



**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

Steven Schiller

Related F-CDM-NM document ID number

CDM NM0114

*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:>>Improved Efficiency of Electrical Power System generation through SCADA Control Systems and Related Energy Management Protocol

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

>>This methodology is intended to be applicable to the installation of large scale thermal power plant dispatch control systems on a regional or countrywide basis where no such systems are currently installed and for which better dispatch control would result in lower CO<sub>2</sub> emissions. SCADA stands for Supervisory Control and Data Acquisition.

ii. Strengths and weaknesses of the methodology:

>>

Strengths: Simple

Weaknesses:

- The methodology does not properly address significant additionality issues associated with the greenhouse gas emission reductions being a secondary, at best, benefit associated with this type of project;
- It oversimplifies the analysis that would be necessary for the calculation of the CO<sub>2</sub> reductions directly associated with the project, which will most likely be relatively difficult to separate out from normal variations in, for example, system generation efficiency, which also impacts Carbon emissions in a similar way; and
- Ignores other independent variables that would impact generation efficiency during the crediting period.

iii. Any changes needed to improve the methodology:

a. Minor changes:>>Removal of numerous redundancies between baseline and monitoring methodologies

b. Major changes:>>This reviewer is not sure that even with major changes that this project type and this methodology would be applicable for the CDM. Certain changes that are needed though, if one wishes to peruse the methodology further, would be:

- In addition to the use of existing or historical emissions approach of Paragraph 48 of CDM Modalities the methodology should consider “emissions from a technology that represents an economically attractive course of action, taking into account barriers to investment” and as such the

additionality tests should include investment analysis - particularly the benefits associated with energy costs savings (to some party)

- Additional and clarified equations that address how hydro and modified power plants output is subtracted from analysis; significant clarification of equations particularly associated with calculating baseline and project generation efficiencies; inclusion of other independent variables other than the project that impact system efficiencies such as weather and maintenance; and use of hourly or at least monthly fuel emission factors versus annual average emission factors.
- Inclusion of leakage analysis associated with possible importing and exporting of electricity outside of the electrical grid under consideration

## II. Evaluation of the proposed new monitoring methodology:

Title of new monitoring methodology: >> Improved Efficiency of Electrical Power System generation through SCADA control Systems and Related Energy Management Protocol

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

>> This methodology is intended to be applicable to the installation of large scale thermal power plant dispatch control systems on a regional or countrywide basis where no such systems are currently installed and for which better dispatch control would result in lower CO<sub>2</sub> emissions

- ii. Strengths and weaknesses of the methodology:

>> Strengths: Simple

Weaknesses:

- Relies on data being available from an electricity generating infrastructure that is not necessarily well organized or structured as would be expected of any electrical utility that does not have a dispatch control system
- QA/QC procedures are not described
- Is primarily a repetition of the baseline methodology

- iii. Any changes needed to improve the methodology:

a. Minor changes: >> Eliminate redundancies

b. Major changes: >> As indicated above, this reviewer is not sure that even with major revisions that this methodology would be applicable for CDM. However, at a minimum the data collection and analysis must be better defined and the issues raised in the review of the baseline methodology, as applicable to data collection, would need to be addressed.

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

I. Proposed new baseline methodology (*specify title here*): >> Improved Efficiency of Electrical Power System generation through SCADA control Systems and Related Energy Management Protocol

(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:

1. >> Determine, using the approach outlined by the Tool For The Demonstration And Assessment Of Additionality, that the project would not happen without CDM. – although the tool is not fully referenced
2. Define project boundary as sum of all generating units – although any potential impacts of

independent power plants attached to grid, if any, and power plants located outside of country and connected to grid are not addressed

3. Baseline emissions are calculated with multiplying together, for each hour of the year during the project crediting period, the following three factors:
  - Total electricity (kWh) “delivered through the transmission system” less “output” of fossil fuel plants installed or “significantly rehabilitated” after the project start and less “output” of non-fossil plants
  - Hourly fuel efficiency factor (kcal/kWh) for the fossil plants within the project boundary during the baseline year for the same amount of delivered power, presumably less the “significantly rehabilitated” facilities
  - An annual carbon coefficient (kg CO<sub>2</sub>/kcal) for the project year

*b) State the approach selected:*

>> The proposed approach 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:*

>>It is probable that the appropriate approach is 48(b) “Emissions from a technology that represents an economically attractive course of action, taking into account barriers to investment” and that the technology to be evaluated is a SCADA system. SCADA systems are well-established technologies and, due to energy savings and improved system reliability (less brown and black outs), are likely be a sound investment without the CDM benefits. Thus, the investment analysis should clearly be conducted for this type of project. For this particular PDD, the sponsor argues on page 7 that the “main asset generated by this project is energy savings” but that the electric utility does not pay for fuel through some sort of “perverse subsidies” arrangement and it is thus not even appropriate to do an investment analysis. Whether this situation allows for the use of 48 (a) is perhaps up to the CDM Methodology Panel or the Executive Board.

**(2) Basis for determining the baseline scenario:**

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

>>Yes, however it relies on “Tool For The Demonstration And Assessment Of Additionality” without properly referencing the Tool. There is specific discussion of each step and how the sponsor believes that the barriers are too high for the SCADA system without CDM benefits and how the investment analysis is not required. What would be preferable would be a reference to the Tool and then listing of specific issues that should be addressed for this type of project activity - without the commentary on the merits of the specific project being evaluated unless this is to be only a project specific methodology.

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

>> As mentioned above baseline emissions are calculated with multiplying, for each hour of the year, during the project crediting period, three factors. Issues associated with these three factors are discussed below:

- Total electricity (kWh) “delivered through the transmission system” less “output” of fossil fuel plants installed or “significantly rehabilitated” after the project start and less “output” of non-fossil plants – even if these values could be determined on an hourly basis this is mixing output and delivered power and not accounting for any power delivered to/from other power plants outside of the country or in industrial facilities such as through cogeneration systems; also, how “significantly rehabilitated” is determined is not addressed
- Hourly fuel efficiency factor (kcal/kWh) for the fossil plants within the project boundary during the baseline year for the same amount of delivered power, presumably less the “significantly rehabilitated” facilities – this will be very hard to determine and how the hourly efficiencies of perhaps a dozen power plants is combined into a single (weighted?) figure for each level of delivered power is not explained. For example if the grid delivers exactly 3,000 MW four times per year, which of the four times will be used for determining baseline efficiency at 3,000 MW and how will situations be handled where project year weather and power plant operation and maintenance schedules are different from the baseline year?
- An annual carbon coefficient (kg CO<sub>2</sub>/kcal) for the project year – this is an annual average value which would seem to dilute the value of the other factors being determined on an hourly basis and would possibly hide potential savings or increases in carbon emissions due to the project.

It should also be noted that the difficulty in calculating emission reductions due to the SCADA project are compounded by the likelihood that the reduction will be a small percentage of baseline emissions. In the document provided by the sponsor there is an example cited (several times) that results in a 3% improvement in thermal plant efficiency, from 0.3 to 0.291. This is a small change that could be easily overshadowed by changes in weather, power plant maintenance, load profile changes, and simple uncertainty in the data collection.

*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. And the “Tool For The Demonstration And Assessment Of Additionality is used.

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

No, as described above the investment analysis should be completed for this type of project and 48(b) should be considered as the proper method for defining the baseline

>>

### **(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

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):

>>No

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.

>>Unlikely

Please explain:

>>As noted above, the baseline additionality analysis is not compelling for this project, or the generic type of projects; the calculation of baseline emissions are not documented in that the algorithms do not adequately define how the critical factors will be determined; and the algorithms do not include consideration of other independent variables that, in addition to the project installation, will impact emissions.

### **(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):

>>No, the single equation provided for both baseline and project emissions:

- Relies on values that will be difficult to determine
- Mixes two “types” of electricity (delivered and generated)
- Ignores other important variables that will impact emissions (e.g., weather, cross border power sales, minor plant operating changes)
- Does not show how efficiency will be determined – for example, is it fuel in divided by gross or net power output – and how will it be calculated on an hourly basis for every operating point of the entire grid?
- Utilizes an average fuel emissions factor that is not defined as to how it will be determined or how it is applicable to hourly grid performance data (particularly important if multiple fuel types are used at one or more of the different fossil fuel plants)
- States that hydro, new and “significantly modified” power plants will be excluded form the analysis, but it is not shown how and it will be virtually impossible to remove their contribution from the “total measured electricity delivered” – which is part of the algorithm. It does not appear appropriate to reduce the delivered electricity amount by the subtracting out the generated value for the new/hydro/modified plants, etc. (as indicated) when the whole purpose of the algorithms is to evaluate electricity delivered more efficiently with the SCADA
- How historical data will be used to calculate baseline performance is not indicated, nor if any of the necessary data are available for this particular project

Overall the algorithm is not well defined or explained.

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

>>The spatial scope consists of the power plants identified as being part of the grid. The spatial scope is not appropriate because:

- It does not appear to include power sales from outside of the country, although the PDD indicates that this is a possibility.
- It also does not seem to include any generation that takes place from other in-country generating units, such as industrial cogeneration systems.
- And, lastly it removes from the scope of consideration plants that have been significantly rehabilitated – although what the criteria are for defining “significant” is not provided, nor is there a mechanism for somehow excluding the electricity generated by these plants from the electricity delivered

*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:*

>>Historical data for baseline efficiency includes baseline year, and, “if possible”, two years prior data. The power supply and emission factor are calculated annually. The likelihood of all the data being available seems small.

#### **(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<sub>2</sub> from fossil fuel power plants

*ii) Physical delineation*

>>National grid

*b) Indicate whether this project boundary is appropriate:*

>>As noted above in 4b) the spatial scope is not 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:*

- IPCC fuel emission factors can be used
- Data are available for use in equations – problematic
- All electricity comes from identified power plants that are part of a utility – problematic
- Factors that impact power plant and grid efficiency and performance, other than SCADA installation, can be ignored - problematic

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

>>No, there is very little explanation of analysis methods and there is significant repetition of text throughout the PDD, baseline methodology and monitoring methodology

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

>>No, for reasons stated above

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

>>The monitoring methodology indicates that much of the data will be collected by the SCADA system – which is also the system to be evaluated

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

>>No, even if the data are available the uncertainty that will be found in fuel use and electricity delivered will most likely be similar in scale to the effect to be evaluated

*f) State possible data gaps:*

>>Fuel usage, electricity delivered by each plant, operating status of each power plant, imports/exports of power from within and outside of the national grid, and data on variables which also impact system efficiency (which are not included in the algorithms in their present form)

**(7) Assessment of uncertainties:**

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

*i) The basis for determining the baseline scenario:*

>>No

*ii) Algorithms/formulae:*

>> No

*iii) Key assumptions:*

>> The only factor discussed is the removal of new power plants from the analysis

*iv) Data:*

>>No

*b) State whether the uncertainties presented are reasonable:*

>> No

**(8) Leakage:**

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

>> Leakage is not addressed.

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

>> It does not address leakage associated with how the grid will operate with the SCADA. It is not a given that the SCADA will operate to optimize (minimize) carbon emission, but will most likely optimize for efficiency and reliability. The analysis does not take into account emissions from any other power plants that may supply power to the grid, whether they be outside of the country or internal to the country, such as independent power projects.

**(9) Transparency and “conservativeness”:**

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

>>No, the analysis is not well explained.

*b) State whether the baseline methodology is conservative:*

>>Unknown, as the analysis method does not appear to result in an indication of emissions reductions and thus could be very conservative or very optimistic.

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

>>See Section A

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

>>The Additionality analysis discusses subsidies for fuel use, which discourage efficient operation of power industry.

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

>>Not in its current form

**(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:

>>NA

b) Indicate any further comments:

>>The proposed SCADA project is appropriate for improved operations of the country's electrical grid. Whether it is "additional" and whether it will result in emission reductions are possibilities that are difficult to prove and are not shown by the methodologies provided.

## **II. Proposed new monitoring methodology (specify title here): >> Improved Efficiency of Electrical Power System generation through SCADA control Systems and Related Energy Management Protocol**

*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:*

>>Data from SCADA system and IPCC (fuel factors) are collected for use in equations for baseline and project emissions. The monitoring methodology is not explained; where it should be explained text from the baseline methodology are repeated.

### **(2) Key assumptions/parameters:**

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

>>With respect to the monitoring methodology the key assumptions are that:

- Data for baseline and project power plant output, fuel input, and electricity distributed can be measured accurately on an hourly basis
- Systemwide fuel efficiency, for each electrical load, can be determined on an hourly basis with an uncertainty much less than the improvement in system efficiency solely due to the use of the SCADA system
- There are no other variables, such as weather, number of plants operating, etc. that will impact systemwide power plant efficiency
- The power output of new power plants, "significantly modified" power plants, and hydro power plants can be identified and subtracted from delivered power

These assumptions are all problematic.

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

>>No, most of the text is simply copied from the baseline methodology

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

>>The assumptions 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):

>>Data are indicated to come from the SCADA system and IPCC (fuel emission factors). Energy content of fuel is assumed to be known.

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

>>As discussed above, it is not clearly shown that the data collected will result in the factors that are required for determining emission reductions. This reviewer expects that additional data would be required and that most of the data will be difficult to obtain. The use of the system to be evaluated, the SCADA system, for virtually all of the data collection could also be considered quite problematic.



c) *State possible data gaps:*

>> The expected data gaps are missing information on each power plant's output and the power distributed to each "node" on the electrical grid. Inevitably, there will be data gaps for this information. In addition, there is no data collection on other variables – such as weather and trans-border power sales.

**(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):*

>> No

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

>> No

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

>> The methodology does not address leakage. Leakage may occur with power sales (to or from grid) that are based not on the identified power plant generation, but on generation from outside of the country or internal to the country, such as independent power projects.

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

>>QA/QC is not discussed other to state that the SCADA data will be very accurate.

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

>>The methodology's strength is that it is simple. Its weakness is that it oversimplifies the analysis that would be required.

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

>>None

**(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:*

>>N/A

b) *Indicate any further comments:*

>>N/A

Signature of desk reviewer



Date: 24 / 05 /05

**Information to be completed by the secretariat**

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