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-NM0113: "Mondi Gas Turbine Co-generation in Richards Bay, South Africa "
Related F-CDM-NMex document ID number(s) (electronically available to EB members)	F-CDM-NMex0113: Sarkar / Winkler
Related F-CDM-NMpu document ID number(s) (electronically available to EB members)	F-CDM-NMpu0113: Takao

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:>> Gas powered combined cycle cogeneration replacing coal based steam generation and grid electricity.

a. To approve this proposed methodology with minor changes

☐

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

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i. Reasons for non-approval:

>> This methodology is well designed in many ways, and introduces a novel process worthy of close consideration. The proponent has provided some clarifications and improvements during the feedback loop. However the project type and context are quite complex, and the methodology proposed appears insufficient to effectively define and characterize the baseline situation.

In particular, it appears that in the draft CDM-PDD example a coal-to-gas facility is importing natural gas to provide for (synthetic) gas supply beyond what its current coal gasification capacity can allow. It also appears that the paper mill (in the draft CDM-PDD project site) can access this synthetic via existing pipelines from Sasol (the synthetic gas supplier) less expensively that via a (new?) natural gas pipeline. Thus, it appears that this could be a rather unique case. In principle, there appear to be good emission-reducing opportunities here, however the methodological issues, are significant and are not adequately considered in the CDM-NMB and CDM-NMM. .

For instance, based on the clarifications, it appears that the gas supplied in the draft CDM-PDD case is not "synthetic gas" as often referred to in the literature and practice (CO and H_2), but rather a "methane-rich" (90% CH_4) synthetic gas that is quite specific to the draft CDM-PDD project's context. Looking at the flow diagram now provided on p.8 and chemical compositions shown on p.7, it appears that the input natural gas mixes with the coal gasification products, these are then reformed together before the methane rich gas is extracted. Therefore, it is not clear how it can be stated, from a technical standpoint, that the gas supplied to this project is derived purely from natural gas, nor how can this be tracked over time. What distinguishes natural gas based synthetic gas from other coal-based synthetic gas produced by the facility? What if other project developers wish to do similar projects with the same SASOL coal gasification plant? Is a tracking mechanism needed to ensure that there is no double counting, i.e. to avoid a situation where two projects claim the same marginal fraction of the total synthetic gas production that can be attributed to natural gas rather than coal?

Important contextual information is provided for the project case (the draft CDM-PDD), however, the CDM-NMB does not appear to require this information. In other words, from a reading of the CDM-NMB, the application to a complex situation such as the one found in the draft CDM-PDD could not be readily inferred readily.

For example, the draft CDM-PDD does aim to address this question, in part by noting that:

"The additional synthetic natural gas supplied to the project could conceivably be supplied by additional coal gasification; the gasification capacity is already a constraint on the production capacity of the plant. Furthermore, it has been shown by mathematical modelling using the Aspen™ modelling package that, given this constraint, any additional supply of synthetic natural gas to clients must be made up by an equivalent quantity of natural gas supplied to the plant, and that the Green House Gas emissions of the coal to liquid plant are under these conditions independent of the volume of natural gas supplied up to the maximum supply capacity of methane rich gas to clients".

However this explanation is problematic in a number of respects:

- Most importantly, there is no corresponding procedure in the methodology that deals with development of baseline for the synthetic gas facility, or that deals with the question of coal vs. gas sources for the synthetic gas. In fact, we could find no mention in the CDM-NMM or CDM-NMB that even suggests the possibility that another fuel (e.g. coal) could be used to meet the project's synthetic gas demands. What appears in the draft CDM-PDD (e.g. mathematical modelling) may address some of the key questions, but would not appear to be required by the methodology.
- Were the above (Aspen modelling) approach to become part of the methodology, the

mathematical modelling procedure would need to be more transparent than provided here, along with the key assumptions and so forth.

- That gasification capacity is a constraint does not fully address the baseline question. For instance, if this project and others created enough synthetic gas demand, would it become profitable to expand capacity? Conversely, were other synthetic gas demands to decline, and gasification capacity were to be sufficient and natural gas use reduced? It is unclear how these seemingly plausible and relevant outcomes would be reflected in the methodology.

It appears likely that for this methodology or a similar one to work for this project context, the synthetic gas facility would need to be brought within the project boundary, with procedures to develop a synthetic gas manufacturing baseline (that consider how the gasification facility would operate and how it might evolve over time), as well as procedures to explicitly track the fuels used, plant emissions (e.g. are there fugitive CH_4 emissions at the plant? Or process fuel use?), and procedures to allocate input fuels (coal and gas) to specific synthetic gas users. (In some senses this would be parallel to a grid electricity methodology). There may be simpler ways to deal with this methodology (e.g. means to verify that the synthetic gas demand is truly only increasing natural gas, not coal inputs, to the facility), but they are not provided in the CDM-NMB and CDM-NMM.

The above points are the principal reasons for non-approval. In addition, there are a number of other areas that a resubmission would need to address.

- A clearer definition is of synthetic gas is still needed, and the applicability conditions need to be more carefully considered, given the peculiarities of this particular draft CDM-PDD circumstance.
- In spite of some improvements – text added to the summary description -- the methodology does not provide a clear method for the identification and selection of a most likely baseline scenario. It still only evaluates whether the project is part of the baseline scenario, but does not indicate how or which "alternative' is chosen as the baseline. Furthermore, these steps are only shown in the summary, but do not appear in the actual baseline procedure.
- Please be a bit clearer in the additionality section and elsewhere – e.g. does "below is *a* technology barrier test" (D.3) mean that it is part of the methodology? Vague terms like "mainly" in "The argument for the additionality of the project is based *mainly* on the technology barrier element…" are overly ambiguous for verification purposes.

  Avoided T&D losses are counted to increase baseline emissions and hence ultimately CERs (D.6, step 3 of the OM). While the rest of the combined margin for the electricity baseline is taken directly from ACM0002, this introduces a new element. No clear methodology is proposed for estimated T&D losses, other than being "supported by documentary evidence".

  It is important to define how this can be conservatively estimated, taking into account the location of the plant within the grid, and the voltage characteristics of the electricity supply (i.e. to ensure distribution losses are not erroneously attributed to high voltage customers). Furthermore, this should not be applied in the case of captive generation, which the equations in the draft CDM-PDD and CDM-NMB might suggest.
- Consult the remainder of this recommendation for additional comments.

(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: >> Gas powered combined cycle cogeneration replacing coal based steam generation and grid electricity.

a. To approve this proposed methodology with minor changes

☐

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

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i. Reasons for non-approval:

>> The key reasons are included in section A.I. on 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):* >> Gas powered combined cycle cogeneration replacing coal based steam generation and grid electricity.

(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:

>> Synthetic gas generated from natural gas with the emissions intensity per unit energy of natural gas equivalent (separately verified) is supplied by pipeline for the production of heat and power using a combined cycle gas turbine. The heat and electricity generated in the project activity is used at the industrial plant partly replacing existing sources of heat and power. The project activity heat replaces that generated by coal on site and the electricity from the project activity replaces that generated by coal on site and that imported from the national grid. The baseline emissions consist of existing actual emissions or historical emissions from the coal fired boilers and the emissions from the production of grid electricity taking into account transmission and distribution losses.

A combined margin methodology is used to calculate the baseline emissions for the electricity component, while the baseline emissions for heat draw on emissions factors for the various fuels. Additionality is established using the "Tool for the demonstration and assessment of additionality", with particular emphasis on technological barriers.

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:

>> The approach selected is appropriate.

(2) Basis for determining the baseline scenario:

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

>> It is described step-wise in the summary description as follows:

- Step 1: establish the alternative to the project activity.
- Step 2: assess which alternatives are plausible.
- Step 3: assess the investment requirements for the project activity base-case.
- Step 4: compare the investment requirements with the alternatives to the project activity.
- Step 5: establish whether the return on the base case is sufficient to allow it to proceed (if so the project activity is the baseline unless there are other barriers.)
- Step 6: assess the project for barriers to implementation (technical, normal practice, availability of finance etc.)
- Step 7: calculate the emissions in the baseline and the project activity.

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

>> For electricity, a combined margin approach is used. Avoided T&D losses are added to this.

The heat baseline considers the fuel consumption * emission factor for each fuel in the baseline scenario and the 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, it uses 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 identification and selection of the baseline scenario is somewhat incomplete. The summary description in Section B provides only a schematic explanation. These steps are absent from Section D (beyond the summary). It is unclear how baselines other than business as usual (BAU) would be considered in the equations and parameters of the methodology. For instance, if the baseline were an efficiency improvement or boiler replacement at the facility, then presumably the ex ante efficiencies would not be appropriate.

In addition suggestions in places that single parts are sufficient on their own, e.g. section B: "Key tests are the investment analysis and the technical barrier approach" and D.3: "The argument for the additionality of the project is based mainly on the technology barrier element" conflicts with the notion that the full additionality tool should be used.

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

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

>> No it has not. See reasons for non-approval above.

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, it is appropriate in principle.

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.

>> To some extent, yes.

Please explain:

>> As noted above, some sources have not been included.

(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):

>> Yes, it could be used for other project activities, if concerns above are addressed.

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

>> The spatial level of the data is specified in Table 2, E.4. Most of the data is at local scale, with a few national data points, and only emission from natural gas being international.

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 CDM-NMB indicates that consolidated data over the past 3 years prior to the crediting period should be used where possible

(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 gases are clearly listed in D.5, and include CO_2, CH_4 and N_2O from combustion on site, as well as "CH_4 leaks" (a good term for fugitive emissions); CO_2 from electricity generation and CO_2 -eq from transportation

ii) Physical delineation

>> A diagram is provided in D.5, but no narrative.

b) Indicate whether this project boundary is appropriate:

>> A narrative description of the physical delineation would help avoid confusion about the project boundary. The diagram is very specific to the underlying project. The project boundary should consider inclusion of the full emissions from the synthetic gas production process.

(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:

>> Several important key assumptions are included in the applicability conditions stated by the project participants (See A.1.i above).

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

>> Mostly transparent, except in relation to T&D losses and synthetic gas production.

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

>> Synthetic gas emissions need to be better characterized per above.

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

>> The data sources are listed clearly in E.2, and include IPCC, gas suppliers, T&D authority and many "to be elaborated by PP".

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

>> In many cases these are adequate, but sources need to be clearer for T&D losses, synthetic gas production, and other missing items noted above.

f) State possible data gaps:

>> Several per above.

(7) Assessment of uncertainties:

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

i) The basis for determining the baseline scenario:

>> Yes, if the set of plausible alternatives is incomplete.

ii) Algorithms/formulae:

>> Yes, if financial analysis is not conservative.

iii) Key assumptions:

>> As above, plus gas provision in the project activity

iv) Data:

>> No.

b) State whether the uncertainties presented are reasonable:

>> In large part, yes, however uncertainties related to synthetic gas production and T&D losses are not adequately addressed

(8) Leakage:

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

>> Emissions from the use of the incremental natural gas at a synthetic fuel plant, fugitive CH_4 emissions from gas transmission and CO_2, CH_4, and N_2O emissions from coal and ash transportation are categorized as leakage. Emissions from fuel transportation are counted only if the fuel is transported in a non-Annex I country.

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

>> Per above, emissions from synthetic gas production are not adequately treated. Upstream gas transmission leakage has not been adequately addressed. Physical leakage estimation relies mainly on average default leakage guidelines of the IPCC.

(9) Transparency and "conservativeness":

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

>> Yes, in most aspects, the methodology is transparent.

b) State whether the baseline methodology is conservative:

>> Not necessarily.

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

>>

Strengths:

- The methodology draws on approved methodologies, notably ACM0002 "Consolidated methodology for grid-connected electricity generation from renewable sources"; AM0008 "Industrial fuel switching from coal and petroleum fuels to natural gas without extension of capacity and lifetime of the facility"; AM0014 "Natural gas-based package cogeneration"and the "Tool for the demonstration and assessment of additionality".
- The methodology allows for the use of syngas as equivalent to natural gas, but would be applicable in cases where only natural gas is used.

Weakness:

- See part A.I recommendations above.

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

>> The CDM-NMB refers to accounting for South African regulations. All project specific information should not be included in the CDM-NMB (only in the draft CDM-PDD).

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

>> Unclear until major concerns are addressed.

(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:

>> None.

b) Indicate any further comments:

>> No further comment.

II. Proposed new monitoring methodology *(specify title here):* >> Monitoring methodology for gas-powered combined-cycle cogeneration replacing coal-based steam-generation and grid-electricity

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 requires monitoring of the quantity of natural gas used in the combined heat and power plant and monitoring the quantities of both heat and power that are provided for the operations. The amount of heating and electricity provided in the project activity can then be used to estimate the emissions from the baseline electricity and heat sources. The grid emission factor and parameters needed to calculate the combined margin are monitored. T&D losses and other aspects of grid operation are also included. Fuel efficiency are either measures *ex ante* or in the case of the natural gas, "early".

(2) Key assumptions/parameters:

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

>> The combined cycle gas turbine at the facility would use synthetic gas. It has been assumed that in terms of emissions intensity per unit energy is equivalent to natural gas. This assumption needs to be substantiated by clear evidence or monitoring (analysis of contents). Gas transmission leakage is also physical leakage and can be calculated using the difference between what the synthetic gas plant dispatches and what the project facility receives. Should the relationship between natural gas and synthetic gas change, emission factor of gas will change accordingly.

See T&D discussion in CDM-NMB above.

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

>> The key monitoring assumptions are mostly transparent – see baseline comments above.

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

>> Generally adequate.

In Table B.2.1 and / or B.4.1, a factor indicating the shares of NG and syngas might be included.

The CDM-NMM could be improved by defining "early", e.g. within the first 3 months of project operation.

In Table B.2.3, it should read "electricity *imported* from the grid" not exported. .

The detailed repetition of the CDM-NMB steps for the combined margin (section B.2.4) seems unnecessary.

(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):

>> Several data variables are measured.

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

>> Yes, but for the issues not addressed per above.

c) S*tate possible data gaps:*

>> None.

(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:

>> The CDM-NMM is generally adequately described.

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):

>> In principle, yes.

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

>> Yes.

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

>> As with the CDM-NMB, the methodology for estimating synthetic gas emissions needs to be improved. Also the emissions associated with natural gas transport should be monitored, if positive leakage from avoided emissions from coal transport are to be counted.

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

>> The Quality Control and Quality Assurance procedures are integrated with the existing ISO 14001 system which describes the method of data collection and reporting. This is adequately considered in B.7; however, the project participants should clarify "PI system".

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

>>

Strength:

- Includes a wide range of parameters to be monitored.

Weaknesses:

- Precise QC and QA procedures are lacking from the monitoring methodology.
- The methodology uses default parameters where it is possible to monitor project specific data.
- Several of the monitoring data will come from third party entities or third party verifiers which renders the methodology weak.

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

>> Unclear until improved.

(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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