CDM: Proposed New Methodology
Meth Panel recommendation to the Executive Board
(version 04)
(To be used by the Meth Panel to make a recommendation to the Board regarding a proposed new methodology)

Date of Meth Panel meeting:	6 - 9 September 2005
Related F-CDM-NM document ID number (electronically available to EB members)	F-CDM-NM0122: "Shell Cogeneration Project"
Related F-CDM-NMex document ID number(s) (electronically available to EB members)	F-CDM-NMex0122: Grütter / Sharma
Related F-CDM-NMpu document ID number(s) (electronically available to EB members)	F-CDM-NMpu0122: Murayama Shigeo

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. Final recommendations by the Meth Panel

I. Recommendation on the proposed new baseline methodology: *(checkmark the choice made)*

Title of proposed new baseline methodology:>> Cogeneration at an Industrial Facility.

a. To approve this proposed methodology with minor changes

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

>>

ii. Minor changes:

>>

b. To reconsider this proposed methodology, subject to required changes

☐

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

>>

ii. Required changes:

>>

(Project participants shall make required changes to the proposed new methodology and send it back to the Meth Panel. The proposed new methodology will be reconsidered by the Meth Panel if changes required are made by the project participants. The Executive Board will only consider this proposed new methodology after the revised proposed methodology has been reconsidered by the Meth Panel.)

c. Not to approve the proposed methodology

☒

i. Reasons for non-approval:

>>

- The methodology does not clearly explain how emission reductions will be computed. Two different approaches for baseline emission determination seem to be proposed and it is not clear how these approaches relate to each other. Thermodynamic analysis is used for calculating ex ante and ex post baseline emissions, but this approach is not associated with mathematical formulas. Use of absolute emissions due to fuel consumption in the baseline and project scenario is not a correct approach. This is a fundamental issue to the methodology and resolving it will lead to a requirement of a full review.
- The methodology is not adequately independent of the draft CDM-PDD.
- Fuel consumptions are related to activity level of the industry without giving details of how this would apply to the methodology. A statistical relationship between baseline fuel consumption and activity level is indicated, but no clear details are given.
- Applicability conditions in relation to effects on project emissions due to changes at the industrial facility. Supply of steam to the industrial facility is assumed, and it is not clear how the interrupted supply of steam to the facility would affect project emissions, or how the output efficiency of the industrial facility would impact the emission reductions.
- Methodology needs to explain how legal and regulatory issues as well as national and/or sectoral policies and circumstances are taken into account rather than quoting the guidelines on this section.
- The methodology lacks explanations on assumptions and uncertainties.
- Leakage has not been adequately described (see section 8 below).

(A new proposal should be submitted in accordance with the procedures for submission and consideration of proposed new methodologies of the Executive Board.)

II. Recommendation on the proposed new monitoring methodology: *(checkmark the choice made)*

Title of proposed new monitoring methodology: >> Cogeneration at an industrial facility.

a. To approve this proposed methodology with minor changes

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

>>

ii. Minor changes:

>>

b. To reconsider this proposed methodology, subjected to required changes

☐

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

>>

ii. Required changes:

>>

(Project participants shall make required changes in the proposed new methodology and send it back to the Meth Panel. The proposed new methodology will be reconsidered by the Meth Panel if changes required are correctly made by the project participants. The Executive Board will only consider this proposed new methodology after required changes proposed have been made and the revised proposed methodology has been reconsidered by the Meth Panel.)

c. Not to approve the proposed methodology

☒

i. Reasons for non-approval:

>> The methodology must be applicable to the conditions of the baseline methodology.

(A new proposal should be submitted in accordance with the procedures for submission and consideration of proposed new methodologies of the Executive Board.)

B. Details of the evaluation of the proposed new methodology by the Meth Panel:

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 a project activity that involves the installation of a gas turbine generation system at a refinery in order to generate electricity. The waste heat from the gas turbine would also be used to supply part of the demand for steam at the power plant. The remainder of the steam demand would be met by equipment and installations existing prior to project implementation. As a result, there would be an improvement in plant efficiency in a thermodynamic sense, while generated electricity in excess of plant requirements would be supplied to the power grid, offsetting generation and emissions elsewhere. The installation of the natural-gas-fired gas turbine is said to involve fuel switching, whereby more carbon intensive petroleum fuels are replaced by natural gas.

For combined margin emission factors the methodology incorporates ACM0002 "Consolidated methodology for grid-connected electricity generation from renewable sources", and contemplates using as an alternative the small-scale methodology I. D. Additionality is analysed using the "Tool for the demonstration and assessment of additionality". The methodology also uses equations from AM0008 "Industrial fuel switching from coal and petroleum fuels to natural gas without extension of capacity and lifetime of the facility"for determining emissions at an industrial facility.

Emissions due to fuel consumptions in the baseline and project case are based on absolute consumption rates, and an additional thermodynamic analysis approach is used for calculating ex ante and ex post baseline emissions without any associated mathematical formulas. A statistical relationship between baseline fuel consumption and activity level is indicated, but no clear details are given.

b) State the approach selected:

>> The approach selected is as per paragraph 48 (a) of the CDM modalities and procedures: "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:

>> Approach 48(a) may be used in certain aspects of the project, e.g, fuel change to natural gas. However, the methodology has to provide evidence that the continuation of the current practice in absence of the registration as a CDM project is the most probable scenario. This is because introduction of a new technology, the gas turbine, creates a more efficient mode of operation and replaces some of the old equipment. 48(a) would be accurate if increased output level could be achieved with the old equipment. Therefore 48(c) might be more appropriate in the present case.

(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):

>>

- Baseline fuel usage to determine emissions, average over a three year period;
- Use of a combined margin approach to calculate emission reductions from displaced grid electricity;
- Use of electricity purchases to determine baseline emissions;
- Use of average heat output and electricity generation in association with baseline and project emission.

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 it does, using the 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 is appropriate though inadequate. The basis for determining additionality is appropriate and adequate. However, while the investment analysis is not mandatory, justification for its exclusion is inappropriate. The investment analysis can be made using hurdle rates and including sensitivity analysis.

(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 has not been described adequately. The following aspects in the methodology are not very clearly stated:

- The boundary of the project includes the equipments generating heat and/or electricity leaving out the other components of the industrial facility where the generated energy is used. The methodology is silent on the source of fuel used within the project boundary, whether these are procured or generated at the industrial facility or both. This has an important bearing on emission reduction since the proposed methodology does envisage changes in the existing fuel use.
- Natural gas is to be the new fuel in the project in conditions where there is inadequate supply of the fuel. This is likely to prompt leakage. Source and supply terms of this fuel have to be explained.
- The description of steps to estimate the baseline "dynamically" is not clear in the methodology, (one is able to understand the process only after reading the application of this step in the draft CDM-PDD):
  - It is stated that ex-post estimation, based on the steam output of facility within the project boundary, is done to account for changes in activity level of industrial facility. It is not explained why such changes in the activity level are expected. And how the methodology will address the issue of differentiating between the changes in activity level due to factors that are independent of proposed CDM project implementation and others.
  - Clearer criteria for having a statistically valid relationship between fuel consumptions and heat and electricity outputs need to be given, for both baseline and project cases.
  - The ex-post estimation of baseline is based on energy consumption per unit of steam produced from the installed equipments, as understood from application of the methodology in draft CDM-PDD (though the CDM-NMB defines it as ratio of energy input to enthalpy of steam and electricity output). This in the case of the example project is High Pressure Steam (HPS). One also understands from the project that consumption of steam by the industrial facility is not HPS, but medium pressure steam (MPS), extracted from steam generation turbines used for generating electricity from HPS. Therefore, the basis of calculating the energy consumption per unit steam

should be MPS, as this is expected to remain invariant to equipment configuration within the project boundary. One could envisage a situation where in the project scenario a boiler-turbine combination is installed purely for producing electricity. Since this would result in increased production of HPS, the methodology as suggested will estimate baseline fuel consumption higher than that based on historical data.

- The formulae described for the baseline estimation does not reflect the ex-post baseline calculation method described in the methodology.

- Some of applicability conditions of the methodology have been stated in Sections other than Section A.3. Section D.1 states that methodology is applicable to projects where continuation of present situation is the only feasible baseline scenario. Similarly in Section D.4, it is stated that the methodology is not applicable to projects where the proposed project activity will result in replacement of existing cogeneration equipment that is at the end of its useful life.
- The justification for the choice of approach is not clearly stated.

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, it is not 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.

>> No, it would not.

Please explain:

>> The methodology is not clear on a number of issues to reasonably say its application would capture accurate quantification of GHG emission reductions. Equipment in the baseline scenario includes steam turbines and boilers, and use of a number of fuels. It is not clear what are the conditions for use of the different fuels used, and how they relate to equipment. How the equipment relates to fuel use and output is not clear.

Furthermore, the introduction of gas turbine on old equipment is not clear on which boilers are replaced.

(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):

>> The formulae described in the methodology are generic, but a number of issues need to be cleared for their applicability to be seen to hold. Dynamic baseline approach lacks mathematical description.

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

>>

- Project specific data: Baseline fuel consumption, baseline electricity purchase from the grid, project fuel consumption, and net electricity sales to grid in project situation. Project specific data for CO_2 emission factor for fuel is used where either there are significant variations in fuel properties or fuel is not widely used.
- National level data: CO_2 emission factor for fuel used based on national GHG inventory. In the absence of nation specific data, IPCC default emission factors as a last resort can be used.
- IPCC default data: methane emission factor and nitrous oxide emission factor for fuels used, fugitive methane emission from fuel produced and CO_2 emission factor for transportation fuel.
- National data for estimating grid emission factor is as defined in ACM0002.
- The spatial scope for data 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 historical data used is for three years prior to the start of the project activity. Rest of the data will

be based on project monitoring.

(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

>> Gases involved are CO_2, CH_4, and N_2O, from fuel consumption, electricity usage and sales and fugitive emission. These have not been mentioned in the project boundary section.

ii) Physical delineation

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

b) Indicate whether this project boundary is appropriate:

>> The proposed methodology defines the project boundary as all equipments producing steam and/or electricity, whereas the role of boilers in the activity is not quite clear. Changes in steam supplied by the boilers could affect both the project and 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:

>> No assumptions have been given in the methodology. Perceived assumptions include:
Explicit assumptions: As proxy for activity levels the steam enthalpy output is used. A stable relationship between steam and electricity output and fuel consumption is assumed. The steam output can thus be used as a proxy for activity levels of the industry.
Implicit assumptions: No surplus steam production.

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

>> Assumptions not given.

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

>> Assumptions not given.

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

>> Three main data sources are used (i) project specific data, (ii) National GHG inventory, and (iii) IPCC. The data sources for estimating grid electricity emission factor are in accordance to data defined in the ACM0002 "Consolidated methodology for grid-connected electricity generation from renewable sources".

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

>> Data used are adequate, consistent, accurate and reliable to the extent the methodology has defined the variables. Changes to the methodology will necessitate additional data and information.

f) State possible data gaps:

>> None that are critical.

(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:

>> Yes

iii) Key assumptions:

>> No

iv) Data:

>> No

b) State whether the uncertainties presented are reasonable:

>> More assessment of uncertainties required.

(8) Leakage:

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

>> The baseline methodology considers leakage from (i) fugitive methane emission from production of fuel used at the project site; and (ii) emissions from transportation of fuel.

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

>> The treatment of leakage is not adequate because as natural gas is stated to be in limited supply, it should discuss leakage in association with use of this fuel by the new gas turbine.

(9) Transparency and "conservativeness":

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

>> The methodology has made a good effort at transparency, with several exceptions like lack of discussion of basic assumptions made in the methodology.

b) State whether the baseline methodology is conservative:

>> Methodology could not result in non-conservative estimate of baseline. The methodology considers as part of the baseline non-CO_2 emissions, and this could be regarded as non-conservative.

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

>>

Strengths:

- The methodology is simple and the data requirement is easy to address.
- Based partially on approved methodologies.
- Can be widely applied.

Weaknesses:

- The methodology doesn't provide sufficient detail to translate the methodology into estimation of emission reduction.
- The methodology doesn't address the situation where the implicit assumptions do not hold.

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

>> The methodology does not explain in detail how 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, but rather quotes the guidelines on this section.

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

>> The methodology could be applied to similar project types in different regions if the required improvements are made.

(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:

>> AM0014 "Natural gas-based package cogeneration"ACM0002 "Consolidated methodology for grid-connected electricity generation from renewable sources", Tool for the demonstration and assessment of additionality", NM0077 "Shell Fuel Switching and Cogeneration Project "and comments related to NM0077 "Shell Fuel Switching and Cogeneration Project".

b) Indicate any further comments:

>> None.

II. Proposed new monitoring methodology *(specify title here):* >> Monitoring Methodology for cogeneration 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 methodology is based on monitoring the following items:

- Fuel used to produce heat and electricity for use at an industrial facility to determine the project emissions.
- Electricity imports/exports to the facility.
- Heat output of the cogeneration system to estimate emission associated with fuel consumption in the baseline.
- Key parameter of grid to estimate grid electricity emission factor, as defined in monitoring methodology of ACM0002 "Consolidated methodology for grid-connected electricity generation from renewable sources"or AMS I.D. "Renewable electricity generation for a grid".

(2) Key assumptions/parameters:

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

>> There are no assumptions listed in any of the section describing the methodology.

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

>> Assumptions not stated.

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

>> Assumptions not stated.

(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):

>> Three data sources are used in the methodology – project specific data (for estimating total steam output of project, fuel consumption of the project, and electricity imported (in baseline) and exported (in project case) from the grid; National/ Governmental publications for sourcing CO_2 emission factor for fuels used and for estimating the grid electricity emission factor; IPCC default values for methane emission factor, nitrous oxide emission factor, and fugitive methane emission factor.

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

>> Data may not be adequate.

c) S*tate possible data gaps:*

>> The data gaps in the methodology are related to the gaps in the baseline methodology. The baseline methodology doesn't define the following formulae for: (i) thermodynamically estimating ex-ante baseline and project emissions; (ii) ex-post estimation of baseline fuel consumption using project monitored data on steam output; and (iii) estimating fuel consumed in baseline and project case for transportation of fuel. All the data related to these formulae are the data gaps of the methodology.

(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:

>> No. The monitoring methodology doesn't suggest data to be collected/monitored for estimating (i) the historical data to be recorded for using the ex-post estimation of baseline emission, and (ii) fuel consumption for transporting fuel. For the later, the methodology argues that it is an estimated value, therefore, need not be monitored. But the estimation will be based on certain project related information and cannot be independent of it.

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):

>>No, it is not.

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

>> Yes, but with limited compatibility.

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

>> The limitation in leakage related monitoring arises from limitation in the baseline methodology. As the baseline methodology has not defined the leakage estimation appropriately, the monitoring of information for leakage assessment is not adequately addressed.
Furthermore, use of natural gas as the new fuel could cause leakage. This would need monitoring.

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

>> The QC/QA table B7 only states what the data variable information will be used for. No details of QC/QA are provided in the table.

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

>>

Strength:

- The methodology captures all the important data to be monitored for estimation of emission reduction as defined in the baseline methodology. The methodology uses public and verifiable sources for sourcing data and also gives preference to national level data over default parameter values.

Weaknesses:

- The weakness is the monitoring methodologies are related to the weakness in the baseline methodology.
- The methodology doesn't provide QC/QA procedures.

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

>> With the necessary required changes, the methodology could be used across similar projects in different 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:

>> None

b) Indicate any further comments:

>> No further comments.

Signature of Meth Panel Chair ……..

Date: 14/09/2005 *(Jean-Jacques Becker)*

Signature of Meth Panel Vice-Chair ……..

Date: 14/09/2005 *(José Miguez)*

Information to be completed by the secretariat	
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