CDM: Proposed new methodology expert form (version 04)

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

Name of expert responsible for completing and submitting this form	Ashok Sarkar
Related F-CDM-NM document ID number	

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 proposed new baseline methodology:

Title of new baseline methodology:>>Gas powered combined cycle cogeneration replacing coal based steam generation and grid electricity.

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

The methodology, as stated, is applicable to:

- Fuel switching from imported grid (dominated by coal) electricity and coal-based steam generation to combined heat and power provision to an industrial plant wherever data exists to calculate the baseline and project activity emissions.
- Where the cogeneration plant is owned and run by the plant it provides energy to, or by a third party operator.
- The heat and power provided by the cogeneration plant contributes part of the energy requirements for the demand of the plant it provides utility to.
- The leakage calculation includes a component that is applied to the production of a synthetic gas equivalent in part to natural gas.
- Excess electricity is not exported to the grid.

ii. Strengths and weaknesses of the methodology:

The strength of the approach are based on the fact that the methodology attempts to draw from approved (AM 0008 and AM 0014) and approved and consolidated (ACM 0002) methodologies and the Tool for Demonstration and Assessment of Additionality. However, the weakness lies in that a number of features of ACM 0002 that makes the baseline robust have not been included and no reasons have been provided thereof.

In addition, even though the Additionality Tool has been used in D.3 the details therein are lacking with respect to the specific project activity and therefore the additionality assessment is not clear. Of particular significance is the lack of any discussions on the alternative options (D.3, Step 1 of the Additionality Tool) in the NMB. While there is limited discussion of the options in A.4.4 of the CDM-PDD, the analysis is not adequate to justify the proposed baseline. For instance, it is unclear and no reasons have been provided why the alternative of (process) energy efficiency improvements in the industrial (Mondi integrated pulp and paper manufacturing) facility would not

be a baseline (this seems to be unrealistic because the plant was set up in 1984 and can not be expected to have the same technology/process through the end of the crediting period, that is, 2012). In this context, and in the absence of information on integrated pulp and paper processing technologies in use in the country and region, it appears that the baseline approach 48 (a) - "Existing actual or historical emissions, as applicable" used in this methodology may not be most appropriate.

Another inherent weakness is in the estimation of the emissions from electricity supply (in baseline) and upstream leakage in the production of the incremental synthetic gas (in project activity) both of which require data from third parties and use of third party verifiers.

The project activity electricity replaces electricity generated by coal at site and electricity imported from the national grid. In the baseline scenario, in the absence of the project activity, electricity would have been drawn from the grid or generated from coal on site. Although for the grid power component the methodology applies correctly the ACM 0002 approach, the description of project boundary related to baseline methodology selected for project activity is inadequate in explaining what the proportion/share of each of two existing sources - grid power and site-generated power from coal - is there in the baseline case. This appears to led to erroneous electricity baseline emissions which assumes only one source of power - grid power - in the estimation of electricity baseline emissions (E.4 in CDM-PDD and D.9 of CDM-NMB). This would have further resulted in higher estimates of electricity baseline because a T&D loss factor of 10% has been used for the entire amount of electricity while, in reality, the T&D loss factor should not have applied to the electricity from coal at site in the baseline case.

iii. Any changes needed to improve the methodology:

a. Minor changes:

The following additional conditions may also be necessary for the applicability of this methodology to other potential projects and should be analyzed and added in A.3, as appropriate: (i) The facility would not have major energy efficiency improvements during the crediting period (ii) The project activity does not increase the capacity of the final outputs and lifetime of the existing facility during the crediting period. (iii) Local regulations/programs do not constrain the facility from using coal for steam generation (iv) use of coal is less expensive than natural gas per unit of energy (v) there is no excess heat from the cogeneration system which is sold to another facility/user (vi) information/data on the characteristics of the grid is available (vii) IPCC default emission factors for fuel is appropriate choice of emission factors

Source of data and corresponding data variables to be made consistent in Table 2.1.3 of the CDM-PDD for data variables EFOM,y; EFBM,y; Fi,y; etc.

In Equation 6 (D.2.1.4 of CDM-PDD), the units of λy should be "'fraction" not "%".

b. Major changes:

The tool for demonstration and assessment of additionality should be used with project activity-specific details in order to demonstrate the additionality clearly. There is some project activity-specific reference in the CDM-PDD (B.3) but none in CDM-NMM (D.3).

The electricity baseline emissions should incorporate the component related to the

emissions from onsite coal-generated electricity at the industrial facility, which would have existed in the absence of the proposed project activity. It is unclear if the estimated quantity of gas for project activity (2,355 GJ/year) is for a CCGT plant that would produce same amount of heat and an equivalent amount of electricity (equivalent to the sum of electricity from onsite boiler as well as offsite grid electricity) as in the baseline scenario.

The appropriateness of the baseline approach 48 (a) - "Existing actual or historical emissions, as applicable" will need to be strengthened further vis-à-vis approach based on "economically most attractive option" as it is unclear if there is a scope for achieving emissions reductions through process changes and by improvement in energy efficiency, especially because the process seems to be of 1980's vintage.

II. Evaluation of the proposed new monitoring methodology:

Title of new monitoring methodology: :>>Gas powered combined cycle cogeneration replacing coal based steam generation and grid electricity.

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

The methodology, as stated, is applicable to:

- Fuel switching from imported grid (dominated by coal) electricity and coal-based steam generation to combined heat and power provision to an industrial plant wherever data exists to calculate the baseline and project activity emissions.
- Where the cogeneration plant is owned and run by the plant it provides energy to, or by a third party operator.
- The heat and power provided by the cogeneration plant contributes part of the energy requirements for the demand of the plant it provides utility to.
- The leakage calculation includes a component that is applied to the production of a synthetic gas equivalent in part to natural gas.

ii. Strengths and weaknesses of the methodology:

The strength of the methodology is based on the fact that the methodology attempts to draw upon the approved (AM 0008 and AM 0014) and approved and consolidated (ACM 0002) methodologies. However, the methodology lacks in clear and precise definition of data to be monitored, sources of data and relevant information. The weakness exists in the methodology because a majority of the parameters are based on IPCC default values and are not measured even if it is possible to monitor project specific data. Furthermore, most of the variables related to the electricity baseline (to which the largest share of the emissions reductions of this proposed project activity are attributed to) comes from third party entities (utilities/plants in the grid and the NER) and third party verifiers. The potential upstream leakage from transport and use of natural gas in the manufacture of synthetic gas and gas transmission also require data from third parties which may not be easy to obtain and may not entail good quality. The project participants do not directly measure or monitor the electricity and gas emissions information. The methodology also lacks in precise Quality Control and Quality Assurance procedures, particularly with respect to data from third parties.

iii. Any changes needed to improve the methodology:

a. Minor changes:

As the methodology is specific to the baseline, all changes suggested for the baseline methodology should be appropriately reflected in the monitoring methodology.

b. Major changes:

As the methodology is specific to the baseline methodology, all the changes suggested for the baseline methodology should be appropriately reflected in the monitoring methodology.

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

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:

The methodology uses approach 48 (a) - "existing actual or historical emissions, as applicable". The project activity includes provision of electricity and heat from natural gas. The project baseline is continued use, by the industrial facility, of coal in boiler at site to produce electricity and steam (for heating) and of imported grid electricity. Drawing upon parts of AM 0008, AM 0014 and ACM 0002, the proposed baseline methodology has been developed for the heat and electricity generated in the project activity from a onsite combined cycle gas turbine using synthetic gas generated from natural gas. The heat and electricity generated in the project activity is used at the industrial plant for replacing existing sources of heat and power (the baseline). The heat baseline calculates the amount of coal that would be required to provide the same amount of heat (steam) as that provided by the CCGT in the project activity. The electricity baseline uses a combined margin approach (from ACM 0002) consisting of operating margin and build margin factors, based on data available from annual reports of NER and IPCC default values, wherever applicable.

The Additionality Tools proposed by the CDM EB have been used to demonstrate additionality to a limited extent. The methodology addresses the leakage issues pertaining to the project boundary.

b) State the approach selected:

The methodology uses approach 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 selected approach is presumably guided by the fact that the baseline scenario is continuation of the same technology and therefore, constant energy efficiency, of the process applied for integrated pulp and paper production at this industrial plant. This is difficult to comprehend and appears unrealistic because the integrated pulp and paper process is already 21 years old (mill was commissioned in October 1984) and will be extended to another 8 years (first commitment period) and it may not represent a technology that represents an economically attractive course of action". The appropriateness of this approach is therefore questionable unless there is additional evidence provided by the project participants to prove that the process technology used in the industrial facility is at least similar to that being used in similar industries in the country.

(2) Basis for determining the baseline scenario:

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

No explanation of specific alternative scenarios in provided in the CDM-NMB. There is mention of three (the fourth alternative is "plant closure", which is irrelevant) alternative scenarios in CDM-PDD ,two of which are unrealistic and non-credible. It is not clear why a baseline scenario of efficiency improvement of the production process has not been included in this analyses. There are some inconsistencies in statements across the documentation. For instance, investment analysis suggests that the rate of return of the base case of the project activity is below the threshold for the project participant (B.3 of CDM-PDD) but at the same time, in A.4.3, it is stated that the technology choice is yet to be determined. If the latter is true, then it is unclear what the assumptions for the costs of technology are.

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

The underlying rationale for the formulae/algorithms originate from approved methodologies AM 0008, AM 0014 and ACM 0002. The estimation of emission reduction from the project activity is the difference between total baseline emissions and total project activity emissions for all gases and adjusted for leakage. The baseline emissions are computed as sum of electricity baseline and heat baseline emissions.

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

The documentation refers to the additionality demonstration and assessment tool recommended by the CDM-EB to evaluate project additionality but is not clear about its actual application to this specific project activity. The selection/identification of alternatives (described only in CDM-PDD and not in CDM-NMB) seem to have ignored apparently important options (such as improved energy efficiency of the production process) and the resulting conclusion with respect to additionality is therefore weak and sub-optimal. Next, the barrier analysis uses only a part of the AM 0014 barrier analysis method, focusing on the technological barriers only. That institutional barriers may also be there is not demonstrated, similar to that demonstrated in the method in AM 0014. Finally, the common practice analysis does not give any details other than just stating that the project activity is not common practice.

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

Although the approach seems to be appropriate its application has not been presented effectively in CDM-NMB. For reasons presented above, the basis for determining baseline scenario and for assessing additionality does not appear to be completely adequate.

(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.

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):

The proposed methodology may not appropriate because all the plausible alternatives for the baseline scenario do not seem to have been considered in the assessment of additionality, while using the CDM-EB approved tool for assessment and demonstration of additionality. Even if it was presumed that all realistic and credible alternatives are indeed included, it is not clearly described as to what is the split between the grid electricity and coal-based electricity generated at site, in the baseline case. The proposed project activity appears to replace both but in the methodology the description is only provided to focus on the baseline case of grid electricity.

The project boundary is also unclear. There are other related issues which may be beyond the project boundary but, for instance, the conversion from natural gas to synthetic gas and its implications are not clear.

In the case of electricity baseline the use of a overall grid T&D loss of 10% many not be most appropriate approach and may result in higher emissions reductions than what would be the actual baseline which could be more accurately determined given the voltage and line capacity at which electricity is delivered to this integrated pulp and paper plant, from the grid.

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 may not result in a baseline scenario that reasonably represents the anthropogenic emissions by sources of GHG that would occur in the absence of the proposed project activity, due to the reasons described above.

Please explain:

See above comments.

(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. Most of the algorithms and formulae are based on AM 0008, AM 0014 and ACM 0002.

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

Spatial scope of data is adequate, except the following: (i) for fuel specific emission factor, for which it is difficult to identify the spatial scope, as no specific reference for the IPCC source is provided in the documentation for the use of IPCC default values. (ii) the T&D losses of 10% is for the overall grid but the baseline for this specific project should refer to T&D loss for this particular industrial plant which could actually be estimated more accurately.

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 vintage of the data pertaining to energy efficiency of the industrial plant is not stated. However, the plant was commissioned in 1984 and the inherent presumption seems to be that the same technology has continued to be used since then and will continue through the crediting period. So, this data will inherently be of 30 years vintage by the crediting period.

Vintage of IPCC default values is difficult to assess in the absence of complete reference. The vintage of data for power plants in the national grid is also more than 10 to 30 years old.

(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 considered are: CO2, CH4 and N2O for the electricity and heating baseline, as appropriate. The sources of emissions for baseline and project activity cases are described for all these three gases. CO2 emissions associated with the transportation of coal and ash in the baseline case are referred to but not included in the calculations because they are on the positive side (positive leakage) and conservatism has been applied. However, it is unclear how much electrical power is being provided by coal combustion as it has been incorrectly assumed in the baseline methodology that all the power (27 MW) is coming from the grid. The project boundary definition is also not clear in the proposed project activity, with respect to how much emissions (upstream and downstream leakage) of CO2, CH4 and N2O due to conversion from natural gas to synthetic gas production (in Secunda plant) for onward use in the CCGT at Mondi.

ii) Physical delineation

The project boundary is defined physically in terms of: (i) In proposed project activity, natural gas inlet into Secunda plant (where natural gas would be used to produce synthetic gas) (ii) In baseline scenario, coal supply point and the ash disposal point

b) Indicate whether this project boundary is appropriate:

The project boundary related to the baseline methodology and project activity case is inconsistent and hence not completely appropriate. It is not clear how the upstream leakage in the manufacture of synthetic gases will be addressed.

(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:

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 its equivalent to natural gas. (as cited in E.2 of CDM-PDD). This assumption needs to be substantiated by clear evidence or monitored data (analysis of gas contents).

The T&D loss of 10% applies for the overall national grid. It would be incorrect to use this as the factor for inflating the emission reduction from project activity because, generally high voltage consumers of the grid (such as industries like the integrated pulp and paper plant) are closer to the generation center and thereby entail lower T&D losses compared to that of the low voltage consumers which are at farther distance or that of the average T&D loss factor for the grid.

The assumption that experience of pulp and paper industries in non-Annex I countries with cogeneration systems is limited may appear to be erroneous and should be substantiated.

The assumption that implementation of this project activity will encourage replication in other pulp and paper mills and other industry sectors within South Africa and the region, needs to be supported by hard data of the potential opportunities for such replication (e.g., number and capacity of similar industries). This assumption in A.4.3. in CDM-PDD is also inconsistent with the analyses of technological barriers in B.3 of CDM-PDD where it is stated that the country does not have a study quantifying its economic cogeneration potential.

GWP of 21 and 310 for CH4 and N2O respectively applies only for the first commitment period (that is through 31 December 2012) while the duration of the project activity is from September 2006 to September 2016 (10 year fixed crediting period).

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

Partially.

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

On the overall, some of the assumptions stated may be inadequate and/or not substantiated by clear evidence.

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

Combined margin data from NER reports/grid operator data and statistics; Coal and Natural Gas Emissions Factors from IPCC; Calorific value of fuel types and fuel oxidation from IPCC GHG Gas Inventory Reference Manual 1996; Fuel consumption of some plants in the national grid from Standard IPCC Guidelines for National Greenhouse Gas Inventories 1996; Emissions from transportation of coal and ash from rail transporter's data; Electricity T&D losses from T&D authority/NER; Mass balance to estimate the up-stream leakage in the production of incremental synthetic gas from inputs of natural gas from the Secunda plant statistics; Physical leakage from gas pipelines from IPCC Guidelines for GHG Inventories; Fuel efficiency of natural gas usage in CCGT at various load factors from monitored data; Quantity of natural gas used as input to CCGT from supplier/purchase records; Actual GWP of synthetic gas from analysis of contents.

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

Some of the data used are not fully adequate, consistent, accurate or reliable. These include, for example, the following: (i) IPCC default guidelines have been used for calorific values of fuel types but these may vary depending upon the specific type and quality of fuel and should have been based on measured data (ii) IPCC default values have been used for fuel consumption of plants in the national grid but this parameter

depends on technology, vintage of technology, plant parameters, plant load factors, etc. and should not be based on average IPCC estimates; (iii) The average default values from IPCC Guidelines for GHG Inventories are used for estimating physical leakage, which may produce erroneous results based on many factors like physical distance between the gas source and CCGT, etc.

f) State possible data gaps:

Some critical information/data with respect to the proposed project activity are missing. These may have implications on baseline and project activity estimation of emissions and also on additionality. These data gaps include: (i) where is the natural gas coming from (source) (ii) where is the CCGT technology being sourced from? (iii) What is the baseline energy efficiency of the integrated pulp and paper manufacturing process (iv) Technology choice for CCGT (among two different technologies) is not yet determined by the project participant but yet it is stated that the investment analysis has been done. It is not clear which cost data was used for this purpose.

(7) Assessment of uncertainties:

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

i) The basis for determining the baseline scenario:

Yes, it is acknowledged in Section F of CDM-PDD that the credibility of the resulting baseline would be questionable if the set of plausible alternatives considered in using the additionality tool is incomplete. Similarly, uncertainties associated with financial analysis is also included.

ii) Algorithms/formulae:

No.

iii) Key assumptions:

Partly.

iv) Data:

Partly.

b) State whether the uncertainties presented are reasonable:

Yes.

(8) Leakage:

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

As natural gas has not been introduced to Secunda before, and it would be done specifically for this proposed project activity, it would be appropriate to include the upstream leakage from gas transmission pipelines feeding into this Secunda plant. At present the methodology does not include this potential leakage.

The average default values from IPCC Guidelines for GHG Inventories are used which may produce erroneous results based on many factors like physical distance between the gas source and CCGT, etc.

Transport emissions (baseline) which is positive leakage, have not actually been calculated even though it is referred to in D.2 of CDM-PDD.

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

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:

This was largely done, based on the data presented in CDM-PDD. It appears that Richards Bay Clean Air Association and Department of Agriculture and Environmental Affairs were well informed of the process. The proposed baseline methodology for the project activity made use of approved methodologies Furthermore, the CDM-EB approved additionality tool was used.

b) State whether the baseline methodology is conservative:

To the extent that transportation emissions from coal transportation to project site (baseline) and from ash transportation have not been included as an element of emissions reduction in the project activity case, the baseline methodology is conservative.

With respect to the use of T&D losses of 10%, equivalent of the T&D loss of the entire national grid, emissions in baseline (and therefore emission reduction) seem to have been overestimated.

The use of EFy (CO2 emission factor from the grid) and EFyT&D multiplier factor for estimating the baseline for the entire power needs of the industrial facility seems to be erroneous and results in overestimated emissions reduction because in baseline case only a part of the electricity requirements is being met by grid electricity, the rest comes from coal boiler/steam turbine.

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

The strength of the approach are based on the fact that the methodology attempts to draw from approved (AM 0008 and AM 0014) and approved and consolidated (ACM 0002) methodologies and the Tool for Demonstration of Additionality. However, the weakness lies in that a number of features of ACM 0002 that makes the baseline robust have not been included and no reasons have been provided thereof.

In addition, even though the Additionality Tool has been used in D.3 the details therein are lacking with respect to the specific project activity and therefore the additionality assessment is not clear. Of particular significance is the lack of any discussions on the alternative options (D.3, Step 1 of the Additionality Tool) in the NMB. While there is limited discussion of the options in A.4.4 of the PDD the analysis is not adequate to justify the proposed baseline. For instance, it is unclear and no reasons provided why the alternative of (process) energy efficiency improvements in the industrial facility would not be a baseline (this seems to be unrealistic because the plant was set up in 1984 and can not be expected to have the same technology/process through the end of the crediting period that is 2012). In this context, and in the absence of information on integrated pulp and paper processing technologies in us in the region, it appears that the

baseline approach 48 (a) - "Existing actual or historical emissions, as applicable" used in this methodology may not be appropriate.

Another inherent weakness is in the estimation of the emissions from electricity supply (in baseline) and upstream leakage in the production of the incremental synthetic gas (in project activity) both of which require data from third parties and use of third party verifiers.

The project activity electricity replaces electricity generated by coal at site and electricity imported from the national grid. In the baseline scenario, in the absence of the project activity, electricity would have been drawn from the grid or generated from coal on site. Although for the grid power component the methodology relies correctly on the ACM 0002 application, the description of project boundary related to baseline methodology selected for project activity is inadequate in explaining what the proportion/share of each of two existing sources - grid power and site-generated power from coal - were. that is the baseline emissions. This appears to led to erroneous electricity baseline emissions which assumes only one source of power - grid power - in the estimation of electricity baseline emissions (E.4 in CDM-PDD and D.9 of CDM-NMB). This would have further resulted in higher estimates of electricity baseline because a T&D loss factor of 10% has been used for the entire quantity of electricity while, in reality, the T&D loss factor should not have applied to the electricity from coal at site in the baseline case.

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

It is stated in CDM-PDD B.3 that all the alternatives included (including the project activity) are in compliance with all applicable legal and regulatory requirements.

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

The methodology is applicable to:

- Fuel switching from imported grid (dominated by coal) electricity and coal-based steam generation to combined heat and power provision to an industrial plant wherever data exists to calculate the baseline and project activity emissions.
- Where the cogeneration plant is owned and run by the plant it provides energy to, or by a third party operator.
- The heat and power provided by the cogeneration plant contributes part of the energy requirements for the demand of the plant it provides utility to.
- The leakage calculation includes a component that is applied to the production of a synthetic gas equivalent in part to natural gas.
- The following additional conditions may also be necessary for the applicability of this methodology to other potential projects and should be analyzed and added in A.3, if required: (i) The facility would not have major energy efficiency improvements during the crediting period (ii) The project activity does not increase the capacity of the final outputs and lifetime of the existing facility during the crediting period. (iii) Local regulations/programs do not constrain the facility from using coal for steam generation (iv) use of coal is less expensive

than natural gas per unit of energy (v) there is no excess heat from the cogeneration system which is sold to another facility/user (vi) information/data on the characteristics of the grid is available (vii) IPCC default emission factors for fuel is appropriate choice of emission factors.

(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:

Have used ACM 0002, AM 0008, and AM 0014 as references.

b) Indicate any further comments:

None.

II. Proposed new monitoring methodology *(specify title here):* >>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 monitors the data for parameters and variables associated with baseline, project activity and leakage assessments. The monitoring and verification methodology is based on recording the amount of gas that is used in 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 baseline electricity and heat sources. The emissions from electricity imported and from coal (as in baseline) are monitored separately. Leakage in the form of emissions from the transportation of gas, coal and coal ash is estimated. This leakage also includes the amount of natural gas consumed in the production of synthetic gas and not equivalent on 1:1 mass terms to the synthetic gas dispatched to the pipeline from the supplier to the CCGT.

(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 its equivalent to natural gas. (as cited in E.2 of CDM-PDD) 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 Secunda dispatches and what Mondi receives. Should the relationship between natural gas and synthetic gas change, emission factor of gas will change accordingly.

The T&D loss of 10% applies for the overall national grid. It would be incorrect to use this as the factor for inflating the emission reduction from project activity because, high voltage consumers of the grid (such as industries like the integrated pulp and paper plant) are closer to the generation center and thereby entail lower T&D losses compared to that of the low voltage consumers or that of the average T&D loss factor for

the grid.

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

Partly.

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

Some assumptions are adequate while others described above need to be substantiated.

(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):

Combined margin data from NER reports/grid operator data and statistics; Coal and Natural Gas Emissions Factors from IPCC; Calorific value of fuel types and fuel oxidation from IPCC GHG Gas Inventory Reference Manual 1996; Fuel consumption of some plants in the national grid from Standard IPCC Guidelines for National Greenhouse Gas Inventories 1996; Emissions from transportation of coal and ash from rail transporter's data; Electricity T&D losses from T&D authority/NER; Mass balance to estimate the up-stream leakage in the production of incremental synthetic gas from inputs of natural gas from the Secunda plant statistics; Physical leakage from gas pipelines from average default values from IPCC Guidelines for GHG Inventories; Fuel efficiency of natural gas usage in CCGT at various load factors from monitored data; Quantity of natural gas used as input to CCGT from supplier/purchase records; Actual GWP of synthetic gas from analysis of contents.

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

As also in case of baseline methodology, some of the data used are not fully adequate, consistent, accurate or reliable.

c) S*tate possible data gaps:*

Some critical information/data with respect to the proposed project activity are missing. These may not have any implications on monitoring methodology, however, these data gaps include: (i) where is the natural gas coming from (source) (ii) where is the CCGT technology being sourced from? (iii) What is the baseline energy efficiency of the integrated pulp and paper manufacturing process (iv) technology choice for CCGT (among two different technologies) is not yet determined by the project participant but yet it is stated that the investment analysis has been done. It is not clear which cost data was used for this purpose.

(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):

The strength of the methodology is based on the fact that the methodology attempts to draw upon the approved (AM 0008 and AM 0014) and approved and consolidated (ACM 0002) methodologies. However, the methodology lacks in clear and precise definition of data to be monitored, sources of data and relevant information. The weakness exists in the methodology because a majority of the parameters are based on IPCC default values and are not measured even if it is possible to monitor project specific data. Furthermore, most of the variables related to the electricity baseline (to which the largest share of the emissions reductions of this proposed project activity are attributed to) comes from third party entities (utilities/plants in the grid and the NER) and third party verifiers. The potential upstream leakage from transport and use of natural gas in the manufacture of synthetic gas and gas transmission also require data from third parties which may not be easy to obtain and may not have good quality. The project participants do not directly measure or monitor the electricity and gas emissions information. The methodology also lacks in precise Quality Control and Quality Assurance procedures, particularly with respect to date from third parties.

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)***:**

Emissions from the use of the incremental natural gas at synthetic fuel plant (Secunda), fugitive CH4 emissions from gas transmission, and CO2, CH4 and N2O emissions from coal and ash transportation are categorized as leakage.

As natural gas has not been introduced to Secunda before, and it would be done specifically for this proposed project activity, it would be appropriate to include the upstream leakage from gas transmission pipelines feeding into this Secunda plant. At present the methodology does not adequately address this potential upstream leakage. The average default values from IPCC Guidelines for GHG Inventories are used which may produce erroneous results based on many factors like physical distance between the gas source and CCGT, etc.

(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.

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

explain):

- 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)*:

The methodology is applicable to projects to which the baseline methodology described above is applicable.

(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:

Have used ACM 0002, AM 0008 and AM 0014 as a reference.

b) Indicate any further comments:

The quality of the PDD , NMB and NMM can be considerably improved through further editing and simplified language, and a schematic diagram showing the baseline and project activity case separately with respective project boundaries. Consistency should be ensured across the entire documentation including PDD, NMB and NMM..

Signature of desk reviewer ……..
Date: / /

Information to be completed by the secretariat	
F-CDM-NMex doc id number	
Date when the form was received at UNFCCC secretariat	
Date of transmission to the Meth Panel and EB	
Date of posting in the UNFCCC CDM web site	