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	NM0119

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):

>> If this methodology incorporates certain improvements and is approved it would be applicable for projects that:

1. Involve energy efficiency, cogeneration and/or self-generation projects at large industrial facilities
2. Are justified as additional using EB 16 Annex 1 “Tool For the Demonstration And Assessment of Additionality” and that the baseline is current practice
3. Are installed at an industrial facility where:
    a. Baseline emission rates can be determined using a statistically valid calibrated model that includes industrial production volumes as the sole independent variable for determining electricity and fuel (e.g., natural, fuel oil, etc.) baseline consumption.
    b. Circumstances giving rise to an eventual interdependence between fuel consumption and electricity purchase/sale can be identified, and their effects separated, in such a way that fuel consumption and electricity purchase/sale are independent variables, removing the constraints among them, if any. This includes, for example, the case of existing equipment consuming steam from boilers (burning fuels) for producing electricity (e.g. using a turbo-steam generator) that is converted to mechanical energy by other equipment. It is required that the operating modality of this equipment (on/off) is not affected by the project activity, in order to assume that this operating modality is the same for both, the baseline and project scenarios.
    c. At least three year’s worth of validated historical data are available concerning fuel usage, electricity usage, production volumes, and emission factors for electricity and fuel usage.
    d. There are no significant modifications to the industrial facility that would impact

energy use or emissions, during the project crediting period. (This may not be valid for one of the facilities described in the PDD, which is undergoing a doubling in production capacity)

e. There is only primary product at the facility and its production method and characteristics do not change during the crediting period

f. There is no fuel switching and no change in proportions of different fuels used prior to and after project installation

4. Displace grid electricity whose emission factors can be defined using ACM0002.

ii. Strengths and weaknesses of the methodology:

>>

Strengths:

- Well organized and prepared.
- Builds on approved methodologies
- Relies on what may be readily available and verifiable data.

Weaknesses:

- Is so specific in terms of requirements for validity that it may not be able to be generalized for a wide variety of projects
- Requires three years of adequate data and that viable correlations be established between facility energy use and (only) production volumes

iii. Any changes needed to improve the methodology:

a. Minor changes:>>

- Address leakage issue of transferring production from one facility to another
- Move all project emissions (for electricity and steam) to the project emissions equation and out of equation for baseline – make sure all "signs" (+ or -) are correct in equations

b. Major changes:>>

- Provide clearer criteria for having a statistically valid relationship between (a) baseline fuel and electricity consumption and emissions and (b) facility associated production values.
- Address any process changes that can affect greenhouse gas emissions, for example by the addition of an entrainer or mass separating agent for the azeotropic distillation
- Document the validity of using two algorithms, one for electricity versus production volume and one for fuel use versus production volume, and show that the operating modality of the electricity generating equipment (on/off) is not affected by the project activity, in order to assume, for baseline emissions calculations, that this operating modality is the same for both, the baseline and project scenarios.

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):

>> If this methodology incorporates certain improvements and is approved it would be applicable for projects that meet the criteria described above (A1i) and for which data can be collected on historical and post-installation project (a) industrial production quantities, (b) on-site electricity and fuel use, and (c) grid electricity characteristics in terms of emission rates per unit of electricity production. In

addition, data are required on fuel characteristics and post-project installation electricity sales to grid, if any.

ii. Strengths and weaknesses of the methodology:

>> Strengths:

- Well organized and prepared
- Builds on approved methodologies
- Relies on what may be readily available and verifiable data

Weaknesses:

- Is so specific in terms of requirements for validity that it may not be able to be generalized for a wide variety of projects
- Requires three years of adequate data and that viable correlations be established between facility energy use and (only) production volumes
- Requires a stronger QC/QA regimen

iii. Any changes needed to improve the methodology:

a. Minor changes:>> The words "Option 1" should be removed from title of section B.2

b. Major changes:>>

- Clarify source of emission factors for fuels consumed at facility, IPCC or site-specific, and how values will be obtained if they are site-specific
- Information on production at facility needs to be more detailed than just units of mass or volume, but include information on product characteristics so that it can be determined if product characteristics have changed since the baseline algorithms have been determined.
- Provide more guidance on how QA/QC procedures can be enforced and verified, particularly given the possible significant reliance on hand-written records; address using billing meters and their accuracy and calibration. Consider independent audits.

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:

a) Describe the methodology:

>> Additionality is determined using "Tools for the demonstration and assessment of additionality (Annex 1 to EB 16 Report)" – although it is not referenced as such. The barrier analysis approach is used.

Baseline fuel and electricity consumption are determined with two regression equations that correlate (a) fuel consumption to industrial process production levels and (b) electricity consumption to industrial process production levels.

For baseline emissions associated with the purchase or sale of grid-based electricity, the consolidated baseline methodology ACM0002 "Consolidated baseline methodology for grid connected electricity generation from renewable sources" or the small-scale methodology is used to determine emission factors. Baseline emissions associated with fuel are calculated using local values or IPCC emissions factors multiplied times annual baseline energy use. For the purchase of electricity from individual facilities, those facilities' emission characteristics shall be used.

b) State the approach selected:

>>48(a) of the CDM M&P – Existing 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:
>> It is appropriate given the reliance on actual data for baseline emissions assessment. However, should it be decided that the baseline should be determined using either the "financially attractive alternative" approach or the "similar project" approach – then changes will be required.

(2) Basis for determining the baseline scenario:

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

>>yes

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

- Baseline electricity and fuel usage can be accurately correlated to production rates
- The use of a combined margin (as outlined in ACM0002) is an appropriate basis to calculate emission reductions from avoided electricity generation.
- The project will displace historic fuel and electricity consumption at the facility
- There will be no modifications of industrial process (or product) during the crediting period, no fuel switching and the selection of fuels (and electricity) purchases will not change

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?
>> Documentation is provided. The documentation provided is based on EB 16 Annex 1 "tool for the demonstration and assessment of additionality".

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

>> The basis for determining the baseline scenario and additionality is appropriate and adequate with possible exception that to make this methodology more generic it should clearly include the investment analysis approach that shows whether the proposed project is cost effective with or without CDM.

(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 methodology is described adequately, however while there is a discussion of requirements for statistical validity of the equations, the specific criteria are not presently clearly.

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):
>> Generally speaking the proposed methodology is appropriate, but additional documentation is required to demonstrate that:

- the project is not the baseline though an investment analysis
- there is a valid correlation between fuel and electricity usage and production rates

Also, the Altamira plant information indicates the production rate will increase form 450,000 to 900,000 tpy – a doubling. Thus, it is quite possible that (a) modifications such as this project were required to make the expansion and that (b) baseline correlations for production versus fuel and electricity consumption, based on baseline production volumes, will NOT be valid at the much higher production volumes to be seen in the project case.

And, The Cosoleacaque plant was built in 1978 and is listed as having a life of "more than 30 years". Since a 10 year lifetime of emission reduction is being claimed, it should be confirmed that the plant has a useful life through the crediting period and would not require significant modifications (that should be the baseline).

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.
>> The documentation is adequate, with some minor changes.

Please explain:
>> Clearer indication of the tests and criteria for statistical validity are required. The current version of the methodology indicates basic statistical concepts but does not clearly specify the requirements for proving that the relationships between production volumes and electricity and fuel use are valid.

(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):

>> Generic formulas are provided for baseline and project emissions that could be used in a general methodology for other projects. However, the baseline emissions formula includes a term for project electricity related consumption and I believe this term should not be included in the baseline formula, but instead placed appropriately into the project emissions formula. I am also not sure if the signs (+/-) have been properly applied in the baseline formula with respect to electricity usage.

There is text on basic statistical modeling technologies that could be applied to this type of project. This is a key and difficult issue for all industrial facilities where baseline energy use can vary based on changes during the project period with respect to production volumes, product types and characteristics, and/or other factors that can change baseline energy use depending on the industrial process in question. It would probably be better if the statistical discussion was written more specifically for this type of project with an indication of specific tests for validity and a discussion of other factors that may determine emissions other than just production volumes. See F-CDM-NMmp Ver 04 – NM0086 for suggestions.

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

>> Fuel consumption data correspond to the industrial facility. Parameters needed to determine the emission factor for grid-connected electricity generation depend on the wholesale electricity market and power plants connected to the grid in question. The information related to on-site fuel and electricity consumption is "local" and the displaced emissions form grid electricity is "national". The scope is appropriate.

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:
>> The methodology calls for evaluation of fuel and energy consumption baseline data from a period starting at least three years prior to project implementation. This, may or may not be adequate if (i) the data are available, (ii) if the data leads to a statically valid regression analysis, and (iii) the data can be shown to be accurate and valid and cover a range of operating scenarios that are reasonably expected to occur during the project crediting period.

(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

>> Fuels used both in the baseline scenario and in the project case are used. CO_2, NO_2 and CH_4 are included in algorithms

ii) Physical delineation

>>The project boundary encompasses the site of the industrial facilities

b) Indicate whether this project boundary is appropriate:

>> In general it should be with the caveat that electricity grid plants (utility and privately owed) are also included within the boundary for the purpose of calculating emission reductions.

(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:

- Carbon dioxide emission factor per unit energy of fuel i (e.g. tCO2/GJ)
- Methane emission factor per unit energy of fuel i (e.g. tCH4/GJ)
- Nitrous oxide emission factor per unit of energy of fuel i (e.g. tN2O/GJ)
- Baseline emission factor from energy generation, including electricity generation by the grid and/or a private plant (e.g. tCO2/MWh).
- No energy-intensive equipment would be replaced during the crediting period under business as usual (BAU) and no major changes in operation at the project sites.
- There is no fuel switching and no change in proportions of different fuels used prior to and after project installation. Situations that cause a facility to use different proportions of electricity or fuel do not change from baseline to project scenarios.
- Adequate historical data are available
- The most important implicit assumption is the validity of the changing baseline energy and emissions, up or down, *based on product production rates*.

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

>> The key assumptions concerning the baseline data and electric grid markets are transparent with the exception of:

- Lack of information, as noted above, on production versus energy use for the baseline. It should be noted that the PDD indicates that the baseline energy use and production rates data are “scattered” which does not inspire confidence in the method or results, particularly since the data and analyses are not provided.
- This reviewer has concerns about proving the validity of making the assumption that “Circumstances giving rise to an eventual interdependence between fuel consumption and electricity purchase/sale can be identified, and their effects separated, in such a way that fuel consumption and electricity purchase/sale are independent variables, removing the constraints among them, if any.” This is a key assumption in the analyses and needs to be

validated for each project, in so much that the reasons for maximizing either electricity purchases or electricity production do not vary from the baseline through the 10 years of the crediting period. Perhaps the way to do this is to show clear patterns during the baseline that can be correlated to controlling factors that are not changing.

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

>> The assumptions can only be shown to be adequate, on a case by case basis, if the regressions models correlating fuel use and electricity use to production rates are shown to be valid over the full range of project production volumes.

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

>> According to the information on page 18 of the CDM-NMB, the following parameters and data are collected from various sources and used in the CDM-NMB:

- For CO_2 factors: 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), or IPCC default emission factors. IPCC default values.
- For Methane and Nitrous Oxide emissions factors: IPCC Default Factors
- For electricity factors: ACM0002 "Consolidated methodology for grid-connected renewable electricity generation from renewable sources." Simplified methodology for small-scale CDM project activities (for electricity generation less than 15 MW equivalent), and if the project activity involves purchase of electricity from isolated power plants, the emission factors provided by power plant owners shall be used, unless the electricity is displaced indirectly from the grid.

On-site data, such as acid production rates and baseline fuel usage, rely on company provided documentation. The QA/QC process is not transparently described.

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

>> Use of official data is adequate. Use of facility data requires an audit documentation procedure.

f) State possible data gaps:

>> The data gaps may consist of historical on site energy usage and production data, and post-installation project fuel and electricity usage.

(7) Assessment of uncertainties:

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

i) The basis for determining the baseline scenario:

>>yes

ii) Algorithms/formulae:

>>yes

iii) Key ayessumptions:

>>yes

iv) Data:

>>no

b) State whether the uncertainties presented are reasonable:

>>Two of the key assumptions are mentioned and they are reasonable if the project conforms to the requirements:

- The ex-post baseline fuel consumption and electricity purchases and sales will be determined through the relations established prior to project implementation, based on measurements of the production in the monitoring process.
- The methodology also assumes that, in the baseline scenario the same type and proportion of fuels are consumed as in the project.

(8) Leakage:

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

a) >> The methodology addresses leakage from upstream fuel production and delivery. For a generic methodology the primary potentials for leakage come from:

- Movement of production of the industrial product (acid in this case) to or from this facility from where it is produced to another facility with higher emission rates
- Any process changes that should be evaluated for their possible emission impacts

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

>> The limited discussion of leakage is probably adequate and conservative for this specific project with the condition that the following items be included within the project boundary (1) all fuel use at the project site(s) and (2) all power purchase from the grid and/or private parties for any use at the project site(s).

(9) Transparency and "conservativeness":

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

>>yes

b) State whether the baseline methodology is conservative:

b) >> Without further documentation and validation, which would need to be done on a project by project basis, it is not possible to tell whether the methodology is conservative or not.

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

>> Strengths:

- Well organized and prepared.
- Builds on approved methodologies.
- Relies on what may be readily available and verifiable data.

Weaknesses:

- Is so specific in terms of requirements for validity that it may not be able to be generalized for a wide variety of projects
- Requires three years of adequate data and that viable correlations be established between facility energy use and (only) production volumes

(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 are examined.

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

>> This methodology would be limited to projects for which:

- Baseline emission rates can be determined using a statistically valid calibrated model which includes industrial production volumes as the sole independent variable for determining electricity and fuel consumption;
- Circumstances giving rise to an eventual interdependence between fuel consumption and electricity purchase/sale can be identified, and their effects separated
- At least three year's worth of validated historical data are available
- There are no significant modifications to the industrial facility that would impact energy use, during the project crediting period.
- There is no fuel switching and no change in proportions of different fuels used prior to and after project installation

(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:

>> Reviews completed for NM0086 available UNFCC CDM web site

b) Indicate any further comments:

>> These versions of the Baseline and Monitoring methodologies have significant improvements over the versions submitted for NM0086, primarily based on narrowing the scope of the project and the methodologies. However, that does mean that the types of applicable projects are quite narrow, particularly in terms of restricting to projects at facilities with little to no changes during the crediting period. The result may be that this becomes a valid project specific, versus generic, methodology.

See F-CDM-Nmex Ver 04 for NM0086, by Ming Ying, item II.9 for some issues that my not be resolved in the PDD.

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:

>> The proposed methodology primarily involves collection of data on baseline and project (a) fuel consumed and electricity purchased and sold, (b) production rates of the facility product (c) fuel emission factors (indicated in text to be site specific or IPCC but not indicated in B.2.3), and (d) displaced electricity emission factors (ACM0002). The collected data are then used to estimate emissions reductions.

The methodology for this type of project is relatively simple and with post-project installation monitoring of all fuel usage and electricity usage (and sales) the emission savings can be calculated without concern for accuracy of initial estimates of emission reductions with one large caveat. This caveat is that the baseline energy (fuel and electricity) consumption, and thus emissions, can be calculated from information about project term production volumes with the use of a baseline model.

(2) Key assumptions/parameters:

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

>> Major assumptions are:

- There are accurate data available on fuel and electricity usage for the prior three years at each facility – unknown in terms of validity as data were not provided for this specific project
- There are no major changes to the facility during the term of the project and the product being produced at the facility does not change during the term of the project. At least one of the proposed facility sites (in the PDD) is undergoing major changes to double its production capacity.
- A correlation can be made between production volume and baseline electricity and fuel usage – unknown in terms of validity as the analysis and data were not provided for this specific project
- Information is available to calculate grid and private party electricity emissions factors - unknown in terms of validity since data and analyses were not provided for this specific project
- Use of site specific or IPCC factors for various fuel type used on site and leakage calculations

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

>>yes

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

>>It is possible that the regression analysis will result in a valid set of algorithms and that there will not be any significant changes at both facilities during the term of the project, but it most be demonstrated for each project. This may be particularly difficult to show for the Altamira plant which appears to be undergoing a doubling in production capacity, as indicated in the PDD.

(3) Data sources and data quality:

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

>> The data come from:

- Industrial facility
- Power grid and/or private plant

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

>> The use of metered data from billing records or government reporting information would be preferable to what is assumed to be manual data collection by facility staff with paper records.

c) *State possible data gaps:*

>>. Need to ensure that there is sufficient and valid data available for:

- Modelling of baseline energy use and calculation of project emissions.
- Confirming other requirements for methodology validation – such as no changes to product, no fuel switching and no major changes to facility that effect energy usage

(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:

>> 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-NMM):

>>Yes, if the criteria shown in A.I.i can be shown to be met with additional documentation not provided in the PDD – e.g., a statically set of energy versus production models and that there will be no change sin product or the plants over the next 10 years. As indicated above this may be particularly difficult to show for the Altamira plant.

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

>> The methodology is compatible with the baseline methodology

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

>> The NMM indicates "The methodology addresses leakage from upstream fuel production and delivery. Emissions from fuel production, pipeline and distribution, and CO_2 emissions from fuel transportation are considered as leakage. Emissions from fuel production/transportation are counted only if the fuel is produced/transported in a non-Annex I country." However, no leakage due to shifts in production are included nor is leakage considered due to changes in the industrial process associated with the project.

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

>> QA/QC is covered but with limited descriptions of what the QA/QC procedures will actually be and how they ensure data integrity, accuracy, etc. As emissions estimates are wholly dependent on energy consumption and production volumes information, the quality and accuracy of the data are critical. Note that there is more information than was provided in NM0086. One option is an independent audit function for the data.

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

>> Strengths:

- Well organized and prepared.
- Builds on approved methodologies.
- Relies on what may be readily available and verifiable data.

Weaknesses:

- Is so specific in terms of requirements for validity that it may not be able to be generalized for a wide variety of projects
- Requires three years of adequate data and that viable correlations be established between facility energy use and (only) production volumes
- Requires a stronger QC/QA regimen

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

>> This methodology would be limited to projects that

- Baseline emission rates can be determined using a statistically valid calibrated model which includes industrial production volumes as the sole independent variable for determining electricity and fuel consumption;
- Circumstances giving rise to an eventual interdependence between fuel consumption and electricity purchase/sale can be identified, and their effects separated
- At least three year's worth of validated historical data are available
- There are no significant modifications to the industrial facility that would impact energy use, during the project-crediting period.

- There is no fuel switching and no change in proportions of different fuels used prior to and after project installation

(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:

>>Reviews completed for NM0086 available UNFCC CDM web site

b) Indicate any further comments:

>>NA

Signature of desk reviewer 

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Date: 25 / 07 /2005

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