND RATIONALE

A CDM PoA is considered "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 programs), which leads to GHG emission reductions or increases net GHG removals by sinks that are additional to any that would occur in the absence of the PoA, via an unlimited number of CDM program activities (CPAs)" (Annex 38, EB32).

Therefore, a program is a deliberate effort implemented via an *unlimited* number of CPAs, which is a multitude of GHG reduction activities occurring over time in a single or multiple sites. The sites could be located within one or more city, region, or country, as long as each country involved submits a Letter of Approval (LoA).

OPERATION OF A POA

A PoA differs from the traditional CDM project mainly by its operation. A PoA operates on two levels: at **the program level (PoA)** and at **the program activity level (CPA)**.

1. The Operation at Program (PoA) Level

The purpose of a PoA at the program level is to provide the enabling environment for others to implement a policy/measure or stated goal. In other words, the program provides the organizational, financial and methodological framework for the emission reductions at the level of the "CDM program activities" (CPAs), which should be managed or coordinating by a public or private entity.

Characteristics of a PoA

1. *Managing Entity.*

The Managing Entity is the project participant which provides the framework and incentives for others to achieve the emission reductions. The Managing Entity, which can be a public or private company, communicates with the Executive Board on all matters, including submission of the PoA and making arrangements for the distribution of certified emission reductions (CERs). The Managing Entity should ensure double counting does not occur by verifying that emission reduction activities in the program are not registered as a separate CDM project activity, or as part of another registered CDM program⁴.

The EB 47 decisions on P-CDM establishes that the Coordinating/Managing Entity shall obtain letters of authorization of its coordination of the PoA from each Host Party's DNA. However,

⁴ See chapter three for similar responsibilities for the validating DOE.

it is not specified whether the entity should be located within the country, or can be any international company. From current practice it can be inferred that the entity can be located outside the host country (as is the case in the Chinese PoA "Hydraulic rams for irrigation and domestic water supply in Zhejiang").

2. Duration.

The GHG-reducing activities do not necessarily occur at the same time. A program can have a duration of up to 28 years or 60 years for afforestation and reforestation programmes. Although all actions respond to the same program, they can occur either simultaneously, or throughout the duration of the program. The Managing Entity can add a CPA to the program at any time throughout the duration of the PoA. The CPAs will have crediting periods of different duration (see section below on '*The CDM Program Activity (CPA) Level*' for crediting periods of CPAs).

3. The starting date of a POA

A POA starts with the beginning of the public comment period of validation.

3. Monitoring and verification.

The total volume of emission reductions to be achieved by a program may not be known at the time of registration. Each CPA shall be monitored according to the monitoring methodology that has been approved for that type of project activity. In cases where there are many small GHG reductions⁵, statistically, sound sampling may be proposed in the monitoring methodology submitted for approval. For purposes of verification, the DOE may also use sampling techniques as long as they ensure the accuracy of the emission reductions⁶.

4. Boundary.

The physical boundary of a PoA can extend beyond the boundary of a single host country, provided each participating country submits a letter of approval from the respective CDM Designated National Authority (DNA). Thus, programs can be national within the boundary of one host country, or regional, including various countries. The boundary of the program must also be defined in terms of which gases are included or excluded; a requirement no different from that of other CDM project activities.

5. Methodology.

According to EB 47, Annex 31, the PoA can apply more than one approved baseline and monitoring methodology to all the CPAs under it. However, if more than one approved methodology is used, a case-by case decision is to be made by the EB before submitting a registration request for the PoA in question⁷.

6. Additionality.

According to EB 47, paragraph 73, "additionality is to be demonstrated either at the PoA level or at CPA level". At the program level, the PoA is additional if it is shown that in the absence of the CDM, (1) the proposed voluntary measure would not be implemented, (2) the mandatory policy/regulation would not be enforced as envisaged but rather depends on the CDM to enforce it, or (3) that the PoA will lead to a greater level of enforcement of the existing mandatory policy/regulation. Furthermore, paragraph 4(g) of the PoA procedure states, "*Definition of eligibility criteria for inclusion of a project activity as a CPA under the PoA, which shall include, as appropriate, criteria for demonstration of additionality of the CPA*". Hence, the assessment of the additionality of a CPA is rather based on criteria for inclusion

5 Notice that some of the small-scale methodologies already include provisions and requirements for sampling.

6 This is a relevant issue for DOEs as at the time of publication of the Primer the guidance for "statistically sound sampling" and "accuracy" was not yet available.

7 "Procedures for Approval of the Application of Multiple Methodologies to a PoA" (EB 47, Annex 31)

pertaining to the additionality of a CPA, which are specifically developed for the PoA in question. The additionality of the individual CPAs can be shown using the approved tool for the demonstration of additionality (see next section for CPAs additionality) and the CPA should also conform to the additionality arguments included in the PoA.

Typical examples for a PoA

Programmatic project activities are most promising in areas of energy efficiency and fossil fuel switching, such as a city-wide efficient lighting program; a national incentive program to switch inefficient industrial boilers, furnaces, and roasters from fossil fuel to NG; an investment program to retrofit steam traps; or activities to enforce an energy efficiency standard that would otherwise not be enforceable. It also seems to be promising in increasing the use of renewable energies, particularly in private households, small enterprises and transportation.

To illustrate the particularities of a CDM program with a few concrete examples, the following table presents the characteristics of a CDM Programme of Activities and how these apply to either a city-wide efficient lighting program, or a national program to switch industrial boilers, furnaces, and roasters from fossil fuel to NG.

2. The CDM Program Activity (CPA) Level

A CPA is the specific activity where the emission reductions are actually achieved by those that participate in the program. The CPA is identical to a traditional stand-alone CDM project in the sense that both must comply with all the procedures and modalities of the CDM and each must include activity that has a direct, real, and measurable impact on emission reductions. It

can be a single measure, or set of interrelated measures, designed to reduce GHG emissions within a predefined area. This area can include one or more locations, provided they are of the same type. All CPAs in a program must apply one or a combination of approved baseline and monitoring methodologies. At registration, the program must define the type of information that is to be provided for each CPA, to ensure that the CPA is eligible under the program and that the resulting emission reductions are real and measurable.

A CPA is a "single, or a set of interrelated measure(s), to reduce GHG emissions applied in either a single or many locations of the same type, within an area that is defined in the baseline methodology."

This definition allows for four main types of CPAs, based on whether the CPA applies a single measure or several, at a single location or several:

1. Single measure, single location.

These are CPAs constituted by a single measure to a single facility, for instance, improved insulation in buildings. In this example, each building is a CPA in which an EE measure is applied. Another example of this type is lighting efficiency programs in hotels, where the single location is each hotel and the single measure is to introduce more efficient lighting devices.

2. Several measures, single location.

These are CPAs constituted by a set of measures to be applied to a single facility. Examples of this type are integral efficiency programs in hotels, where the single location is each individual hotel and the several measures are the introduction

Table 1. Summary of Characteristics and application of a PoA:

Characteristics of a PoA	Examples	
	Implementation of an EE lighting program	Implementation of a fuel-switching program in industrial facilities
Deliberate program	Replace incandescent bulbs with CFLs in all households in a city	Switch industrial facilities from residual fuel oil or diesel to NG
Voluntary	No mandatory policy to replace incandescent bulbs	No mandatory policy for fuel-switching
One Coordinating Entity; Many implementers	Coordinator could be utility, energy efficiency agency, or an NGO Implemented by owners of households in program area	Coordinator could be NG provider, an NGO, or a private company Implemented by owners of industrial facilities
One type of facility	All households	All industrial facilities that currently use fuel oil or diesel
Multiple sites	The Managing Entity could divide the city into specific areas, making each area one CPA. Each CPA would have many locations (homes) where the bulbs are replaced	Fossil fuel burning furnaces, boilers, and roasters would be included in the program Each individual furnace/boiler or roaster is a CPA
Not necessarily simultaneous	New efficient bulbs may be purchased or installed by individuals at different points over the crediting period of the PoA	Facility owners would be able to switch fuels only once they are connected to the gas pipeline
Methodology	Each CPA (city area) applies the same set of CDM baseline and monitoring methodologies	Each CPA (furnace/roaster) applies the same set of approved baseline and monitoring methodologies
Volume of GHG reductions not known at registration	Cannot predict ex-ante exactly which and how many households would join the program. The level of GHG reductions would only be known once the bulbs are installed and functioning CERs are not issued until verification has occurred	Cannot predict ex-ante exactly how many industrial facilities would switch to NG. The level of GHG reductions would only be known once the burners/furnaces are switched to NG and functioning CERs are not issued until verification has occurred
Monitoring	Each CPA (city area) is monitored. The monitoring methodology would likely be based on sampling of homes within the CPA area	Each CPA (furnace/boiler) is monitored. The monitoring methodology would be applied to each furnace
Verification	Can include sampling	Can include sampling

Source: Adapted from Hinostroza, et. al., 2007.

of more efficient lighting devices, better insulating windows and intelligent elevators. Another example is an energy efficiency program for boilers in industrial facilities. There, the single location is each facility, and the several measures are the energy efficiency measures applied to the boilers of the facility.

3. Single measure, many locations.

These are activities that apply one measure, such as replacement of inefficient light bulbs, to many locations within a single CPA defined area. The single measure is the replacement of any/all incandescent light bulbs in each location. Each CPA will cover many locations (e.g. apartment buildings or household blocks)

4. Several measures, many locations.

These are activities that apply a set of interrelated measures (such as various energy efficiency measures in homes), to many locations within a single CPA defined area. The CPA could be a city, or a section of the city, in which a group of efficiency measures (such as efficient lamps, ballasts, air conditioners, fans) are applied to many homes within the area.

Characteristics of a CPA

1. Crediting Period of the CPA

As with all other CDM project activities, the crediting period of a CPA is either a maximum of seven years, which may at most be renewed twice, or a maximum of ten years, with no option

of renewal⁸. The Managing Entity can add a CPA to the program at any time throughout the duration of the PoA. It is important to note that all CPAs' crediting period should end upon expiration of the PoA. Although the EB regulation does not forbid choosing both 10-year fixed and 7-year renewable crediting period under a PoA, as the CPAs are very similar to each other and have similar technology operation life, choosing only one type of crediting period will make issues much simpler.

2. Starting date of the CPA.

The CPAs can start simultaneously or start at any time during the duration of the programme.

3. Additionality

The additionality of each CPA has to be demonstrated through the eligibility criteria for inclusion of CPAs and not on the CPA level itself. However, assessment of these criteria may still occur (and it should be expected that they often will) at the CPA level.

⁸ In preparation for renewing the crediting period of CPAs under a PoA, the Managing Entity needs to prepare (i) A new completed CDM-POA-DD; and (ii) A new version of the PoA specific CDM-CPA-DD. However, if both documents have already been updated due to methodology changes, they can be renewed 7 years after the approval of the latest revision (See Annex 29 to EB 47). To update the crediting period of a specific CPA, the coordinating entity should complete the latest version of the CDM-CPA-DD, and forward it to any DOE for scrutinization. The DOE carries out the CPA crediting period renewable through uploading the CPA DD through a dedicated interface of the UNFCCC CDM website.

DIFFERENCE BETWEEN POAS AND BUNDLING

Bundling requires every single project to be identified and qualified before registration, while a programme can be registered at the concept level without specifying beforehand all its constituent activities, but one CPA.

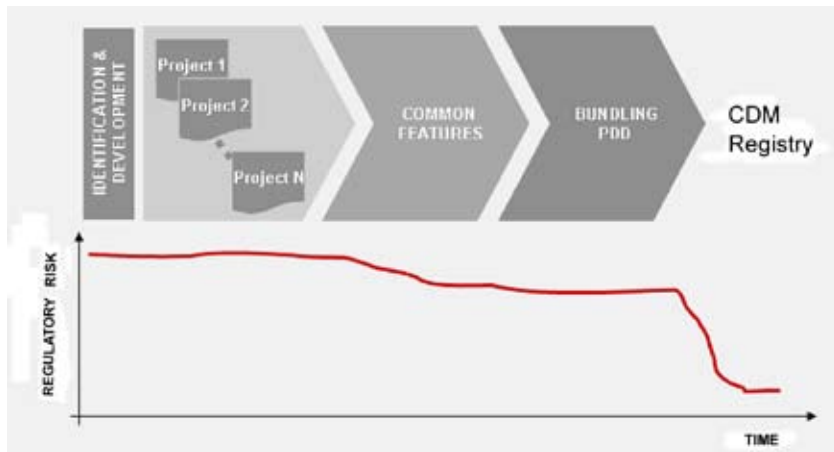
Bundling has had limited success in promoting the origination and grouping of small and dispersed projects. One of the reasons for this is the fact that the regulatory risk is reduced only after the registration of the bundled projects which, as with standard CDM projects, happens only after money and effort have poured into the development of every single project and the drafting of the PDD.

Under the programmatic approach, regulatory risk is handled earlier in the process. Once a PoA is registered (presenting the concept and at least one real activity to the CDM Executive Board), enrolled PoA participants can embark on their individual activities with more certainty that their actions will be rewarded with CERs. Under PoAs, constituent projects are validated and verified by relevant UN-accredited Designated Operational Entities (DOE), while monitoring is performed by a PoA Managing Entity. In the event of an individual activity ("CPA" in Programmatic CDM jargon) failing to comply with the registered PoA terms, the DOE reports this and the non-compliant activity is put aside. However, the rest of the activities in the programme can continue.

This characteristic is particularly important from the buyer's perspective since PoAs offer a simple way of diversifying risk within a single type of project or technology. In addition, much of the complex management is outsourced to the Managing Entity, which is entitled to monitor the projects, trade CERs, distribute their benefits and represent all the programme members. Fur-

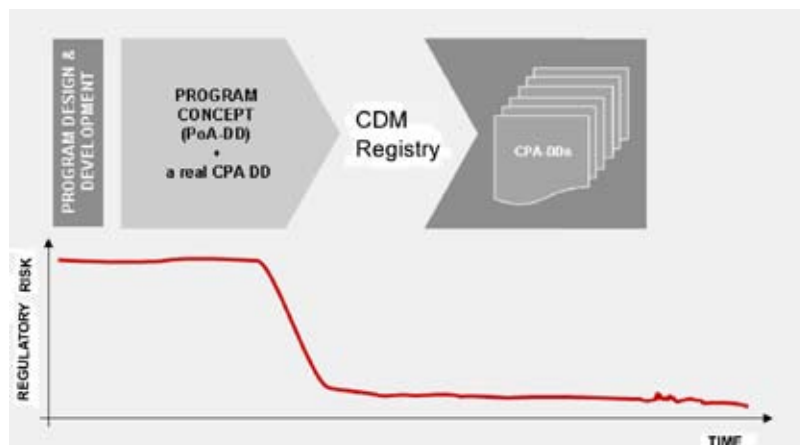
thermore, bundling poses practical limitations on its number of constituent projects since in a bundle "sampling" site visits are not allowed either for validation or verification.

Figure 1: Bundling Scheme



Source: F. Avendaño, Carbon Market Perspectives Series 2008 "A Reformed CDM - Including New Mechanisms for Sustainable Development"

Figure 2: PoA Scheme



Source: F. Avendaño, Carbon Market Perspectives Series 2008 "A Reformed CDM - Including New Mechanisms for Sustainable Development"

III. Understanding the PoA Rules

By its forty-seventh meeting, the CDM's Executive Board (EB) agreed on the basic rules for programmatic CDM. This chapter outlines the application of these rules to the development and implementation of PoAs. To ease the understanding, those rules can be divided into three types:

- Rules defining eligible PoA types
- Rules governing roles of key stakeholders
- Rules setting PoA & and CPA compulsory features

APPLYING RULES DEFINING ELIGIBLE POA TYPES

According to the "Procedures for registration of a Programme of Activities as a single CDM project activity and issuance of certified emission reductions for a Programme of Activities", the most important requirement is the proper definition of the pursued policy or goal. A set of projects do not make or define a program, but a set of interrelated measures that seek GHG emission reductions do. Therefore, once a potential set of interrelated measures that seek emission reductions is identified, the feasibility of developing them as a PoA should be objectively assessed.

Table 2. Main issues to consider for a PoA

PRACTICAL "PRE-REQUISITE"	YES or NO?
The Program measures ¹ can be explicitly distinguished from the projects that would benefit from these measures	
A generic project under the Program can be modeled using only one approved baseline and monitoring methodology OR the baseline, project and leakage emissions can be fully accounted by the use of more than one methodology	
All the projects (i.e. CPAs) will have a start date after the planned date ² on which the CDM-PoA-DD will be first published for global stakeholder consultation	
The PoA can be implemented through the replication of a project template (generic CPA)	
The parameters and criteria to demonstrate that each and every project are additional can be clearly listed	

1 Financial or tariff incentives, specific benefits, supply of specific efficient appliances in a target customer base, etc.

2 "The Board decided to grant an exemption to paragraph 5(d) of the «Procedures for registration of a Programme of Activities as a single CDM project activity and issuance of certified emission reductions for a Programme of Activities» to Programmes of Activities which have commenced validation prior to 31 December 2009. Therefore, such programmes may include CPAs with a starting date between 22 June 2007 and the commencement of validation of the PoA, if a list of such specific CPAs is provided to validating DOE and UNFCCC secretariat prior to 31 January 2010."

The following table lists the main issues that should be considered and checked, in order to see whether the intended action is eligible as a PoA:

If any of the above issues are checked as NO, the intended action is not eligible to be developed as a PoA and should be reformulated. It is recommended to analyze whether the action can be eligible to be presented as a Bundle or an individual project.

Small-Scale PoAs

Similar to standard CDM, Small-scale PoAs are also a possibility. In this case, the entire PoA does not have to be small, but its constituent parts (i.e. CPAs) should comply with the Small-scale definition of CDM. The implications of this are:

- The PoA must use an approved CDM Small-scale baseline methodology. Use of more than one small-scale approved baseline and monitoring methodology must be approved prior to submission for registration. In this case the Managing Entity should send a request for approval for the use of more than one methodology to the UNFCCC Secretariat. Then the EB will pass the assessment of this request to the relevant panel or working group to analyze whether or not the combination is sufficient. If so, the working group will recommend the request for approval by the EB.
- If each of the independent subsystems/measures (e.g. biogas digester, Solar Home System) included in the CPA of a PoA is no greater than 1% of the small-scale thresholds defined by the methodology applied, then that CPA

of PoA is exempted from performing de-bundling checks (i.e. considered as not being a de-bundled component of a large-scale activity). For example, for Efficient Lighting PoAs, a typical household (a possible individual measure) may have an individual efficiency gain around 365kWh⁹ per year. This is well below 1% of the small-scale threshold of 0.6 GWh per year and the PoA would be exempted from performing the de-bundling test.

- If the individual measures included in a CPA go beyond the 1% threshold (i.e. 15 kW installed capacity or 0.6 GWh annual energy savings or 0.6 ktCO₂e annual emission reductions) then the CPAs should pass the de-bundling test. This requires that there should not be any other activity (registered or to be registered CPA or a registered CDM project) with:
 - a) The same activity implementer as the proposed small-scale CPA or with the same Managing Entity, which also manages a large-scale PoA of the same technology/measure, AND;
 - b) Its boundary is within 1 km of the boundary of the proposed small-scale CPA, at the closest point.

Notice that individual measures comprehend individual CPA technology items such as the capacity, efficiency gain or GHG reduction of an individual biodigester, cook oven, set of LFCs per house, Solar Household System, etc. In cases

⁹ Assuming 365 days per year, 5 hours of operation per day, replacing 5 incandescent bulbs of 60W for 5 compact fluorescent lamps of 20W each we will have an efficiency gain of 365kWh per year per household.

where there is another activity that complies with conditions "a" or "b" from above, but the total size of the proposed CPA combined with a registered small-scale CPA of a PoA or a registered CDM project activity does not exceed the limits for small-scale CDM, then the proposed CPA can be considered Small-scale.

APPLYING RULES GOVERNING ROLES OF KEY STAKEHOLDERS

The most relevant and key stakeholders for a PoA are: the Managing Entity, the DOE and the EB. The following paragraphs describe the basic implications of the current PoA rules regarding their roles.

1. Managing Entity

The Managing Entity of a program can be either a public or private entity. Regarding its functions, the PoA rules set duties and responsibilities for this actor. These responsibilities go beyond the typical ones of those of project participants in traditional CDM.

PoA rules do not constrain or condition the Managing Entity to operate in a given geographical area. Indeed, PoA rules give the freedom to have a boundary that can surpass a single country and a given sector (private, public, intersectoral, multisectoral, etc.). However, the geographical and sectoral know-how is one of the critical points for the development of a PoA. In general, a good practice would be to include in the boundary only areas that could be easily reached and managed by the Managing Entity.

The operators of individual CPAs are not required to be project participants, as participation is only recorded at the PoA level. Furthermore,

programmatic CDM requires having the Managing Entity as either the sole or joint focal point for each area of communication with the EB. The Managing Entity is appointed as legally responsible for the program on behalf of all the projects that are part of the PoA.

According to the current PoA rules, the key duties and responsibilities of the Managing Entity are:

- To develop a Programme of Activities Design Document (CDM-PoA-DD). This document will set the formal framework through which the PoA will be implemented. In addition to the PoA-DD, the Managing Entity should also develop a CPA-DD for each CDM Programme Activity (CPA) that is part of the PoA. This CPA-DD should be explicit enough to allow the unique identification and a clear understanding of the project.
- To obtain a letter of authorization of its coordination of the PoA from each Host Party.
- To obtain letters of approval for the implementation of the PoA from each Host Party and Annex I Party involved in the PoA.
- To prepare the PoA specific CDM Programme Activity Design Document (CDM-CPA-DD)^{10,11} using the provisions of the proposed PoA.

¹⁰ The latest version of the template form CDM-CPA-DD is available on the UNFCCC CDM web site in the reference/document section.

¹¹ At the time of requesting validation/registration, the coordinating Managing Entity is required to submit a completed CDM-PoA-DD, the PoA specific CDM-CPA-DD template, as well as one of such CDM-CPA-DD completed (using a real case).

- To identify and define the modalities of communication with the CDM Executive Board.
- Define the inclusion criteria, i.e., measures to ensure that all CPAs under PoA are registered as an individual CDM project activity and not included in another registered PoA.
- To make arrangements with the other Project Participants of the PoA about how to manage communication and distribution of CERs.
- To inform the CDM Executive Board about addition(s), giving details of the programme activity(ies) in a pre-defined format for submitting such information.
- Receive and distribute the CERS or its associated benefits to the CPAs.

2. Designated National Authority (DNA)

DNA officers may see the PoA as an opportunity to strengthen environmental reporting and governance in atomized business sectors. Quite often, governments of developing countries prioritize the allocation of their scarce environmental law enforcement budget on large-scale industry and natural resource extraction operations, leaving SMEs or small projects unmonitored. Having PoAs covered by these small and spread out operations could help to monitor these activities. For example, in most developing countries, small hydropower plants below 10MW capacity do not need to conduct an environmental impact assessment and only present a statement and a brief environmental management plan that will rarely be audited or followed up by government bureaus. However,

if owners of small hydropower installations are enrolled in a PoA, the Managing Entity is entitled to monitor and report their environmental performance, safeguarding the compliance of PoA terms, which would include ecological issues, sound stakeholder relationships, applicable law compliance, and so on.

According to the current PoA rules, the key duties and responsibilities of the Host Country DNA are:

- Assess PoA contribution to host country sustainable development.
- Grant host country letter of authorization to the Managing Entity¹². This is an authorization to coordinate/manage the proposed PoA and enables the Managing Entity to manage/coordinate the PoA. Contingent upon discretion of the host country, this may require to having a Managing Entity represent the projects either by association or by future contracting, and be competent of the technological, commercial and regulatory aspects of the proposed PoA. The EB 47 decisions on P-CDM do not specify if the entity should be located within the country or can be an international company. From current practice it can be inferred that the Managing Entity can be located outside the host country (as is the case in the Chinese PoA "Hydraulic rams for irrigation and domestic water supply in Zhejiang").
- Grant host country approval letters to the PoA. Host countries require that

¹² Only an authorization of its coordination of the PoA is required and not an authorization to be a project participant, i.e. the Managing Entity can be authorized to participate in the CDM by an Annex I Party, but the Host Party has to agree that the Managing Entity coordinates the PoA.

CDM projects demonstrate sustainable development contribution through criteria combining, technological soundness, social acceptability and compliance with local/regional/national policies and regulations.

- Letters of approval should be issued in accordance with the guidance provided by the CDM Executive Board.
- The Designated National Authority (host country and Annex I) are automatically notified of any change in the status of the PoA.
- If a DNA involved in the PoA or a Board Member identifies any error that disqualifies a CPA from inclusion in the PoA, the Secretary of the EB shall be notified.
- If the EB excludes a CPA from the PoA, the DNAs involved should be informed that the error has been found as well as of the decision of the EB.

3. Designated Operational Entities (DOEs)

According to the current PoA rules, the key duties and responsibilities of a DOE are to perform either validation/inclusion or verification/certification of the PoA, including Small-scale PoAs. The validating DOE should also be the one performing the CPA inclusions, and not the one doing the verifications. While it is possible to have the same DOE to do both validation and verification, this must be previously authorized by the EB, as with standard large-scale CDM Projects.

For the validation task, the DOE duties are:

- To prepare and submit to the EB a request for registration of the PoA using the "Program of Activities registration request form" (F-CDM-PoA-REG) together with a validation report and supporting documentation.
- Comply with liabilities in case of any errors that disqualifies the inclusion of a CPA have been identified by DNA or an EB member.

For the inclusion task, the DOE duties are:

- To crosscheck the information in the CDM-CPA-DD against the PoA and documentation requirements, and if consistency/integrity is confirmed¹³, include the proposed CPA(s).
- Add in the registered PoA by uploading the CDM-CPA-DD to the CDM Executive Board via a dedicated interface on the UNFCCC CDM website. CPAs should be grouped and uploaded not more than once per month.

For the verification and issuance task, the DOE duties are:

- To be able to access and assess all monitoring reports of all CPAs in accordance with the record keeping system identified in the CDM-PoA-DD.

¹³ This confirmation includes positive results on the assessment of the additionality of the PoA, eligibility criteria for CPA inclusion (including criteria to be used for demonstration of additionality of a CPA), operational and management arrangements established by the Managing Entity for the implementation of the PoA, consistency between CDM-PoA-DD and the PoA specific CDM-CPA-DD to be used for inclusion of a CPA in the registered PoA.

- To identify those CPAs that it will be subject to verification of GHG reductions.
- To make all monitoring reports received from the Managing Entity immediately available publicly on the UNFCCC CDM website.
- To verify and certify the correct implementation and operation of the record keeping system.
- To include in its verification report a description of how it applied the methods/procedures for the purpose of verification as stipulated in the registered CDM-PoA-DD.
- To include in its verification report a description/justification of the site visits undertaken.
- To request CER issuance no more than every three months.

APPLYING RULES SETTING POA & CPA COMPULSORY FEATURES

This section is based on the *"Guidance on the registration of project activities under a program of activities as a single CDM project activity"*. For the latest official version available, check <http://cdm.unfccc.int/Reference/Guidclarif/PoA/index.html>.

According to the referred guidance, a PoA is defined as a *voluntary and coordinated* Program of Activities implemented by a private or public entity. Consequently, if a program comes from the government it should be documented that the program is unenforceable and noncompulsory, but a voluntary action by the State. This

means that the State shall not have binding agreements to implement the program. In the case of State-promoted programs, it is necessary to document current compliance levels and to clearly state the kind of coordination or specific activities to be used for enforcement (or improve enforcement) of policies or regulations. This is important as it will allow the program to show that the monitored progress in policy or regulation enforcement will be a direct result of the program as opposed to something that would have occurred regardless.

Besides policies and regulations (e.g. *all solid waste goes to landfills*) which enforcement can improve through a program, governments may also implement voluntary programs, such as raising the efficiency of boilers used in state owned hospitals. The challenge here lies in distinguishing those boilers that would inevitably be upgraded from those that are retrofitted or upgraded as a result of the program. The answer is additionality.

While some PoAs presented to date have attempted to use the additionality tool to demonstrate this, the reader should not forget that the additionality tool is addressed to assess project related information, which is not always available at the more generic level in which a PoA specifies its measures. Furthermore, it is worth noting that the use of the additionality tool is only mandatory if the used baseline and monitoring methodology requires its application.

Besides the technical description of each activity of the program (CPA), the program document (PoA-DD) should list the features that will be shared by all CPAs, features that limit clearly the scenario in which such activity happens. Much of these features will come from the baseline and monitoring methodology used, but will also come from facts such as location, remaining lifetime, type of fuel used, level of efficiency and the range of energy service it is able to deliver. The generic CPA-DD,

a template for the specific activity we want to replicate through the program, should describe how leakage, additionality, establishment of the baseline, baseline emissions, eligibility and double counting are defined for each CPA within the program. Chapter two provides information on certain aspects of Programmatic CDM both at the PoA and CPA levels. In essence, the main PoA and CPA features are:

- A PoA is a deliberate effort implemented via an *unlimited* number of CPAs, which is a multitude of GHG reduction activities occurring over time in a single or multiple sites.
- PoAs can have a lifetime of up to 28 years, and 60 years for Aforestation / Reforestation project activities. Notice that their individual constituents (CPAs) crediting period cannot exceed the crediting period of its parent PoA.
- Any CPA can be added to the PoA at any time during the crediting period of the PoA.
- The crediting period of a CPA will be either a maximum of 7 years, which can be renewed at most twice, or a maximum of 10 years (30 years for A/R project activities) with no option of renewal.
- It is possible to extend the PoA's boundary to include more than one non-annex I country provided that for every country, the DNA issues an LoA that confirms the program's contribution to sustainable development.
- CPAs can use more than one approved baseline methodology, provided the combination of methodologies has

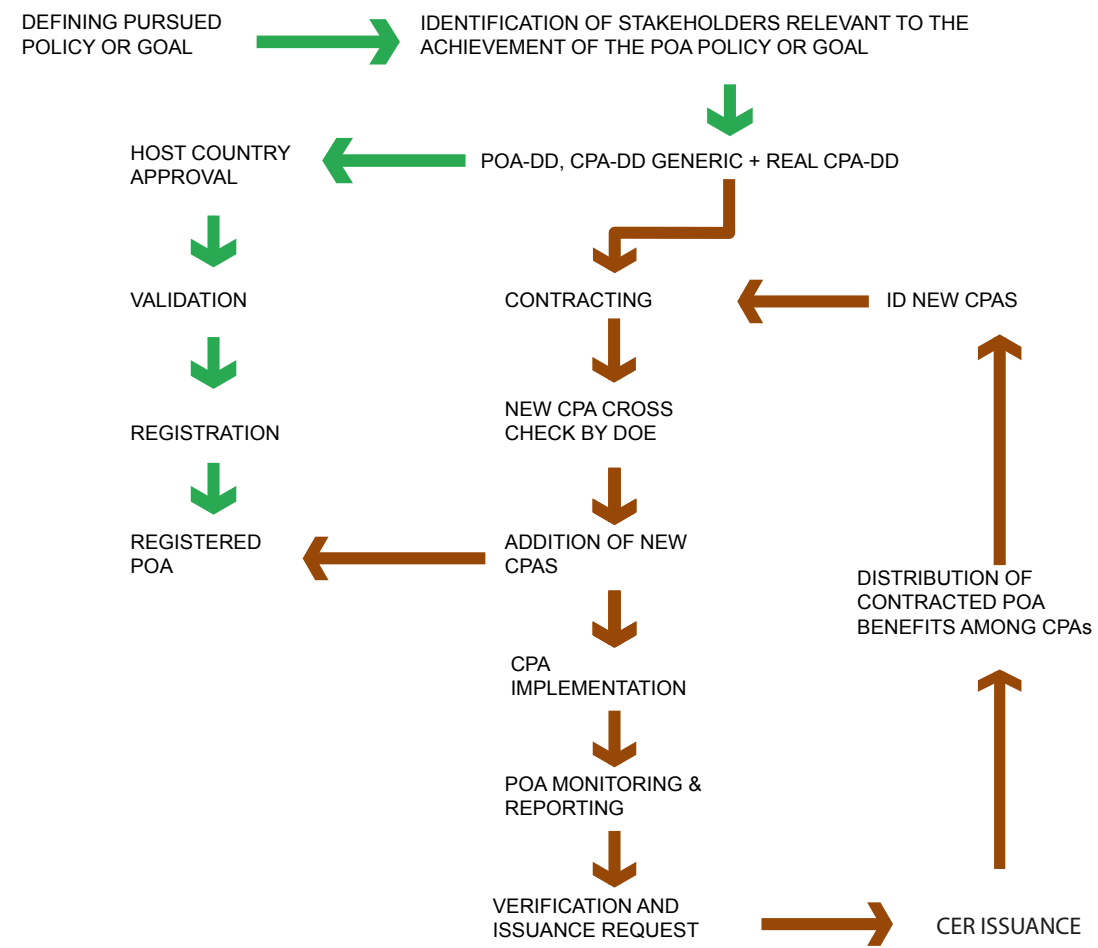
been previously approved by the EB.

- Each CPA emission reduction shall be monitored as per the registered monitoring plan according to the methodology applied to PoA.
- Sampling of CPAs during the verification is a possibility. For further details please refer to chapter five.
- If one of the used methodologies is put on hold or withdrawn, for any reason other than for the purpose of inclusion in a consolidated methodology, no new CPAs can be included to the PoA.
- If one of the used methodologies, subsequent to being placed on hold or withdrawn, is revised or replaced by inclusion in a consolidated methodology, then the PoA should be updated and a new version of PoA (e.g. Version 1.1) has to be validated by a DOE and approved by the EB. This defines a new version of the PoA and the PoA specific CDM-CPA-DD. Such revisions to the PoA are not required in cases where a methodology is revised without being placed on hold or withdrawn.

IV. Structuring a POA

Structuring a PoA requires many steps, not necessarily sequential, throughout actions and time and not managed by only one actor. To ease the reader's understanding of what it takes to structure a PoA, the following diagram sketches the main generic steps to accomplish the PoA cycle:

Among the steps included in the above diagram, the following issues are fundamental for the success of the PoA:



DEFINING A POA PURSUED POLICY OR GOAL

Whether starting from scratch or having previously existing experience developing CDM projects, the very first step is to identify the policy/measure or goal that the program seeks to promote through a “replicable GHG mitigation activity” or CPA. Around this activity, clearly identified should be those stakeholders who are instrumental in its execution, such as financial institutions, project owners, government agencies and neighboring communities, to name a few.

One of the most important issues addressed by P-CDM is the relationship between policies and programs. Programs that stem from mandatory policies and regulations are permissible provided it is demonstrated that these policies and regulations are not systematically enforced. If they are enforced, the program must provide proof that it increases the enforcement beyond the mandatory level required (EB47).

A newcomer to the carbon market may have the desire to use P-CDM to implement broad policies or programs that promise to reduce GHG emissions. From the governmental point of view (e.g. an Energy Official) this might be perceived as an opportunity to promote policies for boosting, for example, hydroelectric or wind power. For an investor, this may represent a long term business plan through which they may look for exposure to emerging technologies and renewable energy portfolios. For a boiler manufacturer, this may be seen as a way to boost sales of high efficiency boilers in a given customer base.

PoA rules require the Managing Entity to define, as precisely as possible, what the scope of the program is. For instance, saying that the program aims to increase the renewable energy share in the national energy matrix is not enough. It is not enough to choose well suited baseline and

monitoring methodologies, as this would sound ambiguous and prevent the specification of details about the technologies to be implemented and the level of the intervention. Additionally, it makes it difficult to quantify the level of associated GHG emissions reductions and the corresponding scale for the associated CPA.

Notice that the idea of promoting a measure or a policy goal may come from a range of actors. However, they may not necessarily be the implementer or be listed as the Managing Entity before the UNFCCC. For instance, efficient lighting programs are usually championed by energy ministries and/or finance ministries, but the final implementer will most likely be a local utility or a technology commercializing company that already has the framework to reach households, monitor power usage and enforce the program terms and conditions.

Important inputs for the definition of the PoA policy/goal are technology assessments, national, regional or sectoral GHG inventories, business association reports, technology sales plans for specific business sectors and public or private promotion programs for activities leading to GHG reductions (e.g. energy efficiency, fuel switch, forestry, clean production, etc.). These inputs not only help to shape the PoA policy/goal but are also helpful to sense the PoA potential boundaries and give an idea of the universe of potential interventions of the PoA.

The following table provides examples of the policy and/or goals targeted by real PoA cases:

Table 3. Policies and goals targeted by current PoAs

REAL PoA CASE	TARGETED GOAL / POLICY
CUIDEMOS México (Campaña de uso Inteligente De Energia Mexico) – Smart Use of Energy Mexico - Programme of Activities	The goal: The PoA has been able to set a specific goal which is to transform the energy efficiency of Mexico's residential lighting stock by distributing up to 30 million compact fluorescent lamps (CFLs) to households. This PoA will also include a significant public education component promoting the importance of energy efficiency in Mexico. The policy: This PoA is developed under the national strategy of climate change and additionally strengthens efficiency campaigns developed by some major institutions in Mexico. Demand-side energy efficiency has been identified by the Mexican government as one of the key areas to address in order to reduce greenhouse gas emissions and energy consumption (National Energy Savings Commission).
Promotion of Energy-Efficient lighting using Compact Fluorescent Light Bulbs in rural areas in Senegal	The goal set by the Senegalese Rural Electrification Agency (ASER) is to promote energy efficient lighting in newly electrified households in rural areas of Senegal. This Demand-side Energy Efficiency Measures PoA is based on the installation of CFLs <i>in newly electrified households and buildings</i> instead of the commonly used and less costly ILBs. The policy: This energy efficiency CDM PoA will be undertaken in connection with a nation-wide rural electrification plan implemented under the supervision of ASER. The objective of the plan is to increase electricity access in Senegal rural areas from 16% to 50% by 2012.
Installation of Solar Home Systems in Bangladesh	The goal: The PoA aims to provide access to electricity for households which are not connected to the power grid by implementing Solar Home Systems (SHS) with capacities ranging from 10Wp to 150Wp depending on the amount of electricity used by the household.
Uganda Municipal Waste Compost Programme	The goal: The PoA seeks to avoid methane emissions from municipal waste landfills by undertaking composting of the wastes and using the organic matter in the waste as humus for soil conditioning and plant growth. The policy: The Government of Uganda has taken a loan from The World Bank under the "Environment Management and Capacity Building Project-II" and intends to use part of this loan to improve municipal solid waste management in cities and municipalities through the proposed municipal waste compost program.

IDENTIFICATION OF STAKEHOLDERS RELEVANT TO THE POA POLICY / GOAL

Beyond the CDM rules that require that all relevant stakeholders have been consulted about the Project activity, stakeholders' participation, directly and indirectly, are critical to the success of a PoA. The stakeholders of a PoA are those actors that are within the defined program boundary and whose participation are instrumental to the success of the PoA. The Managing Entity and the other project participants should clearly identify the stakeholders in the PoA, keeping all decisions and rules dealing with them properly documented. One of the ways to make this possible is by performing a value chain analysis for the Program around the desired PoA goal/policy. This will identify not only the actors directly involved in the CPA execution, but the suppliers and end clients as well.

Different types of stakeholders may intervene in the design and implementation of a PoA. The most relevant stakeholders are:

- Managing Entity
- DNA
- DOE
- EB
- CER Offtaker
- Project Owners
- Investors
- Lenders
- Central and local governments
- Consultants
- Technology Providers

- Projects Offtaker
- Projects workers and employees

The following steps may assist PoA developers to identify the relevant stakeholders for their particular PoA:

1. Start with the desired PoA goal/policy/measure.
2. Disaggregate the PoA goal/policy/measure into smaller goals or tasks.
3. Identify the sector (electricity, agriculture, manufacturing, residential, commercial, etc.) of each goal or task.
4. Identify project owners of potential CPAs and estimate their gross average GHG reductions. This will serve to quantify the number and scale of CPAs needed to reach your desired target as well as to get a sense of the PoA milestone calendar.
5. Ask the project owners to list their clients, project offtakers or consumers. This is particularly relevant for CPAs producing electricity, heat or steam. Some contractual obligations (amount, time, quality) may already be in place and the CPA design should be compatible with it, otherwise the CPAs may be discarded.
6. Ask the project owners to list their consultants, if any. They are useful for gaining quick access to information helpful for shaping a common project template for all CPAs.
7. Classify the projects according to their

financial status (raising equity, raising debt, raising both, fully financed). This is very important for being able to defend additionality on the grounds that the PoA opens new financial venues to raise equity or debt for the projects.

8. Identify the CPAs potential locations and identify relevant authorities for getting permits and authorizations. Sometimes processing times and requisites for permits and authorizations can be very heterogeneous. This needs to be taken into account in order to reflect their impact on the PoA calendar and needed actions.
9. Identify the communities present in the CPAs locations. They should be contacted and their comments invited.

10. Ask CPA owners if they have identified a potential technology provider. This may help to gather information on the technology base (and their cost, financing, etc.) of the CPAs and existing or ongoing arrangements to supply this technology to the project owners.

To get a sense of the stakeholders identified and listed in the PoA, presented to date before the CDM EB, the reader may check the publicly available PoA-DDs and CPA-DDs through the web link <http://cdm.unfccc.int/ProgrammeOfActivities/index.html>

The following summarizes the approaches used by real PoA cases

Table 4. Summary of the approaches used by current PoAs:

REAL PoA CASE	STAKEHOLDER APPROACH
CUIDEMOS México (Campaña de uso Inteligente De Energia Mexico) – Smart Use of Energy Mexico - Programme of Activities	In this case, by the generality of the programme and the lack of knowledge of future locations of CPAs, the stakeholders consultation and environmental analysis was developed, initially at the programme level. However, as a consequence of the validation of the PoA, the PP changed the approach and will carry out local stakeholder consultations for each CPA. To comply with the requirements of the Gold Standard, a comprehensive environmental analysis was developed for the programme.
Promotion of Energy-Efficient lighting using Compact Fluorescent Light Bulbs in rural areas in Senegal	The consultations with the local stakeholders and environmental analysis have been made at the programme level. The identified stakeholders for this PoA are the members of the National Committee for Climate Change (COMNACC) designated according to Article 2 of the ministry decree, and all the associations and non-governmental organizations involved in the protection of the environmental and rural development in Senegal.
Installation of Solar Home Systems in Bangladesh	Stakeholders include community leaders, local people, women, children, youth, hospitals, schools, and other development organizations. Formal and informal meetings with different stakeholders are organized during planning, implementation and monitoring stages of the program. I. Planning stage: Meetings are organized with the local people and their representatives before starting a new program or scaling up an existing program. PO staff also visit households to get feedback. Feedback is discussed during local, regional and head office meetings and incorporated into PO programs. II. Implementation stage: PO staff visit, on a monthly basis, the homes of clients to collect payments and conduct monthly check-ups. This gives the consumers an opportunity to discuss and receive responses. Unit offices are located in rural areas and clients can easily come to offices to give their feedback. Unit offices also frequently talk to top management situated at the head office through mobiles or telephones. Regional / Divisional / Unit Offices send their reports to the head offices. These reports are discussed during monthly meetings. III. Monitoring stage: Top management and audit teams make frequent visits to the fields. This gives them the opportunity to directly interact with the consumers. This is done either through meetings or home visits. Audit teams make formal reports on what they have seen and responses they have received. These reports go directly to the Managing Director who discusses the findings with the General Manager and Deputy General Manager.
Uganda Municipal Waste Compost Programme	Stakeholders' consulting was undertaken on two levels: • Local stakeholder consultation is done at PoA level • Local stakeholder consultation is done at CPA level Stakeholder consultations have been undertaken at the PoA level. The details of the consultation at the PoA level included stakeholder consultation at Kampala and at multiple town and municipalities which have shown interest in participation in PoA. The CPAs are for towns and municipalities, so it was required to include their views into the program formulation. As the program also addresses multiple towns and municipalities, country level stakeholders consultations were also undertaken.

DEVELOPMENT OF POA-DD, GENERIC CPA-DD AND REAL CPA-DD

The development and presentation of these documents, used for Host Country Approval, DOE Validation, EB Registration and Annex 1 DNA approval, is the exclusive responsibility of the Managing Entity.

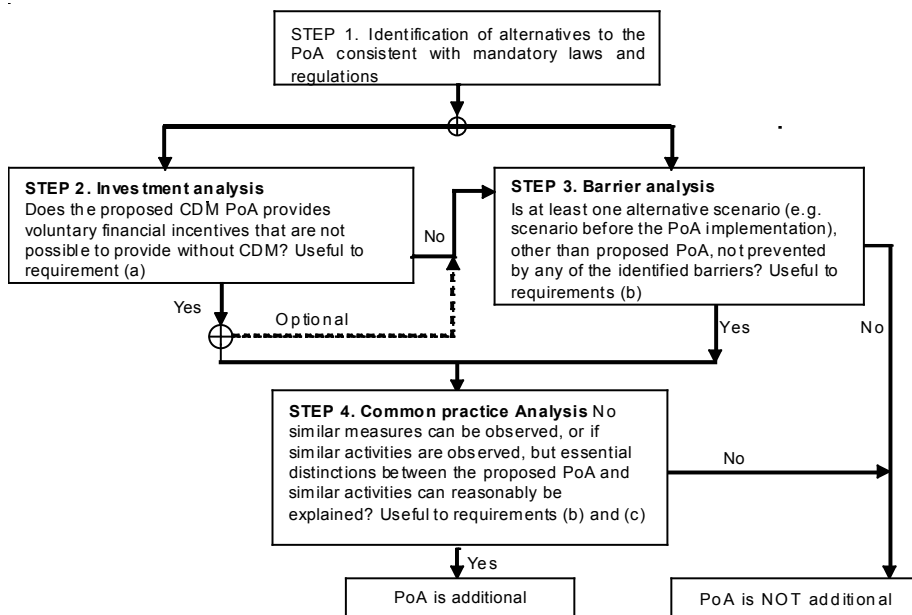
The first of these documents (PoA-DD) should clearly identify the Managing Entity, the host countries in which it will operate, and PoA participants. This document should also define among other things: boundaries of the PoA in terms of a geographical area within which all CPAs will be implemented; the policy/measure/goal that the PoA seeks to promote; demonstration of additionality of the PoA and conforming CPAs; criteria to include CPAs within the PoA; and a description of the management framework used to keep the PoA in good standing.

The Managing Entity is responsible for completing the PoA-DD and CPA-DD forms. According to the PoA rules, the Managing Entity should:

- a) Identify the Host Party(ies) and other PoA participants. Note that only the Managing Entity is required to be a PoA participant. The CPA owners and other stakeholders are not required to be participants. Furthermore, the Managing Entity should be listed as focal point for communications.
- b) Define the PoA boundary in terms of a geographical area (e.g. municipality, region within a country, or several countries) within which all CPAs will be implemented.
- c) Identify and describe the effect on the proposed PoA of applicable national and/or sectoral policies and regulations of each host country; Add detail such as the level

of enforcement of current rules and policies relevant to the PoA. This may vary within the PoA boundary.

- d) Describe the policy/measure or stated goal sought by the PoA and how these policies/measures or actions go beyond current levels of policy/regulations application or compliance; and the desired PoA policy/goal/target. If possible, disaggregate it into smaller targets/tasks that can be further assessed. This is particularly important for being able to prove the additionality of the whole PoA.
- e) Show confirmation that the proposed PoA is a voluntary action of the Managing Entity. In addition to a statement from the Managing Entity, this should also include a quick checklist of the laws applicable to the Managing Entity, showing that it is not obliged by law to implement the PoA measure or whether it has any previously existing contractual obligations to do so.
- f) Demonstrate additionality of the PoA proving that in the absence of the CDM any of the following conditions apply:
 - i. The proposed voluntary measure would not be implemented. Note here not to confuse the measure with the CPAs. For instance, setting a program that generates financial incentives to energy efficiency is different from the actual energy efficiency projects benefiting from the Program.
 - ii. The mandatory policy/regulation would not be systematically enforced and that noncompliance with those requirements is widespread in the country/region. This applies if the PoA is seeking to enforce a policy or rule or promotes



an early compliance of a future policy/ rule.

- iii. That the PoA will lead to a greater level of enforcement of the existing mandatory policy/regulation. This requires having background information on the desired “beneficiary” base. For instance, waste management laws usually require that sending all the domestic waste to a landfill and dumpsites to be prohibited. However in most countries, that level of enforcement is usually limited to big cities.

The PoA-DD requires in section A.4.2 to demonstrate, with specific details, that the PoA complies with the following:

- a) If the PoA is implementing a voluntary coordinated action, it would not be implemented in the absence of the PoA. Notice that for PoAs involving public funding or public programs, the involvement of public funds comes as a voluntary effort from the State (e.g. through public bureaus or

state companies) to implement/promote/ stimulate activities leading to GHG emission reductions;

- b) If the PoA is implementing a mandatory policy/regulation, this would/is not enforced;
- c) If mandatory policy/regulation are enforced, the PoA will lead to a greater level of enforcement of the existing mandatory policy/regulation.

The flowchart above shows some possible steps to demonstrate PoA additionality. These steps act as a tool for the demonstration and assessment of additionality, and considering an approach to CDM PoA, instead of CDM Project activity. The outcome of the following steps can be useful for supporting the answers to the above PoA additionality requirements.

The following table shows that the commonly preferred approach used by real PoA cases to prove additionality **is the discussion of barriers**:

Table 5. Current PoA approaches for additionality.

REAL PoA CASE	ADDITIONALITY APPROACH
CUIDEMOS México (Campaña de uso Inteligente De Energia Mexico) – Smart Use of Energy Mexico - Programme of Activities	This programme demonstrates additionality at the PoA level through the discussion of the following barriers: Investment barrier: The high costs of the proposed technology make this programme not the most economically viable, compared to other existing technologies, both for lighting and for other energy efficiency projects in the assessed country. Technology barrier: The programme offers a more efficient technology than the common practice. Institutional & Regulatory barriers: There are no regulations for developing such technologies. However, there are incentives that allow the development of other lighting technologies. Based on existing national legislation, three baseline options are proposed a) the PoA measures without CDM, b) the measures implemented without the PoA (as a consequence of natural trends), and c) the current reality.
Promotion of Energy-Efficient lighting using Compact Fluorescent Light Bulbs in rural areas in Senegal	This programme demonstrates additionality at the PoA level through the discussion of the following barriers: Investment barrier: An analysis of the financial barriers existing in Senegal is performed to demonstrate that the implementation of a nation-wide rural electrification plan in the framework of CDM will face financial barriers. Within this discussion the PoA documents the lack of public and private funds to implement energy efficiency programmes, the nonexistence of locally available international funds, incomplete operation and maintenance financing for the existing 12 concessions, lack of incentives for the use of CLFs, with prices up to \$8 compared to less than US\$1 for an ILB (the programme can lower prices to 6 US\$ but it is still considerably higher). Technology barrier: In the programme, a barrier is the lack of knowledge from the residents of the economics and benefits of using CLFs. It is indicated that the prevailing technology in Senegal is the use of incandescent light bulbs. The proposed PoA will introduce, for the first time in Senegal, systematic dissemination of energy-efficient lighting devices for grid-connected clients in rural areas.

Installation of Solar Home Systems in Bangladesh	This programme demonstrates additionality at the PoA level through the discussion of the following barriers: Investment barrier: The main objective of the overall Solar Home Systems (SHS) program in Bangladesh is to commercialize SHS across the country. However, SHS investment is a non-feasible activity in Bangladesh given the high upfront investment cost and technical constraints. CDM funding mechanism will help to promote the commercialization of the solar energy sector and enhance the deployment of SHS across Bangladesh. Technology barrier: The PoA refers to World Bank statistics to state that only 32% of Bangladesh's total population has access to grid-connected electricity. Besides electricity from the grid, kerosene and diesel are the only popular options for lighting and other energy needs in Bangladesh. SHS is a relatively new technology in the rural areas compared to the traditional use of kerosene and diesel fuel based appliances like wick lamps and diesel generators. People are unfamiliar with the technology and there is a general lack of experience in operation and maintenance. These "technical barriers" slow the promotion of SHS. Performance uncertainty is also attributable to such technical barriers, and to a large degree depends on the extent of regular maintenance and equipment servicing. In Bangladesh, the low market share of the SHS technology has led to low availability of local technicians to deal with maintenance problems. Therefore, providing for after-sales services is a barrier to the wide implementation of SHS across the country. Hence, the success of any SHS programme depends on robustness of maintenance and after-sales service network, and their cost effectiveness. To overcome this, POs may reserve a part of the additional revenues benefits accruing to the project activity from CER revenues to provide free maintenance service for the initial three years, thus ensuring that that benefits from CDM percolates to the end users. Moreover, by providing training during the initial three-year period, the capacities of the users will be built on basic SHS operation and maintenance. After three years, users can access maintenance service at minimal cost. CDM revenues, therefore, play a very important role in the project implementation strategy. Training and awareness activities will add to the project costs though it is very difficult to correctly quantify the investments required for such activities. Accordingly, the project activity is dependent on CDM revenues to cover the risk of cost overruns. Institutional & Regulatory barriers: In Bangladesh, there is a lack of supporting regulations, fiscal incentives and standards to encourage renewable energy practices and technologies. At present there are no regulatory standards in Bangladesh for effective implementation & uptake of renewable energy projects. There is very little governmental support to assist the renewable energy industry to undertake comprehensive programs and to transform the energy industry into a less polluting and more efficient one. NGOs and agencies like those listed in A.3 have to take the initiative and spend the additional resources to promote this kind of energy and overcome institutional barriers over which they have limited control.
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	Future SSC – CPAs should demonstrate additionality based on the following criteria: Flexibility or innovativeness of financial mechanisms being used in order to expand the reach and implementation of the Solar Home System program; CDM revenues being used to subsidize the cost of equipment maintenance. The above two criteria shall be applied in the following way: An explanation of the financing mechanisms available to households and the role of the CDM. Demonstration that CDM revenues (whole or in part) play a role in helping to expand the program.
Uganda Municipal Waste Compost Programme	Additionality is not defined for PoA, but it is explained for typical CPA. Investment barrier: Options considered in this analysis are: continuation of current practice, project without the CDM and project with CDM. The Net Present Value (NPV) of the investments is chosen as the relevant financial indicator for comparing the two options. This is done, as the present practice of landfilling operations, has only costs, while the composting operations have both costs and revenues. The financial analysis (carried out for a typical operation involving 70 tons of waste per day) shows that the current practice of disposing wastes in the landfills is the least costly alternative. The sensitivity analysis carried out for different scenarios with variations in capital costs, compost sales, and compost price, also concludes that the compost plant is not viable without carbon revenues in any of the scenarios. Technology barrier: The proposed CDM program would introduce a new technology for the processing of solid wastes in Uganda. The fact that there are no plants in Uganda that process municipal solid waste into compost, makes the technological risks associated with composting operations by the municipalities high. Technology appropriate for Uganda is available in other developing countries but needs to be localized and adapted to Uganda. There is a need for demonstration of the technology at multiple locations, in order to assess the appropriateness and acceptability. Institutional & Regulatory barriers: There is no explanation about institutional and regulatory barriers. Other barriers: Other barriers are considered as such due to prevailing practice (i.e. municipal solid wastes are disposed of in landfills, gas without recovery and/or utilization methane process).

- g) Set a starting date and length of the PoA, not exceeding 28 years (60 years for A/R); do not confuse the PoA start date with the start date of the first CPA.
- h) Describe the operational and management arrangements established by the Coordinating/Managing Entity for the implementation of the PoA. This includes a record keeping system for each CPA under the PoA, a system/procedure to avoid double accounting (to avoid including a new CPA that has already been registered, either as CDM project activity or as a CPA of another PoA), and provisions to ensure that those operating the CPA are aware and have agreed that their activity is being subscribed to the PoA.
- i) Define a check list for the requisites to include CPAs under the PoA. This check list should include factual criteria for demonstration of additionality, and the type and/or extent of information (variables, parameters or measurements) required. Special care should be placed on avoiding the use of ambiguous, subjective or very particular requisites. The checklist of requisites should ease a straightforward and auditable process to confirm the factual suitability of projects for their inclusion as CPAs of the PoA.
- j) Describe a monitoring plan for a CPA, developed in accordance with the approved monitoring methodology, and identify the monitoring provisions and data parameters a CPA has to apply/monitor.
- k) In case public funding is used, confirm that official development assistance is not being diverted to the implementation of the PoA.
- l) Provide confirmation that the CPA is neither registered as a CDM project activity nor included in another registered PoA.
- m) Describe a typical CPA which will be included in the PoA covering the technology or measures to be used.
- n) For the typical CPA, select an approved baseline and monitoring methodology and provide justification for this choice.
- o) For the typical CPA, provide demonstration of additionality and account for leakage. Proving additionality at the CPA level needs to be based on the information used to prove additionality for the generic CPA. Therefore, the additionality approach and rationale should be clearly defined in the generic CPA-DD, which must define the parameters and variables, together with their acceptable ranges, to be considered a CPA and at the same time prove to be additional.

Be aware that, the additionality tool or the combined baseline and additionality tool may be used as appropriately for proving the additionality of the generic CPA. Notice that additionality can be established on the PoA level and the additionality of CPAs is assessed through specific inclusion criteria, pertaining to the CPA. Hence, the additionality tool does not have to be applied to each CPA.

- p) Describe the monitoring plan for a CPA, according to the selected and approved monitoring methodology.
- q) If allowed, propose and describe a statistically sound sampling method/procedure to be used, first as part of the monitoring plan, and then by the DOE during PoA verification. Sampling in monitoring must be in accordance with the applied approved baseline and monitoring methodology. If the methodology does not allow sampling for monitoring, sampling is also not allowed in the monitoring plan. Sampling may only be applied in the verification process.

In the event that the Managing Entity opts for a full verification (without sampling) and verifies each CPA, it has to be a transparent system, ensuring that no double accounting occurs and that verification can be determined anytime for each CPA. If the Managing Entity does not wish to have all CPAs verified, the DOE should present a description of the proposed statistically sound sampling method/procedure to verify the amount of anthropogenic emissions reductions by sources or removals by sinks of GHG achieved by CPAs under the PoA. The program may include random sampling for the monitoring as defined in the approved monitoring plan included in the registered PoA-DD and CPA-DD¹⁴.

During verification the DOE will check the consistency and conservativeness of the monitoring report, and that the amount of emissions reduction claimed has already discounted any statistical error introduced by the sampling (conservative measure).

For example, if the PoA includes "m" CPAs, and according to the approved monitoring plan (included in the registered PoA-DD) "n" of them are allowed for sampling, and the final number of GHG emissions reductions for the universe of CPAs is "Z" tons CO₂eq +/- x%, then the monitoring report should cap GHG emissions reductions at $Z \cdot (1 - x/100)$ tons CO₂eq in order to be conservative.

In other words, sampling may be applied, but this should be conservative. This way, program developers will have to look at the tradeoff between:

- Detailed and possibly expensive monitoring for more or all the CPAs (leading to higher GHG emissions reductions cap and certainty on PoA income); or
- Sampling fewer CPAs (leading to a lower cap on GHG emissions reductions claims, since any error should be discounted in order to be conservative).

At the time of writing this document, the EB announced that it will develop a guideline containing criteria for

¹⁴ Please note that sampling in monitoring is only allowed if the applied baseline and monitoring methodology allows doing so. Hence, the methodology will define how to deal with uncertainty due to sampling. At the time of writing this Primer, it is not given that the EB will require discounting for uncertainty in case sampling is applied for monitoring; however conservativeness is always recognized as a good practice. It may also be that the EB will simply require a certain confidence level and if this confidence level is applied, no consideration of uncertainty is necessary. Only if a lower confidence level

is chosen, discounting may become necessary. This is the approach currently used in small-scale methodologies, which allow sampling for monitoring.

determining statistically sound *verification* techniques and methods¹⁵. At its forty-seventh meeting, the EB also announced that project developers are requested to take note that PoAs which may be registered prior to the adoption of this guideline will be required to comply with such criteria at the point of verification.

has been drafted for real PoAs, please refer to the UNFCCC website <http://cdm.unfccc.int/ProgrammeOfActivities/index.html>

- r) Invite and take into account comments by local stakeholders with regards to the PoA. Local stakeholders need to be consulted either at the PoA level or, for each individual CPA, at the CPA level. Document this process, including how comments were invited, what kind of comments were received, a summary of these comments and the response provided to these stakeholders.
- s) Perform an environmental analysis of the PoA. Environmental impacts need to be assessed either at the PoA level or, for each individual CPA, at the CPA level. Provide a description of why and how it was done, either at the PoA or at the CPA level.

The Managing Entity shall obtain letters of approval for the implementation of the PoA from each Host Party and Annex I Party involved in the PoA. Letters of approval shall be issued in accordance with the guidance provided by the CDM Executive Board. After these steps are completed, the Managing Entity holds the basic information to fill the PoA-DD and CPA-DD forms.

For examples of how the PoA-DD and CPA-DD

¹⁵ Notice that this refers to sampling during verification. In a PoA a DOE may not visit every CPA and only visit a sample of the CPAs and then extrapolates these findings to the CPAs where no on-site verification audit was carried out.

V. Contracting

One of the challenges in implementing a PoA is defining workable agreements among the parties involved. It is particularly important to distinguish between the PoA (*the emission reductions program registered or to be registered at the CDM Registry*) and the real program, which may be composed of an intricate arrangement among many parties of different nature. As with any project, the critical success factor of any CDM project is not what is written on its PDD, but on the actual arrangements and proper housekeeping required to design, implement and keep the program in good standing.

The following paragraphs sketch three basic contracting schemes and their provisions under which PoA may be built upon.

A PUBLIC PRIVATE PARTNERSHIP PROGRAM

This is the most complex scenario. It usually starts with a governmental desire to push for the achievement of a specific goal, or to enhance the enforcement of a law or policy. In this case, the government would act primarily as a promoter who still has to identify the other actors. Depending on their core business, resources and risk appetite, involved actors could be willing to act either as:

- Consultant, to design the program and escort the Managing Entity through the process of registering the PoA and adding new CPAs during the lifetime of the PoA.
- Facilitator, to bring potential partners together.
- Manager, but with no legal liabilities arising from the program.
- Managing Entity, taking full responsibility of the PoA.

- Technology providers, providing the technological kit needed to implement the CPAs.

Governments eager to implement lighting efficiency policies or goals may use this scenario. Once the parties and roles are defined, the contracts most likely will be bilateral ones between each party and the designated Managing Entity. This designation may come as a result of a government tender to appoint the Managing Entity, or as a result of a private initiative from a company willing to act as Managing Entity in exchange of for a managing and success fee (either in cash or in a share of the CER volume to be generated by the PoA). The following diagram highlights the arrangement under this scheme:

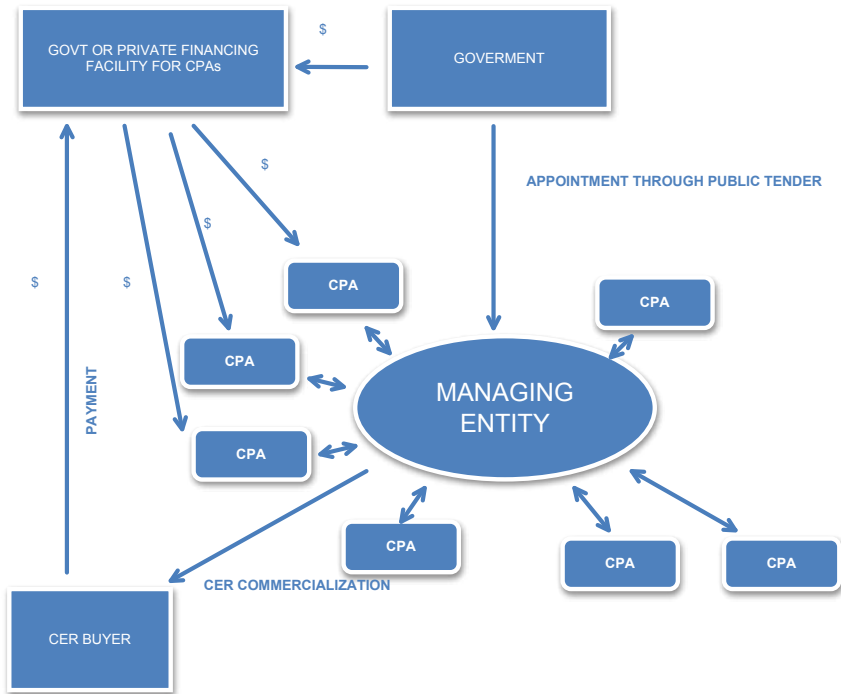
TOP DOWN PROGRAM

This resembles a "voluntary" command and control approach and may be found in situations in which the CPA is executed in a subsidiary company (or entity) of the commanding or Managing Entity. For example, a voluntary governmental initiative to upgrade all the boilers operating in public companies and entities, such as state owned companies, hospitals and district heat facilities, fall under this scenario. In this case, the State is acting as a "project participant" and voluntarily decides to implement a program with the aim to raise efficiency and reduce GHG emissions.

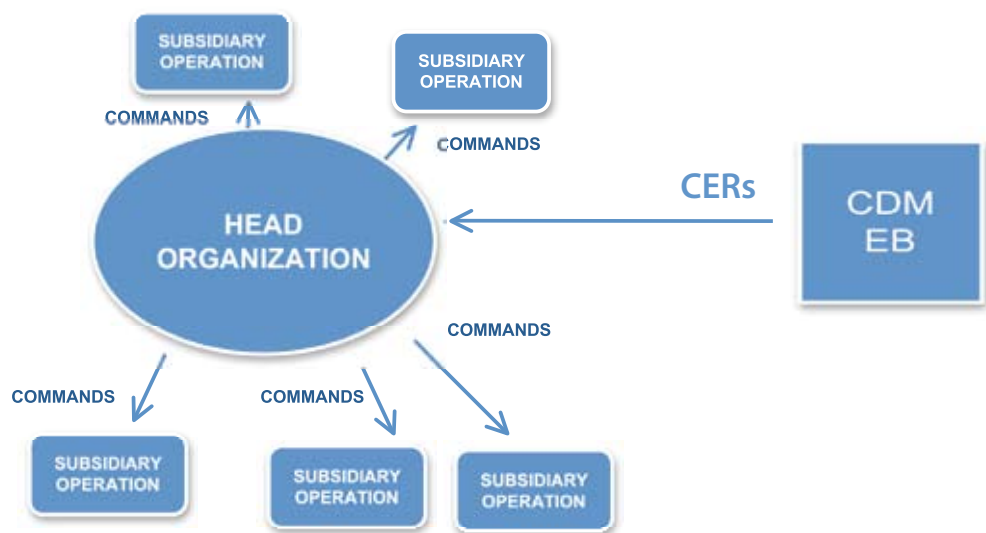
BOTTOM UP PROGRAM

This case may be illustrated by the initiative of many agricultural cooperative members who organize a broad program to introduce standardized biomass fueled boilers nationwide for members currently using fossil fuels. If widely accepted, the program promises to capitalize on the critical mass of CPAs bringing down imple-

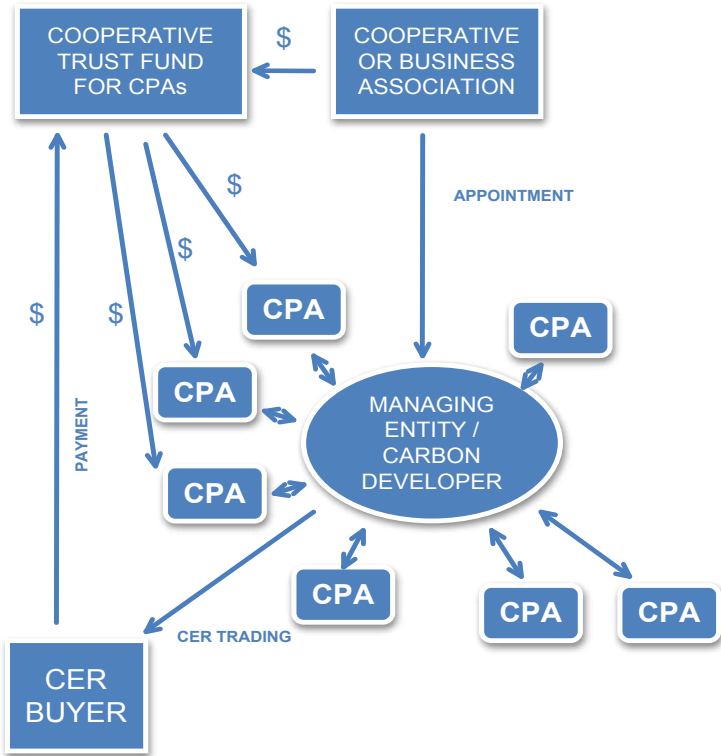
A Public Private Partnership



Top down program



Bottom up program



mentation and operative costs, and financing with CER income a cross subsidy fund to extend further the number of beneficiaries.

The contractual arrangements may be based on a trust fund fed by the cooperative membership fees, or a service contract with a company or entity that may be selected through a tender chosen to appoint a Managing Entity. The funds can be used as collateral for equipment leasing or acquisition.

VALIDATION

It is of particular importance to pay attention to the contract with the validating DOE. At the

time of writing this document, only one PoA has been registered, subject to corrections, and nearly a dozen are in the pipeline through validation. Having a DOE contracted for the validation job is one of the current bottlenecks for having broad and spread out implementation of PoAs. The "Procedures for Registration of a Programme of Activities as a Single CDM Project Activity and Issuance of Certified Emission Reductions for a Programme of Activities" set

liabilities on the DOE in charge of validation¹⁶. According to these procedures, if the DNA or any EB member identifies any error that disqualifies the inclusion of a given CPA, within one year after the inclusion of CPA into a registered PoA or renewal of the crediting period of the CPA, or six months after the issuance of CERs for that CPA (whichever is the later), then the DOE that included the CPA should acquire and transfer to a cancellation account, an amount of reduced tonnes of carbon dioxide equivalent, to the amount of CERs issued to the PoA associated to that specific CPA, within 30 days of the exclusion of the CPA. This cancellation account is maintained in the CDM registry by the Executive Board.

Once the DOE has been contracted, with the PoA-DD and CPA-DD at hand, the PoA can proceed to validation. The Managing Entity must submit these documents to a contracted DOE. After a satisfactory review by of the PoA and a completed validation report, the DOE should submit a request for registration of the proposed PoA using the "Programme of Activities registration request form" (F-CDM-PoA-REG) along with the respective validation report and supporting documentation. Chapter two provides details on the DOE duties during the validation process.

VERIFICATION AND ISSUANCE

If registered, the request for CER issuance by the DOE cannot be done more than once every three months. The Managing Entity has to make available all monitoring reports of all CPAs in accordance with the record keeping system identified in the CDM-PoA-DD, and all monitoring reports requested by a DOE for verification purposes.

The Managing Entity shall submit a request for the forwarding of CERs issued in accordance with the modalities of communication as agreed between project participants. Chapter two provides details on the DOE duties during the verification and issuance tasks.

WAY FORWARD

As PoAs are quite new, the early movers are currently going through the learning curve. The reader is invited to follow up on the process of maturing and advancing P-CDM. There is an ever increasing interest of using this new CDM modality to generate CERs in areas previously unattended or easily overlooked by traditional CDM Project developers. It is hoped that this first document helps to shed light on the first steps to understanding the intricacies of P-CDM.

¹⁶ Unfortunately the current guidelines still allow for the liability to cover all of the crediting period. The new guidelines only limit the length of time in which an inclusion can be questioned after each verification. Given that a review may also be requested, not only after the inclusion of the CPA but also after each issuance for the CPA, there is in reality no time limit either. If an inclusion is questioned, the validating DOE is liable for all of the CERS issued to that date. Most DOEs that accept validation mandates request to contractually transfer the liability to the Managing Entity before the DOE accepted a validation mandate. The improvement made at EB47 on the DOE liability issue promises to make the participation of DOEs more attractive in upcoming, and much needed, validation of PoAs.

Appendix 1: Real PoA cases

Case 1: CUIDEMOS México (Campaña de uso Inteligente De Energia Mexico) – Smart Use of Energy Mexico - Programme of Activities

Country: Mexico

I. Identification and conceptual design

Description of the Programme of Activities (PoA)

The Programme of Activities, CUIDEMOS Mexico, involves the distribution of energy efficient light bulbs to households across Mexico. Each small-scale CDM programme activity (SSC-CPA) will be implemented in geographically distinct areas across Mexico. The PoA and each CPA will be implemented and managed by Cool nrg Carbon Investments Pty Ltd ("Cool nrg Carbon Investments") and Cool nrg Mexico SRL de CV ("Cool nrg Mexico"), in collaboration with key operational partner organizations.

The goal

The programme has been able to set a specific goal which is to transform the energy efficiency of Mexico's residential lighting stock by distributing up to 30 million compact fluorescent lamps (CFLs) to households. By doing so, the program will abate greenhouse gas emissions through avoided electricity usage, significantly reduce the national electricity demand and stress on energy infrastructure, and save individual households money on their electricity bills. PoA will also include a significant public education component promoting the importance of energy efficiency in Mexico.

The policy

This programme is developed under the national strategy of climate change and additionally strengthens efficiency campaigns developed by some major institutions in Mexico. Demand-side energy efficiency has been identified by the Mexican government as one of the key areas to address in order to reduce greenhouse gas

emissions and energy consumption (National Energy Savings Commission).

II. Characteristics of the program

Contribution to sustainable development:

Economic Sustainability: The need for infrastructure for the generation of the country for the next 10 years is approximately US\$69 billion on a cost of US\$800,000 per megawatt of capacity installed. The installation of 1 million of CFLs will reduce the need for installed generating capacity of approximately US\$19.5 million; additionally helping to avoid generation costs by an order of US\$12.2 million, by increasing the useful life of plant penetration (by decrease in subsidies).

Technological Sustainability: The use of CFLs in homes is not new to Mexico. However, the cost of this technology on an individual basis is high, especially for the poorest families. This program breaks down that barrier for the use of this technology, to acquire the luminare scale to lower costs.

Social Sustainability: Generates social benefits by creating jobs and lowering energy costs for households and families that enter into part of the efficiency criteria. The programme includes training on energy efficiency to households that are part of the programme.

Voluntarily

The Coordinating Entity will voluntarily provide CFLs to each household. There are no mandatory requirements in Mexico stipulating the use of such devices, and the PoA requires individual households to take voluntary action to participate in project activities.

Stakeholders consulting

In this case, by the generality of the programme and the lack of knowledge of future locations of CPAs, stakeholders consultation and environmental analysis was developed, initially at the programme level. However, as a consequence of the validation of the PoA, the PP changed the approach and will carry out local stakeholder consultations for each CPA. To comply with the requirements of the Gold Standard, a comprehensive environmental analysis was developed for the programme.

Environmental analysis

Similarly, the environmental analysis has been developed at the programme level.

III. Structure and scopes

Managing Entity and participants of PoA

This is a purely private proposal based on the implementation of a business activity (selling CFLs); the programme has, as Coordinating/Managing Entity, a private company Cool nrg Carbon Investments Pty Ltd. As project participant, it also has Cool nrg Mexico SRL de CV, who will be responsible for the technical operation of the programme (training, distribution, collection of lights, etc). Finally, the programme also has the UK and Northern Ireland involvement as parties, but no clear roles are specified.

Boundary

This programme is national, and it covers the entire Mexican territory. Any CPA developed in Mexico could be part of this programme, provided the eligibility criteria are met.

Eligibility criteria to include CPAs in PoA

The eligibility criteria are simple, relating to compliance with the limits of the programme, requirements of the methodology selected, and the contractual agreements:

- Each SSC-CPA will involve the distribution and/or installation of energy efficient light bulbs to households within the geographical boundary of Mexico.

- Each SSC-CPA must implement the monitoring requirements stipulated in ASM II.C. 'Demand-side energy efficiency programmes for specific technologies' version 09.
- No other CPA or CDM project involving the distribution and/or installation of energy efficient light bulbs is already registered and operating in the same, specific physical geographical area.
- Each SSC-CPA must be approved by the Coordinating Entity and DOE prior to its incorporation into the PoA.
- The geographical location of each SSC-CPA must be a minimum of 1km (NEWS) from another SSC-CPA implemented under the PoA.

The last criteria listed could limit the participation of some households if no spatial size limit is set for CPAs. CPAs can be established by region, regardless of whether a one region has more households than another. These regions could include one or more districts or villages, and should be separated by non populated areas, so as to allow districts that are geographically united to be a part of the programme completely, while avoiding problems of monitoring (in reference to the real location of the CFLs). However, there is always a limitation, in that large regions are likely to exceed the limit of small-scale regions faster; this issue must be considered by the Coordinating/Managing Entity, keeping in mind that the goal is to distribute 30 million CFLs.

III. Additionality

Additionality of PoA, as a whole.

Investment barrier:

The high costs of the proposed technology make this programme not the most economically viable, compared to other existing tech-

Operational category management	Responsibilities and Arrangements
Product Supply	- Maintain existing relationships with suppliers - Ensure timely production and supply of CFLs for each SSC-CPA
Transport & Storage Logistics	- Arrange transport of CFLs from supply partner - Arrange storage prior to distribution - Delivery of CFLs to distribution hubs
Distribution to Households	- Management of distribution points; stock; customer transactions and staff - Household data collection
Baseline Technology	- Collection of baseline technology from distribution hubs - Undertake independently verified destruction of incandescent bulbs
Monitoring Emission Reductions	- Selection & and recruitment of sample group households - Periodic collection of monitoring data - Preparation of monitoring reports for emission reduction verification

nologies, both for lighting and for other energy efficiency projects in the assessed country.

Technology barrier:

The programme offers a more efficient technology than the common practice.

Institutional & Regulatory barriers:

There are no regulations for developing such technologies. However, there are incentives that allow the development of other technologies of illumination. Based on existing national legislation, three alternatives were identified: a) start the programme, b) expect the change without the support of the programme, and c) allow it to continue using incandescent bulbs.

Other barriers:

There is no explanation about other barriers.

IV. Operational and management plan

Provides a description of the operational and management arrangements established by the

Coordinating/Managing Entity, for the implementation of the programme. These include:

- i. A record keeping system for each CPA under the PoA.
- ii. A system/procedure to avoid double accounting (to avoid including a new CPA that has already been registered, either as a CDM project activity or as a CPA of another PoA).
- iii. The SSC-CPA included in the PoA is not a de-bundled component of another CDM programme activity (CPA) or CDM project activity.
- iv. The provisions to ensure that those operating the CPA are aware and have agreed that their activity is being subscribed to the PoA.

The proposal includes various activities to be carried out to ensure the implementation of the programme, by the Coordinating/Managing Entity in five categories, responsible for:

V. Monitoring plan

The use of sampling for gathering information necessary for verification is not clearly defined in this programme. The programme begins with a single CPA, and the number can be increased substantially. The programme established the possibility that the DOE uses both alternatives (sampling or complete). However, in either case, the preparation of information is to be developed based on the established methodology chosen.

The monitoring requirements of AMS-II.C, stipulate that if the devices installed have a constant current (ampere) characteristic, the monitoring shall consist of either the "power" and "operating hours" or the "energy use" of the devices installed, using an appropriate methodology.

Based on this methodology, each SSC-CPA within the proposed PoA will collect three sets of data to determine emission reductions:

1. Collection of nameplate wattage data from all replaced incandescent bulbs. This data will be collected at the time of the exchange for CFLs.
2. Monitoring a sample of CFLs to determine average hours of utilization (to use for determination of baseline emissions when combined with nameplate wattage information from collected incandescent lamps) and total energy consumption (to calculate project emissions of CFLs in use). The procedure to determine the sample of devices will ensure that they adequately represent the broader population, minimizing sampling errors. Given that participa-

tion in each SSC-CPA is voluntary, determination of the exact population of participating households prior to establishment of sample groups is not possible. In addition, because the Coordinating Entity cannot force households to participate in sample groups, the devices monitored in the resulting sample will be, to a degree, self-selected rather than purely random. Despite these limitations, the Coordinating Entity will work to ensure that CFLs sampled are representative of the broader population of CFLs distributed to participating households.

3. Survey a non-metered sample of devices installed in participating households, at least annually, to ensure continuing operation. As with (2) above, this sample is likely to be self-selected rather than entirely random. However, the Coordinating Entity will work to ensure that, as much as is feasible, annual checks cover a representative sample of operating devices. The statistical methods used to select households for this crosscheck group will be the same as those used to select households with metered CFLs.

In case the Coordinating/Managing Entity opts for a verification method that does not use sampling but verifies each CPA (whether in groups or not, with different or identical verification periods), a transparent system is to be defined and described that ensures that no double accounting occurs and that the status of verification can be determined at any time for each CPA;

Case 2: Promotion of Energy-Efficient lighting using Compact Fluorescent Light Bulbs in rural areas in Senegal

Country: Senegal

Provides that implementing this programme will contribute to:

I. Identification and conceptual design

Description of the Programme of Activities (PoA)

This CDM Program of Activities (PoA) promotes the use of energy efficient lightings in newly electrified households and buildings in Senegalese rural areas. Emission reductions will come from the energy efficiency improvements resulting from the use of Compact Fluorescent Light Bulbs (CFLs) instead of Incandescent Light Bulbs (ILBs). The utilization of CFLs instead of ILBs will reduce carbon dioxide emissions associated with the combustion of fossil fuel at grid-connected power plants, and fossil fuel consumed by electricity generators in isolated areas.

The goal and the policy

The goal set by the Senegalese Rural Electrification Agency (ASER) is to promote energy efficient lighting in newly electrified households in rural areas of Senegal. This Demand-Side Energy Efficiency Measures PoA is based on the installation of CFLs in newly electrified households and buildings, instead of the commonly used and less costly ILBs.

This energy efficiency CDM PoA will be undertaken in connection with a nation-wide rural electrification plan, implemented under the supervision of ASER. The objective of the plan is to increase electricity access in Senegal rural areas from 16% to 50% by 2012.

As shown, the programme does not provide a specific goal; it is intended to continue replacing the ILBs if there is compliance with the limits of small-scale for each CPA.

II. Characteristics of the program

Contribution to sustainable development:

- Enable access to electricity to a larger number of clients in rural area, at a time when electricity supply is limited in Senegal. Part of the revenues generated by this PoA will be allocated for the further expansion of rural electrification in the country.
- Bridge the rural/urban energy divide in terms of electricity access for clients, and provide access to electricity for productive uses and social services (e.g. health service centers, schools) in rural areas.
- Enable rural clients to afford access to electricity on a more sustainable basis. The proposed measures will help promote an alternative to traditional fuels such as kerosene lamps and small batteries, which have a negative impact on the local and global environment and health.
- Develop awareness of energy efficiency and environmentally responsible behaviours in rural communities through the consultation process organized for the implementation of this PoA, and through a reinforcement awareness campaign during the lifetime of this PoA.

Voluntarily

Demonstrate willingness, as ASER has voluntarily decided to introduce this coordinated action as part of its strategy for Rural Electrification. There is no mandatory policy/regulation or law in Senegal that requires ASER to implement the specific energy efficiency improvement

measures (i.e. distribution of CFLs to newly electrified households and buildings).

Stakeholders consulting and environmental analysis

The consultations with the local stakeholders and environmental analysis have been made at the programme level.

The identified stakeholders for this PoA are the members of the National Committee for Climate Change (COMNACC) designated according to Article 2 of the ministry decree, and all the associations and non-governmental organizations involved in the protection of the environmental and rural development in Senegal.

III. Structure and scopes

Coordinating/Managing Entity and participants of PoA

In this case it is a state initiative, and proposes ASER as Coordinating/Managing Entity. ASER is an autonomous public entity created in 1998, under Senegal's Electricity Reform Law 98-29, to provide technical and financial assistance for rural electrification in Senegal. ASER coordinates and monitors the implementation of the national rural electrification plan, which was designed under a Public/Private Partnership scheme.

The International Bank for Reconstruction and Development ("IBRD") is acting as the trustee of the Community Development Carbon Fund (CDCF), and is also a project participant. The Italian government is also listed as a party involved in the program, but no clear definition is described.

The government of Senegal is listed as party involved wishing to be considered as project participant.

ASER will share a minimum of 15% of the CDM revenues with concessionaires to help them recover the monitoring costs incurred for the implementation of this PoA and give an incen-

tive to pursue the implementation of the CPA. The balance of the CER revenues will provide ASER with financial resources to support the additional investment and operational costs resulting from the implementation of this PoA (such as data management for verification, awareness program of CFLs, recycling of CFLs). The balance will be made available for the densification of the electricity network. The cost of the electrical internal equipment, including CFLs, will be pre-financed by concessionaires with grant funding made available by Output Based Aid (OBA) schemes.

Boundary

This is a National programme that is covering the entire territory of Senegal, including the necessity of having (12) CPAs - one CPA per concession (consider that every CPA should be comply with the limits of small-scale.).

These 12 CPAs are established according to the Programme Prioritaire d'Electrification Rurale that divides the country into geographical concessions. Each concession will be granted investors/operators through an international competitive bidding process. Standardized contracts have been drawn up by ASER to provide a framework for the activities of the concessionaires.

Insert section on Approved Methodology here

Eligibility criteria for include CPAs in PoA

This programme defines the criteria for including CPAs in the Programme including features that each entity should be responsible for (CPAs and/or concessions), and also further defines the maximum number of CPAs in the programme (12), so that a typical CPA will comprise of the following characteristics:

- The concessionaires selected by ASER for each of the 12 CPAs will be responsible for installing CFLs in newly electrified households and buildings, instead of ILBs.

- Each concession will be granted investors/operators through an international competitive bidding process. The operator's role will be to manage, technically and commercially, the rural electrification concessions. Concessionaires will be responsible for (i) design, (ii) construction, (iii) operation and maintenance of the grid and associated equipment and, (iv) the connection of rural households and buildings to the grid.
- Concessionaires are requested to include a proposal for a grid design in their bid. Different grid options may be considered by concessionaires, ranging from grid extension to mini-grid or off grid individual solutions. In the case of connections to the national grid, electricity will be purchased from SENELEC, the national utility in charge of generation, transmission and distribution of electricity in Senegal urban areas. Grid design and description will be part of the concession contract with the ASER (Republic of Senegal) and defined in each CPA-DD.
- Four categories of services (Service 1-4), based on monthly consumption, will be offered by concessionaires to consumers. Monthly consumption is limited for the first three categories and a fixed monthly tariff, determined by taking into account rural client capacity to pay, will be charged to rural clients. Consumers included in the fourth category will pay their real consumption in kWh. A specific number of CFLs will be installed for each level of service: 3 for Service 1 (below 50W), 6 for Service 2 (between 50W and 90W), 9 for Service 3 (between 90W and 180W) and 12 for Service 4 (above 180W).
- The cost of internal electrical equipment, such as fixtures and CFLs, installed on the consumers' premises, for the implementation of the PoA, will be recovered from consumers in the form of monthly installments, paid with their electricity bill, over a 10 year period. The cost of the internal equipment will be prefinanced by concessionaires with grant funding made available from the Fond d'Electrification Rurale on Output Based Aid (OBA) scheme.

The criteria for a CPA to be a part of the programme, are as follows:

1. A CPA under this PoA can be undertaken only within the geographical boundaries of ONE of the 12 concessions that are a part of the Senegalese rural electrification plan, implemented under the coordination of ASER.
2. A CPA under this PoA shall be based on the final signed concession contract between Republic of Senegal (for ASER) and the selected concessionaire. Only villages included in the contract of concession can be a part of the defined CPA.
3. A CPA under this PoA shall consist of the installation of CFLs, meeting the quality criteria set by ASER (i.e. power consumption of 8W or less, life time of 10 000 h or more, conformity with the norm NF EN 60969 § 6, 7, 8, 9) in newly electrified households and buildings by the selected concessionaire. The lumen output of the CFL should be in a

range of +/- 10% of the baseline (i.e. 40W incandescent lamps).

4. The aggregate energy saving of a CPA in this PoA may not exceed the equivalent of 60 GWh per year (limit for a small-scale project).

IV: Additionality

Additionality of PoA as a whole.

Investment barrier:

In this programme, the demonstration of additionality is based on:

An analysis of the financial barriers existing in Senegal for implementing (starting) a programme of renewable energy in rural areas, and whether this includes the fact that implementing a nation-wide rural electrification plan as a CDM, will increase the financial burden to the programme.

Financial identified barriers were:

- The lack of public and private funds to implement energy efficiency programmes.
- No existing international funds.
- Not all 12 concessions having guaranteed funding for maintenance.
- Lack of incentives for the use of CLFs, with prices up to \$8 compared to less than US\$1 for an ILB (the programme can lower prices to 6 US\$ but it is still considerably higher).

Technology barrier:

In the programme, a barrier is the lack of knowledge from the residents of the economics and benefits of using CLFs.

It is indicated that the prevailing technology in

Senegal is the use of incandescent light bulbs. The proposed PoA will introduce, for the first time in Senegal, systematic dissemination of energy-efficient lighting devices for grid-connected clients in rural areas.

Institutional & Regulatory barriers:

None identified.

Other barriers:

None identified.

V. Operational and management plan

Contractual arrangements will be signed with the private operators of the 12 concessions for electrification of the concession area, dissemination of CFLs, their replacement, the installation of power control devices and their monitoring. Data will be transmitted every six months to ASER, who will be in charge of the record keeping.

i. A record keeping system for each CPA under the PoA.

Data collected at the CPA level will be sent to ASER, who has designated one of its departments for collecting, treating and archiving CDM data: 'la Direction des Etudes et du Système d'Information'. This department is qualified to manage data and records as it is part of its normal assignment.

Paper and electronic records will be kept during the entire crediting period of each CPA (ten years) and two years after the crediting period. All the monitored parameters such as the coordinate (x y) of each village, the client number, the serial number of each CFL installed in households and buildings, will be included in the Information System on rural electrification implemented by ASER.

- ii. A system/procedure to avoid double accounting (to avoid including a new CPA that has already been registered, either as a CDM project activity or as a CPA of another PoA)

There is only one rural electrification and CFL distribution program in Senegal. Each CPA operates in a geographically distinct area and reports its activities to ASER, which is the Managing Entity.

Furthermore, as this is an OBA program, each concessionaire has to provide exact information on the beneficiary, to be able to recover its incurred cost

- iii. The SSC-CPA included in the PoA is not a de-bundled component of another CDM programme activity (CPA) or CDM project activity

According to paragraph 2 of Appendix C of the Simplified Modalities and Procedures for Small-Scale CDM project activities (FCCC/CP/2002/7/Add.3), a small-scale project is considered a de-bundled component of a large project activity, if there is a registered small-scale activity or an application to register another small-scale activity:

- With the same project participants;
- In the same project category and technology;
- Registered within the previous two years; and
- Whose project boundary is within 1 km of the project

boundary of the proposed small-scale activity.

None of the four conditions are applicable to the CPAs of this proposed PoA. So, it is not a debundled Small-Scale PoA.

- iv. The provisions to ensure that those operating the CPA are aware, and have agreed, that their activity is being subscribed to the PoA.

The concessionaires are those operating the CPA. Prior to the inclusion of a CPA in the proposed PoA, agreements for credits ownerships will be signed between the coordinating agency and the electricity operator. A signed contract between the concessionaire (CPA) and Republic of Senegal (for ASER) (PoA) is also an eligibility criteria of the PoA.

VI. Monitoring plan

This programme is clear to specify the need to use a method of statistical sampling so the DOEs can verify the amount of emission reductions and losses in each CPAs under the PoA. The monitoring programme here presents three steps to follow:

STEP 1: verification with the designated national authority to avoid double counting

The purpose of this step is, in conjunction with the DNA of the host country, to confirm the validity of the boundary of the PoA and the CPAs. This will be checked with other PoA or CDM project activity undertaken by other project entities in the host country, to avoid double counting.

STEP 2: interview with the CDM unit of ASER in charge of the project monitoring

ASER will make available monitoring reports of all the CPAs to the DOE.

The purpose of this interview is, in conjunction with the ASER CDM coordinator, to confirm the validity of the monitoring data/report prepared by ASER.

STEP 3: site visit

Reported Number of CFLs

- For the purpose of verifying the number of CFLs in working condition, it is proposed that the DOE, in random manner, choose households that are part of the CPAs, integrated with the PoA (at the time of the verification), to confirm the information provided in the monitoring report.
- The sample size (number of households) is determined randomly by a minimum of 90% confidence interval and 10% maximum error margin. The size of the sample shall be no less than 100.
- The DOE will verify the reported number of CFLs in working condition and the serial number of each CFL in each sampled household.
- For the purpose of consistency, during verification of CFL related parameters, it is important to consider that all verified characteristic (i.e. reported CFL in working conditions, serial number of each CFL, etc.) are in place.
- Depending on the number and type of discrepancy, the DOE may recommend some corrective actions or alternatively recommend the application of a discount rate on the emission reduction. Such discount rates should be based on the magnitude of the discrepancy observed during the

verification process, and its impact on the global emission reductions.

Reported operating hour

- The mean operating hours of the CFLs will separately be verified based on a sampling method. The DOE will choose, in a random manner, some run time meters to be checked and for each of them, determine the mean daily operating hours. This verified value will be compared to the mean daily operating hours monitored for the same run time meter.
- For the purpose of verifying the daily average of CFLs operating hours, there might be an inconsistency if for a given run time meter, the verified daily average of operating hours is not in compliance with the monitored one (within a range of + 5% of the reported value).
- Depending on the number and type of discrepancy, the DOE may recommend some corrective actions or alternatively recommend the application of a discount rate on the emission reduction. Such discount rates should be based on the magnitude of the discrepancy observed during the verification process, and its impact on the global emission reductions.

Case 3: Installation of Solar Home Systems in Bangladesh

Country: Bangladesh

I. Identification and conceptual design

Description of the Programme of Activities (PoA)

The Solar Home Systems (SHS) program is being implemented through 15 NGOs and financial institutions referred to as Participating Organizations (POs). POs select project areas and potential customers, extend loans, install the systems and provide maintenance support. IDCOL is one of the financing agencies providing grants and refinance, sets technical specifications for solar equipment, develops publicity materials, provides training, and monitors PO's performance. IDCOL offers soft loans of 10-year maturity with 2-year grace period at 6% per annum interest to its POs.

The SHS program is not required by law; it is a purely voluntary initiative.

The goal

The Programme of Activities aims to provide access to electricity for households which have no access to the power grid, by implementing SHSs with capacities ranging from 10Wp to 150Wp, depending on the amount of electricity used by the household.

The policy

The Programme of Activities is being implemented through NGOs and Participating Organizations (who are referred to as financial institutions).

II. Characteristics of the program

Contribution to sustainable development:

The project would bring in positive changes in the economic status of the rural areas. The following points summarize contributions of the project activity to sustainable development in rural Bangladesh:

Introduction of SHS will produce a positive impact on the rural economy of Bangladesh. Dependency on imported fossil fuels such as kerosene and diesel will reduce as SHS directly replaces usage of kerosene for lighting purposes and diesel for electricity generation. The project activity will replace approximately 5,081 kilo liters of kerosene and approximately the same quantity of diesel per annum.

- Project activity in the rural areas will create new business and job opportunities related to operation and maintenance of SHS. For example, GS trained local technicians can provide maintenance and repairing services to SHS users and may start independent enterprises.
- Reliable electricity supply will give impetus to development of micro-enterprises. The improved lighting from SHS will enable longer working hours, and support higher income-generation.
- Tailoring businesses, convenience stores, cafés and restaurants can serve more clients by continuing to run their businesses after dusk. New income opportunities, such as mobile phone charging services and renting time on mobile phones, are generated. This, in turn, will impact the socio-economic scenario.
- SHS users will have better home and work environments. Since SHS will replace the conventional soot-producing lamps, it will reduce health risks in terms of respiratory and eye related diseases; as a result, health-care expenditure will also be reduced.

Voluntarily

The SHS program is not required by law; it is a purely voluntary initiative.

Stakeholders consulting

Stakeholders include community leaders, local people, women, children, youth, hospitals, schools, and other development organizations. Formal and informal meetings with different stakeholders are organized during planning, implementation and monitoring stages of the program.

- **Planning stage:** Meetings are organized with the local people and their representatives before starting a new program or scaling up an existing program. PO staff also visit households to get feedback. Feedback is discussed during local, regional and head office meetings and incorporated into PO programs.
- **Implementation stage:** PO staff visit, on a monthly basis, the homes of clients to collect payments and conduct monthly check-ups. This gives the consumers an opportunity to discuss and receive responses. Unit offices are located in rural areas and clients can easily come to offices to give their feedback. Unit offices also frequently talk to top management situated at the head office through mobiles or telephones. Regional / Divisional / Unit Offices send their reports to the head offices. These reports are discussed during monthly meetings.
- **Monitoring stage:** Top management and audit teams make frequent visits to the field. This gives them the opportunity to directly interact with the consumers. This is done either through meetings or home visits. Audit teams make formal reports on what they have seen and responses they have received. These reports go

directly to the Managing Director who discusses the findings with the General Manager and Deputy General Manager.

Environmental analysis

No analysis of the environmental impacts of the programmatic activity is required by Bangladesh, which is the Host Party. Grameen Shakti has conducted an environmental analysis at the PoA level, and concluded that the PoA does not result in significant environmental or social impact.

According to the Bangladesh National regulations do not require Initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA) and Social Impact assessment (SIA) for solar energy projects. Thus, CPAs will not be accompanied by environmental analyses.

III. Structure and scopes

Coordinating/Managing Entity and participants of PoA

The Coordinating Entity for this PoA is Grameen Shakti, Bangladesh.

The 15 Project Participants involved in the CPAs related to the PoA are:

1. Grameen Shakti
2. BRAC Foundation
3. Srizon Bangladesh
4. COAST Trust
5. Thengamara Mahila Shabuj Shangha
6. Integrated Development Foundation
7. Centre For Mass Education in Science
8. Upokulio Bidyutayon O Mohila Unnayan Shamity
9. Shubashati

10. Bangladesh Rural Integrated Development For Grub-Street Economy

11. Padakhep Manbik Unnayan Kendra

12. Palli Daridra Bimochan Foundation

13. Hilful Fuzul Samaj Kalyan Sangstha

14. Mukti Cox's Bazar

15. Rural Services Foundation

Boundary

This Programme of Activities has been developed in Bangladesh, so it is national scope.

Insert section on Approved Methodology here: Small Scale methodology AMS-I.A. "Electricity generation by the user"

Eligibility criteria for including CPAs in PoA

Criteria for enrolling a CPA in the PoA include:

- The proposed CPA has access to financing channels of the ICDOL's Solar Energy Program.
- The proposed CPA must be within the country of Bangladesh.
- The selected end-users of the proposed CPA must be the households in the rural areas that are not connected to the national/regional power grid.

IV: Additionality

Additionality of PoA as a whole.

Investment barrier:

The main objective of the overall SHS program in Bangladesh is to commercialize SHS across the country. However, so far SHS investment remains a non-commercial activity in Bangladesh given the high upfront investment cost and technical constraint. The application

of CDM can facilitate the penetration of SHS into rural households over a period of several years, utilizing the CDM funding mechanism to promote the commercialization of the solar energy sector and enhance the reach of Solar Home Systems across Bangladesh.

Technology barrier:

In Bangladesh, the limited availability of solar modules and batteries is one of the major constraints to the implementation of SHS. Since most of the raw material is imported from other countries, fluctuations in the international market directly affect the local availability of solar modules and batteries.

There is a chance of shortage in the supply of solar modules and batteries during the implementation phase of project activity. Considering this uncertainty, POs may have to access additional resources and investment to sources and keep an inventory of solar modules and batteries in order to complete the project activity on schedule.

According to World Bank statistics, only 32% of Bangladesh's total population has access to grid-connected electricity. Besides electricity from the grid, kerosene and diesel are the only popular options for lighting and other energy needs in Bangladesh. SHS is a relatively new technology in the rural areas compared to the traditional use of kerosene and diesel fuel based appliances like wick lamps and diesel generators. People are unfamiliar with the technology and lack experience in operation and maintenance. These "technical barriers" slow the promotion of SHS.

Performance uncertainty is also attributable to such technical barriers, and to a large degree, depends on the extent of regular maintenance and equipment servicing. In Bangladesh, the low market share of the SHS technology has led to low availability of local technicians to deal with maintenance problems. Therefore, providing after-sales services is a barrier in the wide implementation of SHS across the country. Hence, the success of any SHS programme depends on robustness of maintenance, after-sales service network, and

their cost effectiveness. To overcome this, POs may reserve a part of the additional revenues benefits accruing to the project activity from CER revenues, to provide free maintenance service for the initial three years, thus ensuring that benefits from CDM percolates to the end users. Moreover, by providing training during the initial three-year period, the capacities of the users will be built on basic SHS operation and maintenance. After three years, users can access maintenance service at minimal cost. Consequently, CDM revenues play a very important role in the project implementation strategy. Training and awareness activities will add to the project costs though it is very difficult to correctly quantify the investments required for such activities. Accordingly, the project activity is dependent on CDM revenues to cover the risk of cost overruns.

Institutional & Regulatory barriers:

In Bangladesh, there is a lack of supporting regulations, fiscal incentives and standards to encourage renewable energy practices and technologies. At present, there are no regulatory standards in Bangladesh for effective implementation and uptake of renewable energy projects. There is very little governmental support to assist the renewable energy industry to undertake comprehensive programs and to transform the energy industry into a less polluting and more efficient one. NGOs and agencies like those listed in A.3 have to take the initiative and spend the additional resources to promote this kind of energy and overcome institutional barriers over which they have limited control.

Other barriers:

Changing the established energy system is one of the primary barriers of the proposed project activity.

The energy consumers use conventional kerosene and diesel appliances due to easy access and have little awareness of clean energy options. The program must make rigorous efforts to raise awareness among the rural households regarding the benefits and the correct use of the SHS.

Future SSC – CPAs should demonstrate additionality based on the following criteria:

- Flexibility or innovativeness of financial mechanisms being used in order to expand the reach and implementation of the Solar Home System program;
- CDM revenues being used to subsidize the cost of equipment maintenance.

The above two criteria shall be applied in the following ways:

- An explanation of the financing mechanisms available to households and the role of the CDM.
- Demonstration that CDM revenues (whole or in part) play a role in helping to expand the program.

V. Operational and management plan

The PoA will be implemented by each PO in the following manner:

Grameen Shakti is the Coordinating Entity of this program and will act on behalf of all POs in this program. For CPAs that are implemented by POs other than Grameen Shakti, he will coordinate with them for the purposes of communicating with the CDM Executive Board.

Each PO implements SHS with the help of unit offices that are responsible for undertaking installations, maintenance, monitoring and reporting. One unit office will typically employ between two and ten people, including managers, engineers, assistants and technicians. When consumers /households purchase a Solar Home System, agreements with the POs are signed by the customers. These agreements contain all relevant information for the purchase, including system capacity, price, mode of payment, location/address of customer, and so on. Every month, the head offices are to collect a copy of these sale agreements from the unit offices that implement these SHSs. Based on the sale agreements, POs prepare information

databases at their head offices. This kind of database thus records each SHS with its unique detail. Double counting is avoided because there is a record for every single SHS.

Each PO has agreed to participate in this program.

VI. Monitoring plan

The monitoring methodology as defined in Appendix B for the category AMS-I.A. "Electricity generation by the user" version 12 has been applied in this PoA-DD. This methodology consists of either:

- a) An annual check of all systems or a sample thereof to ensure that they are still operating (other evidence of continuing operation, such as on-going rental/lease payments could be a substitute). Ongoing loan repayment will be documented to provide evidence for continuing operation of the SHS.

OR

- b) Metering the electricity generated by all systems or a sample thereof.

The monitoring plan and procedures will be as follows:

1. Follow up of the installation of SHS.

- A monthly installation program
- Database of installations on a daily basis
- Monthly report on the completed installations

2. Follow up of the number of operational SHS.

- Number of operational SHS reported by O&M team in the unit offices and stored in the central office
- Database at the GS head office

- Loan repayment details and status of recovery of loan from individual households
- Monthly report on operational SHS

Detailed information on the responsibilities and management structure of the implementation of the monitoring plan will be given in each CDM-CPA-DD.

The monitoring data of the above indicators will be collected by surveying a sample group of end-user to ensure a precision at 95% confidence intervals (T-values).

Case 4: Uganda Municipal Waste Compost Programme

Country: Uganda

I. Identification and conceptual design

Description of the Programme of Activities (PoA)

Description is based on increasing population and one of the significant environmental concerns of the growing urban areas: municipal solid waste (MSW). MSW are disposed in landfills that are located adjacent to wetlands that get contaminated by leachate generated from landfills due to heavy rainfalls. Landfills also generate and emit significant amount of methane into the atmosphere, so *Municipal Waste Compost Programme* propose to recover the organic matter from municipal solid waste as compost and avoid methane emission.

Municipal Waste Compost Programme is improved by the Government of Uganda, who has taken a loan from The World Bank under the "Environmental Management and Capacity Building Project II".

« Uganda has 75 urban centres as per 2002 Census (Uganda Population and Housing Census 2002). Urban population has been increasing at over 3.8 % per annum in Uganda. As per Census, 2002 2.9 million people live in towns and municipalities accounting for 12 % of the total population. One of the significant environmental concerns of the growing urban areas has been the management of municipal solid wastes (MSW). So far as disposal of MSW is concerned, the common practice in Uganda is to dispose the wastes in landfills (controlled dumpsites). Many of the landfills/Controlled dump sites are located adjacent to wetlands. The wetlands thus get contaminated by the leachate generated from the landfills due to heavy rainfalls. These landfills also generate and emit significant amount of methane to the atmosphere. It is proposed to recover the organic matter from municipal solid waste as compost and avoid methane emission through

a "Municipal Waste Compost Programme" with the support of CDM. As multiple towns and cities are expected to participate in this programme, a Programme of Activity CDM project is being proposed »

The goal

The goal of the program is to avoid methane emissions from municipal waste landfills by undertaking composting of the wastes and using its organic matter as humus for soil conditioning and plant growth.

The policy

The Government of Uganda has taken a loan from The World Bank under the "Environment Management and Capacity Building Project II" and intends to use part of this loan to improve municipal solid waste management in cities and municipalities through the proposed Municipal Waste Compost Programme.

The National Environment Management Authority (NEMA) is the nodal agency which would support the municipalities in setting up composting facilities, providing technical know-how and monitoring implementation and operation of the individual compost plants (projects). Municipal waste composting is a new concept in Uganda and The World Bank is supporting the transfer of appropriate technology through NEMA.

NEMA would provide technical and financial support to the municipalities to set up and operate the facilities. The municipalities would either set up and operate the facilities themselves through their own staff or contract it out to the private sector. The facilities would sustain on the revenues generated from sale of compost and the sale of emission reductions.

II. Characteristics of the program

Contribution to sustainable development:

At present there is no municipal waste com-

posting activity in practice in the country. The PoA would support the municipalities to set up such facilities. The project would also generate local employment and help the country develop in an environmentally friendly and sustainable way.

In Uganda the town/ municipal councils are taking efforts to collect the waste generated and transport it to identified waste disposal sites. Since Uganda is an agrarian and a less developed country, over 80% of the waste is organic in nature. This programme would support setting of project activities to undertake aerobic composting of the waste, to stabilize the waste and minimize local pollution, and completely eliminate the production of methane.

Voluntarily

The present practice for municipal waste disposal in Uganda is controlled type landfills. Furthermore, with regard to the landfills, there are no specific requirements pertaining to the capturing and flaring of landfill gas (LFG). Composting of solid waste is new to Uganda. It is evident from the fact that Uganda does not have any composting plants that use municipal solid waste as the input.

There is also no regulation that requires the municipalities to follow composting as the only option for processing the municipal solid wastes. The Municipalities are not obligated to set up composting plants. The proposed CPA, which involves composting of MSW, is thus a voluntary action by the Municipalities.

Stakeholders consulting

Stakeholders' consulting was undertaken on two levels:

- Local stakeholder consultation is done at PoA level
- Local stakeholder consultation is done at CPA level

Stakeholder consultations have been undertaken at the PoA level. The details of the consultation at the PoA level included stakeholder consultation at Kampala and at multiple town and municipalities which have shown interest in participation in PoA.

The CPAs are for towns and municipalities, so it was required to include their views into the program formulation. As the program also addresses multiple towns and municipalities, country level stakeholders consultations were also undertaken.

Environmental analysis

NEMA is the National Environment Management Agency for Uganda and it has taken all necessary actions as per Ugandan requirements. Based on the assessment of the project, enough aspects have been considered in the project design.

III. Structure and scopes

Coordinating/Managing Entity and participants of PoA

National Environmental Management Authority (NEMA) would be the Coordinating/Managing Entity (C/ME) for the project activities under the Programme of Activities (POA). The International Bank for Reconstruction and Development (IBRD), as Trustee of its Carbon Funds, would manage the communications with the CDM Executive Board.

Boundary

The Programme of Activities would be implemented in several municipalities of Uganda, so the implementation is national.

Insert section on Approved Methodology here

Eligibility criteria for including CPAs in PoA

The following criteria will be followed to include a CPA.

- a) The CPA would be from a town or city municipality in Uganda. Only one CPA per municipality.
- b) The municipality would have land designated for the composting plant.
- c) The municipality would have signed a cooperation agreement with NEMA to participate in the program, and to transfer the emission reduction rights to NEMA.
- d) The municipality shall take responsibility for operating the compost facility and landfill, as per the guidelines and training provided in the program.

IV. Additionality

Additionality is not defined for PoA, but it is explained for typical CPA.

Investment barrier:

Options considered in this analysis are: continuation of current practice, project without the CDM and project with CDM.

The Net Present Value (NPV) of the investments is chosen as the relevant financial indicator for comparing the two options. This is done, as the present practice of landfilling operation has only costs while the composting operations have both costs and revenues. The financial analysis (carried out for a typical operation involving 70 tons of waste per day) shows that the current practice of disposing wastes in the landfills is the least costly alternative.

The sensitivity analysis carried out for different scenarios with variations in capital costs, compost sales and compost prices also concludes that the compost plant is not viable without carbon revenues in any of the scenarios.

Technology barrier:

The proposed CDM program would introduce a new technology for the processing of solid wastes in Uganda. The fact that there are no plants in Uganda that process municipal solid waste into compost, makes the technological risks associated with composting operations by the municipalities high. Technology appropriate for Uganda is available in other developing countries but needs to be localized and adapted to Uganda. There is a need for demonstration of the technology at multiple locations, in order to assess appropriateness and acceptability.

Institutional & Regulatory barriers:

There is no explanation about institutional and regulatory barriers.

Other barriers:

Other barriers are considered as such due to prevailing practice (i.e. municipal solid wastes are disposed of in landfills, gas without recovery and/or utilization methane process).

V. Operational and management plan

The Monitoring Plan will be supported by a CDM Operations and Monitoring Manual which will be prepared before the start of the first crediting period and will be tested during start up of the components of the project activity. This will provide an opportunity to correct any deficiencies and further refine the monitoring and recording procedures. It will also provide an opportunity to train laboratory and operating personnel for the strict requirements for accuracy in collecting and recording data for CDM purposes.

In order to ensure a successful operation of the project and the credibility and verifiability of the CERs achieved, the project will have a well-defined management and operational system. A system will be put in place for the project activity and include the operation and management of the monitoring and record keeping system that is described in the Monitoring Plan.

VI. Monitoring plan

The purpose of the Monitoring Plan (MP) is to provide a standard by which NEMA will conduct monitoring and verification of the proposed CDM project activity. The MP will be in accordance with all relevant rules and regulations of the CDM. The MP forms an integral part of this PDD and will facilitate accurate and consistent monitoring of the Project's Certified Emission Reductions (CERs). NEMA will use the MP for the duration of the project activ-

ity and will refine and expand it from time to time, as required. A CDM Management Unit has been established within the NEMA organizational structure to manage the preparation and implementation phases of the proposed CDM Programme of Activity. During implementation it will be responsible for organizing and supervising all of the monitoring activities required for accurate and timely verification and reporting of the CERs generated.

Appendix 2. Sampling in CPA Verification¹⁷

If the Managing Entity does not wish to have all CPAs verified, the DOE should present a description of the proposed statistically sound sampling method/procedure to verify the amount of anthropogenic emissions reductions by sources or removals by sinks of GHG achieved by CPAs under the PoA.

Sampling Approaches and Applicability

Simple Random Sample

E.g. Similar to a lottery.

Systematic Sampling. Selecting samples at equal intervals

- E.g. Every tenth household on a street, or every eighth bricks from a production line.

Stratified Random Sample. Group the population into sub-groups, then do random sampling in each sub-group

- E.g. Grouping of participants in a commercial lighting program according to building type, then do random sampling in each sub-group.

Cluster Sampling. The population is divided into sub-groups (clusters), and the sub-groups are sampled, rather than the individual elements to be studied

- E.g. A project installs high efficiency motors in buildings, with several

motors typically in each building. To estimate the operating hours of the motors, sample the buildings instead of the motors, and then meter all of the motors in the selected buildings.

Multi-Stage Sampling. Sampling both clusters and elements in a clusters

- E.g. A study of efficient lighting might first draw a sample of buildings, and then take a sample of lighting fixtures in each selected building. If the Coordinating/Managing Entity does not wish to have all CPAs verified, the DOE should present a description of the proposed statistically sound sampling method/procedure to verify the amount of anthropogenic emissions reductions by sources or removals by sinks of GHG achieved by CPAs under the PoA.

¹⁷ The EB will produce further sampling procedures and all PoAs are expected to abide by those

Sampling Precision Requirements

Over sampling is encouraged.

Type of Sampling Estimate	Minimum Confidence Level	Maximum Error Bound	Minimum Sample Size
Point Estimate for Engineering Calculation	90%	± 10%	50
Baseline Penetration or Equipment Characteristic	90%	± 10%	50
Change in Technology Penetration or Performance	80%	± 20%	50

Sampling Practices

- Defining precisely the sampling objectives, target population and the sample measurements
- Developing the sampling frame
- Randomizing cases and drawing sample
- Selecting the most effective information gathering method
- Conducting surveys/measurements
- Target Population
- Sampling Frame
- Sample Method
- Desired Precision/Expected Variance and Sample Size
- Procedures for Administering Data Collection and Minimizing Non-Sampling
- Errors

EB Guidance on Sampling

- Requirements for Sampling Plan in PDD
- Field Measurement Objectives and Data to be collected

Sampling Plan Evaluation Criteria

- Does the sampling plan present a reasonable approach for obtaining unbiased, reliable estimates of the variables?

- Is the sample size adequate for achieving the minimum confidence/precision requirements?
- Are the procedures for the data measurements well defined and do they adequately provide for minimizing non-sampling errors?
 - Minimum Samples Sizes – random sampling
 - Minimum Samples Sizes for Coefficient of Variation = 1

		Confidence Level			
		80%	90%	95%	99%
Precision as Percent of Mean	1%	16435	27060	38416	66358
	5%	657	1082	1537	2654
	10%	164	271	384	664
	20%	50	68	96	166

Minimum Samples Sizes for Coefficient of Variation = 0.5

		Confidence Level			
		80%	90%	95%	99%
Precision as Percent of Mean	1%	4109	6765	9604	16589
	5%	164	271	384	664
	10%	50	68	96	166
	20%	50	50	50	50

APPENDIX 3. ILLUSTRATION OF POA CDM ADVANTAGES

An Example of the Micro-hydro Promotion by Alternative Energy Promotion Centre (AEPC) Project in Nepal

By Zhu, Xianli. URC

This is a real CDM project and the PDD can be found on the UNFCCC website. This is a PDD submitted by the Alternative Energy Promotion Centre under the Nepal Ministry of Environment, Science and Technology (MOEST) through the rural electrification program. This project involves the installation of micro-hydro plants of up to 15MW of capacity. A total of around 750 micro-hydro plants (MHPs) varying from 10 to 500 kW capacities will be installed for local communities and entrepreneurs by pre-qualified private companies through subsidy support that will be provided via REDP and ESAP. The instal-

lation will take place in a phased manner until 2011 with the first construction initiated in early 2003.

The project will lead to reduced GHG emissions through: 1) Replacement of household fuel used for lighting; and 2) Replacement of diesel fuel used for agro-processing units.

The Project has been designed as a bundle, which requires all micro-hydro plants covered under the bundle to share the same crediting period. As the construction of 750 micro-hydro projects will take nine years, and once the finished projects immediately start electricity generation, the project proponent has to choose between either letting the crediting period start before all the micro-hydro projects are built, or postponing the start of the crediting period until all the micro-hydro plants are in operation. In the first case, the project proponent can get CERs at an early date, but are unable to get CERs for part

Installation Plan and Annual Expected CERs from the Nepal AEPC Micro-hydro Promotion PDD

Project Construction and Putting into Operation			Annual Expected CERs from Bundling in existing PDD (as regular CDM)	
Year	kW installed in the year	Cumulative Total kW	Year (10-year crediting period)	Expected CERs per year
2003	287	287	2006	3,106
2004	121	408	2007	9,262
2005	181	589	2008	20,116
2006	378	967	2009	32,697
2007	2,000	2,967	2010	38,529
2008	3,500	6,467	2011	45,819
2009	4,033	10,500	2012	45,819
2010	2,000	12,500	2013	45,819
2011	2,500	15,000	2014	45,819
			2015	45,819

Source: PDD of the Micro-hydro Promotion by Nepal Alternative Energy Promotion Centre (AEPC) Project

of the emission reductions achieved through the operation of the 750 micro-hydro plants. The other option is getting as much CERs as possible from the emission reduction achieved, but waiting until 2011, when all the micro-hydro plants are installed.

PoA CDM can solve the problem and enable the project proponent to both get CERs at an early date (from 2006) and get 38% more CERs through registering the government plan (installing 750 micro-hydro plants as a program and the micro-hydro plants installed each year as CPA). What the CERs from the program can expect, is indicated in Table 2.

Expected CERs from the Nepal AEPC Micro-hydro Promotion Project if implemented as a PoA CDM Activity

As indicated above, in cases that involve large numbers of activities that will start operation

and generate emission reductions in a time range of a few years, or longer periods of time, a PoA gives the option of both early CER issuances and full amount CER issuance.

It can help reduce the registration risks of subsequent CPAs and avoid the long lag time between a project starting public comments, and its registration. According to the UNEP Risoe CDM Pipeline dated 1 June 2009 (www.cdmpipeline.org), it takes on average 424 days from a project starting public comments in the validations stage, to its registration. It can reduce risks through achieved emission reduction, chain operations and franchising, and scale up emission reductions from single projects to regional or sectoral wide programs.

Year	CPA1	CPA2	CPA3	CPA4	CPA5	CPA6	Annual Total
2006	3,016						3,016
2007	3,016	6,156					9,262
2008	3,016	6,156	10,854				20,116
2009	3,016	6,156	10,854	12,581			32,697
2010	3,016	6,156	10,854	12,581	5,832		38,529
2011	3,016	6,156	10,854	12,581	5,832	7,290	45,819
2012	3,016	6,156	10,854	12,581	5,832	7,290	45,819
2013	3,016	6,156	10,854	12,581	5,832	7,290	45,819
2014	3,016	6,156	10,854	12,581	5,832	7,290	45,819
2015	3,016	6,156	10,854	12,581	5,832	7,290	45,819
2016		6,156	10,854	12,581	5,832	7,290	42,803
2017			10,854	12,581	5,832	7,290	36,647
2018				12,581	5,832	7,290	25,793
2019					5,832	7,290	13,212
2020						7,290	7,290

Source: calculated by URC based on the PDD of the Nepal Hydro Project

As an advanced modality introduced in 2005, the Programmatic CDM (POA) is expected to address asymmetries of participation, especially of very small-scale project activities in certain areas, key sectors and many countries with considerable potential for greenhouse gas emission reductions, not reached by the traditional single-project-based CDM. Latest experiences with POAs and the recently finalized official guidance governing the Programmatic CDM are the grassroots of this Primer, which has the purpose of supporting the fully understanding of rules and procedures of POAs by interpreting them and analyzing real POA cases.

Professional and experts from the public and private entities have contributed to the development of this Primer, produced by the UNEP Risoe Centre, as part of knowledge support activities for the Capacity Development for the CDM (CD4CDM) project. The overall objective of the CD4CDM is to develop the capacities of host countries to identify, design, approve, finance, implement CDM projects and commercialize CERs in participating countries. The CD4CDM is funded by the Netherlands Ministry of Foreign Affairs

