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:	17 - 19 October 2005
Related F-CDM-NM document ID number (electronically available to EB members)	F-CDM-NM0117: "Nanjing Chemical Industries Co Ltd (NCIC) Nitrous Oxide Abatement Project"
Related F-CDM-NMex document ID number(s) (electronically available to EB members)	F-CDM-NMex0117: Brodmann / Matsuo
Related F-CDM-NMpu document ID number(s) (electronically available to EB members)	F-CDM-NMpu0117: Heilig

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:>> Baseline Methodology for catalytic N_2O destruction in the Reactor gas of Nitric Acid plants

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):

>> This methodology is applicable for secondary destruction of N_2O produced as a byproduct of HNO_3 manufacture.

ii. Required changes:

>>

1. The basic algorithm of calculating baseline and project emissions by multiplying the volume of gas by N_2O concentration is acceptable, subject to ensuring stable production conditions such as temperature, pressure, catalyst composition and NH_3 input. This needs to be clarified.

2. Remove all project-related references within the CDM-NMB (e.g. sections D3, D4 and D6 of CDM-

NMB) in order to make this methodology applicable for other similar projects regardless of region.

3. Provide justification for the downstream destruction rate (NDF), which is assumed to be 1%. Conversely, provide methods to yield a reliable figure of baseline emissions, such as monitoring (option 1 in CDM-NMB which is rejected) or ex-ante calculation (subject to similar production conditions such as pressure, temperature, catalyst composition and NH_3 input).

4. A limit on CERs should be linked to the design capacity and not the maximum production. Provide explicit description in the CDM-NMB on how design capacity serves as a limit on CERs.

5. Baseline alternatives should not be rejected outright in the CDM-NMB. Rather, CDM-NMB should focus on how the baseline scenario should be evaluated and selected.

6. Description of leakage should be clarified.

7. Methodology should address the potentially large uncertainty arising from N_2O measurement.

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

c. Not to approve the proposed methodology

☐

i. Reasons for non-approval:

>>

(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: >> Monitoring Methodology for catalytic N_2O destruction in the Reactor gas of Nitric Acid plants

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.):

>> The same as described in the baseline section

ii. Required changes:

>> The same as described in the baseline section.

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

proposed have been made and the revised proposed methodology has been reconsidered by the Meth Panel.)

c. Not to approve the proposed methodology

☐

i. Reasons for non-approval:

>>

(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):* >> Baseline Methodology for catalytic N_2O destruction in the Reactor gas of Nitric Acid plants

(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 concerns projects which destroy N_2O formulated as a by-product of nitric acid manufacture, through the installation of a secondary catalyst, located just behind the reactor which oxidizes ammonia.

N_2O is a gas which passes through the subsequent steps unchanged and is released to the atmosphere with the tail gas, unless adequate control equipment is installed. The proposed methodology is intended for project activities which destroy N_2O in the reactor gas of nitric acid plants by installing a special catalyst anywhere between the platinum gauzes of the ammonia burner and the entry of the gas into the absorption tower (="secondary" approach for N_2O destruction). The catalyst decomposes N_2O into N_2 and O_2.

The methodology assumes that the project activity has no influence on the amount of N_2O formed. Consequently, baseline emissions are quantified ex-post based on the volume and N_2O content of the reactor gas stream entering the destruction facility. To this end, continuous online monitoring of the reactor gas is required.

Project emssions are determined based on the monitored volume and N_2O content of the tail gas after the destruction facility. Operation of the destruction facility is assumed not to result in any other emissions (e.g., no consumption of fuels, electricity, or reducing agents).

Emission reductions are calculated as the difference between the baseline and project emissions. No leakage of emissions outside the project boundary is expected.

b) State the approach selected:

>> The approach selected is as per paragraph 48 (a) of the CDM modalities and procedures: "Existing or historical emissions, as applicable".

c) Indicate (in summary form) why the approach selected is the most appropriate. Please provide your expert judgement on the appropriateness of the selected approach to the project category:

>>This approach was selected on the grounds that it is the most consistent approach.

Alternatives such as recycle, stripping or Non-Selective Catalytic Reduction is mentioned, evaluated in section D1, but are also rejected outright. Rejection of alternatives should be done on a project-by-project basis (in the draft CDM-PDD not in the CDM-NMB) or is done under applicability conditions.

(2) Basis for determining the baseline scenario:

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

>> Baseline scenario alternatives to the "no-action" scenario proposed, evaluated but are also rejected in the CDM-NMB, which does not seem appropriate (see 1c) above).

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

>> The baseline emissions are calculated by multiplying the volume flow rate of the reactor gas at the inlet of the destruction facility by the N_2O concentration of the gas, taking into account subsequent destruction which would have happened in the absence of the project activity. Project emissions include the non destroyed N_2O at the outlet (estimated as volume flow rate times N_2O concentration).

If a regulation to limit N_2O is implemented, baseline emission is the emission limit of N_2O (i.e. N_2O reductions are additional only when reduction in emissions is in excess of what is mandated by the regulation. This may be the case when additional efforts are required to reduce emissions in excess of the legal limit. This may not be the case for the technologies covered under this methodology.

It is assumed that for N_2O, the environment (temperature, pressure, traces of catalysts) in and downstream of the platinum gauzes of the ammonia burner of nitric acid plants may lead to a partial decomposition of N_2O after formation. It has been questioned that measurement of N_2O concentrations immediately after the platinum gauzes, as proposed by the methodology, provides an adequate indicator of the baseline emissions at the stack. In the absence of any corrections for downstream decomposition, this approach can lead to an overstatement of the baseline emissions. The methodology takes into consideration this effect, and deducts 1% as the N_2O gauze decomposition factor. Though the basis of choosing 1% is not explained.

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 CDM-NMB demonstrates additionality through the four steps, which, while not identical with the "Tool for the demonstration and assessment of additionality", draws upon it.

Condition:	Corresponding step of EB Additionality Tool
1. Compliance with N_2O regulation at project start.	Step 1 (w/o identifying lawful alternatives)
2. Project activity is not common practice.	Step 4 (largely literal quote)
3. Project activity not commercially viable w/o CERs	Steps 2 and 1a (largely literal quote)
4. CER revenue makes project activity financially viable.	Step 5

As an additional key element, the methodology provides for monitoring of N_2O regulation during the crediting period. Regulatory requirements to control N_2O emissions will be incorporated in the baseline from the moment implementation of such control becomes mandatory.

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

>>1. Baseline scenario determination

The methodology discusses several baseline options such as recycling, stripping and NSCR, but also rejects them. It is not clear whether this should be done on a project-by-project basis (in the draft CDM-PDD) or

is a part of the applicability conditions. Either way, the present description is not adequate.

2. Additionality

The methodology deals with recovery and destruction of N_2O currently vented as a byproduct. As with the case of AM0001 and AM0021, demonstration of additionality is straightforward if it becomes apparent that the baseline is the continuation of current activities. In this respect, demonstration of additionality is appropriate (though the baseline scenario selection, as mentioned above, merits improvement). However, project-specific information (e.g. regulatory information in China) is included in the methodology, which is not appropriate and is a step back from the prior version.

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

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

>> Inadequate. The revised draft incorporates some of the suggestions made in the preliminary recommendations, but includes many project specific information (e.g. in sections D3, D4, and D6) and is not qualified as being "stand-alone".

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):

>> In view of the constraints on temperature and pressure, it is deemed that the basic elements of the methodology is sound. However, many project-specific information are included (e.g. in sections D3, D4, and D6). Therefore, unlike its prior version, the methodology has ceased to become "stand-alone" .

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, if applicability conditions are redrafted (see below).

Please explain:

>> The section of the applicability condition suggests that the methodology is limited to secondary destruction of N_2O. If this is so, then condition 2,3 and 5 could be redundant, though the relationship to the proposed project activity is not entirely clear.

As per draft recommendation, the limitation on HNO_3 production is described, but there are two options (design capacity and maximum historical production, which the latter is preferred in CDM-NMM). This implicitly suggest some sort of a "cap", though it is not clear as to how this might serve its purpose since this is not incorporated in the baseline calculations (though a footnote in the CDM-NMM suggest proportional deduction). Furthermore, use of maximum historical production is not advisable due to its inconsistency (with AM0021), conservativeness and integrity (since it is assumed that staying within limits of design capacity is an indicator of sound management).

(4) Assessment of algorithms/formulae and type of data needed:

a) State whether the description of the methodology includes algorithms and generic formulae that can be applied to other potential project activities (if not, the proposed new methodology will be considered as a project-specific methodology):

>> The methodology includes algorithms and generic formulae which are potentially applicable to a wide range of byproduct N_2O destruction projects (though the extent of application remains unclear).

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

>> Yes, adequate:

Site: N_2O formation (measured at inlet of destruction facility) and emissions (at DF outlet).
Local: Fuel specific emission factors.
National: National regulations (on N_2O control).

Global: IPCC default values, e.g. for hydrocarbon and ammonia emission factors.

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:

>> Methodology states that "Based on the fact that baseline and project emissions are monitored ex-post there is no restriction on the vintage of data". This 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

>> N_2O generated from the nitric acid production facilities, and N_2O remaining after destruction.

ii) Physical delineation

>> Nitric acid production facility.

b) Indicate whether this project boundary is appropriate:

>> It is appropriate, in principle.

(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:

>> Key assumption is that there will be no room for possibilities of non-conservative ex-post estimations of emissions reduction in calculating the baseline emissions through volume of reactor gas and concentration of N_2O in the gas. Subject to certain conditions (pressure, temperature and catalyst composition) staying within a certain range, this is appropriate.

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

>> There has been an improvement on the initial submission, in that a default baseline destruction factor (NDF) has been set, though it is not transparent as to how the value was derived.

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

>> Inadequate.

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

>> Most data are site-specific. Exceptions are data used for the purpose of projection, which is taken from IPCC Guidelines (1996) & Good Practice Guidance (2000). Regarding national regulations of NO_X and N_2O, no specific sources are indicated.

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

>> The data are adequate and consistent, subject to the changes specified above. Their accuracy and reliability depends on their monitoring methodology, where uncertainty and calibration issues are not properly addressed.

f) State possible data gaps:

>> Basis of using 1% value for NDF.

(7) Assessment of uncertainties:

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

i) The basis for determining the baseline scenario:

>> No.

ii) Algorithms/formulae:

>> No.

iii) Key assumptions:

>> No.

iv) Data:

>> No.

b) State whether the uncertainties presented are reasonable:

>> No. The key source of uncertainty is the error in estimation of N_2O in the baseline scenario (through flow meter reading). The effect can be so large to potentially make some items pointless. Since references on byproduct rates typically cite an uncertainty range of 10%, it is assumed that the measurement of reactor gas volume and N_2O concentration could yield a comparative figure. This is not addressed.

(8) Leakage:

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

>> It is cited that "The secondary catalyst (DF) does not consume any energy. However utility usage such as electricity and energy use will be monitored and recorded and if any increase can be statistically verified then adjustments to claimed emissions reductions will be made."

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

>> Not appropriate (even though the eventual leakage could be negligible). The above sentence seems self-contradictory. If the secondary catalyst does not consume energy, then there will be no leakage due to energy consumption, and any statistically significant increase in utility usage has nothing to do with the project activity.

(9) Transparency and "conservativeness":

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

>> The methodology is mostly transparent. The potential downstream destruction of N_2O in the baseline is addressed by deducting 1% from the calculated reductions (NDF), but no basis for assuming 1% as NDF is offered in either the CDM-NMB or the CDM-NMM.

b) State whether the baseline methodology is conservative:

>> Conservativeness has been substantially increased since the methodology takes into account the effect of pressure and temperature change as well as downstream degradation of N_2O. However, since there is no justification of the level of NDF, it remains to be seen whether this is adequate. Furthermore, potentially large uncertainty with respect to N_2O measurement is not reflected, as is mentioned above.

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

>> Strength: simplicity, ex-post approach accounting for variations of baseline N_2O.

Weakness: does not address the possibility of possibilities of non-conservative ex-post estimations of emissions reduction, and potentially large uncertainty due to measurement of baseline N_2O.

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

>> National and sectoral regulations and policies for control of N_2O will be taken into account:

- Project facility must be in compliance at the start of the project activity;
- N_2O regulation is part of the monitoring and baseline will be adjusted during the crediting period if such regulation is introduced;
- It must be shown that the project activity is not common practice at nitric acid plants in the region.

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

>> The proposed methodology can be applicable to many non-Annex I countries, most of which do not have policies and regulations for N_2O reduction.

The methodology is not applicable across regions for project activities which reduce N_2O emissions at existing nitric acid plants through end-of-pipe treatment of the tail gas ("tertiary approaches" according to CDM-NMB Section B) or to project activities which prevent N_2O formation in the ammonia burner ("primary approaches").

The proposed methodology is, in its present form, not applicable to N_2O destruction methods other than the secondary approach..

(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:

>> Analysis of technical issues relating to catalytic N_2O destruction in nitric acid plants.

Evaluation of methodologies NM 0111 and NM 0117.

U.S. Adipic Acid and Nitric Acid N_2O Emissions 1990-2020: Inventories, Projections and Opportunities for Reductions, EPA.

Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories.

b) Indicate any further comments:

>> No.

II. Proposed new monitoring methodology *(specify title here):* >> Monitoring Methodology for catalytic N_2O destruction in the Reactor gas of Nitric Acid plants

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 monitoring methodology focuses on the method of monitoring volume flow rate, N_2O concentration and operation hours.

(2) Key assumptions/parameters:

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

>> See above.

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:

>>Yes.

(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):

>> Most data are measured directly on-site.

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

>> It is assumed that they are mostly adequate and consistent (though see section c) below). Accuracy and reliability of data need to be addressed in detail to ensure conservativeness.

c) *State possible data gaps:*

>> The percentage used in baseline destruction of downstream N_2O (NDF).

(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:

>> Generally, yes. However, project-specific parts should be removed from the CDM-NMM or put into applicability conditions.

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):

>> Mostly appropriate, though some project-specific information (included in the CDM-NMM, e.g. use of GASMET gas analyzer) should be removed.

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

>> Compatible.

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

>> See above.

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

>> The methodology denotes that calibration procedure is to be developed for routine calibration of key parameters. This needs to be more specific, including a description of the instrument, calibration frequency and applicable industry standards. It is not clear as to why the uncertainty level can be explained as being low when the QA / QC procedure is not elaborated, and the amount of N_2O produced can fluctuate with respect to various conditions. Further, the mention on GASMET gas analyzer is specific to the Nanjing project, its mention should be avoided when proposing a methodology (except in case when use of such instrument is necessary for all such projects). Accuracy, uncertainty and calibration method for GASMET analyses is not mentioned.

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

>> Strength: simplicity

Weakness: key parameters on baseline and project N_2O measurement does not have a built-in check and balance mechanism. Therefore, extra care is needed to ensure the accuracy of data. The methodology in its current form does not offer a convincing view.

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

>> The proposed methodology is, in its form, not applicable to project types which consumes energy and/or has other source of emissions (e.g. use of methane as a reducing agent).

The proposed methodology is, in its form, applicable to all regions.

(9) Any other comments:

a) State whether any other source of information (i.e. other than documentation on this proposed methodology available on the UNFCCC CDM web site) has been used by you in evaluating this methodology. If so, please provide specific references:

>> See above.

b) Indicate any further comments:

>> No further comments.

Signature of Meth Panel Chair ……..

Date: 24/10/05 *(Jean-Jacques Becker)*

Signature of Meth Panel Vice-Chair ……..

Date: 24/10/05 *(José Miguez)*

Information to be completed by the secretariat	
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