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	NM0086

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 judgments 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:>> Baseline methodology for project activities involving energy efficiency, self-generation, cogeneration, and/or fuel switching measures at an industrial facility

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

>>

According to section A.2 of the NMB, the methodology is supposed to be applicable to projects in "industrial energy efficiency, self-generation, cogeneration, and fuel switching" in "Sectoral Scopes" of (3) Energy demand, (4) Manufacturing industry, or (5) Chemical industry.

The methodology is very simple and ease to use. The data required by the methodology is available. But the methodology does not provide detailed descriptions, (such as mathematical models/equations, data process/conversion and calculations) for project activities involving power self-generation, co-generation and fuel switching. The methodology does not address the issues of energy demand analysis and forecasting. Consequently, the methodology at the current status can hardly be applied to potential projects.

ii. Strengths and weaknesses of the methodology:

>> Strengths:

(1) Developed on the basis of an accounting model, the methodology is very simple and easy to use.

(2) The data to be used in the methodology can be easily collected.

>> Weaknesses:

(1) The methodology is too general. It needs more calculation equations or sub-models for specific equipment or a process. For example, the methodology, when applied to the PDD, does not provide calculation equations for quantifying the emissions for a biogas generation facility which is developed as one of the main activities in the project (see Para. 1 page 3 of project PDD).

(2) The methodology lacks consistence. The key equations/models are adopted from the UNFCCC's approved methodologies. However, the CDM-NMB equation developed on the basis of AM0008 do not have much to do with the proposed energy efficiency project, and it is not used in the project PDD either.

iii. Any changes needed to improve the methodology:

a. Minor changes:>>

b. Major changes:>>

(1) Energy intensity measurement, which is the most useful and simple way in identifying energy savings and CO_2 emission reductions in industrial sector, should be used in the methodology. The baseline methodology is supposed to determine emission reductions from the industrial process. The improvement of the industrial energy efficiency will result in energy intensity reduction and hence mitigate GHG emissions per unit of output. The project developer should use the additionality tool to assess additionality and define the appropriate baseline scenario. Energy consumptions at the baseline and project emissions are calculated by multiplying an energy intensity of the product by the amount of the outputs at both baseline scenario and project activity scenario. Emissions from fuel use in the baseline and project scenario can be calculated separately by multiplying the amount of fuel used with the corresponding GHG emission factor. Activity data (production of the commodity, 630,000 tons of PTA as indicated on page 8 of the PDD for example) should be the same in the baseline and project case.

(2) Do not mix the items of emissions calculation in baseline scenario with project activity scenario. On page 7 of the NMB, the following formula is used to calculate baseline emissions: $BE = \Sigma j\ BFCj \times [CEFj + MEFj \times GWP (CH4) + NEFj \times GWP (N2O)] + \Sigma j\ (NBEPj + NPESj) \times EFelj + \Sigma j\ (NBSPj + NPSSj) \times EFstj$, where NPESj is the net electricity sold (electricity sold less electricity purchased) in the project scenario including net electricity sold to the grid (e.g. MWh) by the buyer/seller of j. It is suggested that NPESj be moved to the equation of project emissions calculation and change the definition into: "net electricity PURCHASED (electricity PURCHASED less electricity SOLED) in the project scenario including net electricity PURCHASED from grid j. This revision will make the formulae less confusing.

(3) Add more detailed equations to the methodology/model to calculate in both the baseline scenario and the project activity scenario. For example, the equation, $E = \Sigma i\ FCi \times [CEFi + MEFi \times GWP (CH4) + NEFi \times GWP (N2O)]$, on page 13 of the NMB calculates the project emissions. The FCi stands for fuel consumption i in the project scenario, measured in energy units (e.g. GJ). However, the project developer does not show how and what kind of formulae used to calculate FCi. This can also be seen from the PDD. On page 37, the PDD states: "… For this PTA annual production, the fuel saved (in energy content) is 2,620,895 MMBtu/year…, which was estimated from historical data of the industrial facility." This figure (2,620,895) is very important in the PDD. A simple and widely used methodology/model to calculate FCi in industrial sector is to multiply the industrial outputs by energy intensity. See Argument (1) above. The calculation sub-steps should be detailed, clearly stated and presented.

II. Evaluation of the proposed new monitoring methodology:

Title of new monitoring methodology: >> Monitoring methodology for project activities involving energy efficiency, self-generation, cogeneration, and/or fuel switching measures at an industrial facility

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

>> According to section A.2, the methodology is supposed to be applicable to projects in “industrial energy efficiency, self-generation, cogeneration, and fuel switching" in “Sectoral Scopes” of (3) Energy demand, (4) Manufacturing industry, or (5) Chemical industry.

Particularly, the methodology will be applicable on condition:

(1) there are changes in the energy efficiency of equipment (fuel and electricity savings)

(2) there is an installation of electricity self-generation (or standby power) equipment or changes in electricity self-generation equipment

(3) there is an installation of electricity cogeneration equipment or changes in electricity

cogeneration equipment

(4) fuel switching takes place for equipment

The methodology is not subject to region, but to availability of historical data of the equipment or facility in question.

ii. Strengths and weaknesses of the methodology:

>>

Strengths:

(1) The project boundaries are well defined and it is easy to monitor the project emission reductions and emission leakages, if it is appropriately modified.

(2) The methodology is very simple.

(3) The data to be used for project monitoring and auditing can be easily collected.

Weaknesses:

(1) Too general, the methodology does not provide detailed descriptions, such as mathematical models/equations, data process/conversion and calculations, for monitoring power self-generation, co-generation and fuel switching.

iii. Any changes needed to improve the methodology:

a. Minor changes:>>

b. Major changes:>>

Add more detailed sub-models/formulae to calculate emission reductions by using monitoring variables of industrial outputs and energy efficiency improvement, and using energy efficiency parameters for specific facilities such as a co-generation power plant, and/or biogas production in the PDD.

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

I. Proposed new baseline methodology *(specify title here):* >> Baseline methodology for project activities involving energy efficiency, self-generation, cogeneration, and/or fuel switching measures at an industrial facility

(1) Short description of the methodology, including an assessment of which approach from paragraph 48 of the CDM modalities and procedures was used:

a) Describe the methodology:

>> On the Page 3 of the NMB, it states: "The methodology considers emissions from fuel consumption by equipment at the industrial site (boilers, furnaces, etc.), both in the baseline and the project scenarios. Energy purchased (electricity or steam) results in emissions from energy generation outside the industrial facility, and energy sold from the industrial facility reduces such emissions …" The approach focuses the emissions in energy purchases/sales (electricity/steam) from grids, but failed to describe how the methodology will be used/implemented in an energy efficiency project (energy intensity, outputs, etc).

b) State the approach selected:

>> Approach (a) "Existing actual or historical emissions, as applicable" from "Para. 48 of the CDM modalities and procedures" are used in the project.

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 an energy efficiency improvement project. The historical data in energy and environment is available. The project boundary can be clearly defined, and project activity related data can also be easily collected. Consequently, the selected approach is appropriate.

However, some changes are required to make the approach more appropriate. For details, see my comments provided in (1) in "Major Changes" on page 2 of this document.

(2) Basis for determining the baseline scenario:

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

>> Yes, the documentation explained how to choose the baseline, but the approach and calculation need to be improved. See my comments in the previous section.

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

>> The baseline emissions BE (tCO_2e/year) are calculated by adding all the emissions within the project boundary (On page 8 of NMB):

$$BE = \Sigma_j BFC_j \times [CEF_j + MEF_j \times GWP(CH_4) + NEF_j \times GWP(N_2O)] + \Sigma_j (NBEP_j + NPES_j) \times EF_{elj} + \Sigma_j (NBSP_j + NPSS_j) \times EF_{stj}$$

where:

BFC_j -- Consumption of fuel j used in the baseline scenario, measured in energy units (e.g. GJ)

CEF_j -- Carbon dioxide emission factor per unit energy of fuel j (e.g. tCO_2/GJ)

MEF_j -- Methane emission factor per unit energy of fuel j (e.g. tCH_4/GJ)

$GWP(CH_4)$ -- Global warming potential of CH_4 set as 21 tCO_2e/tCH_4 for the 1st commitment period

NEF_j -- Nitrous oxide emission factor per unit of energy of fuel j (e.g. tN_2O/GJ) $GWP(N_2O)$ Global warming potential of N_2O set as 310 tCO_2e/tN_2O for the 1st commitment period

$NBEP_j$ -- Net electricity purchased (electricity purchased less electricity sold) in the baseline. Include net electricity purchased from the grid and/or a private plant (e.g. MWh). Each seller/buyer of electricity is denoted by j.

$NPES_j$ -- Net electricity sold (electricity sold less electricity purchased) in the project scenario. Include net electricity sold to the grid (e.g. MWh). Each buyer/seller of electricity is denoted by j.

EF_{elj} -- Baseline emission factor from electricity generation, including electricity generation by the grid and/or a private plant (e.g. tCO_2/MWh). Each source of electricity is denoted by j.

$NBSP_j$ -- Net steam purchased (steam purchased less steam sold) in the baseline. Include net steam energy purchased (e.g. GJ/year). Each seller/buyer of steam is denoted by j.

$NPSS_j$ -- Net steam sold (steam sold less steam purchased) in the project scenario. Include net steam energy sold (e.g. GJ/year). Each buyer/seller of steam is denoted by j.

EF_{stj} -- Baseline emission factor from steam generation (e.g. $kgCO_2e$/GJ steam). Each source of steam is denoted by j.

The methodology developer may need to use average energy intensity of the product production in 2004 while applying the above formulae to calculate BFC_j. See Argument (1) in the "Major Changes" on page 2 of this document.

It is better to move the term " $NPSS_j$" from baseline scenario to project activity scenario and change its definition and calculation approach. See Argument (2) in the "Major Changes" on page 2 of this document.

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

>> Yes, in principle, the methodology demonstrated that the project activity is additional. However, while

using the methodology, one can hardly quantify the additionality correctly. The reduction of energy consumption in one facility may result in energy increase in another linked facility or equipment. The methodology developer has noticed this issue. On page 5, the NMB sates the following: "The equipment involved in the project activity might be only a part of total equipment of the industrial facility. Since all equipment is typically inter-related in a complex and large process, it is consistent to consider total input and output of the facility". However, it does not provide how to do it. A better and simple way is to use energy intensity that applies for the facility/equipment within the whole project boundary.

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

>>

The basis for determining the baseline scenario and for assessing additionality is not really appropriate and adequate due to the following reasons:

(1) As mentioned, the whole methodology is very general and vague. No one can identify from the document how the developer will calculate $\Sigma_j BFC_j$.

(2) The methodology does not provide unambiguous guidance on how to apply the additionality tool in the energy efficiency projects.

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

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

>> No, it is too general and lack of sub-models to calculate energy consumptions.

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 is appropriate for the referred proposed project, if it is revised as suggested.

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, the proposed methodology could result in a baseline scenario, if it is revised in accordance with the suggestions indicated in the "Major changes" on page 2 of this document.

Please explain:

>> The methodology framework is applicable to the calculation of the anthropogenic emissions by sources of greenhouse gases that would occur in the absence of the proposed project activity. However, more equations and sub-models are needed for the calculation of baseline emissions, additionality and leakages (see the "Major Changes" of this document on pages 2 and 3).

(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, the description of the methodology includes algorithms and generic formulae. These formulae can be widely used in any energy efficiency projects. However, more detailed supporting sub-model/formulae should be developed to quantify energy consumptions and emissions.

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

>> According to the NMB, the spatial scope of data used to determine the baseline includes the following:

"Fuel consumption, energy purchase/sale, control variables, and equipment efficiency data correspond to the industrial facility. Parameters needed to determine the emission factor for grid-connected electricity

generation depend on the wholesale electricity manager and power plants connected to the grid in question."

This data scope is not sufficient. The missing data include (1) energy intensity of the product (toe per ton of PTA for example in the PDD) at the baseline scenario and the project scenario; (2) additional energy consumption to generate energy that is associated with the project (Biogas, for example, in the PDD).

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 data sources are based on three year historical data and existing audited information in accordance with the petrol-chemical industry, and will be measured / processed by the firm in a monthly basis. Thus, it is appropriate (although more detailed historical data should be collected).

(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

>> CO_2, CH_4, and NOx are defined in the documents as the target of GHG emission reductions, since these gases are the major GHG emissions from the industrial process and the boilers within the project boundary (see pages 13 and 14 of the NMB).

ii) Physical delineation

>> The project boundary is physically defined, which includes the geographical site of the industrial facility (see page 7 of the NMB). However, it does not apply the required terminologies such as "direct on site", "direct off site", "indirect on site" and "indirect off site" for the project boundary. That may leave difficulties to the future project developers. For example, the current PDD does not show how and where the biogas will be generated. Consequently, it is difficult to know what and how much of leakage relating to the biogas generation.

b) Indicate whether this project boundary is appropriate:

>> Generally speaking, the project boundary is appropriate.

(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:

>> On page 16, the NMB document lists the following explicit parameters:

(1) CEFi -- Carbon dioxide emission factor per unit energy of fuel i (e.g. tCO_2/GJ)

(2) MEFi -- Methane emission factor per unit energy of fuel i (e.g. tCH_4/GJ)

(3) NEFi -- Nitrous oxide emission factor per unit of energy of fuel i (e.g. tN_2O/GJ)

(4) EFeli -- Baseline emission factor from energy generation, including electricity generation by the grid and/or a private plant (e.g. tCO_2/MWh). Each energy source is denoted by i.

(5) EFsti -- Baseline emission factor from steam generation (e.g. $kgCO_2e$/tonne steam).

Comments:

The above parameters are very general and not enough to perform the analysis. As indicated above, more specific parameters that are related to energy efficiency projects such as energy intensity for industrial outputs, primary energy consumptions in a co-generation or standby (or captive) power plant in a typical industrial premise (in tons of oil equivalent per MWh), must be listed and assumed.

On page 16, the NMB document lists the following explicit assumptions:

(1) The dynamic baseline calculation is used to calculate baseline emissions related to fuel consumption.

(2) Data of the three years prior to project implementation, if the baseline scenario consists of the current fuel consumption patterns and maintaining all equipment currently in use.

(3) Dynamic baseline calculation also requires data on the fuel efficiency of each combination of equipment and fuel that produce heat. A preferred source of efficiency data would be based on direct measurements of heat output and fuel input. When it is not possible, efficiency measurements may be based on stack gas analysis (measurements of temperature and oxygen or CO2 concentration).

(4) Studies and/or simulations, if anyone or any combination of energy efficiency, self-generation, cogeneration, and fuel switching measures, different from the project activity, would be executed in the absence of the project.

Comments: These assumptions are not clear, and the NMB does not show how to apply these assumptions in project development. In the PDD, one cannot find the details either. For example, the data for energy consumption calculation in the PDD are not assumed. While calculating emission reductions, the PDD only gives out the energy savings between the baseline and the project activity scenarios: 1,620,895 MMBtu/yr (see page 37 in the PDD).

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

>> Not really. See comments above.

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

>> Not really. See comments above.

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

>> According to the information on page 16 of the NMB, the following parameters and data are collected from various sources and used in the NMB:

(1). National inventory of GHG emissions, prepared as part of the National Communications to the UNFCCC or other official documents.

(2). On-site measurements of carbon content and calorific value of fuels. This would be recommended for fuels where there is significant variation in properties and/or when the fuel is not widely commercialised.

(3). IPCC default emission factors. (4) IPCC default values. Methane emissions from fuel combustion are likely to be insignificant so that standard values should suffice to provide an adequate estimate.

(5) IPCC default values. Nitrous oxide emissions from fuel combustion are likely to be insignificant so that standard values should suffice to provide an adequate estimate.

(6) ACM0002 "Consolidated methodology for grid-connected renewable electricity generation from renewable sources."

(7) Simplified methodology for small-scale CDM project activities (for electricity generation less than 15 MW equivalent).

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

>> More adequate data that relates to specific facility or equipment should be added. For example, if the project activity involves purchase/sale of steam from a co-generation power plant, emission factors of the fuels that relate to the power plant shall be used. The PDD shows that the project will be related to power and heat purchase/sell from/to a grid or a private energy producer. The current data scope does not cover such data. Thus, the data used in the NMB is not adequate.

f) State possible data gaps:

>> As mentioned above, data gaps include what specifically related to facilities and equipment. The methodology is too general and hence leaves gaps of more specific data.

(7) Assessment of uncertainties:

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

i) The basis for determining the baseline scenario:

>> Not included.

ii) Algorithms/formulae:

>> Not presented.

iii) Key assumptions:

>> Not developed.

iv) Data:

>> Not collected.

b) State whether the uncertainties presented are reasonable:

>> Not presented

Comments: In project development, an uncertainty analysis is mostly related to project financial or economic analysis. The assessment of uncertainties is missing in NMB and in PDD. For the NMB developer's information, the World Bank and the Asian Development Bank provide standard methodology for the assessment of project uncertainties/risks.

(8) Leakage:

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

>> The baseline methodology for project activities involves energy efficiency, self-generation, cogeneration, and/or fuel switching measures at an industrial facility. However, the baseline methodology did not address how to apply the formula in the NMB in calculating leakages in energy efficiency process, self-generation (standby power), co-generation, and fuel switching.

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

>> Too general, not adequate.

(9) Transparency and "conservativeness":

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

>> The last paragraph of the NMB states:

"All equations that make up the determination of baseline emissions are straightforward and transparent. Wherever data limitations might exist, this methodology proposes alternative procedures and, in case of doubt, how to make conservative assumptions".

The formulae given in the NMB are simple and transparent. However, the formulae are not enough, more detailed formulae should be developed for the baseline methodology. See Argument (1) in the section of "Major Changes" on page 2 in this document.

b) State whether the baseline methodology is conservative:

>> It cannot be identified, because the calculation is too general.

According to the PDD, it is not really very conservative. A mixed fuel supply, with natural gas for example, should be assumed at the baseline scenario. See Argument (4) in the last section of this document: "Comments on the PDD".

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

>> >> Strengths:

See Section I on page 1 of this document

>> Weaknesses:

See Section I on page 1 of this document

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

>> The NMB does not include detailed analysis in policies. The PDD takes into account the national and international fuel oil prices in the analysis. However, the details/steps of the analysis are not presented.

Other policy analyses such as the impacts of the government tax policy/regulations and utility's preferences/subsidies on electricity generation by a standby power plant or co-generation should be presented.

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

>> The proposed methodology can be applied in any energy efficiency projects across regions, if it is revised accordingly.

(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:

>> A similar methodology was developed to undertake a feasibility study of CDM project in Cambodia. The project was to substitute an oil-fired power plant with a natural gas fired power plant in the centre of Phnom Penh.

b) Indicate any further comments:

>> No.

II. Proposed new monitoring methodology *(specify title here):* >> Monitoring methodology for project activities involving energy efficiency, self-generation, cogeneration, and/or fuel switching measures at an industrial facility

In respect of the proposed new monitoring methodology, evaluate each section of CDM-NMM to the draft CDM-PDD. Please provide your comments section by section:

(1) Brief description of new methodology:

Describe new methodology:

>> As described by the authors, the methodology is based on monitoring fuel in an industrial facility, and in generating electricity to meet all or a part of the industrial demand.

Project emissions are directly related to fuel consumption at the industrial facility, so that only project fuel consumption needs to be monitored in order to determine them.

In order to estimate the ex-post baseline emissions from fuel combustion, the proposed methodology provides the following two options: (1) baseline emissions from fuel combustion would be determined in a dynamic manner from project monitoring data; (2) baseline emissions from fuel combustion would be determined in a quasi-dynamic manner from project monitoring data and relations between fuel consumption in the baseline and adequate process variables.

The methodology focuses on the monitoring the following parameters between the baseline scenario and project activity scenario (pages 4 and 5 of the NMM):

(1) Changes in electricity purchase or sale from the connected power grid and/or a private plant as a result of the project activity would cause changes in emissions outside the industrial facility.

(2) Changes in steam purchase or sale.

(3) Quantity of fuel i consumed at the industrial facility Qfi.

Then, the methodology defines the baseline scenario as the most plausible scenario in the absence of project activities, analyse the project additionality, and calculate emissions reductions achieved during project activities.

(2) Key assumptions/parameters:

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

>> The assumptions include (page 17 of the NMM):

(1) Heating values and emission factors of fuels keep unchanged throughout the project. Where data from other sources are not available, IPCC default emission factors may be used.

(2) Emissions from grid-connected electricity generation require data that are specified in ACM0002

(3) Calculation of emissions from fuel transport, the specific energy consumption of the transport mode is determined ex-ante from historical data or estimations, and it is considered fixed during the crediting period.

(4) A dynamic baseline calculation is used to calculate baseline emissions related to fuel consumption when Option 1 is chosen.

(5) When Option 2 is applicable, the quasi-dynamic baseline calculation is used to calculate baseline emissions related to energy purchase/sale, and also baseline emissions related to fuel consumption.

Comments: The calculation of fuel consumption per unit of output (energy intensity) in a baseline scenario and in the project activity scenario should be performed for the CDM project. That parameter or calculation result will be able to really monitor the additionality of the CDM project where production capacity is in constant increase. Take the Petrotemex Energy Integration Project as an example, the project capacity has been increasing over the past 20 years and will increase in the forthcoming 10 years. Without taking into account the reduction of energy intensity, it would be difficult to monitor real energy savings and CO_2 reductions.

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

>> The key assumptions listed in the NMM are transparent.

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

>> No, the assumptions/parameters are not adequate/comprehensive. Assumptions/parameters such as energy intensity for products, primary energy consumption by the co-generation of self-power generation are not developed. See Arguments (3), (4) and (6) in the last section of this document.

(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):

>> The data come from (1) industrial facility; (2) power grid and/or private plant; and (3) steam supplier.

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

>> The data used are consistent, accurate and reliable, but not adequate. More data such as energy intensity of the products should be collected to effectively monitor CO_2 reductions in such energy efficiency projects.

c) *State possible data gaps:*

>> Data that relate to equipment, the final products and energy intensity of the final products are also needed.

(4) Assessment of the description of the proposed methodology and its applicability:

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

>> No, the methodology failed to quantify energy efficiency improvement in terms of per unit output of the industrial facility.

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 proposed methodology is appropriate for the referred proposed project activity. However, more detailed calculation formulae are needed in the PDD. For example, the PDD failed to show how to calculate energy savings between the baseline and project activity scenarios. See Argument (5) of the comments on the PDD at the last section of this document.

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

>> The proposed methodology is compatible with the proposed baseline methodology.

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

>> The methodology of leakage monitoring and leakage calculation presented on page 16 of the NMM are very general. More detailed formulae to calculate leakages from a newly developed facility, a biogas plant for example, should be developed. In the PDD, the project developer does not show how to monitor leakage of the biogas plant. That may be resulted from the lack of detailed methodology to capture such leakage in the NMM document.

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

>>

In the NMM, there is very limited information on quality assurance and control procedures. On page 19 of the NMM, it states, "The industrial facility shall have a series of internal procedures that ensures data have low uncertainties during monitoring process. These procedures are specific for each industrial facility and shall be explained in the PDD".

The project related PDD states that the firm has its quality assurance (QA) and quality control (QC) procedures (page 33). However, these procedures are not explicitly stated.

An acceptable quality assurance and control procedures may include the allocation of the monitoring tasks to a couple of professionals in the firm and a monitoring plan needs to be specified.

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

>> Please see Section II on page 3 of this document.

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

>> This methodology can be applied to all energy efficiency projects as long as it is conforming to requirements indicated in Sections I and II.

(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:

>> International Energy Agency (2004) Energy Prices & Taxes, Quarterly Statistics, IEA, Paris

b) Indicate any further comments:

>> Additional comments on the project PDD:

(1) Correct the outstanding errors in the PDD. These include: (a) Tables 2 and 3 on page 10 - the power

output of the generator is 11,500 kVA (or 9,200kW with a power factor of 0.8). However, the capacity of the turbine is 27,700 kW, three times as that of the generator. It is a waste of capital to install such a large turbine to drive such a small generator. This must be wrong. Similarly, Tables 5 and 6 on page 12 show that the capacity of the turbine (7,343 kW) is smaller than that of the power generator (7,500 kW). A small turbine cannot drive a large generator. It might be wrong again.

(2) Undertake more project economic and/or financial analyses and present the results more clearly. At "Step 2. Investment Analysis" on Page 18, the PDD says: "This step has not been selected". Nevertheless, on page 16, the PDD states: "However, an increase from the required initial investment of more than 50% has put the project on halt. The additional benefits associated by considering it as a CDM project are crucial for the approval of additional funds needed to implement the project activity." Stating that, the project developer must have developed the project cash flow under the two scenarios: with and without CDM benefits. Thus, the PDD should show such information.

(3) A standby (or captive) power plant cannot run 8,400 hours a year! While calculating emission reductions related to electricity purchases, on page 38 the PDD developer assumes that the power plant runs 24 hours a day and 350 days a year (or equivalently 8400 hours a year or at the power plant factor of 95.89%). Throughout the world, one can never and ever find a thermal power plant which can run 8,400 hours a year. A power plant has to be stopped for annual repairing and inspection which cannot be accomplished in 10 days. A typical standby power plant in developing countries runs 3,000-6,000 hours per year.

(4) A mixed fuel consumption scenario for the future in the absence of the project activity may be more reasonable. The PDD developer assumes that "heavy fuel oil is the fuel that would have been consumed in the absence of the project activity (alternative 5)" on page 17. The developer's justification for the assumption is that the forecast prices of natural gas will be higher than that of oil prices in the future years. However, energy price is not the one and only factor to influence on energy consumption. Other factors, such as fuel transportation and clean environment in the energy use are also very important. It is hard to accept the assumption that the heavy fuel oil is the one and only fuel in the future for the firm in the absence of the project activity. A mixed fuel consumption will reduce the emissions of the baseline and hence be more conservative.

(5) Consider the primary/secondary energy consumptions to produce biogas as possible project leakages. On page 37 in the PDD, it reads "Additionally, it is expected that 1,260,000 m3/year of biogas will displace a small part of the heavy fuel oil consumed at the boiler room. However, the PDD does not demonstrate how the biogas comes from, and what and how much additional energy will be used to produce the biogas.

(6) Check and revise the prices of oil and gas. Table 9 on page 17 shows **the decreasing trends** of the prices of natural gas and heavy fuel oil, while the text on Page 16 reads "**increasing trends of natural gas prices**". There must be some mistakes. The numbers in Table 9 might be in constant prices, while the prices in the text are in nominal terms. The developer of the PDD should justify it and clearly state it. (For the PDD developer's information, the desk reviewer verified the historical prices of oil and gas in Mexico over the past few years. It shows that the nominal prices of oil and gas have been increasing and the acceleration rate of gas prices has been larger than that of oil. See Table 1 at the end of this document.

Signature of desk reviewer

Date: 13 / March / 2005

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	

Table 1 Average nominal oil and natural gas prices in Mexico (in Mexican Pesos)

	Heavy oil for industry (per tonne)	Oil price index (1994=100)	Natural gas for industry (per 10^7 kilocalories calculated at GCV)	Gas price index (1994=100)
1994	213.9	100.00	269.99	100.00
1995	357.66	167.21	395.34	395.34
1996	570.5	266.71	678.54	678.54
1997	689.41	322.30	787.19	787.19
1998	585.89	273.91	744.88	744.88
1999	696.84	325.78	843.21	843.21
2000	1091.46	510.27	1418.28	1418.28
2001	963.33	450.36	1527.11	1527.11
2002	1136.11	531.14	1185.32	1185.32
2003	1506.77	704.43	2214.71	2214.71
2004	1587.63	742.23	2192.94	2192.94

Source: International Energy Agency (2004) Energy Prices & Taxes, Quarterly Statistics
Note: GCV = Gross calorie value (9400 kcal/m^3)