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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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 judgements are substantiated.

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

I. Evaluation of the porposed new baseline methodology:

Title of new baseline methodology:>> Baseline methodology for energy integration project activities involving energy efficiency, self-generation, and/or cogeneration measures at an industrial facility

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

>>The methodology is applicable to other potential projects under the following conditions:

- The project involves energy integration, aimed primarily at energy efficiency in industrial facilities which may be:
  - Change in energy efficiency of any equipment (which leads to fuel and/or electricity savings), e.g. by replacement, adaptations, or incorporation of more advanced technologies, partial redesign of processes, better use of process heat, etc.
  - Addition of electricity self-generation equipment or changes thereof
  - Addition of electricity cogeneration equipment or changes thereof
- One product only is produced in the industrial facility.
- The production process involves variables that are difficult to predict and where an individual monitoring of equipment is impractical. I.e. the methodology refers to complex processes, the conditions of which change frequently, which make it impossible to determine a one-to-one correlation between energy fluxes and consumption patterns. Correlations between fuels or electricity, respectively, and plant product are determined using a statistical analysis.
- The continuation of current practice is not prevented by any circumstance.
- Implicitly, fuel switch is excluded (since the same share of fuels is assumed in the baseline and in the project case).

- Implicitly, the provided methodology is only applicable if the plant has not undergone changes whatsoever in process design during the last three years and if operation conditions have been "normal" during the last three years (see B I 4 c)).
- Implicitly, the methodology is only applicable if the project design remains the same, i.e. no further energy efficiency measures are carried out during the crediting period (since these would be accounted for as emission reductions in the CDM project, although they are potentially implemented independently).

ii. Strengths and weaknesses of the methodology:

>> Strengths:

- The methodology makes use of approved methodologies and tools (such as ACM 0002, the simplified methodology for small-scale projects, or the additionality tool as provided by EB 16).
- The methodology uses data readily available (mostly measured data)

Weaknesses:

- The methodology does not define alternatives to the project activity (see B I 2 d))
- The methodology does not provide further guidance on the implementation of the statistical analysis. Many assumptions concerning parameters are made, some variables are not explained. Neither the methodology nor the PDD provide an example calculation. It is therefore difficult to judge whether this analysis is appropriate for the proposed methodology. Furthermore, no guidance is given on whether the statistical analysis and the assumptions made therein are applicable to all kinds of project which comply with the applicability conditions described above. It is therefore difficult to judge whether the proposed methodology is able to derive correlations between fuel or electricity consumption and the production in a realistic and conservative way.

iii. Any changes needed to improve the methodology:

a. Minor changes:>>

- Add applicability conditions (see also B I 2 d) below): The methodology is only applicable if
  1. The product produced in the facility (and the quality thereof) remains the same during the crediting period.
  2. No explicit fuel switch is carried out during the crediting period. This must be demonstrated by the project proponent (see B I 2 d)).
  3. The process design remains the same during the crediting period. This means that no further energy efficiency measures are carried out during the crediting period (unless explicitly related to the CDM or unless the related emission reductions can be separated from "CDM emission reductions").
- Assign project emissions to the project emission equation (see 8. in section B I 2 d)).
- Explain assumption 9 in section B I 2 d).
- The methodology must ensure that only such integrated processes may be considered as one activity that physically belong together and are interrelated in a complex manner (see B I 13 b)).
- If leakage emissions are negative (leakage emissions are higher in the baseline than in the project case), then they should be neglected.
- Fuel consumption QFij should be reflected in the formulae in both the baseline

and monitoring methodologies.

b. Major changes:>>

- Provide further guidance on the implementation of the statistical analysis. Explain the assumptions made. Provide more information on the applicability conditions of this analysis. Demonstrate that this statistical analysis is able to determine correlations between fuel or electricity consumption and production in a realistic and conservative manner. Provide an example of the implementation of the statistical analysis. Provide guidance on how project proponents can judge whether the provided statistical analysis is suitable for the operating conditions of their own plants.
- Define all relevant plausible alternatives which may exist to the project activity. Carry out the additionality test as well as the determination of the baseline with all these alternatives.

II. Evaluation of the proposed new monitoring methodology:

Title of new monitoring methodology: >>Monitoring methodology for energy integration project activities involving energy efficiency, self-generation, and/or cogeneration measures at an industrial facility

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

>>Same as for the baseline methodology.

ii. Strengths and weaknesses of the methodology:

>>Weaknesses:

- It is considered that heating values and emission factors are constant over the crediting period. Especially, for solid fuels and waste fuels this may not be correct.
- No information is provided on how to monitor fuel consumption, electricity purchase/sale and production prior to project start (for the determination of the correlation curves).
- The recording frequency during monitoring is often not defined.

iii. Any changes needed to improve the methodology:

a. Minor changes:>>

- The monitoring methodology should reduce the scope of fuels which may be considered to the ones, that can really be assumed to be constant in heating value and emission factor (such as natural gas) or the monitoring of heating values and emission factors should be included in this methodology.
- Fuel consumption QFij should be reflected in the formulae in both the baseline and monitoring methodologies.

b. Major changes:>>

- The monitoring methodology should provide guidance on how to monitor fuel consumption, electricity purchase/sale and production *prior* to project start. This is of utmost importance, since this data is used to determine the correlation curves which are later used for the determination of baseline emissions.
- Define the recording frequency during monitoring for parameters where this is left open.

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

I. Proposed new baseline methodology *(specify title here):* >> Baseline methodology for energy integration project activities involving energy efficiency, self-generation, and/or cogeneration measures 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:

General remark: The baseline methodology refers to ex-ante and ex-post baselines. Ex-ante refers to the estimation of emission reductions in the PDD only, while the actual proposed methodology refers to ex-post. This should be made clearer in the document. The following discussion refers to the ex-post baseline only.

a) Describe the methodology:

>> 1. The methodology analyses whether the continuation of current practice is not prevented by any circumstance by analyzing legal and regulatory requirements as well as national and/or sectoral circumstances.

2. Additionality of the project is determined by carrying out a barriers analysis according to the additionality tool provided by EB 16. If the project activity started before registration, it must be proven that the CDM was seriously considered in the decision on whether to proceed with the project activity. It must be ensured that the project activity is in compliance with all applicable legal and regulatory requirements and it shall be analysed to which extent the proposed project type has already diffused in the relevant sector and region.

3. Baseline emissions are calculated by using a quasi-dynamic baseline. Based on a statistical analysis of data of the last three years, correlation curves are derived which relate fuel and/or electricity consumption to the production. If operation conditions exist which make it impossible to find one correlation for all possible states, a set of curves is to be developed (e.g. for operation conditions with and without using the steam turbine). The baseline fuel consumption is then calculated by applying the correlation curve to the actual daily production in the crediting period. It is assumed that the baseline fuel consumption has the same fuel shares as the actual daily fuel shares in the project. Like this, the baseline fuel consumption, separate for each fuel can be determined. The baseline net electricity purchase is also calculated by applying the relevant correlation curve to the actual daily production. Additional net electricity sales due to additional electricity generation in the project case is added up to the baseline electricity consumption (since by this additional electricity generation electricity is displaced which, in the baseline, would have led to additional emissions). The baseline fuel consumption, separate for each fuel, is converted into emissions of CO2 equivalents by multiplying the values with the emission factors of CO2, CH4 and N2O and the respective global warming potentials. The baseline net electricity consumption and project net electricity sales are converted into CO2 emissions by applying a grid emission factor for electricity (either ACM 0002 or the simplified methodology for small-scale projects are proposed). In the case the electricity of an individual plant not connected to the grid is displaced, an individual emission factor for that power plant must be applied.

4. Project emissions are calculated by measuring the actual fuel consumption in the project case, separate for each fuel type, and converting the fuel consumption into emissions of CO2 equivalents by multiplying the values with the emission factors of CO2, CH4 and N2O and the respective global warming potentials.

5. If relevant, leakage emissions may be calculated, which encompass fugitive emissions from the production of fuels as well as emissions associated with the transport of fuels. The former is calculated by applying a respective emission factor for fugitive emissions (such as methane emissions from the production of natural gas) to the baseline and project consumption of fuels. The latter is calculated by determining the amount of fuels needed for the transportation of fuels and by applying the relevant emission factor.

6. Emission reductions are calculated by subtracting project and leakage emissions from baseline emissions.

b) State the approach selected:

>> Para 48 a): Existing actual or historical emissions, as applicable.

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

>> The determination of baseline emissions is based on a statistical analysis of fuel and electricity consumption and production during the last three years prior to project implementation. Approach 48 a) (existing actual or historical emissions) is therefore appropriate. Since the methodology encompasses a set of mitigation options, approach 48 b) dealing with one technology only can be ruled out (technology that represents and economically attractive course of action). For the complexity of the project, "similar" project activities, as stipulated by approach 48 c), do not exist. The chosen approach is therefore appropriate.

(2) Basis for determining the baseline scenario:

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

>> Yes, it does.

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

>> Basic underlying rationales include:

1. The project activity may involve a series of measures that change energy consumption patterns of the industrial facility, which lead to fuel and/or electricity savings.
2. The equipment involved in the project activity might only be part of the total equipment. However, it is assumed that due to the complexity of processes it is valid to consider the total input and output of the facility.
3. It is possible to correlate fuel and/or electricity consumption with the production of the industrial facility on the basis of a statistical analysis. It is assumed that this analysis is valid to describe the different and complex plant operation conditions.
4. The correlation curves are valid over the whole crediting period and therefore fixed.
5. It is possible to calculate the baseline fuel consumption on the basis of actual production and the correlation curves provided by the statistical analysis.
6. No fuel switch takes place. It is assumed that the shares of fuel used in the project case are the same as in the baseline.
7. The emissions related to the net purchase or net production of electricity can be calculated by multiplying with the grid emission factor (as in ACM 0002 or as in the simplified methodology for small-scale projects) or with the emission factor of an individual plant, as applicable.
8. Emissions related to the net electricity purchase prior to the project activity as well related to the net electricity sale after starting the project activity are considered as baseline emissions.
9. The modification of industrial processes does no affect emissions of GHG in other ways.
10. It is assumed that there are no other feasible project activities that provide outputs or services comparable to the proposed project activity.

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?

>>Yes, the documentation explains how additionality is to be determined. Firstly, the methodology analyses whether the continuation of current practice is not prevented by any circumstance by analyzing legal and regulatory requirements as well as national and/or sectoral circumstances. Then, the additionality of the project is determined by carrying out a barriers analysis according to the additionality tool provided by EB 16. If the project activity started before registration, it must be proven that the CDM was seriously considered in the decision on whether to proceed with the project activity. It must be ensured that the project activity is in compliance with all applicable legal and regulatory requirements and it shall be analysed to which extent the proposed project type has already diffused in the relevant sector and region.

This means the methodology makes only partly use of the additionality tool as provided by EB 16 (barriers analysis). Some parts of the methodology are guided by elements in the additionality tool.

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

>> It is appropriate to make use of the additionality tool as provided by EB 16. However, only parts are taken from that tool. Some core elements for the determination of the baseline scenario and of additionality are not taken into account in the methodology (which are included in the additionality tool from EB 16):

- The methodology does not define alternatives to the project activity (as in sub-step 1a of the additionality tool). The only choice is to either continue with the current plant configuration or to implement the project activity as in the relevant PDD. This is not appropriate. There may be other alternatives to the project than just the current situation. Referring to the proposed activity in the PDD (Petromex), for instance, it might be possible to carry out the project in only one of the two plants. Moreover, it would be possible, to change or replace only some equipment or to change the plant configuration in another way as in the project case and in the current situation. The methodology should allow for the determination of all plausible alternatives in order to determine the baseline. Otherwise, emission reductions due to the project activity might be overestimated.
- No investment analysis is carried out. This is not mandatory. However, financial considerations would add credibility to the determination of the baseline.
- Since the proposed methodology does not define alternatives to the project activity (as in sub-step 1a of the additionality tool), it does not carry out sub-step 3 b of the additionality tool either (demonstration that the identified barriers would not prevent the implementation of at least one of the alternatives). The same concerns as for the missing definition of alternatives above apply here.
- Comment on the PDD: In the methodology it is proposed to consider the existence of technology support programmes when determining whether the identified barriers are ground for the demonstration of additionality. However, in the PDD (p. 16) the possible grant of funds for technological innovation is not analysed sufficiently with respect to alleviating barriers.
- Common practice as well as the effect of registration as CDM project is analyzed. However, the methodology does not draw on the relevant sections in the additionality tool (step 4 and 5).
- In general, it is recommended to draw on the approach provided by the additionality tool. This is not mandatory, however.

My comments on the above (section 2 b) presented underlying assumptions:

1. This is a plausible assumption for complex industrial processes
2. This assumption is valid as long as
    - There is no further change of the process design during the crediting period. If further measures are implemented, it is rather difficult (in some cases impossible) to determine which part of the emission reduction is owing to the before implemented CDM project and which part is due to the new process design during the crediting period. This condition should be added to the applicability conditions.
    - The product produced in the facility remains the same. If the product (or the product quality) changes, it is rather difficult to judge whether potential emission reductions are attributable to the CDM project or to the change of the product. This condition should be added to the applicability conditions.
3. It is impossible to judge whether this is a plausible assumption. The methodology provides a statistical analysis in order how to correlate fuel and electricity consumption with the production of the facility. However, in the PDD no data set is provided as example showing the application thereof. This would be very helpful to judge whether this statistical analysis is valid in general and to which cases of industrial production it may be applied. The methodology should therefore give additional guidance on how to demonstrate that this procedure is valid and that it has a high level of confidence. This is of utmost importance, since this determines the baseline emissions.
4. This assumption is only valid in the case the process design can be proven not to be changed during the crediting period (see 2.)). If that is the case, one may assume that the plant efficiency is constant or deteriorates over time. The proposed assumption is therefore then valid. In the case the process design is changed, this assumption is not valid, since the

correlation curves change with a changing process design.

5. See comments on 3. and 4.
6. This implicit assumption must be justified for each specific project activity. It must be demonstrated by project proponents that the new process design is actually able to use the same fuels as in the current situation. For instance, if a multi-fuel boiler is replaced by a natural gas boiler, only natural gas can be used in the project, whereas several fuels could be used in the baseline. The assumption would therefore not hold true. If in the new process design the same fuels can be used as in the old design, project proponents should make plausible that no fuel switch has been induced by the project activity (for instance, in a multi-fuel scenario, project proponents might want to switch from carbon extensive (e.g. natural gas) to carbon intensive (e.g. heavy fuel oil) fuels in order to obtain more CERs (in the case of heavy fuel oil, the specific and absolute emission reduction is higher than for natural gas). If this happens, it should be made plausible that this does not happen due to the registration as CDM project, but independently, driven by other factors.
7. This is a valid assumption.
8. Considering the calculated emissions reductions, this is valid. However, according to the Meth Panel recommendation to the Executive Board for the former methodology (NM 0086), project proponents should assign project emissions to the project emission equation and out of the baseline equation. This was not done in this methodology.
9. It is unclear what this assumption means. This should be explained.
10. This assumption is not valid. There may be alternatives to the project activity. These shall be defined when the baseline and additionality are to be determined (see above).

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

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

>>The overall description of the methodology is adequate. However, some explanations are missing (see above). Especially with respect to the core of the methodology, the determination of the quasi-dynamic baseline, project proponents should provide more information in which cases the statistical analysis is valid and on how to actually implement it. The description should entail a step-by-step description of this analysis (preferably with an example of a data set) in order to make sure the analysis can be reproduced by other project proponents in the same way.

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):

>> Yes, in principle it is appropriate.

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.

>> Yes, but the risk of defining a wrong baseline scenario is high.

Please explain:

>> Two main aspects increase the risk of defining a baseline scenario that does not represent emissions that would occur in the absence of the proposed project activity:

- The methodology does not envisage the definition of alternatives to the project activity, which is fundamental for the definition of the baseline (see above).
- The methodology does no provide sufficient guidance for which projects the statistical analysis is valid and on how to actually implement it in a step-by-step way (see above).

(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):

>> In general, the algorithms and formulae provided in the methodology are generic and can be applied to other potential projects (taking into account the applicability conditions above).

However, more guidance should be given for which project activities the statistical analysis and the corresponding equations are valid and on how to implement it for different industrial sectors and activities.

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

>>The spatial level of fuel consumption, electricity purchase/sale, and production corresponds to the industrial facility and is therefore local, which is appropriate.

For the CO2 emission factors as well as for the corresponding lower heating values of the fuels values shall be taken from 1) national inventories or other official documents, 2) on-site measurements, or 3) IPCC. On-site measurements are preferred for fuels with a significant variation of properties. IPCC default values are chosen as last choice. This proposed spatial level is therefore appropriate.

CH4 and N2O emission factors are taken from IPCC, since it is assumed that CH4 and N2O only contribute to a small extent to the overall emissions. This is adequate.

The spatial scope for the emission factor for grid-connected electricity depends on the methodological choice (ACM 0002 or simplified methodology for small-scale projects) and is regional or national. This is appropriate.

In the event electricity is taken from isolated power plants, local emission factors corresponding to those plants should be used. This is appropriate as well.

For leakage emissions IPCC values are chosen, since leakage is considered to be small. This is appropriate.

Important note: The methodology must make sure that for different plants different sets of data must be used (in the case local data is to be used as for fuel use and electricity consumption/sale and production). In the PDD in two different plants (Altamira and Cosoleacaque plants) energy efficiency measures are to be carried out. The corresponding data should therefore refer to each individual plant.

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:

>>It is proposed that for the statistical analysis data is to be collected for a period of at least three years prior to project implementation in order to calculate the quasi-dynamic baseline on a sound statistical basis. This refers to fuel consumption, electricity purchase/sale, and production level.

The baseline methodology states (p. 19) that “this three-year data vintage is adequate when the data are available; the data lead to a statistically valid regression analysis; and the data can accurately cover a range of operating scenarios that are reasonable expected to occur during the project crediting period”. However, the methodology does not provide any guidance on what to do if at least one of these conditions is not met.

The authors should elaborate further on the vintage of the data to be used in order to allow a sound statistical analysis and how the mentioned conditions can be met.

Especially, the authors should describe the vintage of data to be used in the following cases:

- The process design was changed in the recent past. For example, if some part the process design was changed only few months ago, a period of three years might deliver wrong results because different process designs are reflected. If a shorter period is used (e.g. the months during which the recent process design has been operational), the statistical basis may be too short.
- Abnormal operation conditions prevailed during a part of the last three years. For example, in the case part of the process design was operating incorrectly during some time due to a failure of certain elements, the calculated correlation curves might be wrong, since they take into account this data. As above, in the case “abnormal” data is excluded, the statistical basis might be too small.

In conclusion, the provided methodology is only applicable if the plant has not undergone changes whatsoever in process design during the last three years and if operation conditions have been "normal" during the last three years. The authors should elaborate on how to proceed if these conditions are not met.

No information is provided on the vintage of other data (such as emission factors).

(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

>> The project boundary comprises CO2, CH4, and N2O emissions from fuel combustion and CO2 emissions related to the purchase/sale of grid electricity. As leakage outside the project boundary, fugitive methane emissions due to fuel production as well as CO2 emission due to fuel transport are taken into account.

ii) Physical delineation

>> The physical delineation comprises the industrial facility (fuel consumption) as well as the regional or national power plants belonging to the grid (for the determination of CO2 emissions related to the purchase/sale of electricity).

b) Indicate whether this project boundary is appropriate:

>> The project boundary is appropriate.

However, it must be ensured that the smallest plausible project boundary is chosen. I.e. if only parts of the facility are affected by the measures and the other parts are not affected, the project boundary shall be chosen smaller. Especially, if two or more independent plants are operating, different project boundaries shall be defined (in the PDD two plants in different locations are considered together, which is not appropriate, the analysis should be carried out independently for each plant).

(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:

>> On p. 18, the CDM-NMB lists the following explicit parameters:

- CEFj: Carbon dioxide emission factor per unit energy of fuel j (e.g. tCO2/GJ)
- MEFj: Methane emission factor per unit energy of fuel j (e.g. t CH4/GJ)
- NEFj: Nitrous oxide emission factor per unit of energy of fuel j (e.g. t N2O/GJ)
- EFelj: Baseline emission factor from energy generation, including electricity generation by the grid and/or private plant (e.g. t CO2/MWh). Each energy source is denoted by j.

Furthermore, the following assumptions are made:

1. Leakage is considered to be small.
2. The quasi-dynamic baseline is fixed ex-ante and is considered unalterable during the crediting period.
3. Using the actual production, the baseline emissions can be calculated from the quasi-dynamic baseline which is determined ex-ante on the basis for fuel consumption, electricity consumption/sale, and production.
4. The production level in the baseline and in the project case is the same.
5. Electricity purchase/sale may be considered constant in the baseline scenario if the corresponding values remain approximately constant prior to project implementation and if it can be considered that they would remain constant in the absence of the project activity.

See also extensive discussion in section 2 above.

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

>> The explicit parameters are arrived at in a transparent manner.

With respect to the other assumptions:

1. This is made transparent in the leakage section. Moreover, this is well known from other such projects. It is therefore adequate.
2. This assumption is not justified and not transparent. It is therefore not adequate.
3. This assumption is justified by the statistical analysis of fuel consumption, electricity purchase/sale, and production prior to project implementation. It is only adequate if it can be demonstrated that the statistical analysis is valid to determine such correlation curves with a high level of confidence.
4. This assumption is not justified. However, it is a valid assumption, since emission reductions shall not be claimed for a change of the activity level. It is therefore adequate.
5. This assumption is justified by the statistical analysis carried out prior to the project activity. It is a valid assumption. Actually, this assumption equals the corresponding correlation curve which would be determined on approximately constant electricity purchase/sale. It is therefore adequate.

See also extensive discussion in section 2 above.

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

>>included under b)

The definition of the explicit parameter EFelj refers to “energy generation, including electricity generation by the grid and/or private plant”. The parameter certainly refers to electricity production only; “energy generation” should therefore be deleted here.

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

>> The following data sources are used:

- CO2 emission factors per unit energy of fuel:
  - National inventory of GHG emissions, prepared as part of the National Communications to the UNFCCC or other official documents.
  - On-site measurements of carbon content and calorific value of fuels. This would be recommended for fuels where there is significant variation in properties and/or when the fuel is not widely commercialized.
  - IPCC default emission factors
- Methane emission factors per unit energy of fuel: IPCC values
- Nitrous oxide emission factors per unit energy of fuel: IPCC values
- Baseline emission factor for electricity generation by the grid and/or a private plant:
  - ACM 0002
  - Simplified methodology for small-scale project activities (for electricity generation less than or equal to 15 MW equivalent).
  - Emission factors provided by power plant owners (for the purchase of electricity from isolated power plants).
- Leakage emission: IPCC default values
- Determination of the quasi dynamic baseline as well as project emissions: the data stems from the industrial facility.

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

>>The data sources are adequate. However, with respect to the data used for the quasi-dynamic baseline it cannot be determined whether it is adequate, consistent, accurate and reliable, since it is monitored project-

specifically. Plant-specific data sources as such are adequate, though.

f) State possible data gaps:

>> There are no data gaps with the current methodology. However, data gaps may arise once the discussion above on the determination of the baseline scenario and additionality is taken into account.

(7) Assessment of uncertainties:

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

i) The basis for determining the baseline scenario:

>> No. Since the methodology does not analyze alternatives to the proposed project, there is significant uncertainty related to the determination of the baseline scenario.

ii) Algorithms/formulae:

>> At the end of the uncertainty section in the baseline methodology many equations are provided on how to carry out the statistical analysis. Uncertainties are dealt with by the Pearson's correlation coefficient R for multilinear regression. However, the presentation of the statistical analysis remains rather abstract and no example is provided on how to implement the statistical analysis for each individual project activity. Moreover, many assumptions and hypotheses are made which are not justified. It remains therefore difficult to judge in which sense the proposed statistical analysis is able to determine uncertainties. Moreover, it remains unclear what the magnitude of uncertainties is in the case of highly uncorrelated values and what consequences this would have on the applicability of the methodology.

In general it is adequate to use a statistical analysis to determine correlation curves and related uncertainties. However, the authors should provide more guidance on how to actually use the provided analysis in the context of the methodology and related project activities.

iii) Key assumptions:

>> No.

iv) Data:

>> The following uncertainties are identified:

- Methane and nitrous oxide emission factors have large uncertainties. However, it is judged that these uncertainties are not relevant since methane and nitrous oxide emissions account for only a small part of the overall emission of carbon dioxide equivalent. This is plausible and reasonable.
- The determination of the electricity emission factor according to ACM 0002 is sensitive to the option chosen. A check for appropriateness is envisaged by a DOE. Uncertainties related to the electricity emission factor should be dealt with in ACM 0002. Therefore a detailed analysis thereof in this methodology is not necessary.
- Leakage uncertainties are not relevant due to the small magnitude. This is plausible and reasonable.

b) State whether the uncertainties presented are reasonable:

>> Included above.

(8) Leakage:

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

>> The baseline methodology considers leakage from fugitive emission from upstream fuel production as well as emissions related to fuel transport.

The fugitive emissions refer to methane emissions from natural gas production and pipeline leakage as well as from coal mining. It is calculated by the difference of fuel production in the baseline and the project case and by multiplying this difference with the relevant IPCC default methane emission factor for fugitive

emissions.

Emissions related to fuel transport are calculated by multiplying the fuel consumed for fuel transport in the baseline and project case with the relevant CO2 emission factor. The fuel consumed for fuel transport is calculated by multiplying a specific energy consumption of the transport mode (ship, rail, truck, etc.) and the quantity of fuel transported.

Only emissions from fuel production/transportation are counted if the fuel is transported/produced in a non-Annex I country.

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

>> The treatment for leakage is appropriate. However, in most cases, fugitive emissions and emissions from fuel transport will be smaller in the project case than in the baseline. In these cases, leakage should be neglected.

The latter assumption (referring to fuel transport/production in non-Annex I countries) is unclear and therefore not appropriate. This should be explained.

(9) Transparency and "conservativeness":

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

>>The methodology is mostly developed in a transparent way. However, the methodology contains several implicit assumptions and implicit applicability conditions (see above). This is not transparent. In addition, the application of the statistical analysis to project activities should be explained better and made more transparent, since this is the core for determining baseline emissions.

b) State whether the baseline methodology is conservative:

>>There is a serious risk that the baseline methodology is not conservative for two main reasons:

- No alternatives to the project activity are analyzed. The only options available are the project case and the current situation. This may lead to an overestimation of baseline emissions.
- The statistical analysis lacks explanation and guidance on how to implement it and on how to judge whether it is valid in a certain project context. This may therefore lead to a wrong calculation of baseline emissions. This may lead to an overestimation as well as an underestimation of baseline emissions.

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

>>See section: A I. ii)

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

>>Legal and regulatory issues as well as national and/or sectoral policies and circumstances are taken into account in the determination of the baseline scenario.

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

>>In principle the proposed methodology is applicable to all project types which fulfil the applicability conditions and across all regions.

(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:

>> * Documents related to the previously submitted methodology NM 0086.

* Additionality tool by EB 16.

* ACM 0002

b) Indicate any further comments:

>>

- The methodology must ensure that only such integrated processes may be considered as one activity that physically belong together and are interrelated in a complex manner. The methodology should be applied to each of the identified activities independently. In the case of the PDD, the methodology should be applied to Altamira and Cosoleacaque plants independently (in the PDD, the two, physically separated, plants are considered together, which is not adequate).
- It is assumed that in the event the production value monitored in the project falls out of the historical range, an extrapolation of the correlation curve can be used until the maximum production capacity reachable. This assumption must be justified.
- In the case an isolated power plant is connected to the grid it is assumed (p. 5 baseline methodology) that "it is highly probable that they are purchasing electricity from the isolated power plant due to its lower price so that the reduction of electricity demand from this plant by the industrial facility indirectly has an influence on the purchase of electricity by the other facilities, resulting in emission reductions in the power grid". This assumption should be justified.
- P. 6 baseline methodology states: "Therefore, emission reductions associated with equipment not included in the project activity, as originally proposed in the PDD, can be accredited by project participants, if they are part of minor improvements of some equipment, also helped by CER revenues. Thus, once the project activity has been decided, no energy-intensive equipment would be replaced during the crediting period." The former sentence is not clear, explain. The latter sentence should be included in the applicability conditions, excluding projects which make energy efficiency improvements after the start of the crediting period (see also section 2 d)).
- P. 7 reads: "The purpose of the project activity is the reduction of GHG emissions while performing energy savings, regardless of the options for achieving those energy savings. Thus different energy integration alternatives are a single *type* of project activity". Especially the latter sentence is unclear. Explain.
- P. 15 states that it might be necessary to monitor on a daily basis whether a turbo-steam generator is being used or not and choose the corresponding correlation curve. It must be analyzed whether a daily basis for monitoring the operation mode is enough or whether a shorter time period is more appropriate (hourly basis), since electricity prices may change on an hourly basis rather than on a daily basis.

II. Proposed new monitoring methodology *(specify title here):* >> Monitoring methodology for energy integration project activities involving energy efficiency, self-generation, and/or cogeneration measures 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:

>> Baseline emissions related to fuel consumption are determined by applying the monitored production of the facility in the project to the correlation curves previously established which correlate fuel consumption with the production of the facility.

Emissions from electricity generation outside of the project boundary are assigned to the baseline. They are determined by direct measurements during the crediting period (electricity purchased/sold by the industrial facility) and by applying the monitored production of the facility to previously established curves which correlate electricity purchase/sale in the baseline with the production of the facility. Thus, the baseline concerning electricity corresponds to the net electricity purchase in the baseline and the net electricity sale in the project.

Project emissions are determined from direct measurements of fuel consumption following project implementation.

The relevant emission factors are applied to calculate emissions and emission reductions.

(2) Key assumptions/parameters:

Most of the assumptions/parameters correspond to the ones in the baseline methodology. In this section, therefore only additional assumptions/parameters used in the monitoring methodology are presented and discussed.

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

>>

1. There are data available on fuel and electricity usage for the prior three years at the facility.
2. Total input and output at the industrial facility is considered in order to ensure a thorough accounting of the emissions resulting from the project activity.
3. Information is available to calculate grid or isolated power plant electricity emission factors.
4. Emissions from grid-connected electricity generation require data that are specified in ACM 0002, and depend on the specific methodological option chosen among several alternatives proposed therein. The use of combined margin (as outlined in ACM 0002) is an appropriate basis to calculate emission reductions from avoided grid electricity generation.
5. The assumptions regarding heating values and emission factors of fuels are unchanged throughout the project. These factors should be country-specific. In the case data is not available, IPCC default values may be used.

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

>>

1. This assumption is rather trivial and is therefore transparent.
2. This assumption is transparent.
3. This assumption is rather trivial and is therefore transparent.
4. This assumption is transparent.
5. The assumption that heating values and emission factors are constant is not transparent.

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

>>

1. Since the assumption is trivial, it is adequate.
2. In principle, it is adequate to consider aggregated inputs and outputs in complex process designs. However, the methodology should reduce the project boundary (and thus the relevant input and output monitored) to the parts which are actually affected by the project. If parts of the facility are not affected by the project activity, they should be excluded from monitoring. Moreover, if the project encompasses different facilities (as in the PDD), the monitoring shall be carried out for each plant individually. See also relevant discussion for the baseline methodology.
3. Since the assumption is trivial, it is adequate.
4. If all the provisions stipulated in ACM 0002 are followed, the assumption is sufficient. However, the baseline provides the possibility in certain cases to use the simplified baseline for small-scale projects. This should be mentioned here as well.
5. It is not adequate per se to consider heating values and emission factors as constant. Especially for solid fuels as well as for waste fuels, this does not hold true. The monitoring methodology should therefore reduce the scope of fuels which may be considered to the ones, that can really be assumed to be constant in heating value and emission factor (such as natural gas) or the

monitoring of heating values and emission factors should be included in this methodology.

(3) Data sources and data quality:

Data sources and the discussion thereof are mostly already described in the baseline methodology. For this reason, only additional data sources and aspects relevant for the monitoring methodology are discussed.

General aspects:

- Monitoring frequency: The methodology does not, in many cases, determine the monitoring frequency. This refers to the fuel consumption, to electricity purchases/sales and to the production of the facility. However, this is important for the determination of the correlation curves (see data gaps) and for the application of correlation curves during the crediting period. So prior to project start, in order to determine the correlation curves, the monitoring frequency should be relatively high in order to have a sufficient set of data for the statistical analysis. During the crediting period, the monitoring frequency may be lower (since only yearly fuel consumption and electricity production is important). However, in order to determine the baseline ex-post, the monitoring frequency of the production of the facility should correspond to the correlation curves (e.g. if the correlation curves includes fuel/day over production/per day, the monitoring frequency during the crediting period shall be at least daily).
- The fuel consumption QFij (item 1 in tables 2.1 and 2.3) is not reflected in the formulae, neither in the baseline, nor in the monitoring methodology. The corresponding formulae should therefore be updated.
- Item 1 in table 2.3 may be deleted, since the fuel consumption in the *project scenario* is not necessary to determine *baseline emissions*.
- Parameters relating to ACM 0002 may be deleted here, since they are included in the monitoring methodology of ACM 0002. They should be monitored according to that methodology.
- IPCC parameters should be updated once the new guidelines are available.

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

>>

1. Items 4, 5, 6, 22 in table 2.3.
2. Item 21 in table 2.3

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

>>

1. The data is appropriate since these are calculated values.
2. It might be necessary to monitor the mode of operation of the fuel-to-electricity equipment more frequently depending on the possible frequency of the on/off mode. See also relevant discussion for the baseline methodology. Moreover, the value should not be estimated, but measured. This should be possible using meter data of electricity generation.

c) *State possible data gaps:*

>>

- The monitoring methodology only provides information on what information is to be monitored *after* project start and how. However, since the determination of the correlation curves between fuel consumption, electricity purchase/sale and production prior to project start is the basis for determining baseline emissions, the monitoring methodology should also provide information on how to monitor the data *prior* to project start.
- The lower heating values as well as the emission factors of fuels may have to be monitored (see also discussion in section 2)).

(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:

>> Principally, the monitoring methodology is described appropriately. However, it provokes some confusion on which parameters are relevant for the baseline and which for the project case.

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):

>> Yes, in principle it is appropriate.

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

>>Yes, in principle it is compatible with the baseline methodology.

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

>> For the monitoring of leakage, only the fuel use in the project and the baseline is relevant. This is calculated in the relevant sections. For this reason item 1 and 5 in table 4.1 may be deleted. It is conservative not to monitor the transport emission factor, since it can be expected that it decreases over time (increasing transport efficiency). Therefore, leakage emissions are possibly overestimated, which is conservative. IPCC values should be updated, once the revised guidelines are available. Leakage shall only be considered if leakage emissions are positive. In most cases, they will be negative. In these cases, leakage shall be neglected.

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

>> The QA/QC procedures for items 1 and 3 in table 7 should be substantiated. Especially prior to project implementation (for the determination of the correlation curves) it is of great importance to have reliable measurement appliances in place, since these determine, later on, the baseline emissions. The authors should therefore elaborate further on these parameters. During the crediting period, item 3 should be monitored with a sufficient level of confidence (see also discussion related to recording frequency). QA/QC measures should be foreseen for this purpose. Items 1 and 7 during the crediting period are less sensitive, since the recording frequency may be low. Still, standard QA/QC measures should be in place.

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

>> See section A II ii)

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

>> In principle the proposed methodology is applicable to all project types which fulfil the applicability conditions and across all regions.

(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 methodology.

b) Indicate any further comments:

>> None.

Signature of desk reviewer ……  ……..   Date: 2005/07/25

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