CDM: Proposed new methodology expert form (version 04)

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

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Related F-CDM-NM document ID number	NM0101

Note to those completing this form, as applicable: Please provide recommendations on the proposed new baseline and monitoring methodologies based on an assessment of CDM-NMB and CDM-NMM and of their application in sections A to E of the draft CDM-PDD, desk reviews and public input. Please ensure that the form is entirely filled and that arguments and expert judgements are substantiated.

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

I. Evaluation of the porposed new baseline methodology:

Title of new baseline methodology:>> Grasim baseline methodology for the energy efficiency improvement in the heat conversion and heat transfer equipment system

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

>> Suggest revising the applicability conditions to read:

"The methodology is applicable to the following situations:

"1. where there is constant useful heat output conditions of equipment. Constant output levels means that quantity of output per shift/batch should be relatively constant (whether continuous process or batch process), because in absence of constant output it becomes difficult to establish a baseline of consistent and reliable efficiency.

2. where heat energy conversion equipment and heat energy transfer equipment are connected in series, such that the energy efficiency project taken up in any heat transfer equipment will save energy in heat conversion.

3. where heat transfer and conversion systems have efficiencies less than unity

4. Where the historical and current data is available for heat balance parameters vis-à-vis equipment useful heat output.

5. When used in conjunction with the corresponding monitoring methodology."

ii. Strengths and weaknesses of the methodology:

>> strengths: broad applicability, draws on approved methodologies and additionality tool, clear formulae and data sources should be easily accessible in most cases, transparent direct measurement of efficiencies, limiting project to normal production range to minimise inaccuracy in efficiency measurements

weaknesses: vintage for baseline data may be insufficient, power use in baseline must be addressed, baseline scenario selection unclear

iii. Any changes needed to improve the methodology:

a. Minor changes:>> Clarify that baseline scenario is chosen in additionality test process; adjust vintage of baseline data to address seasonal variations; include non-CO2 fuel combustion emissions; clarify formulae and variables, and data sources as suggested in section 6 of this review; modify applicability conditions

b. Major changes:>> Add electricity emissions factor for baseline scenario based on ACM0002 or AM0005 - not the small scale CDM rules - and modify project electricity emissions accordingly; explain how emissions changes from retrofits will be estimated and deducted from claimed emissions reductions

II. Evaluation of the proposed new monitoring methodology:

Title of new monitoring methodology: >> Grasim monitoring methodology for the energy efficiency improvement in the heat conversion and heat transfer equipment system

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

>> uggest revising the applicability conditions to read:

"The methodology is applicable to the following situations:

" 1. where there is constant useful heat output conditions of equipment. Constant output levels means that quantity of output per shift/batch should be relatively constant (whether continuous process or batch process), because in absence of constant output it becomes difficult to establish a baseline of consistent and reliable efficiency.

2. where heat energy conversion equipment and heat energy transfer equipment are connected in series, such that the energy efficiency project taken up in any heat transfer equipment will save energy in heat conversion.

3. where heat transfer and conversion systems have efficiencies less than unity

4. Where the historical and current data is available for heat balance parameters vis-à-vis equipment useful heat output.

5. When used in conjunction with the corresponding baseline methodology."

ii. Strengths and weaknesses of the methodology:

>> Strengths: relies on measured data sources that are reliable and well understood in industry; transparent process for calculating changes in efficiency and emissions

Weaknesses: does not address grid electricity emissions; does not show how to deal with retrofits after project implementation; does not calculate total emissions reductions; needs more detail on QA/QC procedures

iii. Any changes needed to improve the methodology:

a. Minor changes:>> show formula for total emissions reductions (as opposed to hourly); include all variable nomenclature in monitoring tables rather than separate table; change electricity coverage to 100%; minor unit changes as suggested in review below

b. Major changes:>> Include formula for grid electricity emissions factor; elaborate on how to address retrofits and estimate and deduct their emissions impact; improve QA/QC procedures

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

I. Proposed new baseline methodology *(specify title here):* >> Grasim baseline methodology for the energy efficiency improvement in the heat conversion and heat transfer equipment system

(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:

>> This methodology evaluates the energy, and thus emissions, savings from improving the energy efficiency of heat transfer and heat conversion equipment/systems. The methodology does this by establishing a baseline energy efficiency for the system based on historical data. This is compared to monitored project data on the efficiency of the system, as well as any additional electricity used in the project, to calculate the net emissions savings.

b) State the approach selected:

>> 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:

>> This is appropriate because the primary source of baseline data and emissions is from directly measured historical data at the project site.

(2) Basis for determining the baseline scenario:

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

>> This could be clearer. While the methodology states that the baseline scenario is taken from historical data, it does not clearly state how this is chosen as the baseline scenario. Presumably this is through the evaluation of alternatives during additionality testing (as in AM0018), but this should be stated clearly. If the additionality assessment determined that project was additional but the baseline scenario was something other than continuation of current practice, then the methodology should not be used.

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

>> Average emissions per unit of output, based on the average efficiency of the equipment and relevant fuel emissions factors. For the additional electricity use, the combined margin approach is used from the simplified baseline methodologies.

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 approved tool from the EB is used, which is appropriate. It would be useful, however, if the methodology noted whether any special issues in this sector must be taken into consideration when applying the generic tool to these project types.

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

>> Additionality is adequate. As mentioned above, the choice of baseline scenario should be more clearly linked to the evaluation of alternatives in the additionality testing,

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

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

>> Other than the suggestions made in later sections, the methodology is described well.

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 does

c) State whether the application of the methodology could result in a baseline scenario that reasonably represents the anthropogenic emissions by sources of greenhouse gases that would occur in the absence of the proposed project activity.

>> Yes, it will

Please explain:

>> By using the EB approved tool to asses project alternatives, the methodology will produce an appropriate baseline scenario

(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, they can be applied across a very wide range of energy efficiency projects

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

>> Emissions factors are local or national if possible, and IPCC otherwise. Technical data such as heat enthalpy of steam are from standard international publications. All other data is local. This is appropriate. It would, however, help to have a table of all the parameters and the source and spatial level indicated for each one.

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:

>> For the baseline efficiency, one month prior to the start of the project activity is used. This could be problematic if there are seasonal variations in production or external factors (e.g. climate) that influence efficiency. AM0018 specifically says that the data sampling for the baseline must cover the relevant seasonal variations. This should be added to this methodology as well.

For other data, collecting this during the crediting period is appropriate.

(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

>> CO2 only

ii) Physical delineation

>> the project boundary covers:

- Heat conversion and heat transfer equipment
- Hot streams going to the equipment
- Cold streams going to the equipment
- Useful output3 streams from the equipment
- Source of electricity for additional electrical loads or change in electricity consumption (if any) due to project activity for transporting the fluid.

b) Indicate whether this project boundary is appropriate:

>> The spatial boundary is appropriate for almost all cases. The exception would be where electricity is used for heat input in the baseline. In this case, the upstream emissions from that electricity must be considered within the project boundary (e.g. as in AM0005 and ACM0002).

Other industrial methodologies (eg. AM0008) address non-CO2 emissions from combustion in industrial heat processes. It is not clear why this methodology does not address those 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:

>> the key assumption for the baseline is that emissions are directly related to the efficiency of the process and the emissions factors of the sources of heat used. For the project activity, and emissions reductions, the key assumption is that, given constant output, the change in emissions will be directly related to the change in process efficiency, as long as any incremental emissions due to increase electricity use are netted out.

One question, however, is how the methodology proposes to deal with retrofits identified after project implementation. While this is mentioned in a box as in AM0018, there is no reference given to how to estimate and deduct the impact of a retrofit. This should be added, or the methodology has to be restricted to cases where this does not happen.

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

>> Yes, they are, and draw on AM0018

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

>> They are adequate, except for the fact that the methodology does not consider upstream emissions from power production in the baseline, and how these would decline if required energy input changes. These upstream emissions should be captured using a combined margin approach as in AM0005 or ACM0002. Using the small scale rules is not appropriate, because amount of electricity involved in the baseline and project scenario could be substantial at a large industrial facility.

It is not clear how E_{avg} is obtained in energy units (MWh) from nameplate data that would typically be in power units (kW) (section D.9, step 5, substep 1 and 2)

It would be helpful to have clear steps in D.6 to calculate useful heat output and total heat input, so that these variables could then be used in the equation for efficiency. The formulae as presented in the monitoring methodology should be used here.

All equations should be numbered and all variables clearly defined.

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

>> Key data sources include:

- specific heat and heat capacity - from standard chemical engineering handbook
- latent heats - "
- equipment efficiency calculations - as per Indian Bureau of Energy Efficiency
- Fuel emissions factors - local laboratories or IPCC guidelines
- grid emissions factors - as per small scale CDM rules

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

>> It should be clear that local emissions factors, where available, should be used in priority to IPCC factors

If η_c is going to be calculated in D.9, then the relevant parameters and equations from AM0018 should be included, rather than simply referring to them in a footnote.

All of the parameters in sections D.6 and D.7should have variable names and definitions (i.e rather than being spelled out as in D.6 Step 2a)1 numbers 2 to 4).

Definition of HI on page 16 in footnote should be included in main text, and an equation should be shown for how this is estimated.

All parameters and variable should have clearly marked units.

f) State possible data gaps:

>> Sources should be given for heats of reaction, enthalpy of phase transformation

If the methodology is applied in countries other than India, other sources for equipment efficiency should be identified

It is not clear what emissions factor is used for electricity as a source of heat in the baseline scenario ((D.9 Step 4)

(7) Assessment of uncertainties:

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

i) The basis for determining the baseline scenario:

>> this is not addressed - see earlier point in section 2

ii) Algorithms/formulae:

>>not needed

iii) Key assumptions:

>> yes, at least the key assumption about normal output range

iv) Data:

>> yes, but see comments on data in section 6

b) State whether the uncertainties presented are reasonable:

>> Generally yes, as long as comments in previous sections are addressed

(8) Leakage:

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

>> no leakage considered

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

>> this is appropriate - AM0018 is similar, and it is reasonable that upstream emissions will not change significantly except for grid electricity

(9) Transparency and "conservativeness":

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

>> Yes, except for the issue of electricity use in the baseline for heat, which needs to be addressed

b) State whether the baseline methodology is conservative:

>> Yes, except that non-CO2 emissions should be included as they are in AM0008

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

>> strengths: broad applicability, draws on approved methodologies and additionality tool, clear formulae and data sources should be easily accessible in most cases, transparent direct measurement of efficiencies, limiting project to normal production range to minimise inaccuracy in efficiency measurements

weaknesses: vintage for baseline data may be insufficient, power use in baseline must be addressed, baseline scenario selection unclear

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

>> This is done through the additionality assessment, which is appropriate

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

>> Suggest revising the applicability conditions to read:

"The methodology is applicable to the following situations:

" 1. where there is constant useful heat output conditions of equipment. Constant output levels means that quantity of output per shift/batch should be relatively constant (whether continuous process or batch process), because in absence of constant output it becomes difficult to establish a baseline of consistent and reliable efficiency.

2. where heat energy conversion equipment and heat energy transfer equipment are connected in series, such that the energy efficiency project taken up in any heat transfer equipment will save energy in conversion.

3. where heat transfer and conversion systems have efficiencies less than unity

4. Where the historical and current data is available for heat balance parameters vis-à-vis equipment useful heat output.

5. When used in conjunction with the corresponding monitoring methodology."

The reasons for deleting points 4 and 5 in the meth as proposed is that these are not actually restrictions on the use of the meth, but describe how it is used.

The meth should have a wide geographical range of applicability to any region

(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:

>> AM0018, AM0008

b) Indicate any further comments:

>> none

II. Proposed new monitoring methodology *(specify title here):* >> Grasim monitoring methodology for the energy efficiency improvement in the heat conversion and heat transfer equipment system

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 measures all of the key variables to directly determine the energy efficiency of the heat conversion/transfer process before and after the project, including flows rates and temperatures of incoming and outgoing streams, fuel consumption (including electricity), efficiency of heat conversion equipment, and other relevant parameters. It uses a heat balance approach to estimate energy efficiency on the basis of these measured parameters.

(2) Key assumptions/parameters:

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

>> The methodology assumes: that it is possible to accurately measure flow and temperature; that all relevant input and output/production data can be collected at the end of the batch/shift; that electricity consumption data is available for relevant equipment or that nameplate data is a reliable proxy; that the efficiency of electricity generation is constant; that instruments are calibrated regularly; and that NCV, ultimate analysis and carbon emissions factors can be determined locally or that IPCC guidelines are a reliable proxy.

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

>> Yes

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

>> These assumptions are generally fine, although it is not clear whether using nameplate data for electrical equipment is sufficient if the operating hours are not known. It is also not clear how the emissions from grid power used as a heat source are estimated.

(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):

>> almost all of the data presented in the monitoring plan is directly measured. parameters that are calculated are explained in the text.

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

>> Yes, except for the issue of emissions from grid electricity generation. this needs to be included with reference to AM0005 or ACM0002

c) *State possible data gaps:*

>> see previous point

(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:

>> Overall, yes: in fact the presentation of the formulas should be used in the baseline methodology to help make it clearer.

The final formula for emissions reductions is in units of kg CO2/hr, because the units for H_{actual} are kCal/hr. The methodology must show how total emissions reductions are to be calculated.

The main formatting change required is that it would be easier to understand the nomenclature if the variable names were used in the actual monitoring tables (e.g. B.2.1 under the column "data variable") rather than presented in a separate table.

Sections B.2.2 and B.2.4 do not actual show how emissions are calculated - they only show efficiency. Emissions are only covered in section B.5.

The variables for electricity consumption say that only 2.5% of data is monitored - this is not really the case because, even though hourly electricity use may only be monitored periodically, total electricity use over the shift is known with high certainty. I suggest it says that 100% of data is covered (i.e. for B.2.8, B.1.12, B.3.8, B.3.12)

In section B.5, the "average emission factor for all the fuels used" $E_{avg,heat}$ should have units of kg CO2/kCal

Variable B.3.1 should have units kg/hr or m3/hr, not kCal/hr

b) State whether the proposed methodology is appropriate for the referred proposed project activity and the referred project context (described in Sections A - E of the draft CDM-PDD and submitted along with CDM-NMM):

>> Yes

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)*:

>> leakage is not considered, which is appropriate

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

>> The QA/QC procedures are not adequate. In all cases where QA/QC is needed, the methodology only says that procedures must be defined, but does not say anything about what they are. This may be due to the broad range of projects and sectors covered by the methodology. While this is similar to some of the QA/QC table in AM0018, the reviewer believes that more detail is necessary.

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

>> Strengths: relies on measured data sources that are reliable and well understood in industry; transparent process for calculating changes in efficiency and emissions

Weaknesses: does not address grid electricity emissions; does not show how to deal with retrofits after project implementation; does not calculate total emissions reductions; needs more detail on QA/QC procedures

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

>> I would suggest revising the applicability conditions to read:

"The methodology is applicable to the following situations:

" 1. where there is constant useful heat output conditions of equipment. Constant output levels means that quantity of output per shift/batch should be relatively constant (whether continuous process or batch process), because in absence of constant output it becomes difficult to establish a baseline of consistent and reliable efficiency.

2. where heat energy conversion equipment and heat energy transfer equipment are connected in series, such that the energy efficiency project taken up in any heat transfer equipment will save energy in conversion.

3. where heat transfer and conversion systems have efficiencies less than unity

4. Where the historical and current data is available for heat balance parameters vis-à-vis equipment useful heat output.

5. When used in conjunction with the corresponding baseline methodology."

The reasons for deleting points 3 and 4 in the meth as proposed is that these are not actually restrictions on the use of the meth, but describe how it is used.

The meth should have a wide geographical range of applicability to any region

(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:

>> AM0018

b) Indicate any further comments:

>>

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	