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:	14 - 17 June 2005
Related F-CDM-NM document ID number (electronically available to EB members)	F-CDM-NM0100: "Electric motor replacement program in Mexico"
Related F-CDM-NMex document ID number(s) (electronically available to EB members)	F-CDM-NMex0100: Phylipsen / Schiller
Related F-CDM-NMpu document ID number(s) (electronically available to EB members)	F-CDM-NMpu0100: Niederberger / Takao / Graichen

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:>> Activities for the promotion of electricity efficiency, through the replacement of unitary equipment, by parties that are not the energy consumers.

a. To approve this proposed methodology with minor changes

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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:

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b. To reconsider this proposed methodology, subject to required changes

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

>>

ii. Required changes:

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(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:

>> The methodology is intended for programmes that encourage the adoption of energy-efficient equipment such as lamps, ballasts, refrigerators, motors, fans, air conditioners, other appliances, etc. at many sites.

- The methodology suggests that it can be used for equipment with fixed load as well as variable loads. The latter may be very complicated in terms determining the baseline and in monitoring energy consumption after implementation. The methodology does not describe the case of variable loads. The methodology for variable loads in both the baseline and monitoring methodologies is missing.
- Also, the methodology indicates that it is applicable to all types of equipment, however, the methodology has been developed primarily for electric motors with fixed load only.
- The methodology is for an important type of potential CDM project activities that of addressing efficiency improvements in dispersed small load variable electrical equipment. However, the methodology does not address measurement and estimation issues related to such types of projects.
- The documentation does describe different scenarios that should be included, but does not describe how the correct baseline scenario should be identified, other than that this should be done on a project by project basis by using the "Tool for the demonstration and assessment of additionality". Appropriateness of this is difficult to judge at this general level especially for this project type.
- The methodology does not provide any assessment of uncertainties.
- The methodology states that technologies may replace existing equipment "in operation" "or be installed at new sites". It is not clear how it is possible to replace "in operation" equipment at "new" sites?
- The methodology would be applicable to the promotion of energy efficiency realized by organizations that are not the end users of energy. (not clear why this restriction is necessary. In theory a group of consumers, say an industrial group, can develop a similar CDM project activity).
- The methodology relies on three major assumptions: motor efficiency, remaining motor life, and motor operating hours. All these assumptions are not documented in the draft CDM-PDD or explained in the baseline or monitoring methodologies. Often old motors do not have their nameplates or the nameplates are no longer readable, and sponsors provide documentation on the baseline motor efficiencies (issue of transparency). A classification of the motors into different subgroups with different assumptions for operating hours, loads, remaining motor life and baseline efficiencies is required.
- Operating hours in the calculation of project and baseline energy should be the conservative value from the pre-project and the post-project installation operating hours, this is not discussed in the methodology.
- Emission factors for electricity using "Consolidated methodology for grid-connected electricity generation from renewable sources" (ACM002) for the entire power grid may be too broad an application if the replaced motors are not uniformly distributed in the physical boundary of the project. The same is true for the T&D factors.
- The motor life assumption, at forty years is overly optimistic as well as the assumption that all new motors would stay in operation for 21 years. It is also implied that all of the replaced motors were operational (that is the motor was replaced "early" not when it failed) and that there are no "free-riders"(that is none of the motors would have been replaced without the incentive provided by the program). Feedback effect and leakages need to be addressed. Leakage is not addressed adequately. For example, it is also assumed that the hours of operation are unchanged during the baseline and project activity, which may not be the always the case. Smart systems may reduce hours of use or improved efficiency will increase usage.
- The study should also focus on monitoring new replaced motors and their operation at nameplate

efficiencies. A burnout in a new motor is equally likely (as that for old motors) to get local rewinding, which would be less efficient than what is assumed for calculating ERs.

- The ownership question is not addressed. There could be multiple potential "claimants" on the ERs and the methodology doesn't ensure that there will be no double counting of the ERs from an efficient motor and that the end-user or manufacturer will not claim the ERs from efficient motors.
- The use of "Tool for the demonstration and assessment of additionality" in the context of the proposed applicable project activities should be elaborated in the methodology.
- EPk should refer to electricity purchased for the new "project" equipment, not all energy used by participants in the program.

(A new proposal should be submitted in accordance with the procedures for submission and consideration of proposed new methodologies of the Executive Board.)

Title of proposed new monitoring methodology: >> Activities for the promotion of electricity efficiency, through the replacement of equipment, by parties that are not the energy consumers.

a. To approve this proposed methodology with minor changes

☐

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

>>

ii. Minor changes:

>>

b. To reconsider this proposed methodology, subjected to required changes

☐

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

>>

ii. Required changes:

>>

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

c. Not to approve the proposed methodology

☒

i. Reasons for non-approval:

>> The methodology is intended for programmes that encourage the adoption of energy-efficient equipment such as lamps, ballasts, refrigerators, motors, fans, air conditioners, other appliances, etc. at many sites. The baseline methodology has to changed significantly and corresponding changes are required in the monitoring methodology.

- Tables listing variables to be measured, estimated or calculated should include the name of the factors, not just the symbols. Also use different letters than "pn" for power input of new devices as "n" is already defined as the number of equipment replaced.
- Some variables listed in the tables that are indicated to be measured are actually estimated, e.g. hours of operation.
- Energy use of motors is shown to vary by climate in one of the tables, but this independent variable is not discussed in text and it would seem to be only one of several possible independent variables

(such as motor application, or usage) that should be considered

- Frequency of measurements and surveys are not defined for key parameters such as operating hours and persistence of savings. The generalization of assumptions across all motors in Mexico, for example the relatively high estimate of operating hours, is not segmented by types of applications or other factors that determine operating hours.
- QA/QC procedures are not well defined and will be of particular importance with unreadable nameplates and the potential of overly optimistic reports of motor operating hours.
- As indicated above in the baseline methodology section, there should be more segmentation of assumptions for emissions, motor operating hours, etc. and surveys and analysis to determine ERs transparently and conservatively.
- The methodology needs to provide guidance on:
  (a) How to assess whether previous studies are applicable to the current project;
  (b) How to determine what is 'similar' equipment;
  (c) What are the representative samples;
  (d) Address leakages;
  (e) Reduce dependency on project sponsor data.

(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):* >> Activities for the promotion of electricity efficiency, through the replacement of equipment, by parties that are not the energy consumers.

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

a) Describe the methodology:

>> The methodology determines emissions reduction from a project activity that replaces existing inefficient equipment with new efficient equipment. The methodology determines baseline energy use as the electricity consumption of the end-use equipment to be replaced, using a simplified procedure to determine energy use in the device. The equation corresponds to equipment with fixed power input during operation, energy consumption is given by the product of the number of equipment of a given power input (kW) and the annual operating hours. Energy (electricity) savings are converted to emission reductions using the approved consolidated baseline methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" and taking into account transmissions distribution losses. Additionality is assessed using the "Tool for the demonstration and assessment of additionality" (published as Annex 1 to EB 16 Report, Dec. 2004). Though the methodology includes variable load equipment it does not address issues related to variable loads.

b) State the approach selected:

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

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

>> Paragraph 48 (a) of the CDM modalities and procedures is most applicable, because the project involves replacement of equipment currently in service, which reflects the nature of demand-side management programs and best practice for evaluating energy savings and greenhouse gas emission reductions. However, for generalized use the methodology should indicate that the energy efficient alternative is not cost-effective on the merits of energy cost savings (paragraph 48 (b) of the CDM modalities and procedures. "Emissions from a technology that represents an economically attractive course of action, taking into account barriers to investment") and that no similar equipment replacement program has been

conducted in the past, or sponsored with government financing, and could not be implemented without CDM revenues (paragraph 48 (c) of the CDM modalities and procedures "The average emissions of similar project activities undertaken in the previous five years, in similar social, economic, environmental and technological circumstances, and whose performance is among the top 20 per cent of their category"). Though approach as per paragraph 48 (a) of the CDM modalities and procedures may be the most suitable it has not been sufficiently substantiated.

(2) Basis for determining the baseline scenario:

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

>> The methodology explains how the baseline emissions factors are calculated but there is no documentation (only a report is mentioned) on how baseline motor efficiency and operating hours were determined. This is not sufficient for a generalized methodology.

The documentation does describe different scenarios that should be included, but does not describe how the correct baseline scenario should be identified, other than that this should be done on a project by project basis by using the "Tool for the demonstration and assessment of additionality". Elaborating the applicability of the tool will improve the methodology

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

>> The basic underlying rationales consist of assuming that the baseline is the current electricity consumption of the end-use equipment taking into account T&D losses and that this energy consumption would continue to be the baseline for the entire crediting period. ACM002 is used (the combined margin approach) to determine the emission factor of the avoided electricity production.

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

>> The documentation provided in the draft CDM-PDD is based on the "Tool for the demonstration and assessment of additionality". The draft CDM-PDD explains how barriers analysis is used and arguments provided that the baseline scenario is the existing operation of the equipment, in part due to the lack of existing programs in Mexico as well as the existence of other similar programs in other industrialized nations that address market barriers. Further elaboration and inclusion of the additionality tool in the baseline methodology would be useful.

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 additionality is appropriate and adequate with the exception that analyses are not provided indicating that the early replacement of motors is not cost-effective for the owners of the motors or the servicing electric utility, and that all motors (equipment) are operational.

(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. Additional information is required on key assumptions. See item 3(c) below

Only the approach for fixed load equipment is described, not for variable load, while Section B does suggest the methodology is also applicable to both types of equipment.

In general, the description does not pay any attention to the difficulties of determining the electricity consumption (or load and operating hours) of a large group of dispersed electrical equipment or which requirements this determination should meet.

The equation on the top of p7, using EPk as the total amount of electricity purchased by users of the equipment is not the same as the formula described further below on the same page, which determines the electricity consumption of each of the individual equipment, as the end-users can purchase electricity for a variety of other purposes as 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):

>> Additional documentation is required to determine whether this methodology is appropriate, see item 3(c). Some issues raised by this specific draft CDM-PDD and methodology that need to be addressed are:

Continuation of existing motors till end of technical life is not substantiated

Not much corroboration that there are no alternatives to continuation of current equipment (baseline) and replacement by high efficiency motors in project activity. Section on barriers (step 3 of "Tool for the demonstation and assessment of additionality") is weak, basically stating that the fact that there are still inefficient motors being used proves that barriers exist. This would mean that each project improving the efficiency of existing plants or equipment would by definition be additional! A metric to identify barriers for such projects could be defined and included in the methodology.

System boundary is different in draft CDM-PDD than in methodology description (excludes electricity grid).

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

>> Cannot be determined as sufficient rigor in the methodology is lacking and many types of devices are excluded.

Please explain:

>> While the baseline energy analyses equations are straightforward they rely on three major assumptions: motor efficiency, remaining motor life, and motor operating hours. These all appear to be based on undocumented assumptions. These are compounded by the fact that often old motors do not have their nameplates or the nameplates are no longer readable.

- Emission factors come from "Consolidated methodology for grid-connected electricity generation from renewable sources" (ACM0002) and are applied to the entire Mexican power grid. This may be too broad an application if the replaced motors are not uniformly distributed over all of Mexico. The same is true for the T&D factors.
- There is also an implied assumption that increasing motor efficiency requirements will not impact the net energy savings from the program over 21 years. There is also an implied assumption that all of the replaced motors were operational (that is the motor was replaced "early" not when it failed) and that there are no "free-riders" (that is none of the motors would have been replaced without the incentive provided by the program).

It is also assumed that hours of operation remain unchanged overtime. As pointed out in a public comment: "The methodology does not consider other factors which might influence the electricity consumption of project participants. One example is the variable $o_{i,}$ which describes the annual average operating hours of the equipment. First, it is unclear whether the operating hours of the old or of the new equipment should be used in the determination of the project emissions if they are different (e.g. when the installation of a more efficient lighting technology is accompanied by an intelligent controller and timing system to reduce operating hours). Second, a change in operation hours might be due to the project but could also have reasons like reduced operation hours due to insufficient demand for a product, malfunctioning of equipment, strikes, etc. In an extreme example the new equipment does not operate for a full year for reasons not connected to the project but emission reductions (ERs) would still be generated." and" operating hours depend on many factors and samples from other users are not likely to be representative for different project participants. Small differences like the position of a refrigerator in a building or the working hours of offices can change electricity consumption considerably. Operating hours or electricity consumption therefore have to be monitored directly for the project and the baseline situation to ensure that adequate data is generated for determining actual emission reductions. Technology to monitor electricity consumption of distributed small consumers exists, e.g. http://see www.dezem.de".

In the same context it is unclear, why only climate is considered as an influencing factor for electricity consumption. Geographic location, working hours, controlling and operating systems and other factors have an important influence on consumption. Even for cooling equipment the consumption does not only depend on climate and model installed but also on the insulation of a building, the installation of the

distribution network, user patterns and other parameters. Default values will not be able to reflect all of these factors and do not provide a reasonable basis for the determination of emission reductions." The methodology has to demonstrate how it is being conservative in its estimation of the ERs.

(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 algorithms can be used for programmes that relate to some electrical end-use equipment , but their applicability is limited to fixed load equipment.

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

>> For this project the spatial scope is national, although for other projects it could be regional. The project would always involve multiple, actual "site" locations.

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:

>> Baseline data on motor characteristics (age, rating and efficiency) would come from motors submitted for replacement. Baseline motor efficiency comes from assumptions that are not documented. Baseline motor operating hours come from assumptions that are not provided. Baseline motor operating hours and project activity motor operating hours will most likely vary over the term of the crediting period. Not clear in the methodology how the differences in remaining life time of existing equipment is included.

(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(e) emissions associated with electricity produced for national electrical grid. The grid is assumed to supply the electricity used by baseline and project equipment. No gases identified, although Section E2 mentions CO2 as well as methane and N2O.

ii) Physical delineation

>>National (as is case for this project) or regional including equipment consuming electricity that is replaced and the electricity grid they are connected to.

b) Indicate whether this project boundary is appropriate:

>> Yes, with the possible exception that regional emission (and T&D) factors should probably be used for a national program versus a single national value unless it can be shown that a single value provides acceptable results for the country of implementation

(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:

>>

Explicit assumptions that are problematic:

- Motor life, motor operating hours, and motor efficiency
- The only parameter/assumption explicitly mentioned is the grid emission factor, for which ACM0002 is referred.

Implicit assumptions that are problematic:

- Include that the population of electrical equipment to be replaced can be treated similarly, independent of their size, efficiency, load, operating hours or that these can be accurately determined for the entire population, without any difficulties.

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

>> No as discussed above several assumptions are not supported or substantiated.

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

>> No. Motor life and operating hours seem high, though the efficiencies may be all right all these need to be substantiated. Also, the equipment should be differentiated by age and remaining life.

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

>> A study is referenced on baseline motor efficiencies but not formally cited or provided. Operating hours and life information is not documented

The only data sources mentioned are 'official national statistics' for CO2 emission factors from fuels and the IPCC for emission factors of methane and N2O from combustion

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

>> The referenced study might be perfectly adequate and valid, but it needs to be provided. Similar work is probably required on motor life and operating hours. A single study may be relevant for the draft CDM-PDD but not for the methodology. Other data like operating hours are not documented or explained so accuracy and reliability is difficult to judge.

f) State possible data gaps:

>> As noted before, nameplate data may not be available on existing motors, free riders have not been assessed and the baseline motor operating hours, life and efficiency needs to be documented. If the replaced or new motors have variable input power then additional information would be required to calculate savings. (This is briefly touched upon in the monitoring methodology but not adequately dealt with.).

(7) Assessment of uncertainties:

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

i) The basis for determining the baseline scenario:

>> Not provided.

ii) Algorithms/formulae:

>> No, but the algorithms provided are very straightforward.

iii) Key assumptions:

>> Not provided.

iv) Data:

>> Not provided.

b) State whether the uncertainties presented are reasonable:

>> As indicated above there are a wide range of uncertainties associated with data and key assumptions and some adjustment say a net to gross ratio should be applied to account for these uncertainties as well as for the free rider problem, and spill over effects. As stated in the public input: "The methodology should provide more guidance on data quality issues, recognizing that data availability and quality can vary greatly with country, sector, technology, etc." General principles should be included in the methodology to ensure that data availability and quality are treated explicitly and appropriately in draft CDM-PDD.

(8) Leakage:

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

>> Leakage is addressed in this program through the program requirements that (a) only new equipment is provided to replace baseline motors and (b) replaced baseline motors will be destroyed.

No other leakage is identified.

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

>> Some leakage issued are addressed. Controls that ensure that only operation motors are being submitted for replacement (for example, it is not an old motor from the junk yard) or a motor from outside the project boundaries (for example the neighbouring country).

Another kind of leakage not identified is related to usage before and after the CDM project activity. In some cases, increased efficiency may lead to increased use (higher operation hours), e.g. leaving the lights on longer after installing CFLs because it costs less to leave them on, i.e. resulting in less emission reductions than forecasted.

(9) Transparency and "conservativeness":

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

>> Not transparent as many vital assumptions are not substantiated and data are not documented.

The methodology suggests that it can be used for equipment with fixed load as well as variable loads, but does not describe the methodology for variable loads.

No attention is paid to difficulties of assessing load and operating hours of existing dispersed equipment in determining baseline. Probably not suited for equipment with variable load. All feedback effect (leakage) is not addressed.

The documentation does describe different scenarios that should be included, but does not describe how the correct baseline scenario should be identified, other than that this should be done on a project by project basis by using the "Tool for the demonstration and assessment of additionality". Appropriateness of this is difficult to judge at this general level especially for this project type.

The methodology does not provide any assessment of uncertainties.

b) State whether the baseline methodology is conservative:

>> Not possible to determine with the given information. Documentation has to be provided on the factors of concern, as indicated earlier.

Is not conservative as it does not account for all possible leakages.

It is unclear whether it is conservative or not as it is not indicated how differences in load, operation hours etc are dealt with.

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

>>

Strengths:

- Addresses an important energy efficiency program concept.
- The program approach seems well thought out, particularly the requirement of destroying the replaced, less-efficient, motors.
- Well organized and prepared in a manner that should allow generalization to other projects.
- Builds on approved methodologies and is applicable to whole programmes of dispersed equipment rather than large stand alone projects, extending the scope of the CDM.

Weaknesses:

- Assumes that is not economical, from the customer perspective or the utility perspective, that early replacement of equipment will be cost-effective in absence of the program.
- Relies on undocumented and optimistic assumptions for motor operating hours and motor lives. Relies on baseline motor efficiency assumptions that are not documented. Indicates a crediting period of 21 years for all equipment, which may be excessive.
- The emissions factors would be expected to vary across the country's grid; and motors replaced in one region of the country may have significantly different CO_2 reductions than motors replaced in another part of the country in which power plant fuel mixes and the applicability of build margin versus operating margin calculation methods would vary.
- Methodology does not address major issues associated with these type of projects where many small dispersed unit of equipment are replaced, related to data on number, load, operation hours, etc.
- Methodology also does not address 'feedback effect' or leakage.

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

>> The project is based on the assumption that there will not be government or utility rate payer incentives available for inducing end users to replace existing motors with more efficient motors and that minimum motor efficiency standards will not increase over the entire crediting period.

National policies to promote energy efficiency in electrical end use equipment are included in the baseline.

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

>> This methodology attempted an important contribution to the CDM process by addressing a good program concept of replacing inefficient equipment with more efficient equipment through the use of CDM based financial incentives on a regional or national level. The methodology with significant changes is applicable across region. Its applicability to equipment to be installed at new sites is not obvious.

(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:

>> Public input submitted by:

- Conrad U. Brunner / A. Arquit Niederberger
  A + B International (Sustainable Energy Advisors)
- The Federation of Electric Power Companies -Kitahara Takao

- Jakob Graichen

b) Indicate any further comments:

>> Although it is recommendable that methodologies are developed for programmes aiming to implement large numbers of small energy efficiency or renewable energy technologies, the current proposed methodology does not address the main problems associated with these type of projects, i.e. assessing the load factors and operational hours in the baseline situation, spotting leakage on so many different sites and dealing with the differences (in size, efficiency, life time, etc) within the population.

II. Proposed new monitoring methodology *(specify title here):* >> Activities for the promotion of electricity efficiency, through the replacement of unitary equipment, by parties that are not the energy consumers.

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:

>> This proposed methodology incorporates the following procedure:

- For equipment with a fixed power input, total on-site electricity consumption reduction is given by the product of equipment quantity, power input, the number of operating hours per year and a ratio comparing new and baseline equipment efficiencies. The on-site electricity reduction is increased by a T&D loss factor to calculate grid electricity consumption reduction. The decrease in electricity use is converted into units of CO2 equivalent using an emission factor. Information on each baseline motors' age, remaining life, operating hours, rating (in hp) and operating hours is collected when motors are turned in for replacement or from generalized assumptions. Project motors' similar characteristics are based on nameplate data or assumptions. T&D loss factor is set once for the entire crediting period based on assumptions for the entire country. Grid emission factors are based on the combined margin calculation method in ACM0002 and calculated annually for the entire country.

(2) Key assumptions/parameters:

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

>> Other than the major assumptions discussed with respect to the baseline methodology the primary monitoring assumptions concern:

- The availability of data on old replaced motors – may be very problematic
- Availability of operating hour information – which must be determined in some valid manner, that is not defined in the methodology
- Motor life – which is only referenced to be done via an annual study in one note in table B.2.1
- T&D losses – which are calculated once for the entire country
- Information on variable load devices is assumed to be available and assumed it can be incorporated in the methodology (no source or methodology is given)

  An important implicit assumption is that the population of electrical equipment to be replaced can be treated similarly, independent of their size, efficiency, load, operating hours or that these can be determined for the entire population.

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

>> Documentation and further explanation are required for monitoring methodology, collection of all required data, and QA/QC procedures. The integrity of the data collected and the segmenting of data by application types, region, operating hours, etc. will be critical to the success of this methodology. Some monitoring aspects, for example, variable load equipment energy use are only mentioned in the briefest of ways (for example, an oblique reference to collecting data per climate for variable load equipment). The reliance on project sponsors as the source of most of the data makes the transparency of the methodology weak.

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

>> In their current form for the reasons stated above the assumptions/parameters are not adequate.

(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):

>> Historical motor sales data, prior studies on motor efficiencies, operating hours and motor life, laboratory testing of sample motors and large-scale annual surveys, purchase data for new motors, average national T&D loss data and average national electricity production and fuel use for electricity production,

Many data are based solely on records of the project sponsor, without a possibility for independent verfication or cross-checks, or on 'previous studies' without guidance on whether these are applicable.

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

>> Additional information is required for documenting electricity savings and regional versus national T&D losses and emission factors. Most of the project monitoring procedures are not defined and the historical information used in baseline assumptions is not documented. For generalized use of the methodology it would be helpful to have a set of guidelines for preparing the documentation of assumptions. The methodology in its current form is inadequate.

c) S*tate possible data gaps:*

> >Operating hour information, motor life information, T&D loss information, replaced motor efficiency data. Guidance is required on:

- Applicability of previous studies to the methodology/project.
- How to determine what is 'similar' equipment
- What are 'representative samples'
- How to measure and monitor variable load equipment.

(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.

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):

>> Not without further documentation of sources and use of more segmentation of the population of motors being replaced and addressing monitoring methods for variable load devices.

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

>> Yes, but both have the same problem, of not addressing the main issue of how to determine # and type of equipment, load, operating hours; variable loads.

The monitoring methodology introduces new parameters in the formulas that are not included in the baseline methodology, related to climate zone j for equipment with a variable load. The latter type of equipment in not dealt with in the baseline methodology.

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

>> Some monitoring of the sources of motors would be appropriate to ensure that a significant number of motors are not being turned in that are not functional or are from outside of the project boundaries.

Possible feedback effect (increased use, longer operating hours because of lower energy cost) has not been addressed.

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

>> It is highly commendable that the old motors will be destroyed. Clarification on how any surveying

and testing of this will be done, is required.

Remarks on QA focus on that either data are from project sponsor's own records, or that sample size should be chosen large enough.

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

>>

Strength

- Relatively simple data collection.

Weaknesses:

- Does not address the difficulties in obtaining data from old, replaced motors which often do not have readable, or any, nameplates,
- Reliance on generalized undocumented assumptions on operating hours, motor efficiencies and persistence of savings;
- No attention paid to difficulties of assessing load and operating hours of existing dispersed equipment in determining energy consumption and energy savings;
- Feedback effect (leakage) is not addressed;
- No guidance is given on what represents 'similar equipment', 'representative samples' and whether 'previous studies' are applicable;
- Too dependent on project sponsor's records for data..

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

>> Energy efficiency equipment replacement in any region or country. The methodology is intended for programmes that encourage the adoption of energy-efficient equipment such as lamps, ballasts, refrigerators, motors, fans, air conditioners, other appliances, etc. at many sites. These technologies may replace existing equipment but can not be installed at new sites as stated in the methodology. There are no geographical constraints.

(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:

>>Public input submitted by:

- Conrad U. Brunner / A. Arquit Niederberger
  A + B International (Sustainable Energy Advisors)
- The Federation of Electric Power Companies - Kitahara Takao
- Jakob Graichen

b) Indicate any further comments:

>> Table B.2.1 states that for many of the data 100% of the data set will be monitored, i.e. all individual equipment will be monitored. Seems very unlikely. This is also contradicted by the comments, speaking of 'representative samples'.

Signature of Meth Panel Chair ……..
Date: 22/06/2005 *(Jean-Jacques Becker)*

Signature of Meth Panel Vice-Chair ……..
Date: 22 /06/2005 *(name)*

Information to be completed by the secretariat	
F-CDM-NMmp doc id number	F-CDM-NMmp - NM0100
Date when the form was received at UNFCCC secretariat	22 June 2005
Date of transmission to the EB	22 June 2005
Date of posting in the UNFCCC CDM web site	22 June 2005