CDM: Proposed new methodology expert form (version 04)

(To be used by methodology experts providing desk review for a proposed new methodology)

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Related F-CDM-NM document ID number	NM0122

Note to those completing this form, as applicable: Please provide recommendations on the proposed new baseline and monitoring methodologies based on an assessment of CDM-NMB and CDM-NMM and of their application in sections A to E of the draft CDM-PDD, desk reviews and public input. Please ensure that the form is entirely filled and that arguments and expert judgments are substantiated.

A. Evaluation of the proposed new methodologies by desk reviewers:

I. Evaluation of the proposed new baseline methodology:

Title of new baseline methodology:>>Cogeneration at an industrial facility

i. Conditions under which this methodology is applicable to other potential projects (e.g. project type, region, data availability):

>>

Applicable to all types of industries without cogeneration facility currently.

The methodology states that it is applicable to industries with existing co-generation facility. In this case the crediting period would be limited to the remaining lifetime of the existing equipment. In practice however the methodology as described is not applicable to this case as neither formulae nor parameters are derived for this case and the methodology to determine the baseline and the additionality are clearly only applicable to cases without existing co-generation facility.

Not applicable to industries buying or selling thermal energy in the baseline or in the project situation.

Not applicable to energy efficiency improvements as baseline emissions are calculated based on a constant historical value ex-ante project start.

ii. Strengths and weaknesses of the methodology:

Strengths:

1. Fairly simple
2. Transparent
3. Based partially on approved methodologies
4. Widely applicable

Weaknesses

1. Additionality approach and determination of the baseline incomplete
2. Data for calculation of baseline emission factors not conservative.
3. Calculation of electricity usage baseline unclear.
4. Applicability conditions are inconsistent with thereafter developed methodology especially for

determination of additionality.

5. Data scope and project border are not entirely compatible with the proposed changes. Using total fuel input is like a black-box.

6. Not all parameters are well defined and clear.

iii. Any changes needed to improve the methodology:

a. Minor changes:>>

1. Include as an option the continuation of the current practice but using other fuels.
2. Include in the additionality assessment an investment analysis of the project proposal comparing it with the identified baseline scenario.
3. In the case of leakage include latter only if >0. The leakage calculations are fairly crude. This is justified regarding their magnitude. However it would not be justified with this method to include them as emission reductions which would be the case if leakage < 0 (this is potentially possible if e.g. baseline fugitive emissions were smaller than project fugitive emissions)
4. State clearly in the methodology that leakage calculations must be performed for the fuel used for co-generation independent if the ACM0002 methodology includes this same leakage or not.
5. Instead of using the average of the last 3 years to determine the fuel mix and the fuel usage per unit of steam output use the lowest observed monthly average of the last 3 years. This ensures a conservative approach and ensures that improvements realized recently are included in the baseline. The average of the last 3 years neglects these improvements and thus potentially overstates baseline emissions considerably.
6. Clarify the method to determine the baseline emissions related to electricity consumption. A simple approach would be to use as baseline electricity consumption the amount of electricity produced by the co-generation facility which is used internally in the industry (using monitoring equipment at the point of usage of electricity) plus the amount sold to the grid. For the internal part the baseline emissions would either be based on the grid (if electricity was bought formerly) or on the fuel consumed to produce the electricity (if formerly generated internally). Potentially the methodology implies this. However the formulae and the step by step approach offered are unclear in this respect.
7. Limit the spatial scope of data and the project boundary to the energy facility at the industrial plant (where currently steam is produced e.g. through boilers). Otherwise calculations using total fuel consumption for the baseline parameter could be misleading and could overestimate grossly baseline emissions. Data used to calculate baseline emissions would thus be fuels used to produce the steam formerly at the facility
8. Formulae to calculate steam enthalpy described in the text should be provided.

b. Major changes:>> Applicability only to industries without co-generation equipment. The methodologies presented to determine baseline as well as project emissions, all formulas and especially the methodology presented to determine the baseline as well as the additionality are only related to industries without co-generation. It is thus

recommended to include as condition for applicability of this methodology that the industry in question has currently NO co-generation facility. The method would thus NOT be applicable for industries which intend to expand or change existing co-generation facilities.

II. Evaluation of the proposed new monitoring methodology:

Title of new monitoring methodology: >>Co-generation at an industrial facility

i. Conditions under which this methodology is applicable to other potential projects (e.g. project type, region, data availability):

>> Applicable to all types of industries without cogeneration facility currently.

The methodology states that it is applicable to industries with existing co-generation facility. In this case the crediting period would be limited to the remaining lifetime of the existing equipment. In practice however the methodology as described is not applicable to this case due to baseline considerations (see above)

Not applicable to industries buying or selling thermal energy in the baseline or in the project situation.

Not applicable to energy efficiency improvements as baseline emissions are calculated based on a constant historical value ex-ante project start.

ii. Strengths and weaknesses of the methodology:

>>>>Strengths:

1. Simple

Weaknesses:

1. See baseline discussion.

Other weaknesses specific to the monitoring methodology:

2. Discrepancies between the baseline and the monitoring methodology
3. Lack of formulae for certain data monitored
4. No monitoring of leakage without appropriate justification
5. No QA/QC

iii. Any changes needed to improve the methodology:

a. Minor changes:>>

b. Major changes:>>Monitoring methodology must be re-written to include following components:

1. Include monitoring of leakage
2. Include QA/QC procedures

The monitoring methodology must also be made compatible with the baseline methodology concerning formulae's and data used.

B. Details of the evaluation of the proposed new methodology by the desk reviewer:

I. Proposed new baseline methodology *(specify title here):* >>Cogeneration at an industrial facility

(1) Short description of the methodology, including an assessment of which approach

from paragraph 48 of the CDM modalities and procedures was used:

a) Describe the methodology:

The methodology is for equipment producing heat and/or electricity at an industrial site for usage elsewhere at the site. Baseline emissions are fuel consumed for producing heat/electricity at the industrial site plus net electricity consumed by the facility plus avoided emissions from electricity generation in the case of net sale of electricity by the industrial facility. Depending on the net sale amount the methodology used is ACM0002 or AMS.I.D

Baseline and project emissions are calculated ex-ante using a modeling approach preferably. The exactitude of this approach is not very important as its only purpose is to estimate ex-ante emissions for the PDD. Ex-post baseline emissions are calculated based on measured values of steam-output and fixed values determined ex-ante (based on historical values) of fuel consumption per steam output and fuel mix. Additionally emissions due to the change of electricity consumption/production are included in the baseline. For calculating the GHG emissions of electricity production ACM0002 is taken and potentially in case of less than 15MW sold electricity AMS.I.D. Project emissions are based on measured fuel consumption. Leakage emissions are based on fugitive CH4 emissions of fuel production plus fuel transport emissions. Data in this case is based essentially on default values.

The methodology includes:

- Tool for demonstration and assessment of additionality as published by the EB
- ACM0002
- For projects where the power exports to the grid is less than 15MW AMS.I.D.

The methodology also relies in certain parts on AM0014 (determination of additionality).

b) State the approach selected:

>>Existing actual or historical emissions

c) Indicate (in summary form) why the approach selected is the most appropriate. Please provide your expert judgment on the appropriateness of the selected approach to the project category:

>>appropriate as various technologies may be applied which make projects unique and difficult to compare and difficult to apply a benchmark

(2) Basis for determining the baseline scenario:

a) State whether the documentation explains how the baseline scenario is to be chosen and identified:

>>Two scenarios are given. These are in fact a BAU and a project scenario. The additionality test shall determine which of both scenarios is the baseline.

b) State the basic underlying rationale for algorithms/formulae used (e.g. marginal vs. average basis) (see also section 4 below):

>>For the PDD ex-ante calculations are used while for monitoring ex-post. This allows for adjustment of the emissions data according to the industrial output (relative data).

c) State whether the documentation explains how, through the use of the methodology, it can be demonstrated that a project activity is additional and therefore not the baseline scenario. If so, what are the tools provided by the project participants?

>>The tool used is the additionality tool provided by the EB. Detailed explanations which are project specific are given for this tool. Reference is also made to AM0014.

d) State whether the basis for determining the baseline scenario and for assessing additionality is appropriate and adequate:

The methodology only involves two scenarios. Another possible scenario not included would be to continue without co-generation but using a different fuel mix due to changes of relative fuel prices.

The explanation given to not consider an investment analysis is misleading. No entrepreneur would invest in a cogeneration facility without making an appropriate investment analysis. The methodology would need to compare basically the economics of the project alternative to the continuation of the current practice (the two alternatives described). If in case of the barrier analysis a thorough assessment of alternatives is made it is not clear why the same cannot be made with an economic assessment. If the project alternative is economically seen more profitable than the continuation of the current practice it is most probably non-additional. Especially for industrial project types there is no reason to exempt this important methodological step to assess additionality. The qualitative description of barriers should be used also but only in combination with an investment analysis. Latter could however be limited to the project identified and the continuation of current practice.

For the barrier analysis tools proposed are those approved by the EB in AM0014. This is OK.

It is unclear why a barrier analysis for the expansion of an existing co-generation is relevant. Clearly the industry has already invested in co-generation without CDM even if all the barriers have existed. The barriers mentioned in the methodology are thus irrelevant for them as they have already accrued experience with this technology. Specific barriers for expansion of co-generation would need to be included – these are however not mentioned. The methodology proposed to determine the baseline and the additionality are thus NOT applicable to industries with existing co-generation facilities.

(3) Assessment of the description of the proposed methodology and its applicability

a) State whether the methodology has been described in an adequate manner:

>>yes

b) State whether the proposed methodology is appropriate for the referred proposed project activity and the referred project context (described in Sections A - E of the draft CDM-PDD and submitted along with CDM-NMB):

>>No. The project described in the PDD is the expansion of a co-generation facility. The methodology developed is however only applicable for industrial sites without existing co-generation facility (see criteria above). Specifically the steps described to determine the baseline via usage of the EB additionality tool are based on a barrier assessment relevant for industries without prior investment and experience with co-generation. The existence of co-generation already in these facilities is an obvious indication that the barriers were overcome by the entrepreneur or were considered non-significant. Co-generation is thus BAU. The methodology would need to prove that the expansion of the current co-generation system is additional and the baseline. No method to prove this situation is however given. The PDD also only lists general factors applicable to any investment and not specific barriers to expanding a co-generation facility. Arguments such as a poor economic situation and a high country risk could be applied virtually to any project in most developing countries and are insufficient, especially in the case of a multinational with international access to finance. An appropriate investment analysis could incorporate specific risks for the investment. Arguments such as the bad economic situation are simply too generic.

c) State whether the application of the methodology could result in a baseline scenario that reasonably represents the anthropogenic emissions by sources of greenhouse gases that would occur in the absence of the proposed project activity.

Please explain:

>>Basically the method to determine the baseline depends on AM0014. However an investment analysis should be included to avoid non-additional projects and to have an appropriate identification of the baseline. Also as presented the methodology is not applicable to industries which already have a co-generation system.

(4) Assessment of algorithms/formulae and type of data needed:

a) State whether the description of the methodology includes algorithms and generic formulae that can be applied to other potential project activities (if not, the proposed new methodology will be considered as a project-specific methodology):

>>Can be used for other project activities

b) Explain the spatial scope of data used to determine the baseline and whether the scope is appropriate:

>>Spatial scope is the industrial facility plus emissions from the grid for electricity; The spatial scope should be limited to the energy facility at the industrial plant (this is proposed as possible in the methodology but it should be compulsory). If the spatial scope is the entire industrial facility fuel may well be used for purposes not related to steam e.g. as process fuel (e.g. in many chemical industries gas is used in processes) or for running equipment which might be discharged in the future. The formulae applied using total fuel usage in relation to steam output for calculating the baseline parameter could thus be wrong and overstate baseline emissions.

c) Explain the vintage of data used (in relation to the duration of the project crediting period) and whether the vintage of data is appropriate, indicating the period covered by the data:

>>To determine ex-post the baseline emissions “historical” data of fuel used per steam output and fuel mix data is used. The methodology determines at a later stage that historical data is a 3-year average. This might lead to overestimate baseline emissions as equipment performance may have improved recently or changes to low-carbon fuels may have occurred. A conservative approach would thus be to use the lowest values of the last 3 years based e.g. on monthly averages. Data vintage to calculate ex-post baseline emissions should thus be determined adequately in the methodology.

(5) Definition of the project boundary related to the baseline methodology:

a) State how the project boundary is defined in terms of:

i) Gases and sources

>>CO2, CH4 and N2O

ii) Physical delineation

>>Industrial site where co-generation is made

b) Indicate whether this project boundary is appropriate:

>>The project boundary should be limited to the energy facility at the industrial plant (this is proposed as possible in the methodology but it should be compulsory). If the limit is the entire industrial facility fuel may well be used for purposes not related to steam e.g. as process fuel (e.g. in many chemical industries gas is used in processes) or for equipment which might be discharged in the future. The formulae applied using total fuel usage in relation to steam output for calculating the baseline parameter could thus be wrong and overstate baseline emissions.

(6) Key assumptions/parameters (including emission factors and activity levels) and data sources:

a) List the implicit and explicit key assumptions. Identify those, if any, which are problematic and explain:

>>

Explicit assumptions:

As proxy for activity levels the steam enthalpy output is used. A stable relationship between steam output and fuel consumption is assumed. The steam output can thus be used as a proxy for activity levels of the industry. The usage of total fuel consumed is problematic.

Implicit assumptions:

- No steam surplus production: OK
- For electricity production the project does not change significantly the generation mix. This is based on ACM0002 or AMS I.D. This assumption is in line with approved methodologies by the EB and thus considered as OK

Key parameters:

- Baseline and project emissions are determined ex-ante preferable using a thermodynamic analysis. This is OK.
- Baseline and project emissions ex-post are determined by using steam enthalpy as output indicator and relating fuel usage and fuel mix (based on historical data) with steam output. This is as approach OK but has its problems (see below)

b) State whether the key assumptions are arrived at in a transparent manner:

>>yes

c) Give your expert judgment on whether the assumptions/parameters are adequate:

>>Assumptions yes.

Parameters not all.

1. Instead of total industrial fuel consumption only fuel consumed historically for steam production should be included in this calculation.

2. The baseline emissions are determined ex-post using total steam enthalpy output. For determination of the baseline emissions a GHG emission factor per unit of steam enthalpy output is determined using:

- Relationship fuel input and steam output based on historical data; A 3-year time period is indicated later. However the methodology is unclear in this respect and it is also unclear why 3 years are used. This might be non-conservative as improvements took place. For a conservative assessment the lowest value observed in the last 3 years should be taken.
- Determine average ratio of fuels again based on historical data. As in point 1 the notion of historical data is not explained thus leading potentially to an overstating of baseline emissions. The baseline emissions should include the baseline fuel mix which should be based on the fuel mix with the lowest GHG emission factors observed in the last 3 years.

3. Step 5 to determine the electricity demand in the baseline is unclear. For baseline electricity consumption the electricity produced by co-generation and used internally plus the electricity sold to the grid could be taken.

4. Formulae to calculate steam enthalpy described in the text should be provided.

d) Indicate which data sources are used and how the data are obtained (e.g. official statistics, expert judgment):

>>official data sources for relating fuels used to CO2 factors and for leakage. Proprietary data for steam output. Historical data for relating steam output and fuel consumed.

e) Give your expert judgment on whether the data used are adequate, consistent, accurate and reliable:

>>OK with exception of historical data used (see c) above)

f) State possible data gaps:

>>OK

(7) Assessment of uncertainties:

a) State whether the methodology includes an assessment of uncertainties regarding:

i) The basis for determining the baseline scenario:

>>No

ii) Algorithms/formulae:

>>No

iii) Key assumptions:

>>No

iv) Data:

>>No

b) State whether the uncertainties presented are reasonable:

>>A core uncertainty is related to the usage of ACM002 but this is not attributable to the proposed methodology. No additional assessment is deemed as necessary.

(8) Leakage:

a) State how the baseline methodology addresses any potential leakage due to the project activity:

>>Leakage included is transport emissions (from fuel transport) plus fugitive CH4 emissions from fuel production if in an Annex I country.

b) Indicate whether the treatment for leakage is appropriate and adequate:

>>Appropriate. Leakage is a first order approximation and fairly crude especially for fugitive emissions. As leakage might be negative leading to additional emission reduction from the project this might lead to

problems. To have a conservative approach it is recommended to include leakage only if >0.

The PDD does not include fugitive emissions from gas however referring to ACM 0002 also not including these emissions. This argument can not be used as the proposed new methodology specifically states that fugitive emissions are to be included. The relation between fugitive emissions from electricity production and from gas usage for co-generation might well be highly different as perhaps very little gas is used in the grid or very little electricity is produced. To prevent such wrong and non-conservative applications as realized in the PDD the methodology should thus clearly state that independent of the leakage calculations in ACM 002 the fugitive emissions from gas consumption for co-generation need to be included. This is necessary to calculate leakage in a conservative manner. .

(9) Transparency and "conservativeness":

a) Indicate whether the baseline methodology was developed in a transparent way:

>>Transparent, except for calculations of electricity usage in the baseline

b) State whether the baseline methodology is conservative:

>>The usage of 3-year historical averages for determining fuel per steam output and fuel mix is not necessarily conservative as improvements or changes to low carbon fuels might have taken place in these 3 years. A conservative approach would be to take the "best" (i.e. lowest fuel usage per steam output and lowest GHG emission factor fuel used) value obtained in the last 3 years based on monthly data.

(10) Potential strengths and weaknesses of the proposed baseline methodology *(please explain)***:**

>>Strengths:

1. Fairly simple
2. Transparent
3. Based partially on approved methodologies
4. Widely applicable

Weaknesses

1. Additionality approach and determination of the baseline incomplete
2. Data for calculation of baseline emission factors not conservative.
3. Calculation of electricity usage baseline unclear.
4. Applicability conditions are inconsistent with thereafter developed methodology especially for determination of additionality.
5. Data scope and project border are not entirely compatible with the proposed changes. Using total fuel input is like a black-box.
6. Not all parameters are well defined and clear.

(11) Other considerations, such as a description of how national and/or sectoral policies and circumstances have been taken into account *(please explain)***:**

>>OK; based on national regulations

(12) Applicability of the proposed methodology across project types and regions *(please indicate)***:**

>>widely applicable

(13) Any other comments:

a) State whether any other source of information (i.e. other than documentation on this proposed

methodology available on the UNFCCC CDM web site) has been used by you in evaluating this methodology. If so, please provide specific references:

>>AM 0014, ACM 0002, Additionality Tool EB, NM0077 and comments related to NM0077

b) Indicate any further comments:

>

II. Proposed new monitoring methodology *(specify title here):* >> Co-generation at an industrial facility

In respect of the proposed new monitoring methodology, evaluate each section of CDM-NMM to the draft CDM-PDD. Please provide your comments section by section:

(1) Brief description of new methodology:

Describe new methodology:

>> See Baseline part

The methodology is for equipment producing heat and/or electricity at an industrial site for usage elsewhere at the site. Baseline emissions are fuel consumed for producing heat/electricity at the industrial site plus net electricity consumed by the facility plus avoided emissions from electricity generation in the case of net sale of electricity by the industrial facility. Depending on the net sale amount the methodology used is ACM0002 or AMS.I.D

Baseline and project emissions are calculated ex-ante using a modeling approach preferably. The exactitude of this approach is not very important as its only purpose is to estimate ex-ante emissions for the PDD. Ex-post baseline emissions are calculated based on measured values of steam-output and fixed values determined ex-ante (based on historical values) of fuel consumption per steam output and fuel mix. Additionally emissions due to the change of electricity consumption/production are included in the baseline. For calculating the GHG emissions of electricity production ACM0002 is taken and potentially in case of less than 15MW sold electricity AMS.I.D. Project emissions are based on measured fuel consumption. Leakage emissions are based on fugitive CH4 emissions of fuel production plus fuel transport emissions. Data in this case is based essentially on default values.

(2) Key assumptions/parameters:

a) List the implicit and explicit key assumptions. Identify those, if any, which are problematic and explain:

>>equal to baseline (see corresponding chapter);

Additionally an important assumption is that historical data is reliable and that no major changes have occurred in the 3 years of historical data recording required. This might be problematic as changes may have occurred.

b) State whether the key assumptions are arrived at in a transparent manner:

>>yes

c) Give your expert judgment on whether the assumptions/parameters are adequate:

>>yes; see exceptions equivalent to discussion on baseline

(3) Data sources and data quality:

a) Indicate which data sources are used and how the data are obtained (e.g. official statistics, expert judgment):

>>Basically industrial facility for fuel usage, electricity consumption/sale and heat usage; For electricity sales data as required in ACM0002 is applied;

b) Give your expert judgment on whether the data used are adequate, consistent, accurate and

reliable:

>> The data boiler efficiency is monitored (B3). This is thereafter not used in a formulae. For leakage no monitoring is realized (all calculations based on IPCC default values). The monitoring methodology lists as data to be collected the boiler efficiency (B3). This parameter however does not appear in any formulae later. Formulae to calculate steam enthalpy described in the text should be provided. The data set provided is not fully consistent with the baseline methodology dataset.

c) *State possible data gaps:*

>> Leakage is a data gap. The statement that leakage is very small is whether proven neither in the baseline nor in the monitoring methodology. While this might be the case it needs to be shown in a clear manner. The baseline methodology also states that "in case of unavailability of information and data" IPCC values would be applied while the monitoring methodology uses in general IPCC values without any monitoring. This is a clear discrepancy between the baseline and the monitoring methodology and unjustified. Leakage monitoring must thus be completed.

(4) Assessment of the description of the proposed methodology and its applicability:

a) State whether the proposed methodology has been described in an adequate manner:

>>Differences between the baseline methodology and the monitoring methodology concerning formulae are observed, specifically in the part concerning emissions from electricity production and leakage. These differences are not explained. The monitoring methodology is thus not described in an adequate manner.

b) State whether the proposed methodology is appropriate for the referred proposed project activity and the referred project context (described in Sections A - E of the draft CDM-PDD and submitted along with CDM-NMM):

>>see restrictions mentioned in the baseline methodology.

c) State whether this proposed monitoring methodology is compatible with the proposed baseline methodology described in CDM-NMB of the draft CDM-PDD:

>>In various parts significant discrepancies are found, especially concerning application of electricity surplus and leakage calculations.

(5) Leakage *(please elaborate, if appropriate)***:**

>>No monitoring is realized. This is not consistent with the baseline methodology proposed. The statement of leakage being of minor magnitude is not sustained and thus non-acceptable.

(6) Quality assurance and control procedures *(please explain)***:**

>>No explanations are offered. No QA/QC is provided.

(7) Potential strengths and weaknesses of the proposed monitoring methodology *(please explain)***:**

>>Strengths:

1. Simple

Weaknesses:

6. See baseline discussion.

Additionally:

7. Discrepancies between baseline and monitoring methodology
8. Lack of formulae for certain data monitored
9. No monitoring of leakage without appropriate justification
10. No QA/QC

(8) Applicability of the proposed methodology across project types and regions *(please indicate)***:**

>>see baseline discussion

(9) Any other comments:

a) State whether any other source of information (i.e. other than documentation on this proposed methodology available on the UNFCCC CDM web site) has been used by you in evaluating this methodology. If so, please provide specific references:

>>see baseline discussion

b) Indicate any further comments:

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Signature of desk reviewer

Date: 23 / 07 /2005

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