CDM: Proposed new methodology expert form (version 04)

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

Name of expert responsible for completing and submitting this form	Rob Fowler
Related F-CDM-NM document ID number	F-CDM-NM0125: "La Vuelta and La Herradura Hydroelectric Project"

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

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

I. Evaluation of the proposed new baseline methodology:

Title of new baseline methodology:>>Baseline methodology for new capacity that displaces electricity generation in a centrally dispatched hydrothermal interconnected power system.

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

>>The proposed baseline methodology is applicable where renewable energy power generation capacity is added to a hydrothermal interconnected grid, where:

- the operation of the grid is accurately described by a centrally run, highly sophisticated dispatch simulation model,
- data is readily available to the project proponent to periodically update that model,
- the project proponent has the capacity to effectively run the model, and
- a reliable capacity expansion plan is regularly published by a central authority.

ii. Strengths and weaknesses of the methodology:

>> Strengths:

- The proposed baseline methodology is a relatively accurate approach to estimating avoided GHG emissions in a hydrothermal grid (where there is a high proportion of hydro power generation) given the periodic variability of water resources and hence hydro generation capacity.
- The primary data sources are official, which should reduce the verification burden (assuming verification of official data is not required to verify the project's emission reductions).
- The model data is updated periodically (triggered by significant changes to grid characteristics and information availability) and the dispatch simulation is re-run annually which should provide an appropriate "grounding in reality" for the baseline calculation.

Weaknesses:

- There is an enormous volume of data required to successfully prepare and run the dispatch simulation model. Access to this data, or the appropriateness of assumptions and estimates that must be made in the absence of actual data, could be problematic in many situations.
- A high level of specialised expertise is required to successfully operate such a sophisticated dispatch simulation model. This may not be available to many project

proponents.

- The uncertainty analysis proposed in the baseline methodology does not provide for the robust quantification of key input uncertainties, which could result in significant uncertainties in key outputs (20% deviation in the key output variable is cited). This is especially the case where generators bid into the market out of least-cost merit order (based on portfolio considerations or fuel supply contracts) and this is not reflected in the dispatch simulations that are described in the methodology.

iii. Any changes needed to improve the methodology:

a. Minor changes:>>Yes

- The steps and instructions in the methodology need to be identified as either required or recommended or optional through the consistent use of the words "shall" or "should" or "may". These terms are currently used in some parts of the methodology, but in other areas it is not clear whether a step or instruction is required, recommended or optional.
- The methodology requires that the key outputs from the dispatch simulation model be compared during monitoring to decide whether the thermal generation displacement factor "remains realistic". Further guidance is required to allow project proponents (and DOEs) to determine the bounds of reality for this sort of variable.
- The derivation of project emissions for hydroelectric projects should be revised to focus on the World Bank methodology with the Hydro Quebec approach as a cross-check (as per the draft PDD for the referred proposed project activity). The current ordering of this section of the methodology is misleading.
- The methodology needs to be consistent in the inclusion or not of transport emissions from the project construction works. There is currently inconsistency between the baseline calculations (not included) and the data requirements (included).
- The use of CO_2 only or all GHG emissions from thermal generation needs to be made consistent between the baseline calculations (CO_2 only) and data requirements (CO_2, methane and nitrous oxide).
- The equation D.7.2 which describes the estimation of methane emissions from land flooding should be adjusted to explicitly derive E_{pr} in appropriate units. This variable is used in equation D.9.1 to calculate emissions reductions.

b. Major changes:>>Yes.

- The title of the methodology should specify that it deals with "new renewable energy capacity" rather than just "new capacity" as there is no consideration of new low-emissions fossil fuel capacity in the baseline or monitoring methodologies.
- The description of the dispatch simulation model contained in the methodology is not sufficiently explicit to allow a different project proponent to justify their selection. The list of data required to be collected to prepare and run the selected model is not sufficiently explicit or detailed. The assertion that most generators usually perform dispatch simulations is not correct, especially in centrally controlled grids. These issues could be avoided if the model that is described in the draft PDD were specified in the methodology as the required dispatch simulation model, removing the

ambiguity around what is appropriate in terms of model functionality and data requirements.

- The methodology should recognise that the assumption of least-cost merit order dispatch is problematic, and require the regular collection and analysis of data on the actual bid behaviour of generators. This would allow the project proponent to identify when a generator is not following the least-cost merit order in its bidding. The methodology should prescribe the adjustments that should be made in the ex-post model run. This should reduce the uncertainty associated with the assumption of least-cost merit order dispatch.
- The uncertainty analysis in the methodology needs to be improved to provide more explicit guidance on the quantification of the uncertainty associated with model inputs, and how the calculated uncertainty in the model outputs shall be considered in estimating baseline emissions. The assertions in the methodology that errors will cancel each other out, and that generator data is continuously audited (and hence guaranteed to have a low level of uncertainty) are not valid.
- For completeness, the methodology needs to describe how the methodology deals other CDM projects in the interconnected power grid that are employing the same methodology. What "double counting" is possible when considering the build margin impacts? How should operating margin impacts be distributed between the CDM projects that are displacing thermal generation?

II. Evaluation of the proposed new monitoring methodology:

Title of new monitoring methodology: >>Monitoring methodology for new capacity that displaces electricity generation in a centrally dispatched hydrothermal interconnected power system.

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

>> The proposed monitoring methodology is applicable where renewable energy power generation capacity has been added to a hydrothermal interconnected grid, where:

- the operation of the grid is accurately described by a centrally run, highly sophisticated dispatch simulation model,
- data is readily available to the project proponent to periodically update that model,
- the project proponent has the capacity to effectively run the model, and
- a reliable capacity expansion plan is regularly published by a central authority.

ii. Strengths and weaknesses of the methodology:

>> Strengths:

- The proposed monitoring methodology relates to a relatively accurate approach to estimating avoided GHG emissions in a hydrothermal grid (where there is a high proportion of hydro power generation) given the periodic variability of water resources and hence hydro generation capacity.
- The primary data sources are official, which should reduce the verification burden (assuming verification of official data is not required to verify the project's emission reductions).
- The model data is updated periodically (triggered by significant changes to grid characteristics and information availability) and the dispatch simulation is re-run annually which should provide an appropriate "grounding in reality" for the baseline calculation.

Weaknesses:

- There is an enormous volume of data required to successfully prepare and run the dispatch simulation model, however this data is not explicitly listed to allow effective monitoring. Access to this data, or the appropriateness of assumptions and estimates that must be made in the absence of actual data, could be problematic in many situations.
- The QA and QC procedures specified do not provide sufficient confidence in the quality of the data that is collected and therefore the accuracy of the outputs from the dispatch simulation model or the baseline emissions.
- The accuracy of the outputs from the simulation model depends heavily on data from generators. This data is likely to be confidential, and the key assumption that dispatch is based on least-cost merit order is therefore very difficult to support.

iii. Any changes needed to improve the methodology:

a. Minor changes:>>Yes

- The steps and instructions in the methodology need to be identified as either required or recommended or optional through the consistent use of the words "shall" or "should" or "may". These terms are currently used in some parts of the methodology, but in other areas it is not clear whether a step or instruction is required, recommended or optional.
- The derivation of project emissions for hydroelectric projects should be revised to focus on the World Bank methodology with the Hydro Quebec approach as a cross-check (as per the draft PDD for the referred proposed project activity). The current ordering of this section of the methodology is misleading.
- The methodology needs to be consistent in the inclusion or not of transport emissions from the project construction works. There is currently inconsistency between the baseline calculations (not included) and the data requirements (included).
- The use of CO_2 only or all GHG emissions from thermal generation needs to be made consistent between the baseline calculations (CO_2 only) and data requirements (CO_2, methane and nitrous oxide).
- The equation D.7.2 which describes the estimation of methane emissions from land flooding should be adjusted to explicitly derive E_{pr} in appropriate units. This variable is used in equation D.9.1 to calculate emissions reductions.
- The methodology needs to specify the time periods under which the dispatch simulation model shall be run (i.e. 6 minutes, half hourly, 6 hour blocks, etc) and include the appropriate demand data in the list of relevant data required to determine the baseline emissions.

b. Major changes:>>Yes

- The title of the methodology should specify that it deals with "new renewable energy capacity" rather than just "new capacity" as there is no consideration of new low-emissions fossil fuel capacity in the baseline or monitoring methodologies.
- The list of data required to be collected to prepare and run the selected model is not sufficiently explicit or detailed. No criteria are provided for including generators in the data collection (i.e. based on a minimum size or volume of power exported to the grid) or with what frequency grid characteristics need to be updated for inclusion in the model. These issues could be avoided if the model that is described in the draft PDD were specified in the methodology as the required spreadsheet model, removing

the ambiguity around what is appropriate in terms of model functionality and data requirements.

- The methodology should recognise that the assumption of least-cost merit order dispatch is problematic, and require the regular collection and analysis of data on the actual bid behaviour of generators. This would allow the project proponent to identify when a generator is not following the least-cost merit order in its bidding. The methodology should prescribe the adjustments that should be made in the ex-post model run. This should reduce the uncertainty associated with the assumption of least-cost merit order dispatch.

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 new capacity that displaces electricity generation in a centrally dispatched hydrothermal interconnected power system.

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

a) Describe the methodology:

>> The proposed baseline methodology uses a centrally run dispatch simulation model (updated and re-run annually) to estimate the volume of non-renewable power generation that has been displaced by the project for each year of the crediting period. This information is then combined with the GHG emissions factors of the non-renewable power generators on the grid to derive a reasonable estimate of the GHG emissions that have been avoided through the dispatch of the power generated by the project over the previous year.

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:

>>The selected approach is appropriate as the methodology deals with existing power plants and estimates of their actual emissions intensity over a given period.

(2) Basis for determining the baseline scenario:

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

>>The documentation provides a reasonable explanation of how the baseline scenario is to be determined. Given the high level of complexity inherent in the preparation and operation of the sort of dispatch simulation model described in the proposed methodology, the description of how the baseline is developed could be significantly improved.

Perhaps the proposed methodology should specify exactly the dispatch simulation model that is to be used (ie. by name, developer and version), and therefore provide more explicit guidance on how to set up and run the simulation to achieve the desired outcomes.

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

>> The proposed methodology uses a sophisticated dispatch simulation model to identify the volume of non-renewable power generation from individual power stations across the hydrothermal interconnected grid that has been displaced by the project. The dispatch simulation is based on least-cost order of merit, taking into account the opportunity costs of water for hydro generation, transmission constraints and other grid characteristics.

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. Both barrier and financial analysis are employed.

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 is appropriate but is not adequate. The basis for assessing additionality is appropriate and adequate.

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

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

>>The methodology has not been described in an adequate manner. See comments in section A.I.iii above.

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 activity, but only if certain aspects of the proposed methodology are improved. See comments in section A.I.iii above.

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.

>>The application of the methodology, for the very specific situation described in the referred proposed project activity, could result in an appropriate baseline scenario, but only if certain aspects of the proposed methodology are improved.

Please explain:

>>The principles employed in the proposed methodology are sound, but there are a number of possible situations where the outputs from the dispatch simulation model would not reasonably reflect what would have happened in the absence of the proposed project activity. For example, the assumption that dispatch order of merit is based on least-cost generation (within the boundaries of transmission constraints) does not recognise the significant impact that fuel supply arrangements or portfolio management strategies employed by large power generation companies can have on bid price and therefore merit order.
The methodology also uses the assumption that delays in implementation of the Reference Expansion Plan

are solely due to the proposed project activities. This is a very simplified assumption, and does not take into consideration the wide variety of factors (political, social and economic) that impact the realisation of official expansion plans.

(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 description of the methodology includes algorithms and formulae that could be applied to other potential project activities. However there are a significant number of specific requirements that must be fulfilled for the dispatch simulation approach employed in the proposed methodology to be applied to other potential project activities. See A.I.i above.

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

>>Data from entire interconnected grid, including detail of the characteristics of all generators and any transmission constraints that exist within the power system. This spatial scope is appropriate.

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 data used is for each year in the project crediting period, plus the most recent Reference Expansion Plan published prior to the implementation of the project. The characteristics of the grid, which form the majority of the inputs to the dispatch simulation model, are specified as current as at the time that the simulation is run (ie, updates to model inputs such as generator efficiency improvements, changes to transmission capacities, or grid capacity additions are specified as "when available").

The vintage of data is appropriate. However, to allow the outputs from the dispatch simulation model to be assessed for reasonableness (see Step 12 in section D.6 of the proposed baseline methodology) a series of historical data should be used. Five years of historical grid operation data would be appropriate for this purpose.

(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

>>Baseline: CO_2 emissions from thermal generation displaced by project's generation.
Project: CH_4 emissions due to biomass decomposition in flooded areas for hydropower projects and project emissions from geothermal projects (as per ACM0002)

ii) Physical delineation

>>The hydrothermal power system, including electricity imports considerations as per those specified in AMC0002.

b) Indicate whether this project boundary is appropriate:

>>This project boundary is appropriate. However, the project boundary described in different parts of the proposed methodology is inconsistent in both its treatment of GHG emissions from non-renewable generation and its inclusion of transport related emissions for project construction activities. For example, Section D.5 of the proposed methodology specifies that only CO2 emissions from fossil fuel fired power are to be accounted for in the baseline determination, while section E.1 of the proposed methodology specifies that fuel emission factors for carbon dioxide, methane and nitrous oxide are required to be collected.

(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:

- The dispatch simulation model assumes that generation will always be dispatched based on a least-cost merit order in a perfect competitive market, taking transmission constraints into consideration. This assumption is problematic based on actual behaviour of players in real power systems (based on fuel supply arrangements, portfolio management strategies, and other contractual situations that disrupt the least-cost merit order for dispatch).
- The volumes of data required to run the dispatch simulation model accurately are readily available and the data is verified/audited by the data providers and/or the system regulator. This assumption is problematic based on the verification activities that a DOE may be required to perform to provide assurance over the key outputs from the dispatch simulation model (ie. if the data is not verified/audited by the data providers and/or system regulator, then does it fall on the DOE to provide assurance over the data accuracy?)
- The Reference Expansion Plan provided by the official source would have been realised exactly as specified if the proposed CDM project had not gone ahead. This assumption is problematic as it does not consider the wide variety of reasons (political, social and economic) that impact the realisation of official expansion plans.

Implicit assumptions:

- The key outputs from running the dispatch simulation model can be compared during monitoring to decide whether the thermal generation displacement factor remains realistic. The basis for this assumption should be further explained in the proposed methodology.

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

>>Yes, although certain assumptions are problematic (as described above)

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

>>The explicit assumptions listed above are not adequate and should be further explained and refined.

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

>>The majority of data sources used are official and include Ministry of Energy, dispatch centres, national statistics. IPCC and IEA. Other sources are not official and include generators, fuel distributors, electricity distributors and the project sponsor.

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

>>Data used are adequate if the assumptions listed above prove to be appropriate for a particular interconnected hydrothermal power system. If the assumptions listed above are not appropriate, then additional data would be required.

f) State possible data gaps:

>>Possible data gaps include thermal generator fuel contracts, portfolio management strategies, and other contractual situations that could disrupt the least-cost merit order for dispatch.

(7) Assessment of uncertainties:

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

i) The basis for determining the baseline scenario:

>>Yes. Two categories of uncertainties are identified: 1) uncertainties in the inputs to the dispatch

simulation model, and 2) uncertainties related to the estimation of emissions reductions.

ii) Algorithms/formulae:

>>Yes. Although there is a high level of confidence in the particular dispatch simulation model that the project proponents plan to use. This may not be justified for other simulation models that may be employed under the proposed methodology.

iii) Key assumptions:

>>Yes. Although there is no attempt to provide guidance on the quantification of uncertainties relating to generator contract situations or other factors that impact the least-cost merit order assumption.

iv) Data:

>> Yes. The proposed methodology states that since the majority of model inputs are provided by official sources that "error bars can be assumed by project developers under reasonable and justifiable hypotheses." The dispatch simulation model is then assumed to be able to quantify the uncertainty associated with the outputs based on the specified uncertainties of the inputs.

b) State whether the uncertainties presented are reasonable:

>>Yes. However, the level of deviation in the key model output (thermal displacement factor) that is cited in the proposed methodology ("up to 20%") is of significant concern and should prompt a greater level of scrutiny in terms of uncertainty quantification and conservative assumptions.

(8) Leakage:

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

>>No leakage is perceived.

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

>>Yes.

(9) Transparency and "conservativeness":

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

>>Yes. However, the verification of the outputs from the dispatch simulation model may be problematic for the DOE.

b) State whether the baseline methodology is conservative:

>>The proposed methodology could be conservative, as long as the key assumptions listed above hold true. If certain assumptions are not appropriate for a particular hydrothermal interconnected power grid (such as contract situations that significantly impact least-cost merit order dispatch) then this could result in baseline emissions that are not conservative.

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

>> Strengths:

- The proposed baseline methodology is a relatively accurate approach to estimating avoided GHG emissions in a hydrothermal grid (where there is a high proportion of hydro power generation) given the periodic variability of water resources and hence hydro generation capacity.
- The primary data sources are official, which should reduce the verification burden (assuming verification of official data is not required to verify the project's emission reductions).
- The model data is updated periodically (triggered by significant changes to grid characteristics and information availability) and the dispatch simulation is re-run annually which should provide an appropriate "grounding in reality" for the baseline calculation.

Weaknesses:

- There is an enormous volume of data required to successfully prepare and run the dispatch simulation model. Access to this data, or the appropriateness of assumptions and estimates that must be made in the absence of actual data, could be problematic in many situations.
- A high level of specialised expertise is required to successfully operate such a sophisticated dispatch simulation model. This may not be available to many project proponents.
- The uncertainty analysis proposed in the baseline methodology does not provide for the robust quantification of key input uncertainties, which could result in significant uncertainties in key outputs (20% deviation in the key output variable is cited). This is especially the case where generators bid into the market out of least-cost merit order (based on portfolio considerations or fuel supply contracts) and this is not reflected in the dispatch simulations that are described in the methodology.

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

>>The proposed methodology includes national and/or sectoral policies through the use of an official Reference Expansion Plan.

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

>>The proposed baseline methodology is applicable where renewable energy power generation capacity is added to a hydrothermal interconnected grid, where:

- the operation of the grid is accurately described by a centrally run, highly sophisticated dispatch simulation model,
- data is readily available to the project proponent to periodically update that model,
- the project proponent has the capacity to effectively run the model, and
- a reliable capacity expansion plan is regularly published by a central authority.

(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:

>>None.

b) Indicate any further comments:

>>No further comments.

II. Proposed new monitoring methodology *(specify title here):* >>Monitoring methodology for new capacity that displaces electricity generation in a centrally dispatched hydrothermal interconnected power system.

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

(1) Brief description of new methodology:

Describe new methodology:

>>The proposed monitoring methodology is closely related to the proposed baseline methodology described above.

The monitoring methodology requires the following GHG related data to be monitored:

- Input data for the dispatch simulation model
- Monthly electricity generation for the project
- Monthly electricity generation for all thermal plants serving the interconnected power system
- The share of thermal and hydro electricity in the grid
- Changes to power plant emissions factors

The monitoring plan also recommends that non-GHG related data be monitored to enable an Environmental Management Plan to be executed by the project proponent.

(2) Key assumptions/parameters:

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

>>Same as for the baseline methodology since the monitoring methodology is consistent with the baseline methodology

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

>> Yes, although certain assumptions are problematic (as described for the baseline methodology)

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

>>No. The assumptions are not adequate and should be further explained and refined.

(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 majority of data sources used are official and include Ministry of Energy, dispatch centres, national statistics. IPCC and IEA. Other sources are not official and include generators, fuel distributors, electricity distributors and the project sponsor.

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

>> Data used are adequate if the assumptions listed above prove to be appropriate for a particular interconnected hydrothermal power system. If the assumptions listed above are not appropriate, then additional data would be required.

c) *State possible data gaps:*

>> Possible data gaps include thermal generator fuel contracts, portfolio management strategies, and other contractual situations that could disrupt the least-cost merit order for dispatch.

(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. There is insufficient detail on the information that is required to prepare and operate the dispatch simulation model. "Power plant and grid configuration data (a big set of parameters)" is not sufficiently explicit to allow the proposed methodology to be effectively implemented or verified.
In addition, references to later sections are not applicable (for example, there are a number of references to Section E in the description of the formulae used to estimate baseline emissions. The proposed monitoring methodology only has sections A and B).

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, but only if certain aspects of the proposed methodology are improved. See comments in section A.II.iii above.

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

>>Yes.

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

>>No leakage is perceived and therefore not monitored. This is appropriate.

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

>>The proposed methodology relies heavily on the QA and QC procedures of the grid regulator, generators, fuel suppliers, and essentially asserts that the data used will be of high quality by default. This is not a reasonable position for a good number of interconnected power systems around the globe where data quality and reliability are extremely low.

The QA and QC procedures for the key inputs to the simulation model and baseline emissions calculations should be more explicitly described to enable effective validation of projects employing this methodology and verification of ongoing data collection and use.

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

>> Strengths:

- The proposed monitoring methodology relates to a relatively accurate approach to estimating avoided GHG emissions in a hydrothermal grid (where there is a high proportion of hydro power generation) given the periodic variability of water resources and hence hydro generation capacity.
- The primary data sources are official, which should reduce the verification burden (assuming verification of official data is not required to verify the project's emission reductions).
- The model data is updated periodically (triggered by significant changes to grid characteristics and information availability) and the dispatch simulation is re-run annually which should provide an appropriate "grounding in reality" for the baseline calculation.

Weaknesses:

- There is an enormous volume of data required to successfully prepare and run the dispatch simulation model, however this data is not explicitly listed to allow effective monitoring. Access to this data, or the appropriateness of assumptions and estimates that must be made in the absence of actual data, could be problematic in many situations.
- The QA and QC procedures specified do not provide sufficient confidence in the quality of the data that is collected and therefore the accuracy of the outputs from the dispatch simulation model or the baseline emissions.

- The accuracy of the outputs from the simulation model depends heavily on data from generators. This data is likely to be confidential, and the key assumption that dispatch is based on least-cost merit order is therefore very difficult to support.

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

>> The proposed baseline methodology is applicable where renewable energy power generation capacity is added to a hydrothermal interconnected grid, where:

- the operation of the grid is accurately described by a centrally run, highly sophisticated dispatch simulation model,
- data is readily available to the project proponent to periodically update that model,
- the project proponent has the capacity to effectively run the model, and
- a reliable capacity expansion plan is regularly published by a central authority.

(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:

>>None.

b) Indicate any further comments:

>>No further comments.

Signature of desk reviewer .....

Date: 25/7/05

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