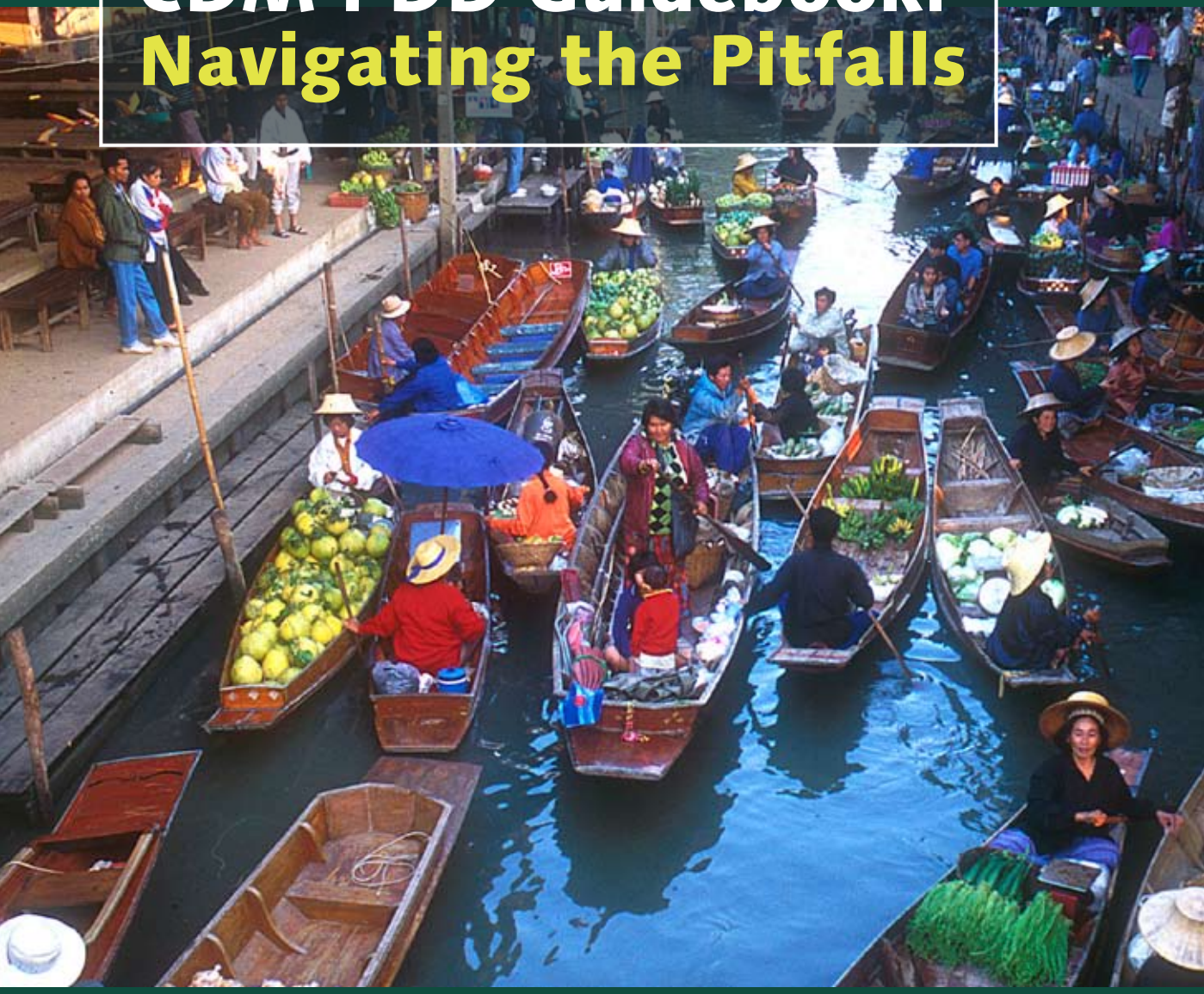
The UNEP project CD4CDM

CDM PDD Guidebook: Navigating the Pitfalls



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Clean Development Mechanism PDD Guidebook: Navigating the Pitfalls

Edited by

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November 2005

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MANAGING RISK DNV

Clean Development Mechanism PDD Guidebook:

Navigating the Pitfalls

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Preface

The Clean Development Mechanism (CDM) has picked up speed following the entry into force of the Kyoto Protocol in February 2005. By October 2005, up to 325 CDM projects have been submitted for validation. A wealth of experience and knowledge has been gained by the different Designated Operational Entities (DOE) through the process of validating the submitted projects, specifically with regard to common mistakes and pitfalls that the CDM project proponents fall into when preparing a CDM Project Design Documents (PDDs).

The Capacity Development for CDM (CD4CDM) Project decided to capitalize on the lessons learned by this validation process and has collaborated with Det Norske Veritas (DNV), an accredited DOE, to produce this guidebook. The guidebook targets CDM project proponents in developing countries, specifically those engaged in PDD preparation. It draws upon the extensive knowledge of DNV, which has validated more than 50% of all CDM projects coming through to the validation stage.

In this guidebook, DNV identifies the 20 most common pitfalls, based on the systematic analysis of all projects it validated up to September 2005, and provides detailed guidance on how to avoid these pitfalls. By producing this guidebook, CD4CDM aims to contribute to the reduction of transaction time associated with CDM project validation through improving the quality of the PDDs produced.

It should be noted that this guidebook *does not* give a detailed description of how to design a CDM project. For guidance on this topic, please refer to other CDM guidebooks downloadable from www.cd4cdm.org

The CD4CDM project would like to express appreciation to the primary authors of this document from DNV including Einar Telnes, Michael Lehmann, Susanne Haefeli, Richard Archer, Mari Grooss Viddal and Ramesh Ramachandran.

Special thanks to Amr Abdel-Aziz, member of the CDM Methodologies Panel[1], and Jorgen Fenhann, UNEP Risoe Centre, for their insightful comments and suggestions.

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November 2005

1 *The comments and suggestions made by Amr Abdel-Aziz do not necessarily reflect the views of the Methodologies Panel.*

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1 Introduction

This guidebook is designed to help readers navigate the pitfalls of preparing a Project Design Document (PDD) for Clean Development Mechanism (CDM) projects.

The purpose of a PDD is to prepare project information for relevant stakeholders. These stakeholders include the investment community, the Designated Operating Entity (DOE) performing validation of the project, the CDM Executive Board (EB), the Designated National Authorities (DNA) of the involved countries and the local population. The PDD, together with the validation report and the approval letter of the DNA, are the basis for the registration of the project and its recognition as a credible CDM project.

The PDD is about the project's design – that is, how the project intends to reduce greenhouse gas (GHG) emissions below those levels that would otherwise have been emitted[2]. Each and every CDM project is unique, from the project design to the application of even the simplest baseline methodology. Some of the projects submitted for validation may be very efficient in reducing emissions and score well in terms of economic, social and environmental benefits, but may still not qualify as CDM projects.

Experience has shown that the information needed to judge a suitability of a project for the CDM is vast and can take months to assemble. Also, the time required to assemble relevant information increases with the number and diversity of stakeholders involved and the complexity of the information itself.

This guidebook is based on a review of all PDDs submitted to DNV for validation. The advice given and the pitfalls described in this guidebook are, therefore, based on day-to-day, hands-on experience and real instances of mistakes made in submissions.

In summary, then, this guidebook takes a practical stance: it is concerned with the practical issues of how to get projects through the validation process. It will help those submitting a PDD by:

- Describing the most common and costly mistakes made in the process of preparation of a PDD
- Providing guidance for completing a PDD
- Explaining the validation process and thus making it easier to understand when and how to interact with the DOE validating the project.

2 *Dec. 17/COP7, Article 43, Marrakech accords*

2 The CDM Project Development and Validation Process

This section describes the generic validation process and the timeline for CDM project development. It aims at helping those submitting a potential CDM project for validation to:

- Better understand the validation process and the different stakeholders involved in this process
- Better understand what information is required by the DOE for validation of projects
- Better plan for a realistic timeline.

Figure 1 shows the interaction between the project developer, the DOE, the DNA of the host country, the CDM Executive Board (EB) and other stakeholders affected by the project activity, such as the local population.

Figure 1 - Steps of the Validation Process

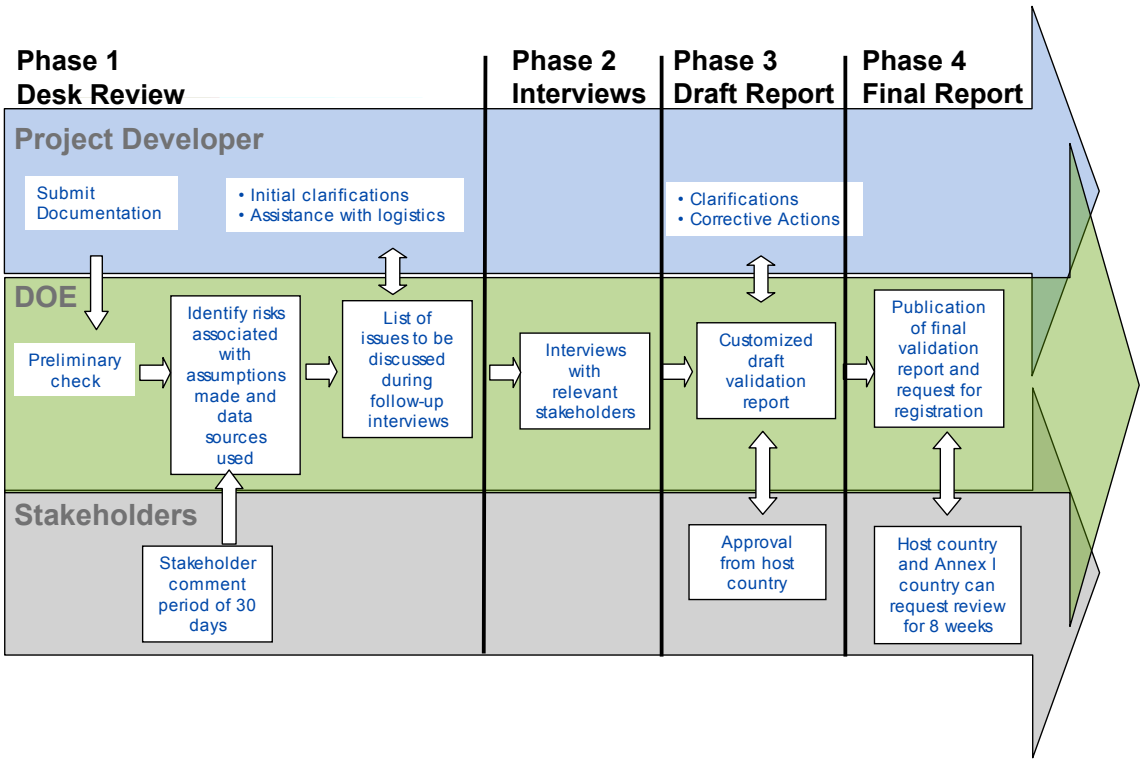


Figure 1 shows that, whereas the project developer is responsible for the project design process, the DOE is the central player driving the validation process as a whole. CDM Executive Board may be involved if there are deviations from the methodology that cause the DOE to request guidance from the EB.

It is also important to note the complexity of the process, in that many activities are being carried out in parallel, especially in phase 3. It is therefore crucial that the players maintain communication with each other and that each of the parties involved dedicates a project manager, acting as a central point of contact, who is responsible for driving the process along and coordinating with the other parties involved. For example, major delays can occur in phase 3, when project operators or DNA representatives are unavailable to respond quickly to a DOE's request for clarification.

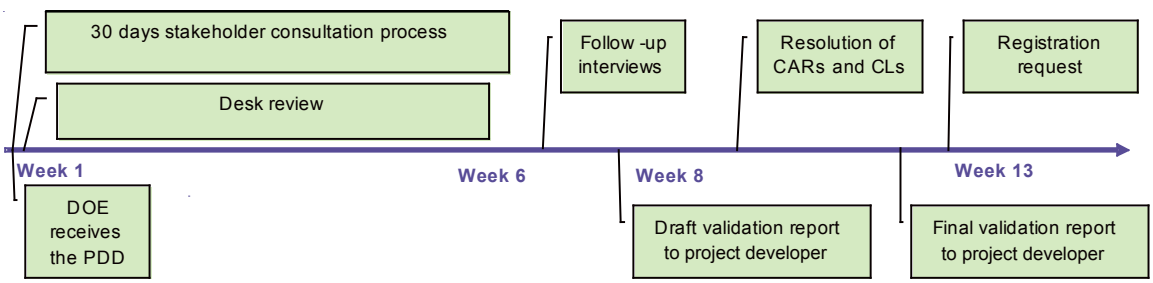
The complexity of the process also leads to another consideration. During the first two validation phases the project developer is mostly not involved. The DOE is busy assessing the project in its totality and assembling facts and background information to construct as realistic and, most importantly, as independent a picture of the project activity as possible. Project developers should understand that it will take 6-8 weeks for the DOE to complete the first two validation phases. This includes the 30 days public stakeholder comments period.

From past experience it is clear that delays often occur in phase 3. These delays are normally a consequence of the time needed by project developers to resolve issues that prevent the registration of the project, or delays in the issuance of the Letter of Approval (LoA).

Figure 1 does not describe the timeline for passing through all these phases. Figure 2 below indicates the approximate time needed to perform each stage.

The desk review and the public stakeholder comments stages will typically be performed in parallel. Ideally, the validation process should take no more than 40 days (including the 30 days stakeholder consultation process). In practice, no validation has been performed in less than 70 days from the date the 30-day stakeholder period begins to the issuance of the request of registration from the UNFCCC. The current average is closer to 100 days, both for full-scale and small-scale projects. Delays commonly occur when the project participant has to resolve outstanding issues (Corrective Action Request (CAR) and Clarification Requests (CLs)). Experience shows that delays usually originate from a few outstanding issues that require much work or time to resolve, such as the lack of an Environmental Impact Assessment (EIA) or operating permit. In conclusion, the timeline of the validation will depend on the complexity of the project, and the type and numbers of outstanding issues that are identified which needs to be resolved by the project participant.

Figure 2 - Steps of the Validation Process and Indicative Schedule



The paragraphs below explain in more detail what happens in each of the validation phases.

Desk review

In reviewing the project information received from the project developer, the DOE validation team will first perform a risk analysis. Particular emphasis will be placed on the identification of key risks to the validity of potential Certified Emission Reductions (CERs). A sector expert is involved at this stage, to ensure the quality required by the UNFCCC for validation.

Many DOEs use a customised validation protocol to ensure transparency of the validation outcome. Such protocols show criteria, means of verification, and the results of the validation. The following areas are described in the protocol and reviewed during validation:

- project design
- baseline assessment (including additionality)
- emission reduction calculations
- monitoring plan
- environmental and social impacts including the local stakeholder process.

The common CDM and JI Validation and Verification Manual (VVM) has been developed since 2002 by a multi-stakeholder process involving government officials, private sector representatives, third party verifiers and NGOs. The sponsoring institutions have been International Emissions Trading Association (IETA) and the Prototype Carbon Fund (PCF). The VVM has established itself as the global best practice standard and is used by all major DOEs. The manual contains process maps outlining the validation process, guidelines on how to perform a validation, and validation report and protocol templates. The complete documentation can be downloaded at 'www.vvmanual.info'.

The desk review stage normally finishes at the same time as the 30-day public stakeholder period, and during this time the DOE works on its own, rarely contacting the project developer. In the past, this has often caused frustration and uncertainty because the project developer, having worked intensely on the PDD for weeks, is suddenly not involved in the process (i.e. the third party independent assessment by the DOE).

Stakeholder consultation process

In parallel with the desk review, the DOE will typically carry out a stakeholder consultation process, as required by the CDM modalities and procedures. The DOE will publish the PDD, and invite parties, stakeholders and observers, via the UNFCCC CDM-site, to comment on the PDD within 30 days.

Follow-up interviews and site visits

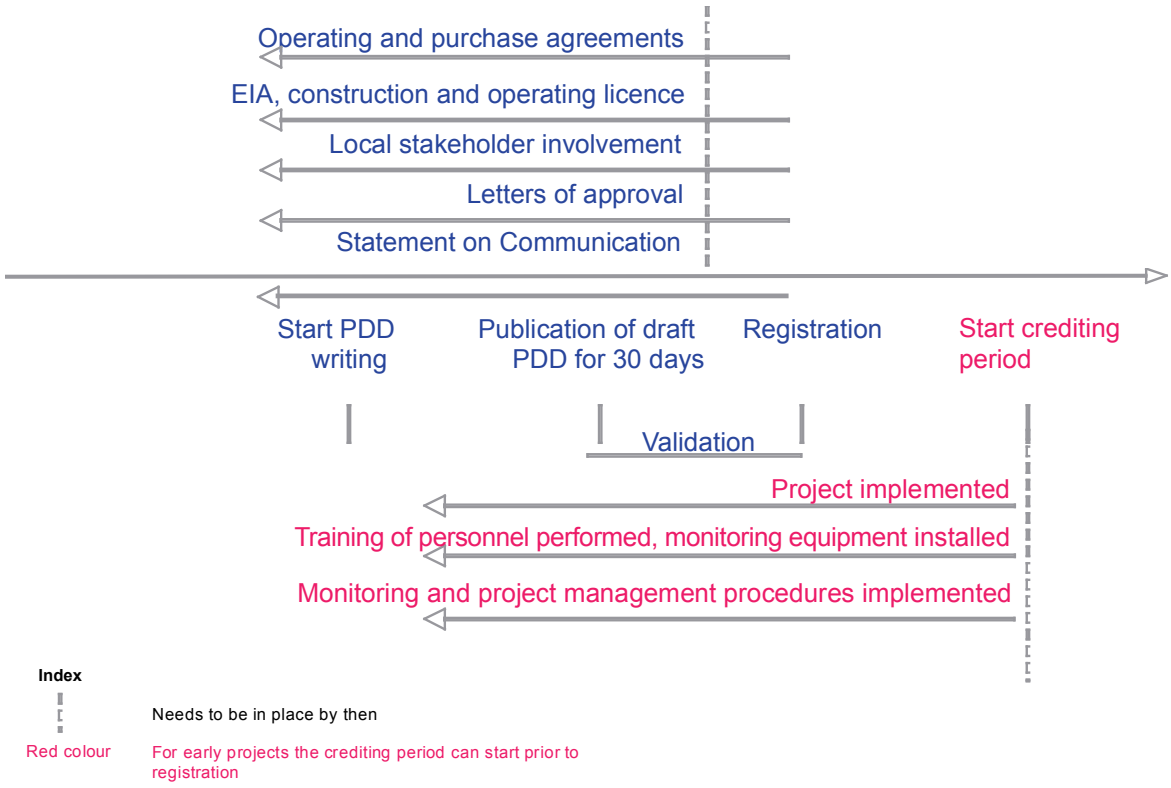
The DOE will review any additional information necessary to allow it to conclude on issues raised during the desk review. This information will typically also be sourced via interviews with project stakeholders in the host country (e.g. project operators, DNA, local community) who can provide evidence of the fulfilment of requirements where this has not been fully established in the desk review.

The project developer is then approached in order to review the list of issues and to decide how these can be resolved. Resolution can be done via email, phone, or direct meetings between the DOE and involved stakeholders, such as representatives from the operating company and the DNA. Past experience has shown that good communication between the DOE and the contact persons of the individual organisations and government agencies is crucial to keep the process going.

Draft validation report and resolution of outstanding issues

In this phase, the DOE issues a draft validation report, which includes the initial findings, for the client to review. The draft validation report should also include issues raised by stakeholders during their 30-day consultation period, which have not already been resolved by the DOE in the desk review. Any outstanding issues that may impact the final validation opinion are presented as either:

Figure 3 - Generic CDM Timeline



It should be noted that the project timeline also varies between countries. For instance, a few DNAs ask for the draft, or final validation report, before starting the approval process and issuing the final LoA. The average time taken by DNAs to issue LoAs can vary considerably.

Also, DNA's revise their processes – so what might be optional one year could be mandatory the next. For example, one host country DNA will switch to requiring a draft or final validation report before starting the approval process in the future. Project developers submitting PDDs must make sure that they understand the latest national requirements, as this may differ from those of previous years.

Final validation report and opinion, and request for registration

In this final phase, a validation report and opinion will be submitted to the client for review. The report will indicate whether the project, as designed and documented, meets the Kyoto Protocol criteria and CDM modalities and procedures, as well as the criteria for consistent project operations, monitoring and reporting.

Following a successful validation and the approval of the project by the DOE and the relevant DNAs, the DOE will finalise the validation report and the project will be presented to the CDM EB for registration. The validation report will then be made publicly available on the UNFCCC CDM-website. The registration is deemed final, if no request for review is presented by either three EB members, or one of the Parties involved within 8 weeks (4 weeks for small-scale CDM projects) after the report is received by the CDM EB. Registration is the formal acceptance by the EB of a validated project activity as a CDM project activity and is the prerequisite for verification, certification and issuance of CERs related to the project.

3 Overview of Key Pitfalls

This section gives a review of 20 key pitfalls, in terms of commonality, frequency and tendency to cause the longest delays. The term 'pitfall' is used broadly to mean 'issues that need to be managed' during a validation and registration process. These pitfalls were identified in an analysis of DNV's findings from the majority of projects validated by DNV up to September 2005. This analysis identified more than 100 issues, which were consolidated into 20 key pitfalls. In Table 1 below, these pitfalls are classified by frequency of occurrence and approximate time delay caused (based on lessons learnt from DNV's validation of CDM projects).

Sometimes entities choose to submit PDDs in the knowledge that they are not complete. This can minimise delays but also involves the risk that documentation and evidence required for project validation may not be obtained. For instance, written confirmation from the Designated National Authority (DNA) that the project is in line with sustainability criteria may be pending, and the entities may wish to have the approval granted. However, if such confirmation is not given, the project will have incurred unnecessary costs.

Table 1 – The Key Pitfalls

	Delay more than 1 week	Delay more than 1 month
Frequency more than 20%	• Lack of logic and consistency in PDD • Deviations from selected calculation methodology not justified sufficiently or incorrect formulas applied • Compliance with local legal requirements not covered sufficiently • Insufficient information on the stakeholder consultation process	• Evidence of EIA and/or required construction/operating permits/approvals not provided • Letter of Approval insufficient or delayed
Frequency less than 20%	• Project participants not identified clearly • The modalities of communication with the Executive Board in terms of CERs issuance and allocation instructions not stated clearly, or not signed by all project participants. • Insufficient description of the technology • Insufficient explanation of baseline scenarios • Insufficient explanation of project additionality • Baseline information not sufficiently supported by evidence and/or not referenced sufficiently • Major risks to the baseline not identified/described • The project boundaries not defined clearly • Project and/or crediting start date unclear • Deviations from monitoring methodology not justified sufficiently • Monitoring and project management procedures not defined	• Small-scale selected for a large-scale project • No written confirmation that funding will not result in a diversion of official development assistance • Non-compliance with the applicability conditions of the applied baseline methodology or methodology compliance not explained sufficiently

4 Pitfall Descriptions

In this section, the 20 pitfalls listed in the previous table are explained in more detail. Good practice and examples are presented as appropriate.

Pitfall 1: Small-scale selected for a large-scale project.

This mistake could arise if you define a large-scale project as a small-scale project, or the opposite.

Examples:

- The eligibility of a project as a small-scale CDM project may be questioned - for example, if the project emits more than 15kt CO_2 in a specific year, although on average it emits less than 15 kt CO_2 per year the eligibility as a small-scale project will be questioned. If at the renewal of the crediting period, the project emissions are higher than 15 kt CO_2e per year, the project ceases to be a small-scale CDM project and must apply a large-scale approved methodology.
- For several biomass co-generation systems and/or co-fires systems such as boilers, if the energy output exceeds 45 MW_{th} in total, the project is not eligible as small-scale project.
- Energy efficiency projects that exceed the limit of, for instance, 15 GWh of energy savings during a year within the crediting period, will only receive CERs up to the maximum value of 15 GWh[3].
- Bundle of several small scale projects that in total exceed the eligibility limits.

Good practice: Information from reliable and conservative data sources must be supplied to justify the submission of a project as small-scale. A full description is required to show that the project is eligible as a small-scale project and is below the relevant small-scale project threshold although, for projects that are not yet implemented, this cannot be completely certain until the technology is operational. However, there should be a reasonable correlation between the stated project capacity (e.g. below 15 MW) and data on, for example, forecasted generation levels, turbine capacity etc. Where the justification of the small-scale eligibility is based on calculations, the input data and the calculations should be transparently and conservatively described.

A related example is the submission of small-scale PDDs from an unbundled full-scale project. If separate projects are presented with the same project participants, in the same project category and technology/measure, registered within a two year period, and with a project boundary within 1 km of the project boundary of the proposed small-scale activity at the closest point, these will be defined as part of a debundled full-scale project. This practice is not allowed under the CDM.

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3 Decision 21/COP8

In practice, it is not often that full-scale projects try to debundle into several small-scale projects, but sometimes project developers have expressed a wish to bundle several projects into one full-scale PDD. So far the EB[4] has requested the Small-scale Working Group to come up with more detailed guidelines for these projects. Four categories of bundling have been defined and each must be handled differently:

- Bundling of project activities of the same type, same category and technology/measure
- Bundling of project activities of the same type, same category and different technologies/measures
- Bundling of project activities of the same type, different categories and technologies/measures
- Bundling of project activities of different types.

It is also possible to bundle full-scale projects together. For example, a project to capture and combust methane from swine manure treatment was registered for two projects in Pocillas and La Estrella in Chile. The rules for bundling of full-scale projects are still being discussed by EB.

For all of the above categories the crediting period should be the same and the composition of bundles must not change over time. Practically, the bundling of several projects into one can be a problem if a delay in one project causes a delay to the rest of the bundle. For example, any requests for review that relate to only one part of a bundled project, lack of operating licence in one project part, or the definition of how credits are distributed within the bundle, may also affect the other parts of a bundled project.

As an example, a suggestion to bundle a hydro, wind and geothermal project into one full-scale PDD by applying ACM0002 was presented. The projects in question were located in South America (see Figure 4). To do this, the same crediting period needed to be chosen for all three projects. Whether it was beneficial for the hydro project to be submitted as small-scale, depended on the forecast generation and the difference in the CO_2/MWh coefficients between ACM002 and ASM-I-D. In this example a number of risks needs to be managed. For instance, if the projects were bundled and the geothermal project did not receive an operating licence in time, the crediting period would start running with a reduced credit generation potential. Also, if the CDM EB requested a review because of problems with one project, the other two projects would be delayed as well.

4 *EB20*

Figure 4 - To bundle or not to bundle… that is the question

Pitfall 2: Project participants not identified clearly.

Sometimes there is confusion on the definition of a project participant, and it is not clear whether the project participants are, or will be, authorised by the respective Party[5] involved.

In the CDM Guidelines, a project participant is defined as follows:

"In accordance with the use of the term project participant in the CDM modalities and procedures, a project participant is:

- a Party involved, or
- a private and/or public entity authorized by a Party involved to participate in a CDM project activity."

In accordance with Appendix D of the CDM modalities and procedures, the decision on the distribution of CERs from a CDM project activity shall exclusively be taken by project participants. Typically, consultants, DNAs and local municipalities do not have a share in the distribution of CERs.

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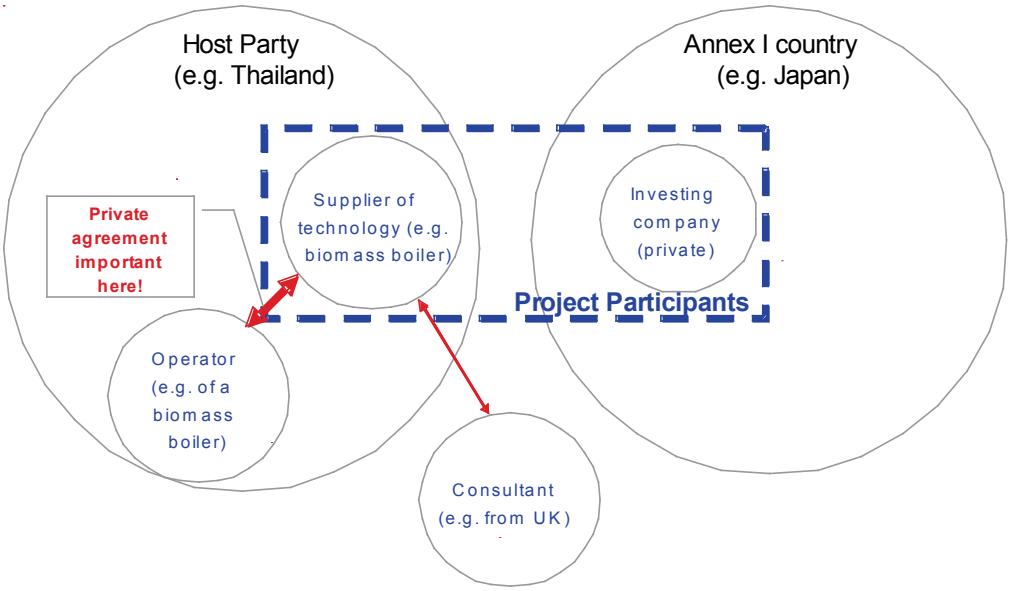
5 "Party" is used as defined in the Kyoto Protocol and means a Party to the Kyoto Protocol. Annex I Party means a Party as listed in Annex I to the Convention,

Good practice: The question of who is a project participant needs thorough consideration. There have been examples where the project operator has not been included as a project participant or even informed about the project being proposed as a CDM project. The operator has then threatened to stop the operation and, hence, generation of CERs, unless they are included as a project participant. As a learning point, it is not mandatory to include the operator as a project participant, however, it is wise to ensure that private agreements are in place to guarantee the generation of CERs. This is also illustrated in Figure 5 below.

Figure 5 - Project participants: Who has a say in CER distribution? What about the operator in this case?



Often it is not clearly described whether all organisations mentioned in section A.3 of the PDD are project participants. Only actual project participants should be listed in section A.3 and Annex I of the PDD.

All private or public entity project participants will need to be authorized by a Party, i.e. a country that is signatory to the Kyoto Protocol. Authorization does not necessarily need to be provided by the country where the private or public entity is located but can also be provided by the DNA of another country participating in the project. Good practice is to explicitly mention the project participant in the Letter of Approval, or to address the LoA to the project participant.

The registration of a project activity can take place without an Annex I Party being involved at the stage of registration. However, before an Annex I Party acquires CERs for such a project activity from an account within the CDM registry, the DNA shall submit a letter of approval to the EB in order to ensure that the CDM Registry administrator forwards CERs from the CDM registry to the Annex I national registry.

Pitfall 3: Evidence of EIA and/or required construction/ operating permits/approvals not provided.

Projects are sometimes submitted for validation without evidence that they have all the required operating permits/approvals to proceed. These permits/approvals are country specific. For example, if required, the DOE will ask to see a copy (a scanned, signed document is sufficient) of a valid construction permit, an operational licence and sometimes an Environmental Impact Assessment (EIA). Also, approvals, such as Environment Licences, need to be presented if required by legislation.

These documents should not be included in the PDD, as they are often in local language and can be too comprehensive. Attachments in a language other than English shall not be included, as the CDM-EB has defined that the working language for the CDM is English only.

Pitfall 4: Letter of approval insufficient or delayed.

Over 80% of all PDDs submitted for validation are not accompanied by a Letter of Approval (LoA) from all relevant DNAs. The reasons for this are that:

- the process of receiving a Letter of Approval started too late and/or the DNAs have not yet established procedures for the approval of CDM projects
- some DNAs want the validation report before they submit the LoA (e.g. Brazil, Korea, Germany) and/or
- Parties and/or project participants change during the validation process because of changing private investor or operator relations, e.g. if a company in Japan wants to become a project participant in a unilateral project in Thailand and receive CERs, this will add a new Party and a new project participant to the project (ref Pitfall 2).

Good practice: The process of receiving an LoA should be initiated at an early stage as this often takes time. Good examples of LoAs can be found on the UNFCCC website (http://cdm.unfccc.int/Projects/registered.html).

As stated in the CDM Guidelines, three points need to be included.

"The DNA of a Party involved in a proposed CDM project activity shall issue a statement including the following:

- The Party has ratified the Kyoto Protocol.
- The approval of voluntary participation in the proposed CDM project activity.
- In the case of Host Party(ies): statement that the proposed CDM project activity contributes to sustainable development of the host Party(ies)."

Further, all private or public entity project participants need to be authorized by one Party.

Pitfall 5: No written confirmation that funding will not result in a diversion of official development assistance.

Written confirmation that funding will not result in a diversion of official development assistance must ideally be obtained from the relevant Annex I country DNA. What this means is that Annex I countries shall not divert official development assistance funds that previously have been directed to other purposes (e.g. for school buildings) in the respective host country to the purchase of CERs from a CDM project. Such evidence should be given by the Annex I country. A key word in this context is therefore "diversion"[6].

Such a statement is only needed when public funding from an Annex I Party is used by the project.

Pitfall 6: The modalities of communication with the Executive Board in terms of CERs issuance and allocation instructions not stated clearly, or not signed by all project participants.

The modalities of communication[7] with the Executive Board are sometimes not stated, or if stated, not signed by all project participants. The communication statement needs to be in place prior to submitting the request for registration as this is often a cause of delay. Good examples of communication statements can be found on the UNFCCC website (http://cdm.unfccc.int/Projects/registered.html).

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6 As of the Marrakech Accords (Dec17/COP7); "Emphasizing that public funding for clean development mechanism projects from Parties in Annex I is not to result in the diversion of official development assistance and is to be separate from and not counted towards the financial obligations of Parties included in Annex I "

7 The modalities of communication between project participants and the Executive Board are indicated at the time of registration by submitting a statement signed by all project participants. All official communication from and to project participants, after a request for registration is submitted by a DOE, shall be handled in accordance with these modalities of communication. If these modalities have to be modified, the new statement shall be signed by all project participants and submitted in accordance with the modalities that are to be replaced.

Pitfall 7: Insufficient description of the technology.

Unnecessary or insufficient information is sometimes supplied on material aspects of a project, leaving ambiguity on core aspects of the project technology or implementation. Comprehensive information on all aspects of a project is not required. Excessive and irrelevant information may obscure the important information to the validator. However, it is important to provide the detail of any advanced/novel technology used, including electricity generation technologies. The level of detail needs to be considered on a case-by-case basis, ensuring that all relevant information having impact on emission reductions and CDM eligibility is presented.

Examples:

- *For wind projects* which normally use standard technology, the technical details and details of selected subcontractors are not required, as long as the details on this are provided in e.g. a feasibility study that is made available to the DOE. However, the type of turbine and its possible type certification, load factor, total installed capacity and important factors summarised from the feasibility study, such as wind conditions, should be described. There is no need to talk extensively about grid connection, voltage etc.

- *Small run-of-river hydro power projects* will also normally use standard technology. In this case, the type of turbine, capacity, load factor and river flow conditions should be described.

- *For projects that are less standard*, such as combined heat and power (CHP), fuel switching, cement and other manufacturing industry projects and large hydro projects, design/engineering details are required. For boilers, a description of the theoretical efficiency and technical characteristics are required.

- *For biofuel projects*, the mixture of the biomass burned, boiler or turbine capacity, and how much biomass needs to be transported from other sites, and by what means, must be made clear.

- *For landfill gas capture projects*, detailed components, such as flare efficiency and combustion engines should be described, but there is no need to go into detail about, for example, component material of the pipes.

Good Practice: From the technology description in the PDD, the DOE needs to receive a clear picture of:

- whether the project design engineering reflects current good practice, as per the Marrakech Accords.

- what technology elements are included in the project boundary in terms of GHG emissions.

Proper sequencing and appropriate use of clear process flow sheets will improve clarity, especially in industry-specific projects. The description should be adapted to sector specifics and can be included as an Appendix to the PDD.

Pitfall 8: Non-compliance with the applicability conditions of the applied baseline methodology or methodology compliance not sufficiently explained.

Experience show that the applicability criteria from the methodologies are sometimes not specifically addressed in the PDD. In other cases, the project may be in non-compliance with one or more of the applicability criteria. Hence, it is important that sufficient information is provided through descriptions in the PDD in order to enable the conformity of the project with the applicability criteria to be evaluated. If in doubt on the appropriateness of an existing baseline methodology, it may be wise to contact the DOE for a discussion

An example from AM0002, where the applicability criteria are as follows:

"This methodology is applicable to landfill gas capture and flaring project activities where:

…

- *The contract stipulates the amount of landfill gas (expressed in cubic meters) to be collected and flared annually by the landfill operator*
- *The stipulated amount of landfill gas to be flared reflects performance among the top 20% in the previous five years for landfills operating under similar social, economic, environmental and technological circumstances…"*

In one project, the contract to operate the landfill gas capture and utilization equipment did not stipulate, as required, the amount of landfill gas (expressed in cubic meters) to be collected. Because of this, the project had to change to another approved methodology.

Another example is a landfill gas capture project that has included credits from generating electricity and displacing grid electricity and, therefore, wants to apply AM0011 in conjunction with ACM0002 or ASM-I.D. One of the applicability criteria of AM0011 is; "…*Emissions reductions associated with generation of the displaced electricity do not generate credits…*". In this case the project can either i) not claim credits from the displacement of grid electricity or ii) will have to use another approved methodology such as ACM0001.

Good practice: Follow the structure and the wording of the methodology and, when justifying the applicability of the methodology to the specific project, substantiate this with as much evidence as possible. Contact the DOE if you are not sure which methodology to apply for a specific project.

Pitfall 9: Insufficient explanation of baseline scenarios.

The identification of the *relevant* and realistic baseline scenarios is not always in line with the methodology.

In the analysis of possible baseline scenarios, *relevant* alternative baseline scenarios are defined as those scenarios that are either:

- business as usual
- the project scenario and/or
- other likely technology alternatives (for example, landfill gas collection, waste incineration and utilization for power generation could be a likely alternative to a project scenario of landfill gas collection and flaring only).

Examples:

1. Relevant and valid baseline scenarios are often not addressed. For example, in landfill gas projects, the possibility of selling off the gas to nearby industry facilities needs to be considered.
2. Too much irrelevant detail about the whole industry context is often provided in PDDs. For example, for co-generation projects using bagasse as fuel, the economic situation of the sugarcane industry is only relevant in so far as it influences the sugarcane producer's choice of saving electricity costs by investing in a biofuel boiler.

Good practice: Follow closely the requirements given in the approved baseline methodology. Identification of baseline scenarios can be broadly categorised into three types:

1) For many approved methodologies (AM) there is only one relevant baseline scenario besides the project and this is already identified, e.g. for AM0011, "the baseline scenario is the release of the landfill gas to the atmosphere." Examples of other approved methodologies that have already identified the one relevant baseline scenario are AM0001, AM0002, AM0003, AM0004, AM0005, AM0008, AM0010, AM0012, AM0013, AM0015, AM0018 and AM0022. The importance for projects applying these methodologies lies in proving that this identified baseline is the only relevant and valid business as usual (BAU) scenario. In AM0003, the project participant should for example "provide a convincing justification that there is no plausible baseline scenario except the project and the business as usual (BAU) scenarios. If there is another plausible baseline scenario, this methodology cannot be used for the proposed project activity."

2) In other approved methodologies, the choice of baseline scenarios is given in the methodology, e.g. AM0006, AM0009, AM0014 and AM0016. The importance for projects that apply these methodologies lies in identifying the plausible scenarios only. For example, for biomass projects applying AM0006, all nine options mentioned in the methodology should be addressed briefly. Only the most relevant ones need be described in more detail.

3) Other methodologies either refer directly to the additionality tool[8] (e.g. AM0019, AM0020, AM0023), or they require the identification of relevant BAU scenarios with regard to a set of specific conditions, for example taking into account national regulations or prevailing practice. Examples of these are AM0007, AM0017, and AM0021.

8 *http://cdm.unfccc.int/methodologies/PAmethodologies/AdditionalityTools/Additionality_tool.pdf*

Pitfall 10: Insufficient explanation of project additionality.

The additionality of the project often needs further elaboration or needs to be made more project-specific.

Good practice: The following advice is in line with the requirements in the "Tool for demonstration and assessment of additionality" where the concepts of baseline scenario and additionality are described in detail. The "Tool for demonstration and assessment of additionality" is a requirement for several approved methodologies. This tool has the following five steps:

Step 0. Preliminary screening based on the start date of the project activity

This step is only relevant for early start projects (ref. the CDM Glossary[9]).

Step 1. Identification of alternatives to the project activity consistent with current laws and regulations.

Sub-step 1a. Define alternatives to the project activity: Refer to Pitfall 9 with regard to identification of baseline scenarios.

Sub-step 1b. Enforcement of applicable laws and regulations.

Possible baseline scenarios as identified in Sub-step 1a shall be in compliance with all applicable legal and regulatory requirements, even if these laws and regulations have objectives other than GHG reductions.

Only laws and regulations that are actually enforced should be considered: laws and regulations that are systematically not enforced, or where non-compliance is widespread in the country, do not have to be considered[10].

Step 2. Investment analysis

Present the investment analysis in a transparent manner and provide all the relevant assumptions in the PDD. This will enable others to reproduce the analysis and obtain the same results. All critical technical and economic parameters and assumptions (such as capital costs, fuel prices, lifetimes, and discount rate or cost of capital) should be clearly presented. Justify and/or cite assumptions in a manner that can be validated by the DOE. In calculating financial indicators, project risks can be identified through the cash flow pattern, subject to project-specific expectations and assumptions (for example insurance premiums can be used in the calculation to reflect specific risk equivalents). The Net Present Value (NPV) analysis does not have to be included in the PDD, but should be provided to the DOE upon request. Ref. box 1 for more details on financial analysis.

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9 *http://cdm.unfccc.int/Reference/Documents/Guidel_Pdd/English/Guidelines_CDMPDD_NMB_NMM.pdf*

10 http://cdm.unfccc.int/methodologies/PAmethodologies/AdditionalityTools/Additionality_tool.pdf

Step 3. Barrier analysis

- Sub-step 3a. Identify barriers that would prevent the implementation of type of the proposed project activity in absence of the CDM:
- Sub-step 3 b. Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed project activity).

Technical barriers are sometimes put forward when there are none. If all the technologies involved are commercially available and have been used effectively in the host country, there are normally no technical barriers.

Investment barriers can include barriers other than solely economic/financial ones (as discussed in Step 2 above). As an example, a project can have a high forecasted IRR (i.e. no financial barrier) but still face an investment barrier because debt funding is not available for this type of project due to the risks associated with the project activity.

Step 4. Common practice analysis

A good approach is to base the analysis of common practice analysis on public, official and recent data. This should be thoroughly referenced in the PDD. There is no formal guidance on what common practice means. It is, therefore, important to clearly state the approach used for the specific project. The common practice analysis (step 4) needs to be seen in conjunction with the barrier analysis (Step 3). As an example, if 60% of sugar cane mills use biomass to produce power, and this is therefore defined as common practice, the project can still be additional provided that these 60% do not have to overcome the same barriers (ref. Step 3). It is important to know that other ongoing CDM project activities should not be included in the analysis of common practice (i.e. in the 60%).

Box 1: Introduction to Net Present Value (NPV) and Internal Rate of Return (IRR)

1. Net Present Value analysis

The Net Present Value (NPV) is the value of a project at present and represents the sum of the investment and future discounted cash flows, using an appropriate interest rate. If the NPV is positive, the project is typically attractive without a CER revenue. If the NPV is negative, the project would probably be additional.

The discount rate is often taken to be the national risk-free interest rate 'i' plus some premium to account for inflation and project risks.

Advantages:

- It gives a financial appraisal in absolute terms, not a %.
- It gives a good discussion basis to further investigate the stated costs and revenues i.e. the DOE will check that stated costs are not inflated and revenues not reduced to support the claim that the project is not viable without the generation of CERs.
- It includes cash flows over the whole forecast crediting time of the project.
- It includes the time value of money in the form of the interest rate i/discount factor i.e. $100 today are worth more than $100 in 5 years.

Disadvantages:

- It involves many assumptions.
- Only one interest rate i/discount factor will typically be reflected in the Net Present Value Analysis, although different project investors (for example government loan, bank loan, equity) may claim different rates of return, according to their degree of involvement and liability in the project.
- Every project with a positive NPV would not necessarily go ahead anyway, as it would compete with other attractive investments within the company.
- It is difficult to include the option to delay the project for a couple of years.

Remember:

- Depreciation should not be taken in as a cash flow.
- Interest payments should not be included as it is a cash flow already included in the discount factor i.
- Do not include the revenue from the sales of CERs or the costs of validation, monitoring and verification. It is the value of the project without the CDM that should provide the argumentation.

- All indirect cost savings from proposed projects need to be calculated. If materially important, details on this should be included. It is recommended that a sensitivity analysis be included, showing whether the conclusion regarding the financial attractiveness is robust, according to reasonable variations in the critical assumptions. The investment analysis provides a valid argument in favour of additionality, only if it consistently supports (for a realistic range of assumptions) the conclusion that the project activity is unlikely to be the most financially attractive, or is unlikely to be financially attractive. Sometimes project participants submit raw data (such as balance sheets and profit and loss accounts) with their PDD, in the false belief that the DOE will carry out the financial appraisals (such as the calculation of Net Present Value or Internal Rate of Return). The following example illustrates the level of information required by the DOE.

	Year											
		0	1	2	3	4	5	6	7	8	9	10
Investment		-500										
Operating and maintenance (% of investment)	3		-15	-15	-15	-15	-15	-15	-15	-15	-15	-15
Contingency (%of investment)	5		-25	-25	-25	-25	-25	-25	-25	-25	-25	-25
Sale of electricity			250	250	250	250	250	250	250	250	250	250
Insurance			-5	-5	-5	-5	-5	-5	-5	-5	-5	-5
Tax (tax lag 1 year)	30%		-61.5	-61.5	-61.5	-61.5	-61.5	-61.5	-61.5	-61.5	-61.5	-61.5
Residual value												
Net cash flow		-500	205	144	144	144	144	144	144	144	144	144
Discount in %	24.0	1	0.8	0.7	0.5	0.4	0.3	0.3	0.2	0.2	0.1	0.1
Present value		-500	165	93	75	61	49	39	32	26	21	17
NPV		-17										

- Scenario analysis: play with the numbers:
  - Is it possible that the investment is 500 000?
  - Are the O & M not too high?
  - Is it not possible that the revenue is bigger and that they can get some revenue from other sources than just selling electricity?
  - Is the tax really so big? Can they not claim a tax lag (delay to pay the tax, varying from country to country) by more years that just 1 as indicated in this example?
  - Is the weighted average interest rte the investors need really so high i.e. 24%

Figure 6: Example of a NPV in a spreadsheet

2. Internal Rate of Return

Advantage:

- IRR values are often used to show at what discount rate projects are attractive.

Disadvantages:

- The normal way to calculate the Internal Rate of Return (IRR) is to do a NPV analysis, where the IRR is the discount rate 'i' that makes the NPV become 0.
- The problem with the IRR analysis is that it is a percentage expression, hence, a big project can have a smaller IRR than a small project although the actual positive NPV is much bigger.
- Another problem with the IRR analysis is that it is often based on accounting values such as revenue and net operating profit. These values include accounting policies such as depreciation, which can distort the profit. For example, if a machine depreciates very quickly, the profit becomes smaller in the early accounting periods. The NPV analysis only deals with real cash flows that do not suffer from these distortions.

3. About the barrier analysis and its link to the IRR

Often, owners of projects with a positive IRR fear that their project may be seen as not additional and therefore choose step 3 of the additionality tool - the barrier test.

Remember:

- A positive NPV or high IRR does not automatically mean non-additionality.
- The DOE has the right to ask for a NPV or IRR assessment if the barrier tests in step 3 are not deemed sufficient, even though this step has not been chosen.

Barriers are there to be overcome. If the forecasted profit is sufficient and the risk level not prohibitive (step 2), a project will go ahead, even though barriers (step 3) are present. The question is how much these barriers are "worth". This is largely subjective and will have to be transparently discussed in the PDD.

Pitfall 11: Baseline information not sufficiently supported by evidence and/or referenced sufficiently.

Half of all PDDs submitted do not contain sufficient evidence for the determination of the baseline scenario.

Good practice:

- Substantiate all claims and assumptions presented in the PDD with references to recognised information sources.
- Discuss sources and assumptions in a transparent way. If the baseline calculation uses default factors, their use must be justified.
- Explicitly mention the conservativeness of your sources and assumptions.

Example for the application of ACM0002:

- If the grid includes coal-fired power plants, the country-specific coal CO_2 emission factors need to be stated and their source given.
- If – based on lack of data availability – the load factors for the baseline power plants are assumed, the PDD needs to discuss them in terms of conservativeness, i.e. a lower load factor increases the CO_2 coefficient and thus has to be substantiated.

Pitfall 12: Major risks to the baseline and project activity not identified/described.

The significant risks related to the viability of the baseline during the crediting period need to be identified.

Examples of such risks:

- With regard to grid electricity, more renewable electricity is added to the grid than expected at the validation stage.
- Change to laws and regulations, such as new regulations to capture a certain amount of landfill gas for a landfill gas capture and flaring project. The importance of this will depend on the practical implementation of the CDM EB Decision[11]that "National and/or sectoral policies or regulations that give positive comparative advantages to less emissions-intensive technologies over more emissions-intensive technologies… that have been implemented since …11 November 2001.. may not be taken into account in developing a baseline scenario".

11 *http://cdm.unfccc.int/EB/Meetings/016/eb16repan3.pdf*

- The project becomes common practice.
- The baseline technology becomes obsolete earlier than expected.

Care should be taken to ensure that the risks to the baseline and the risks to the project are not mixed.

Examples of project risk:

- Utilisation of the project activity is not ensured for the whole crediting period, for example operating licences are only granted on a renewable basis, poor project financing prevents the project from happening, or the operating company is bankrupt
- The operating life-time of project technology is shorter than the crediting period, for example a boiler in a fuel switch project
- The forecasted amount of methane from waste landfilled does not materialise.

Good practice is to identify and evaluate these risks transparently and completely in the PDD.

Pitfall 13: Lack of logic and consistency in the PDD.

Information given in one section is not consistent with information in other sections.

Examples of such inconsistencies:

- Arguments to support the additionality of the project are inconsistent, for example with regard to trends in the energy sector of the country
- Emission factors used in the baseline emission calculations are not consistent with emission factors in the project emission calculations
- GHG sources included in the baseline emission calculations are excluded or not consistent with GHG sources in the project emission calculations without proper justification
- References and links do not provide the relevant information to justify assumptions given in the PDD.

Good practice: Ensure that the same arguments and assumptions are used within each section and between sections of the PDD. Ensure that all references made support the claims in the PDD correctly.

Pitfall 14: The project boundaries not defined clearly.

The project boundaries can sometimes be poorly described in words. Sometimes all direct and indirect, on-site or off-site emissions are not clearly identified or estimated, or some of these are excluded without proper justification.

Typical exclusions include fuel transportation emissions outside the project boundary and fugitive emissions within the project boundary. Another example of exclusions are project emissions from running LFG capture and flaring equipment as required in AM0011, and exclusion of some greenhouse gases that should be included, for example N_2O from combustion activities. The omissions of non-material[12] sources are often not justified clearly.

About leakage: Leakage is defined as an indirect off-site emission not included in the project boundary. The following are examples of leakage that often occur and are not sufficiently taken into account by the project developer:

1) Biomass projects: For activities using biomass, leakage shall be considered including potential effects on biomass availability for other users. If the 'surplus biomass supply: demand ratio' is less than 2:1, the project's biomass demand may result in a temporarily or permanent shortage of biomass for other conventional users, forcing them to move to another fuel. The monitoring plan should, therefore, make provision for monitoring impacts on conventional biomass users, to ensure surplus biomass supply.

For projects that utilise biomass from sources outside the project boundary, transportation emissions from trucks, their capacity and the number of trips, need to be stated clearly.

For biomass projects that claim the avoidance of CH_4 emissions from biomass simply being left to decay in landfill, information on the different kinds and qualities of wood biomass must be provided. If there is shortage of biomass in the area, it is likely that this biomass would be used and not dumped and left to decay. In such cases, no methane avoidance from high quality biomass can be claimed.

Another example is biomass projects where the baseline is open decay of waste, and no emissions are assumed in the project scenario. In this case, the storage conditions of the biomass and duration of its storage may need to be monitored, to ensure that no methane is generated before the biomass is burned.

Negative leakage can also occur. For instance, if a project in a remote location switches from diesel use to a local renewable energy source, this would also eliminate the need to transport diesel, thereby reducing vehicle emissions.

Even if a project is small-scale, leakage still sometimes needs to be considered in the PDD, e.g. for projects using biomass.

12 *Refer to Appendix 4 - Glossary for definition of Materiality*

2) Co-generation projects using bagasse as fuel: For such projects that utilise the bagasse of sugar mills as fuel, the only potential source of leakage is represented by organisations that used bagasse from the sugar mill prior to the cogeneration project's implementation. Without the bagasse supply, these organisations may have to use fossil fuels.

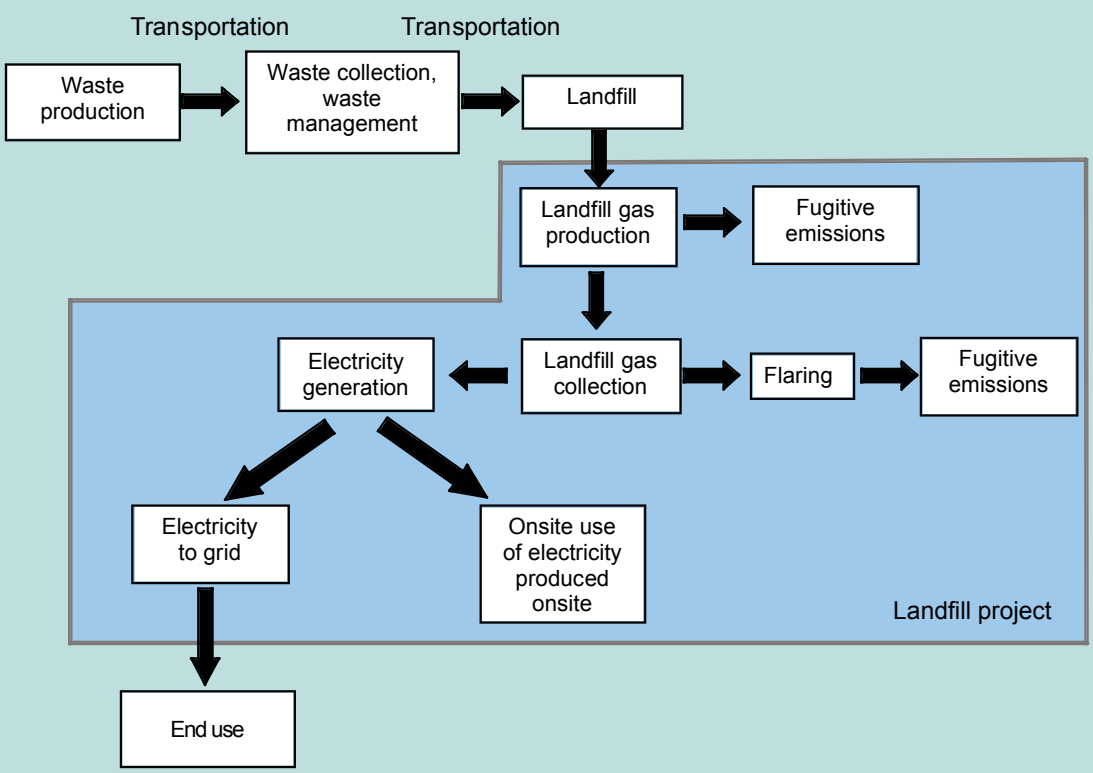
3) Landfill projects: Emissions due to the use of electricity from the grid to run the capture equipment, in the absence of project electricity generation, must be considered as leakage.

Good practice is to include in the PDD a visualisation of the physical project boundary and the system boundary, accompanied by a table defining all material GHG components.

The approved methodologies should be followed in detail to ensure that all sources of direct and indirect, on-site or off-site emissions are included as required.

For an example of project boundary, refer to Box 2.

Box 2: Example of Project Boundary for Landfill Project



Emissions	Project Scenario	Baseline Scenario
Direct on-site	Emissions associated with fugitive landfill gas emissions. A capture efficiency of 50-60% of open landfills is normal	Uncontrolled release of landfill gas generated
Direct off-site	Transportation of equipment to project site – excluded Use of electricity generated from landfill gas, reducing CO_2 emissions in the electricity grid	None identified Emissions associated with use of grid electricity – in the interests of conservatism emission reductions arising from the displacement of more carbon intensive electricity will not be included in the project's volume of CERs
Indirect on-site	Emissions from electricity use for operation of lights and fans of on-site workshop – excluded, since it is carbon neutral Emissions from construction of the project – excluded as it would occur even if an alternative project were to be constructed	None identified
Indirect off-site	Transport of waste to the landfill site(s) – excluded	Transport of waste to the landfill site(s) – excluded

Pitfall 15: Project and/or crediting start date unclear.

Experience shows that many projects:

- lack proof of actual starting date of the project activity, if the project claims a crediting period starting prior to the registration date,
- have several parts of the project being commissioned at different dates, or
- have selected an earlier crediting start date than the CDM project registration date.

Good practice: In general, the starting date of a CDM project activity is the date at which the implementation or construction, or real action, of a project activity begins. Whether start of construction, start of implementation or start of real action is selected, is a matter of choice.

If different parts of the project become operational at different times, this should be clearly stated. This is relevant, for example, for a PDD that contains four wind power plants with different commissioning dates. In this case, all commissioning dates should be clearly defined. As for the crediting period, it can start at any time from the commissioning of the first plant until the commissioning of the last one. It is up to the project developer to evaluate the impact this has on CER generation.

Good practice: As a general rule, the crediting period should not start before the date of registration of a project. At the same time, the CDM project registration date is not known at the time of writing the PDD or at the start of the validation process. As a general rule of thumb[13], the crediting date should be a minimum of four months after the start of validation, or three months for small-scale projects.

An exception to this is for project activities starting between 1 January 2000 and the date of the registration of a first CDM project (i.e. 18 November 2004) and submitted for registration before 31 December 2005, which can have a crediting period starting date prior to registration date. In this case, the project participants have to provide documentation showing that the project starting date fell within this period. Examples of proof could be invoices proving the start of construction activities or invoices for sale of electricity to the grid.

Pitfall 16: Deviations from monitoring methodology not justified sufficiently.

All deviations from monitoring methodology must be justified fully.

An example of deviation from the monitoring methodology is for ACM0002 projects, where the electricity generation and fuel consumption must be monitored for each plant in the grid. However, these data are often not publicly available. Some projects therefore, calculate the grid emission coefficient by dividing electricity generation data by the average plant efficiency of the grid, in order to arrive at a fuel consumption figure.

Good practice: This deviation to the monitoring methodology needs to be justified in the PDD.

A common deviation is to omit one of the project/baseline emissions or leakage indicators. Examples can be the indicators 9, 10 and 11 in ACM001 (*9: "Total amount of electricity and/or other energy carriers used in the project for gas pumping and heat transport (not derived from the gas)", 10. "CO2 emission intensity of the electricity and/or other energy carriers in ID 9.", 11. "Regulatory requirements relating to landfill gas projects"*).

13 *This rule of thumb is the view of DNV.*

All indicators required in the methodology should be included or omissions justified explicitly.

Sometimes the frequency and proportion of data that will be monitored is not established or not in line with the approved methodology. For example AM0003 requires that the flare efficiency should be measured monthly for the first 6 months to check on the stability of the flare, and then quarterly from that time onwards. This is important and the frequency for the first six months therefore needs to be stated explicitly.

Pitfall 17: Monitoring and project management procedures not defined.

Detailed monitoring and project management procedures need to be in place and followed, at the latest, prior to the commencement of the crediting period. The reason for this is to ensure subsequent verifiability of generated emission reductions. If these procedures are not adequate for the project or not fully operational, the verifying DOE may not be able to track evidence of the emission reductions that actually have occurred. The consequences will be a reduced amount of CERs.

Good practice: Give detailed accounts for all of the following:

- The authority and responsibility of project management
- The authority and responsibility for registration, monitoring, measurement and reporting
- Procedures for training of monitoring personnel
- Procedures for emergency preparedness for cases where emergencies can cause unintended emissions
- Procedures for calibration of monitoring equipment
- Procedures for maintenance of monitoring equipment and installations
- Procedures for monitoring, measurements and reporting
- Procedures for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)
- Procedures for internal review of reported results/data, including a system for corrective actions as needed, in order to provide for more accurate future monitoring and reporting.

The level of detail needed for monitoring and project management is project-specific and depends on the project technology. For example, a wind farm does not need emergency preparedness procedures because there are no factors that could create unintended GHG emissions. For a bi-

ogasifier, however, this is a crucial issue. Procedures should, as far as possible, be based on existing procedures for project management and operation.

For many projects that are in the design stage at the time of validation, it is difficult to give a detailed account of the above procedures. In such cases, a plan and outline of monitoring and project management procedures may be sufficient.

This pitfall can be resolved after project registration, but must be resolved before the project starts operation. It is important that monitoring with defined procedures is carried out from the outset.

Pitfall 18: Deviations from selected calculation methodology not justified sufficiently or incorrect formulas applied.

Often the PDD contains incorrect formulas, values or units compared to the approved methodology, or deviations from the methodology are not fully justified or referenced.

Examples from PDDs:

- Renewable electricity projects for grid dispatch:
  - fuel data for the baseline power plants are not available in order to calculate the operating margin as required in ACM0002, and these are, therefore, estimated based on installed capacity and technology type.
  - the installed capacity in MW rather than the generation of electricity in terms of GWh is taken as the basis to calculate the build margin.
  - IPCC values have been applied for the coal emission factor to calculate grid carbon emission factor, while it is not clear why local values for coal have not been used.
- Animal manure projects: If projects involve animal manure, sometimes deviation from recommended default emissions factors are not justified nor assessed for conservativeness.
- Default values in general: It is not clear whether default or bespoke factors will be used. For example, a value for methane content of biogas is referenced as being derived from measurements (i.e. bespoke value) while it is actually a default value from a reference source that is not given in the PDD. In cases where country-specific values are available, the justification for use of default IPCC values is sometimes not presented adequately.
- Efficiency factors: Efficiency factors used are not conservative, or not backed up by sufficient evidence such as:
  - flare efficiency in methane avoidance and landfill projects
  - thermal efficiency of boilers in energy efficiency projects

- load factors for hydro power plants
- methane capture efficiency for landfills.

Good practice:

- Follow the methodology as closely as possible.
- Make sure you state the correct equation from the methodology and how this is intended to be applied to this specific project.
- Provide detailed applications of equations in an Excel sheet. This can be provided to the DOE only, and may not have to be publicised.
- A thorough justification of any deviations from the requirements in the methodology should be based on:
  - conservativeness
  - availability of data/information
  - completeness of information
  - applicability in the calculations.

Good Practice for Small-scale Projects: For small-scale projects, the calculation methodology is often not so prescriptive and different interpretations can be possible. Misinterpretation of calculation methods is therefore common. A good practice is, in this case, to discuss any ambiguous issues with the DOE beforehand.

Box 3: How much monitoring is enough?

With regard to emissions calculations, these can broadly be divided into two categories:

Type 1: Emission calculations that will be monitored and recalculated ex-post, i.e. after the actual emission reductions have taken place and therefore will be verified during periodic verification

Type 2: Emission calculations that are determined ex-ante (i.e. before the emission reductions take place), and remain fixed during the crediting period of the project. These are therefore verified during validation.

For type 1), the PDD only contains an estimate that will not be the basis for the final CERs (as these will be recalculated ex-post). The data and assumptions used should be reasonable, conservative and realistic. A key concern here is whether relevant data is available and can be monitored ex-post (for example, is generation data for a grid available on an annual basis?).

Example: Baseline emissions are forecasted ex-ante in Landfill gas capture projects, e.g. through use of the IPCC or EPA First Order Decay model. It is important here to provide enough data (for example, regional climatic conditions, methane content of waste and methane generation potential, & waste composition) to allow a judgment to be made on whether the forecasted emissions are realistic and conservative. The actual methane captured and emission reductions will be monitored ex-post.

With regard to data which is determined ex-ante and which will be fixed during the crediting period (type 2), the correctness of the data sources and calculations applied is more critical as these will be the basis for final CERs and will not be updated ex-post.

For example, for the determination of grid emission factor (which is determined based on historic data and fixed for the crediting period), the source of the data on electricity generation per power plant, fuel consumption, carbon content of fuel, etc needs to be correct. Moreover, all data has to be obtained from a recognised source (e.g. grid operator, Ministry of Energy, etc.). It is also critical to use the most recent data available (i.e. the data that was available at the time the PDD was submitted for validation). Moreover, it is critical that the grid emission factor is calculated according to the relevant baseline methodology (e.g. that the build margin reflects the greater in MWh of the most recent 20% of generation added to a grid or five most recent plants for type I.D, paragraph 7a.).

Pitfall 19: Compliance with local legal requirements not covered sufficiently.

It is sometimes not made clear whether environmental impacts of the project have been assessed formally and managed as required by host country law. Normally, environmental impacts are not very severe for CDM project technologies. As an example, an EIA is required by law for landfill operations in most countries, but the construction and operation of the landfill gas capture and flaring equipment does not normally require an EIA.

Good practice:

- State the relevant legal requirements in the host country
- State the project's compliance with these
- State the environmental impacts of the project
- State the mitigation measures to be taken for the project. The project's compliance with legal requirements needs be evidenced to the DOE through documents such as the construction and operating license, environmental license and in some cases the environmental impact assessment.

Pitfall 20: Insufficient information on the stakeholder consultation process.

It is sometimes not made clear whether the local stakeholder involvement process is in line with host country requirements and whether all relevant stakeholders have been contacted.

Good practice:

- State the relevant legal requirements, if any, in the host country with regard to which stakeholders to contact and by what means (e.g. through letters, newspapers, meetings)
- State how the project complies with these requirements
- Provide a list of all stakeholders contacted
- Include a summary of the stakeholder comments and a summary of how these comments have been taken into account. The contact details of the stakeholders should be provided to the DOE so that a sample number can be contacted by the DOE for verification
- Have at least one or several meetings with a broad range of stakeholders and invite a DNA representative to these meetings.

5 Guide to Completing the PDD

In this section, the emphasis is on helping to streamline the writing of the PDD by focusing on what project participants have a tendency to forget. The approach is therefore to list "WHAT TO DO" instead of "WHAT NOT TO DO", following the PDD template. The text from the UNFCCC CDM Guidelines is printed in grey text boxes for each section, and DNV comments are added in white text boxes with a "!" in the corner.

Text from UNFCCC CDM Guidelines are included in grey textboxes like this.

!

DNV comments and examples related to "What to do" are included in white text boxes like this.

Clean Development Mechanism

PROJECT DESIGN DOCUMENT FORM (PDD)
Version 02 - in effect as of: 1 July 2004

- Make sure you use the correct template for either full scale (as referred to here) or small-scale projects.
- Always download the latest template of the PDD on the UNFCCC website (http://cdm.unfccc.int/Reference/Documents).
- Make sure not to alter the template.
- Format, font, headers and logos must not be added or deleted or altered in any way.
- Make sure to answer under all headings and give only what the heading asks for in as concise a manner as possible. This also includes Annex I-4. If you believe a heading is not relevant for this project, just state this in a sentence, e.g. "not applicable".
- Where you do not use the table, as for example in part D, just leave the spaces blank.
- Additional appendices, such as copies of permits or environmental impact assessments, can be included if needed. It is important that all information provided in the PDD, including any appendices, are in the English language.
- PDDs are designed to be accessible through the internet, and it is therefore good practice to keep the size below 1 MB. Avoid unnecessary graphs and pictures, and downsize pictures where necessary.
- Avoid calculation errors, unintended omissions, language errors and typos through appropriate quality assurance before submission to the DOE.

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B. Application of a baseline methodology
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Annexes

Annex 1: Contact information on participants in the project activity
Annex 2: Information regarding public funding
Annex 3: Baseline information
Annex 4: Monitoring plan

SECTION A. General description of project activity

A.1 Title of the project activity:

Please indicate:

- The title of the project activity
- The version number of the document
- The date of the document.

See Pitfall 1: Small scale selected for large scale project.

!

Version number and date should be included in section A.1 after the title of the project

and should be updated for each new revision of the PDD.

Most projects submit several revisions of the PDD to the DOE during validation and adequate document control is needed.

A.2. Description of the project activity:

Please include in the description:

- The purpose of the project activity
- The view of the project participants of the contribution of the project activity to sustainable development
- max. one page).

See pitfall 3: Evidence of EIA and/or required construction/operating permits/ approvals not provided.

!

This section should not exceed one page. The purpose of the project activity with regard to emission reductions and the project's contribution to sustainable development should be described.

Do not give excessive information not related to the project, such as marketing profile and figures of the company, description of country economic profiles, or generic details of how the company contributes to sustainable development that are not related to this specific project.

Relevant operating permits and approvals should be referred to and made available on request for the DOE. Possibly, copies can be included in an appendix to the PDD.

A.3. Project participants:

Pleases list all project participants and provide contact details in Annex 1

!

The table in section A.3 should be completed as follows (ref. example in the box below):

Name of Party involved: Here the Parties (i.e. countries) involved must be listed. This is either the countries that participate directly in a project or that participate indirectly through private/public entities from these countries.

Private and/or public entities project participants: Here the private and/or public entities (e.g. companies) that participate in the project (i.e. project participants) need to be listed for each country. Only entities that take decisions on the allocation of CERs shall be listed here. Consultants who only assisted in the development of the PDD and/or the baseline and monitoring plan should not be listed as project participants.

Indicate if the Party involved wishes to be considered as project participant: Here, it shall be indicated with 'Yes' or 'No' whether the Parties (i.e. countries) want to be considered as DIRECT project participants (i.e. not only indirectly participating through the private and/or public entity that the country authorises to participate in the project). For most projects, the answer here will be 'No' as the countries usually do not want to be considered a project participant.

Annex 1 should be filled in after completion of the table in A.3 and the description of the project participants should be consistent (i.e. same name etc).

The DNA approval process should start early as this can be time-consuming. Written approval is needed from *all* relevant Parties prior to submission for registration.

See Pitfall 2: Project participants are not identified clearly

See Pitfall 4: Letter of approval insufficient or delayed

Example of table A.3 filled in.

Please list project participants and Party(ies) involved and provide contact information in Annex 1. Information shall be in indicated using the following tabular format.

Name of Party involved (*) ((host) indicates a host Party)	**Private and/or public entity(ies) project participants (*) (as applicable)**	
Chile (host)	• Company ABC.ltd	No
Japan	• Company XYZ.Ltd	No

(*) In accordance with the CDM modalities and procedures, at the time of making the PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party(ies) involved is required.

Note: *When the PDD is filled in support of a proposed new methodology (forms CDM-NBM and CDM-NMM),* at least the host Party(ies) and any known project participant (e.g. those proposing a new methodology) shall be identified.

See Pitfall 6: The modalities of communication with the Executive Board in terms of CERs issuance and allocation instructions are not stated clearly, or signed by all project participants

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

!

- It is important that project locations should be given so that no submitted project could potentially be confused with another.
- The level of detail required depends on whether there are existing or potential projects in the same area.
- When there is potential for confusion, it is important that the precise location of the project be clearly identified in the PDD, for example by using map co-ordinates. For example, when landfill gas projects are submitted, the exact coordinates of the landfill may be required.
- If a project is developed in an urban/semi-urban region, stating the municipality is rarely adequate.
- All the plants/major equipments to be used must be listed and locations made clear.

A.4.1.4. Detail of physical location, including information allowing the unique identification of this project activity (maximum one page):

Please fill in the field and do not exceed one page.

A.4.2. Category(ies) of project activity:

See Pitfall 7: The description of the technology is not sufficient

Please use the list of categories of project activities and of registered CDM project activities by category available on the UNFCCC CDM website, please specify the category(ies) of project activities into which this project activity falls. If no suitable category(ies) of project activities can be identified, please suggest a new category(ies) descriptor and its definition, being guided by relevant information on the UNFCCC CDM website.

!

Make sure the "category of project activity" is not mistakenly read as "title of the approved methodology". The "category of project activity" must be linked to the scope & project categories defined by UNFCCC and should be as defined for the respective methodology as in: http://cdm.unfccc.int/DOE/scopes.html#11.

Categories are:

1- Energy industries (renewable-/non-renewable sources)
2- Energy distribution
3- Energy demand
4- Manufacturing industries
5- Chemical industries
6- Construction
7- Transport
8- Mining/mineral production
9- Metal production
10- Fugitive emissions from fuels (solid oil and gas)
11- Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride
12- Solvent use
13- Waste handling and disposal
14 - Afforestation and reforestation
15- Agriculture.

A.4.3. Technology to be employed by the project activity:

This section should include a description of how environmentally safe and sound technology and know-how to be used is transferred to the host Party(ies).

!

Information under technical description should neither be too scant nor too excessive.

Proper sequencing and appropriate use of clear process flow sheets will bring more clarity especially in industry -specific projects.

The description should be adapted to sector specifics.

Systems plans and responsibilities with regard to initial training (capacity building) and maintenance efforts during the project period should be outlined in this section. This is relevant when new technology is implemented such as a new boiler type a new wastewater treatment system etc.

The actual capacity building activities should be carried out as soon as possible and at all events prior to start of the crediting period to ensure effective operation of the project.

A.4.4. Brief explanation of how the anthropogenic emissions of anthropogenic greenhouse gas (GHGs) by sources are to be reduced by the proposed CDM project activity including why the emission reductions would not occur in the absence of the proposed project activity taking into account national and/or sectoral policies and circumstances:

Please explain briefly how anthropogenic greenhouse gas (GHG) emission reductions are to be achieved (detail to be provided in section B) and provide the estimate of anticipated total reductions in tonnes of CO2 equivalent as determined in section E. Max. length one page.

!

The description should not exceed one page. Provide a short account of the additionality in this section without going into details.

Details on additionality are to be provided in section B.3

and can be referred to in this section for example by stating that "… the investment and technology barriers are discussed in greater detail in Section B.3").

A.4.4.1. Estimated amount of emission reductions over the chosen crediting period:

Please indicate the chosen crediting period and provide the total estimation of emission reductions as well as annual estimates for the chosen crediting period.

!

State the estimated total reductions in tonnes of CO_2e as determined in section E over the project's crediting period.

Make sure the table in A.4.4.1 is correctly filled in and that the estimated emission reductions in A.4.4.1 are identical with those given in section E.

The table should be filled in as follows (ref. example in Box 4 below):

Number of years from the start of the crediting period to the end of the crediting period should be included in the first column (years) with the corresponding annual estimation of emission reductions in the next column.

When this is filled in total estimated emission reductions should be added up.

The last row "Annual average over the crediting period of estimated reductions (tonnes of CO_2e)" is then the "Total estimated reductions" divided by the "Total number of crediting years".

Box 4: Example of table A.4.4.1 filled in (modified from a LFG project):

Please indicate the chosen crediting period and provide the total estimation of emission reductions as well as annual estimates for the chosen crediting period. Information on the Emission reductions shall be in indicated using the following tabular format.	
Years	**Annual estimation of emission reductions in tonnes of CO2e**
2006	53121
2007	67571
2008	80646
2009	92475
2010	103183
2011	112864
2012	121630
Total estimated reductions (tonnes of CO2e)	631490
Total number of crediting years	7
Annual average over the crediting period of estimated reductions(tonnes of CO2e)	90212

A.4.5. Public funding of the project activity:

Public funding from Parties included in Annex I is involved please provide in Annex 2 information on sources of public funding for the project activity from Parties included in Annex provide affirmation that such funding does not result in a diversion of official development assistance and is separate from and not counted towards the financial obligations of those Parties.

See Pitfall 5: No written confirmation that funding will not result in a diversion of official development assistance.

!

This is important only if public money is used for the project.

Ideally the relevant Ministry of the Annex I country dealing with ODA needs to confirm that this is not a diversion of any official development assistance. Make sure to allocate enough time to get this confirmation.

If there is no diversion of ODA funding this should be explicitly stated in the approval letter and clearly stated in this section (for example "this project does not include a diversion of ODA funding".)

If public funding is included details of why this is not a diversion should be included in Annex 2 of the PDD.

SECTION B. Application of a baseline methodology

Where project participants wish to propose a new baseline methodology please complete the form for "Proposed New Methodology: Baseline" (CDM-NMB) in accordance with procedures for submission and consideration of proposed new methodologies (see Part III of these Guidelines).

B.1. Title and reference of the approved baseline methodology applied to the project activity:

Please refer to the UNFCCC CDM website for the title and reference list as well as the details of approved baseline methodologies. If a new baseline methodology is proposed please complete the form for "Proposed New Methodology: Baseline" (CDM-NMB). Please note that the table "Baseline Information" contained in Annex 3 is to be prepared in parallel to completing the remainder of this section.

!

If you are not certain about which methodology to apply for your specific project, contact the DOE to discuss whether an approved methodology (or a proposed methodology that is expected to be approved in the near future) can be applied or whether a new methodology needs to be submitted.

Reference to the latest version of the approved baseline methodology should be included. Sometimes the project participants just mention the number e.g. "Approved Baseline methodology AM00013" without any title or details of the latest revision (In the case of AM00013 Version 1 was in Sep 2004 and Version 2 in May 2005 and the title of the latter is "Forced methane extraction from organic waste-water treatment plants for grid-connected electricity supply --- Version 2").

B.1.1. Justification of the choice of the methodology and why it is applicable to the project activity:

Please justify the choice of methodology by showing that the proposed project activity meets the applicability conditions of the methodology.

!

Make sure to discuss all applicability conditions required by the methodology and how these are fulfilled for this specific project.

Especially for small scale projects there may be some misunderstanding of how to apply methodologies of different categories for different projects.

If in doubt contact the DOE to discuss the applicability of the methodology to the specific project.

B.2. Description of how the methodology is applied in the context of the project activity:

Please explain the basic assumptions of the baseline methodology in the context of the project activity and show that the key methodological steps are followed in determining the baseline scenario. Provide the key information and data used to determine the baseline scenario (variables parameters data sources etc.) in table form.

!

Excess information such as i) all arguments for additionality (which should be discussed in the next section B3) and ii) all the detailed calculations (which are generally required under Section E) should not be included here.

As per the EB guidelines for completing the PDD the key information and data used to determine the baseline scenario (variables parameters data sources etc) should be presented in the form of a table. This is generally not practised by project developers. Please see an example of such a table in Box 5 below.

It is important that all variables, parameters, data sources, etc, are consistent with those applied in section E and that these are fully justified. Assumptions made should be stated e.g.

- with grid connected electricity projects it should be clearly stated whether national regional or the local/state grid data are used to determine the baseline emissions.
- for fuel switch or energy efficiency projects the remaining lifetime of existing equipment must be discussed to demonstrate that new and more efficient equipment is unlikely to be implemented in the absence of the CDM project activity.

See Pitfall 9: Insufficient explanation of baseline scenarios

See Pitfall 10: Insufficient explanation of project additionality

See Pitfall 11: Baseline information not sufficiently supported by evidence and/or referenced sufficiently

See Pitfall 13: Lack of logic and consistency in the PDD

Box 5: Example of table showing variables, parameters and data sources.

Description	Value	Unit	Source
Annual diesel fuel oil used in baseline scenario	xxx	litre	measured
Kg/litre of diesel fuel oil	xxx	kg/litre	conversion
Annual diesel fuel oil used in baseline scenario	xxx	kg	conversion
Annual diesel fuel oil used in baseline scenario	xxx	kilotonne	conversion
Net calorific value of diesel fuel oil (NCV_{diesel})	xxx	TJ/kilo-tonne	IPCC
Energy content of diesel fuel oil in baseline scenario (EC_{diesel})	xxx	TJ	NCV_{diesel} * kilotonne
CEF for diesel	xxx	tonne CO_2e /TJ	IPCC

B.3. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity:

Explanation of how and why this project activity is additional and therefore not the baseline scenario in accordance with the selected baseline methodology. Include (a) a description of the baseline scenario determined by applying the methodology (b) a description of the project activity scenario and (c) an analysis showing why the emissions in the baseline scenario would likely exceed emissions in the project activity scenario.

!

Arguments to justify the additionality of the project need to be supported by evidence and/or referenced sufficiently.

Many approved baseline methodologies advocate financial analysis such as a Net Present Value (NPV) or Internal Rate of Return (IRR) analysis to demonstrate project additionality. If NPV/IRR calculations are used these should be made available to the DOE including the assumptions made (such as discount rate, expected revenue, maintenance costs, etc). Key assumptions of the NPV and IRR analysis must be included in the PDD such as all relevant costs (including, for example, the investment cost and the operations and maintenance costs) and revenues (excluding CER revenues but including subsidies/fiscal incentives where applicable).

Please also refer to the "Tool for the demonstration and assessment of additionality" for further guidance on this section.

B.4. Description of how the definition of the project boundary related to the baseline methodology selected is applied to the project activity:

!

The project boundary should be clearly defined and be consistent with the requirements of the applicable methodology. A schematic image/figure which depicts the actual project boundary and a table defining all direct and indirect sources should be provided. Please refer to Box 2 for an example.

B.5. Details of baseline information including the date of completion of the baseline study and the name of person (s)/entity (ies) determining the baseline:

Please attach detailed baseline information in Annex 3.

Please provide date of completion in *DD/MM/YYYY*.

Please provide contact information and indicate if the person/entity is also a project participant listed in Annex 1.

SECTION C. Duration of the project activity /Crediting period

C.1 Duration of the project activity:

See Pitfall 15: Project start date and/or crediting starting date is unclear

C.1.1. Starting date of the project activity:

The starting date of a CDM project activity is the date on which the implementation or construction or real action of a project activity begins.

Project activities starting between 1 January 2000 and the date of the registration of a first CDM project if the project activity is submitted for registration before 31 December 2005; have to provide documentation at the time of registration showing that the starting date fell within this period.

!

The date should be as specific as possible e.g. of *DD/MM/YYYY*. Proof of the actual starting date should be available to the DOE upon request. Whether start of construction start of implementation or start of real action is selected is a matter of choice.

C.1.2. Expected operational lifetime of the project activity:

Please state the expected operational lifetime of the project activity in years and month.

!

The operational life time of the project activity should always be identical or exceed the crediting period. Justification or evidence of the operational lifetime of the project activity should be available to the DOE upon request.

C.2 Choice of the crediting period and related information:

Please state whether the project activity will use a renewable or a fixed crediting period and complete C.2.1 or C.2.2 accordingly.

Note that the crediting period may only start after the date of registration of the proposed activity as a CDM project activity. In exceptional cases (see instructions for section C.1.1. above) the starting date of the crediting period may be prior to the date of registration of the project activity as provided for paragraphs 12 and 13 of decision 17/CP.7 paragraph 1 (c) of decision 18/CP.9 and through any guidance by the Executive Board available on the UNFCCC CDM website.

!

- For projects starting after the date of the registration of a first CDM project (i.e. 18 November 2004) the starting date of the crediting period shall be after the registration date.
- Make sure that the start of the crediting period is set after the stated starting date of the project.
- One of the two credit-period options must be selected: i.e. fixed or renewable.
- The total anticipated crediting period (e.g. 3 x 7 years or 10 years) must not be longer than the expected lifetime of the project activity.

C.2.1. Renewable crediting period

Each crediting period shall be at most 7 years and may be renewed at most two times provided that for each renewal a designated operational entity determines and informs the Executive Board that the original project baseline is still valid or has been updated taking account of new data where applicable.

!

Only one of either section C2.1 or C2.2 should be filled while leaving the other blank.

C.2.1.1. Starting date of the first crediting period:

Please state the dates in the following format: (DD/MM/YYY).

C.2.1.2. Length of the first crediting period:

Please state the length of the first crediting period in years and months.

C.2.2. Fixed crediting period:

Fixed crediting period shall be at most ten (10) years.

C.2.2.1. Starting date:

Please state the dates in the following format: (DD/MM/YYY)

C.2.2.2. Length:

Please state the length of the crediting period in years and months

SECTION D. Application of a monitoring methodology and plan

Where project participants wish to propose a new monitoring methodology please complete form "Proposed New Methodology" (CDM-NMM) in accordance with procedures for submission and consideration of proposed new methodologies (see Part III of these Guidelines).

This section shall provide a detailed description of the monitoring plan including an identification of the data and its quality with regard to accuracy comparability completeness and validity taking into consideration any guidance contained in the methodology. The monitoring plan is to be attached in Annex 4.

The monitoring plan needs to provide detailed information related to the collection and archiving of all relevant data needed to:

- estimate or measure emissions occurring within the project boundary
- determine the Baseline

and

- identify increased emissions outside the project boundary.

The monitoring plan should reflect good monitoring practice appropriate to the type of project activity. The plan should follow the instructions and steps defined in the approved monitoring methodology. Project participants shall implement the registered monitoring plan a d provide data in accordance with the plan through their monitoring report.

Please note that data monitored and required for verification and issuance are to be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity whatever occurs later.

D.1. Name and reference of approved monitoring methodology applied to the project activity:

Please refer to the UNFCCC CDM website for the name and reference as well as details of approved methodologies. Where project participants wish to propose a new monitoring methodology please complete the form for "Proposed New Methodology: Monitoring" (CDM-NMM) and subsequently complete sections A-E of the PDD to demonstrate the application of the proposed new methodology to the project activity.

If a national or international monitoring standard has to be applied to monitor certain aspects of the project activity please identify this standard and provide a reference to the source where a detailed description of the standard can be found.

Please fill in sections D.2.2 or D.2.3 below in accordance with the approved monitoring methodology selected.

!

Reference to the latest version of the approved monitoring methodology should be included. Sometimes the project participants just mention the number e.g. ACM0002 instead of referring to the complete title ACM0002 "Consolidated monitoring methodology for zero-emissions grid-connected electricity generation from renewable sources". Version 2.

D.2. Justification of the choice of the methodology and why it is applicable to the project activity:

See Pitfall 16: Deviations from monitoring methodology not justified sufficiently

Please justify the choice of methodology by showing that the proposed project activity and the context of the project activity meet the conditions under which the methodology is applicable.

!

Make sure that all applicability conditions are discussed as required by the methodology and address how these are fulfilled for the specific project. Also refer to guidance for section B.1.1. The applicability requirements are the same for the baseline and monitoring methodologies.

If in doubt contact the DOE to discuss the applicability of the monitoring methodology to the specific project.

D.2.1. Option 1: Monitoring of the emissions in the project scenario and the baseline scenario

Please state if this section is left blank on purpose.

!

Please follow the approved monitoring methodology thoroughly and include a justification of any deviations from the methodology. Clearly explain if and why option 1 (D.2.1) or option 2 (D.2.2) is not applicable. Include, and if necessary explain, all formulas used to estimate and/or calculate baseline emissions project emissions and/or leakage.

D.2.1.1. Data to be collected in order to monitor emissions from the project activity, and how this data will be archived:								
ID number *(Please use numbers to ease cross-referencing to D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

Description of data to be collected and how data will be archived. Data shall be archived for 2 years following the end of the crediting period. Please add rows to the table as needed.

!

Make sure to follow *all* requirements of the approved methodology including:

- all applicable data variables that are listed. In some cases other data variables may be added or some data variables may be deleted because they are not applicable for this specific project. These choices should be made transparent.
- the units must be the same as those required by the methodology
- indicators that are required to be measured ex-post should not be calculated or estimated
- recording frequency should be identical with or higher frequency than the methodology requires

Any deviations from the methodology (e.g. lower recording frequency another unit calculated instead of measured) need to be thoroughly justified and should be seen as a contribution to conservativeness.

Whether the DNA of the respective host country requires monitoring of Sustainable Development Indicators must be clarified. If this is the case these Sustainable Development indicators must be listed in the monitoring plan.

D.2.1.2. Description of formulae used to estimate project emissions (for each gas source formulae/algorithm emissions units of CO_2 equ.)

Formulae should be consistent with the formulae outlined in the description of the baseline methodology.

D.2.1.3. Relevant data necessary for determining the baseline of anthropogenic emissions by sources of GHGs within the project boundary and how such data will be collected and archived :

ID number *(Please use numbers to ease cross-referencing to table D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

Description of data to be collected and how data will be archived. Data shall be archived for 2 years following the end of the crediting period. Please add rows to the table below as needed.

D.2.1.4. Description of formulae used to estimate baseline emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.)

Formulae should be consistent with the formulae outlined in the description of the baseline methodology.

D. 2.2. Option 2: Direct monitoring of emission reductions from the project activity (values should be consistent with those in section E

Please state if this section is left blank on purpose.

D.2.2.1. Data to be collected in order to monitor emissions from the project activity, and how this data will be archived:

ID number *(Please use numbers to ease cross-referencing to table D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

Description of data to be collected and how data will be archived. Data shall be archived for 2 years following the end of the crediting period. Please add rows to the table below as needed.

D.2.2.2. Description of formulae used to calculate project emissions (for each gas source formulae/algorithm emissions units of CO_2 equ.):

Formulae should be consistent with the formulae outlined in the description of the baseline methodology.

D.2.3. Treatment of leakage in the monitoring plan

D.2.3.1. If applicable, please describe the data and information that will be collected in order to monitor leakage effects of the project activity

ID number *(Please use numbers to ease cross-referencing to table D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

Monitored data shall be archived for two (2) years following the end of the crediting period. Please add rows to the table below as needed. Please state if not applicable.

!

Sometimes leakage is described as not applicable even though it is applicable. For example for activities using biomass, leakage shall be considered including potential effects on biomass availability for other users. For the amount of biomass collected from sources outside the project boundary the transportation emissions from trucks, their trucks' capacity and the number of trips all need to be monitored.

D.2.3.2. Description of formulae used to estimate leakage (for each gas source formulae/algorithm emissions units of CO_2 equ.)

Formulae should be consistent with the formulae outlined in the description of the baseline methodology. Please state if not applicable.

D.2.4. Description of formulae used to estimate emission reductions for the project activity (for each gas, source, formulae/algorithm, emissions units of CO2 equ.)

Formulae should be consistent with the formulae outlined in the description of the baseline methodology.

D.3. Quality control (QC) and quality assurance (QA) procedures are being undertaken for data monitored

Data *(Indicate table and ID number e.g. 3.-1.; 3.2.)*	Uncertainty level of data (High/Medium/Low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary.

See Pitfall 17: Monitoring and project management procedures are not defined.

Data items in tables contained in sections D.2.1 or D.2.2, as applicable.

!

The uncertainty level of data is normally defined in the approved methodology. An outline of QA/QC procedures should be described in table D.3. Ref. also the example in Box 6.

Box 6: Example of an outline of QA/QC procedures from a landfill gas project

A (Indicate table and ID number e.g. D.4-1; D.4-2.)	Uncertainty level of data (High/ Medium/ Low)	Are QA/QC procedures planned for these data?	Outline explanation why QA/QC procedures are or are not being planned.
1. LFG For MD project$_y$	Low	Yes	Flow meters will be subject to a regular maintenance and testing regime to ensure accuracy
2. LFG for MD flared$_y$	Low	Yes	Flow meters will be subject to a regular maintenance and testing regime to ensure accuracy
3 FE	Medium	Yes	Regular maintenance will ensure optimal operation of flares. Flare efficiency should be checked quarterly, with monthly checks if the efficiency shows significant deviations from previous values.
4 $F_{CH4,y}$	Low	Yes	The gas analyser should be subject to a regular maintenance and testing regime to ensure accuracy.

D.4 Please describe the operational and management structure that the project operator will implement in order to monitor emission reductions and any leakage effects generated by the project activity

!

The following should be outlined as applicable for the specific project:

- The authority and responsibility for project management
- The authority and responsibility for registration, monitoring, measurement and reporting
- Procedures for training of monitoring personnel
- Procedures for emergency preparedness in cases where emergencies can cause unintended emissions
- Procedures for calibration of monitoring equipment
- Procedures for maintenance of monitoring equipment and installations
- Procedures for monitoring, taking measurements and reporting
- Procedures for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)
- Procedures for internal review of reported results/data, including a system for corrective actions as needed, in order to provide for more accurate future monitoring and reporting

The level of detail needed for monitoring and project management is project-specific and depends on the project technology. Please refer to Pitfall 16 for further details.

D.5 Name of person/entity determining the monitoring methodology:

Please provide contact information and indicate if the person/entity is also a project participant listed in Annex 1 of this document.

See Pitfall 13: Lack of logic and consistency in the PDD

SECTION E. Estimation of GHG emissions by sources

Please fill section E following the selected baseline and monitoring methodologies.

See Pitfall 18: Deviations from selected calculation methodology not justified sufficiently or incorrect formula applied

!

Make sure there are no discrepancies between data used for calculations in any enclosed Excel sheet and those indicated in the PDD.

Never include a data value without referencing to the data source which should be an official and recognised source, and/or to the formula and assumptions used to come up with the specific data value.

Always justify assumptions by providing details with regard to project specifics.

All details of the calculations and assumptions made should be available and as a minimum be provided to the DOE upon request.

Examples of common mistakes are:

- indirect or direct, on-site or off-site emission sources are omitted, (e.g. leakage is not calculated)
- calculation errors such as wrong unit or wrong conversion factor used
- deviations from calculation methodology without justifications with regards to accuracy and conservativeness
- references are missing and there is lack of transparency in calculations
- calculation assumptions are not justified
- the categories of greenhouse gases covered in the project emissions calculations differ from those included in the baseline emissions calculations
- lack of evidence that methodology has been applied conservatively
- bespoke conversion factors are applied in calculations without showing how they were produced and without referencing
- a default conversion factor has been applied without sufficient justification and referencing

E.1. Estimate of GHG emissions by sources:

Please provide estimated anthropogenic emissions by sources of greenhouse gases of the project activity within the project boundary (for each gas, source, formulae/algorithm, emissions in units of CO_2 equivalent). Alternatively, provide directly estimated emission reductions due to the project activity.

E.2. Estimated leakage:

Please provide estimate of any leakage, defined as: the net change of anthropogenic emissions by sources of greenhouse gases which occurs outside the project boundary, and that is measurable and attributable to the project activity. Estimates should be given for each gas, source, formulae/algorithm, emissions in units of CO_2 equivalent. Please state, if not applicable.

E.3. The sum of E.1 and E.2 representing the project activity emissions:

E.4. Estimated anthropogenic emissions by sources of greenhouse gases of the baseline:

Estimates should be given for each gas, source, formulae/algorithm, emissions in units of CO_2 equivalent.

!

- Make sure you use the most recent official source – for example to calculate grid emission factors

E.5. Difference between E.4 and E.3 representing the emission reductions of the project activity:

E.6. Table providing values obtained when applying formulae above:

The *ex post* calculation of baseline emission rates may only be used if proper justification is provided. Notwithstanding, the baseline emission rates shall also be calculated *ex ante* and reported in the PDD.

SECTION F. Environmental impacts

F.1. Documentation on the analysis of the environmental impacts, including transboundary impacts:

Please attach the documentation to the PDD.

See Pitfalls 19: Compliance with legal requirements not covered sufficiently

!

If an Environmental Impact Assessment (EIA) is required by law and/or if an EIA has been carried out, details of the EIA should either be provided in a separate document as an attachment to the PDD if the language is English, or be available for the DOE to validate upon request if the documents are in the local language.

See Pitfall 20: Insufficient information on the stakeholder consultation process

F.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

Pitfall 3: Evidence of EIA and/or required construction/operating permits/ approvals not provided.

SECTION G. Stakeholders' comments

!

In this section, legal requirements for stakeholder involvement (if exists) should be described, including how the project is in compliance with these requirements. Key stakeholders should be listed, including contact information. Stakeholder contact information can be included as an appendix to the PDD or be provided to the DOE when requested. A summary of all comments received should be included in this section, together with an elaboration on how these comments have been, or will be, taken into account.

It is important to always keep detailed minutes of meeting and records of any local stakeholder processes to be able to justify the process at a later stage.

See Pitfalls 20: Insufficient information on the stakeholder consultation process

G.1. Brief description how comments by local stakeholders have been invited and compiled:

Please describe the process by which comments by local stakeholders have been invited and compiled. An invitation for comments by local stakeholders shall be made in an open and transparent manner, in a way that facilitates comments to be received from local stakeholders and allows a reasonable time for comments to be submitted. In this regard, project participants shall describe a project activity in a manner which allows the local stakeholders to understand the project activity, taking into account confidentiality provisions of the CDM modalities and procedures.

G.2. Summary of the comments received:

Please identify stakeholders that have made comments and provide a summary of these4 comments.

G.3. Report on how due account was taken of any comments received:

Please explain how due account has been taken of comments received.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

!

Make sure you include every project participant listed in column 2 of Table A.3. here and check that the information is consistent with that given in Table A.3.

Organization:	
Street/ P.O.Box:	
Building:	
City:	
State/Region:	
Postfix/ZIP:	
Country:	
Telephone:	
FAX:	
E-Mail:	
URL:	
Represented by:	
Title:	
Salutation:	
Last Name:	
Middle Name:	
First Name:	
Department:	
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

!

- Please list all sources of public funding
- Give a confirmation that this is not DIVERTED ODA from an Annex I country
- Make available contact details of relevant persons so that the DOE can further investigate the source of public funding

Annex 3

BASELINE INFORMATION

!

This section tends to be either too scant or too excessive. Examples of information that can be provided in Annex 3 are listed in the Box 7 below.

Box 7: Examples of information provided for electricity to grid or landfill gas capture projects

Projects delivering electricity to the grid;

A table of all power plants used to calculate the operating and build margin for the grid carbon emission factor should be provided.

Name of power plant	Fuel type	Generation in 2005 (MWh)	Generation in 2004 (GWh)	Generation in 2003 (GWh)	Year of commissioning

Landfill gas capture and flaring projects:

Assumptions for estimating emission reductions by using a First Order Decay model should be included here. Such information would be;

- assumptions for the theoretical potential methane generation rate, L_0, including information on waste composition
- assumptions for the methane generation constant, k,
- a table including estimated amount of waste disposed per year,
- information on waste composition

Annex 4

MONITORING PLAN

!

Examples of information to include here are a copy of worksheets that should be filled in by the operators, with an explanation of how these are filled in and used to aggregate data and calculate annual emission reductions.

An example of the annual worksheet for a landfill gas project is enclosed in Box 8 below. This worksheet is filled in based on an aggregation of monthly worksheets and calculated from the formulas given in methodology AM0011.

Box 8: Example of Annual Worksheet for a landfill gas project

	Project characteristics			**Project GHG reductions**		
Data	kWh Generated from LFG project	Methane input to generator	Methane input to flare	Ton CO_{2e} destroyed from generator	Ton CO_{2e} destroyed from flare	Ton CO_{2e} destroyed from generator and flare
Month/data units	kWh	Ton CH_4	Ton CH_4	Ton CO_{2e}	Ton CO_{2e}	Ton CO_{2e}
January						
February						
March						
Etc.						
..						
..						

Guidebook Appendix

Appendix 1 – Sources for further assistance

CDM Guidelines

http://cdm.unfccc.int/Reference/Documents/Guidel_Pdd/English/Guidelines_CDMPDD_NMB_NMM.pdf

Dec.17/COP7: Marrakech Accords;

http://cdm.unfccc.int/Reference/COPMOP/decisions_17_CP.7.pdf

Dec. 21/COP8, Annex II: Simplified modalities and procedures for small scale clean development mechanism project activities;

http://cdm.unfccc.int/Reference/COPMOP/decision_21_CP.8.pdf

CDM Project Design Document (most recent version)

http://cdm.unfccc.int/Reference/Documents

SSC: Guidelines for completing CDM-SSC-PDD and F-CDM-SSC-Subm (most recent versions)

http://cdm.unfccc.int/Reference/Documents

SSC: CDM project design document for small-scale activities CDM-SSC-PDD (most recent version)

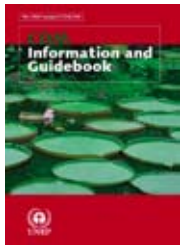
http://cdm.unfccc.int/Reference/Documents

Decisions from EB meetings:

http://cdm.unfccc.int/EB/Meetings

Appendix 2 – CD4CDM Project Publications

URC publications can be downloaded from www.cd4cdm.org



CDM Information and Guidebook (2nd edition)
The CDM Information and Guidebook attempts to provide a comprehensive overview of the CDM, its project cycle, and related issues such as linkage with sustainable development goals, financing and market intelligence. The appendices present frequently asked questions and answers, a short overview of existing guidelines, and a list of project categories which may be eligible for the CDM in the future.

Legal Issues Guidebook to the Clean Development Mechanism
The Guidebook aims at providing an in-depth analysis of the various types of risks associated with the different stages of the CDM project cycle and possible legal and contractual approaches that could be adopted to minimize these risks.

CDM Sustainable Development Impacts
This guideline presents an operational approach to sustainable development in the context of CDM projects.

Institutional Strategy to Promote the Clean Development Mechanism in Peru
This booklet aims to show how Peru has designed an institutional strategy to promote the CDM under a "national project cycle" inspired by and complying with the international rules for the CDM.

Clean Development Mechanism
Vietnamese version, Japanese version, Spanish version
French version, Cambodian (Khmer) version, Chinese version
Korean version

Language versions coming shortly: Arabic
(hard copy available on request), Portuguese

Appendix 3 – Abbreviations

ACM	Approved Consolidated Methodology
ASM	Approved Small Scale Methodology
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH4	Methane
CL	Clarification request
CO2	Carbon dioxide
CO2e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
EB	Executive Board
EB20	The 20th Executive Board Meeting
EIA	Environmental Impact Assessment
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
LoA	Letter of Approval
MP	Monitoring Plan
N2O	Nitrous oxide
NGO	Non-governmental Organisation
NPV	Net Present Value
ODA	Official Development Assistance
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change

Appendix 4 – Glossary

This section outlines the concepts behind key terminology and principles.

Clean development mechanism (CDM) [14]

Article 12 of the Kyoto Protocol defines the clean development mechanism. "The purpose of the clean development mechanism shall be to assist Parties1 not included in Annex I in achieving sustainable development and in contributing to the ultimate objective of the Convention, and to assist Parties included in Annex I in achieving compliance with their quantified emission limitation and reduction commitments under article 3".

The modalities and procedures for a clean development mechanism (CDM modalities and procedures were adopted by the Conference of the Parties (COP) at its seventh session, the see annex to decision 17/CP.7, document FCCC/CP/2001/13/Add.2).

Starting date of a CDM project activity and crediting period [15]

The starting date of a CDM project activity is the date at which the implementation or construction or real action of a project activity begins. In exceptional cases, for project activities starting between 1 January 2000 and the date of the registration of a first clean development mechanism project (18 November 2004), the starting date of the crediting period may be prior to the date of registration of the project activity if the project activity is submitted for registration before 31 December 2005. In this case, the projects may claim a crediting period that starts prior to the registration of the project as CDM project activity. Documentary evidence must be provided for a) the starting date of the project activity and b) that the CDM was seriously considered in the decision to proceed with the project (e.g. a public announcement prior to project implementation that the project will be developed as CDM project, a business plan/financial plant that shows that CER revenues have been considered, a board decision that shows that the CDM was considered, or evidence of consultation with CDM consultants prior to project implementation on the potential to develop the project as CDM project).

Transparency

Transparency relates to the degree to which information on the process, procedures, assumptions and limitations of the PDD information are disclosed in a clear, factual, neutral, and understandable manner based on clear documentation and records (i.e. an audit trail).

Completeness

All relevant emission sources within the chosen project and baseline boundary need to be included in the calculations of emission reductions.

14 *http://cdm.unfccc.int/Reference/Documents/Guidel_Pdd/English/Guidelines_CDMPDD_NMB_NMM.pdf*

15 *http://cdm.unfccc.int/Reference/Documents/Guidel_Pdd/English/Guidelines_CDMPDD_NMB_NMM.pdf*

Focus on relevant information

The PDD should contain the information that the users (i.e. project stakeholders, DOE, CDM-EB) need for their decision making. An important aspect of relevance is the selection of appropriate project and baseline boundaries.

Conservativeness versus accuracy and uncertainty

Accuracy is usually satisfied by avoiding or eliminating bias from sources within estimations, and through describing and improving precision and removing uncertainties as far as practical. Conservativeness is applied in order to ensure that an estimate is as accurate as possible whilst reducing the possibility of over-estimating, especially where highly uncertain sources are used. Project proponents will pursue accuracy insofar as possible, but the hypothetical nature of baselines, the high cost of monitoring some types of GHG emissions and removals, and other limitations, make accuracy unattainable in many cases. In these cases, conservativeness serves as a moderator to accuracy in order to maintain the credibility of project GHG quantification[16]. However, current practice of CDM-EB is to emphasise conservativeness to enhance credibility, and in some cases the most conservative values have been selected instead of the most accurate ones.

Materiality

Some emission sources may not be material compared to others. With the exception of a few approved baseline and monitoring methodologies, there is no formal guidance on how to treat materiality in the context of CDM projects. The EB tends to require that all emissions be included, regardless of whether they are material or not. However, in literature such as in the WBCSD GHG Reporting Guidelines, a rule of thumb is that emission sources can be considered as not material if they are less than 5% of the total emissions reported. However, this literature is targeted towards company reporting and not towards CDM projects.

Good practice for CDM projects is to include as a minimum all emissions which account for more than 1% of total emission reductions.

A more complete Glossary for CDM from the UNFCCC can be found in the "Guidelines for completing CDM-PDD, CDM-NMB and CDM-NMM" available on the UNFCCC website

(http://cdm.unfccc.int/Reference/Documents/).

16 *ISO 14064*

This guidebook identifies the 20 most common pitfalls encountered by Det Norske Veritas (DNV), an accredited Designated Operational Entity, in its validation of CDM projects up to September 2005, which represents more than 50% of total CDM projects submitted for validation. Specific guidance is provided on how to avoid these pitfalls. Examples used to support this guidance are based on actual CDM projects. A later section of the guidebook presents step-by-step directions on how to fill the different sections of a CDM Project Design Document (PDD). By publishing this guidebook, CD4CDM project aims at assisting CDM project developers in developing countries build their skills in PDD preparation.

This guidebook is produced to support the UNEP project "Capacity Development for the Clean Development Mechanism" implemented by UNEP Risø Centre on Energy, Climate and Sustainable Development in Denmark. The overall objective of the project is to develop the institutional capability and human capacity for implementation of the CDM in developing countries.

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CDM PDD Guidebook: Navigating the Pitfalls

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