CLEAN DEVELOPMENT MECHANISM

CDM-SSCWG40-A01

Draft Small-scale Methodology

SSC-II.R: Energy efficiency space heating measures for residential buildings

Version 01.0

Sectoral scope(s): 03

United Nations
Framework Convention on
Climate Change

COVER NOTE

1. Procedural background

1. The Executive Board of the clean development mechanism (CDM) (hereinafter referred to as the Board) at its seventieth meeting agreed to the recommendation made by the SSC WG not to continue the work on the top-down revisions of the methodologies "AMS II.E: Energy efficiency and fuel switching measures for buildings" and "AMS-III.AE: Energy efficiency and renewable energy measures in new residential buildings", which were part of the work on revising methodologies top-down, as mandated by the Board in the SSC WG workplan 2012. Instead, the SSC WG prepared a new methodology top-down for space heating in residential buildings, with an option to focus on rural areas subject to further interaction with stakeholders.

2. The Board at its seventieth meeting agreed to launch a call for public input on the draft new methodology "SSC-II.R: Energy efficiency space heating measures for residential buildings", as contained in annex 10 to the report of the 39th meeting of the SSC WG. The call for input was open from 26 November 2012 to 26 December 2012. The draft new methodology takes into account the input received from the call for public input.

2. Purpose

3. The purpose of the proposed new draft methodology is to improve existing regulation.

3. Key issues and proposed solutions

4. Suppressed demand can be used under this methodology. The conditions and implications have been detailed in Section 5.2.1, as part of the baseline emission calculations. The methodology allows 20 per cent increase of the baseline emissions above the values calculated under non-supressed demand scenario.

4. Impacts

5. The methodology refers to scenarios of suppressed demand.

5. Proposed work and timelines

6. The methodology is recommended by the SSC WG for consideration by the Board at its seventy-third meeting. No further work is envisaged.

6. Recommendations to the Board

7. The SSC WG recommends that the Board adopts this final draft methodology, to be made effective at the time of the Board's approval.

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1. Introduction

1. The following table describes the key elements of the methodology:

Table 1. Methodology key elements

Typical project(s)	Energy efficiency and fuel switching measures implemented within residential buildings to improve the space heating
Type of GHG emissions mitigation action	Energy efficiency and fuel switching measures

2. Scope, applicability, and entry into force

2.1. Scope

2. This methodology is applicable to energy-efficiency activities involving the installation of new equipment or products or the modification of existing equipment or products that are implemented within residential buildings (single or multiple-family residences[1]). Activities applicable to this methodology only include those that are intended to reduce emissions associated with space heating, for example:

   (a) Improving building insulation;

   (b) Enhancing glazing of windows;

   (c) Improving efficiency of heating equipment and/or systems.

2.2. Applicability

3. This methodology is applicable to fuel-switching only when it results from implementation of the energy efficiency measures, for example, replacing a low efficiency diesel fuel furnace with a high-efficiency natural gas furnace.

4. The methodology is only applicable to technology/measures implemented in existing residential buildings.

5. This methodology is not applicable if "AMS-II.G: Energy efficiency measures in thermal applications of non-renewable biomass" is applied to activities within the physical, geographical site of the building(s) in which the installation of new equipment or products or the modifications of existing equipment or products are implemented.

6. If the energy efficiency measures result in displacement of non-renewable biomass, project participants shall document in a project design document (PDD) that non-renewable biomass has been used since 31 December 1989, using survey methods or referring to published literature, official reports or statistics.

[1] For this methodology, the term residence refers to a single housing unit. For example, a single family home is one residence and a building with ten apartments has ten residences.

7. This methodology is applicable to project activities where it is possible to directly measure and record the energy use within the project boundary (e.g. electricity, fossil fuel, and/or non-renewable biomass consumption).

8. This methodology is applicable to project activities where the impact of the measures implemented (improvements in energy efficiency) by the project activity can be clearly distinguished from changes in energy use due to other variables not influenced by the project activity.

9. The PDD shall document how the potential for double counting of emission reductions, for example due to equipment manufacturers or others claiming credit for emission reduction for project activities, are avoided.

10. The aggregate energy savings of a single project activity shall not exceed the equivalent of 60 GWh_e or 180 GWh_{th} per year.

2.3. Entry into force

11. The date of entry into force is the date of the publication of the EB 73 meeting report on 31 May 2013.

3. Normative references

12. Project participants shall apply the “General guidelines for SSC CDM methodologies”, “Guidelines on the demonstration of additionality of small-scale project activities” (previously known as Attachment A of Appendix B), abbreviations and “General guidance on leakage in biomass project activities” , provided at <http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html>.

13. This methodology also refers to the latest approved versions of the following tools:

    (a) “Tool to calculate the emission factor for an electricity system”;

    (b) “Upstream leakage emissions associated with fossil fuel use”.

4. Definitions

14. The definitions contained in the “Glossary of CDM terms” shall apply.

5. Baseline methodology

5.1. Project boundary

15. The project boundary is the physical, geographical site of the building(s) in which the installation of new equipment or products or the modifications of existing equipment or products are implemented.

5.2. Baseline emissions

16. Baseline emissions shall be determined while taking into account possible interactive effects among different activities (e.g. installation of efficiency technologies/measures) undertaken either as part of the project activities or any other activities (CDM or non-

CDM projects) within the project boundary. The principle for considering interactive effect provided in the "Guidelines for the consideration of interactive effects for the application of multiple CDM methodologies for a programme of activities" may be followed. This may require differentiating the energy consumption of project and non-project impacted equipment within the project boundary.

17. One of the following options may be used for determining the baseline energy consumption:

    (a) Use of a **"Baseline Measurement Survey"** carried out prior to or in parallel with the implementation of the project activity. In doing so, the survey shall include direct measurements and recording of the energy use within the project boundary. In addition, the baseline measurement survey shall provide sufficient information, such that the energy and emission impacts of the measures implemented by the project activity can be clearly distinguished from changes in energy use and emissions, due to other variables not influenced by the project activity (signal to noise). For example, in case of a project activity distributing energy efficient systems for spacing heating (with or without cooking) in rural households, a baseline measurement survey should consist of:

        (i) Measuring energy use of the baseline heating equipment (e.g. fossil fuel and biomass, renewable and non-renewable); and

        (ii) Measuring independent variables that determine energy use, such as ambient temperatures and occupancy;

        Measuring the energy use and independent variables shall be done for: (a) for a period of time sufficient to capture the range of independent variables expected to be encountered during the crediting period, which may require measurement during multiple seasons; and (b) from a census or randomly selected sample of representative residences (either participating in the program or eligible for participating in the program) in compliance with the "Standard for sampling and surveys for CDM project activities and programme of activities".

        The energy use data and the independent variable data, obtained from the baseline measurement survey, are used to define a relationship between baseline energy use/emissions and the independent variables, for example by using regression analysis to determine an appropriate equation. During the crediting period, the same independent variables are monitored and used for calculating the baseline energy use/emissions for the values of the independent variables experienced during the crediting period. If, during the crediting period, conditions are such that the value(s) of the independent variables fall outside of the range of value(s) encountered during the baseline survey, then either: (a) additional analysis is required to conservatively demonstrate that the relationship between baseline energy use/emissions and the independent variables (as defined using data collected during the baseline survey) is still valid; or (b) the baseline is determined using the option defined in paragraph 16(b) for "Use of a treatment group versus a control group survey"; or (c) emissions reductions cannot be claimed during periods of time when the value(s) of the independent variables are outside of the range of value(s) encountered during the baseline survey;

(b) Use of a **"Treatment Group Versus Control Group Study"**

The following terms are introduced for the purpose of this option:

(i) **Random assignment** - each residence in the population of project eligible residences is randomly assigned to either the control group or the treatment group based on a random probability, as opposed to being assigned to one group or the other based on some characteristic of the residence (e.g. location, energy use, or willingness to sign up for the program). Random assignment creates a control group that is statistically identical to the subject treatment group, in both observable and unobservable characteristics, such that any difference in outcomes between the two groups can be attributed to the treatment with a high degree of validity (i.e. that the savings estimates are unbiased and precise);

(ii) **Control group** - the group of residences that are assigned not to receive the project efficiency activities (i.e. the treatment). The treatment group is compared to this group. Depending on the study design, residences in the control group may be denied participation in the project efficiency activities; may receive the treatment after a specified delay period; or may be allowed to receive the treatment if requested;

(iii) **Treatment group** - the group of program participant residences that are assigned to receive the treatment.

Under this option, throughout the crediting period, energy used (for each fuel type) by the system(s) affected by the project activities (e.g. stoves/heaters) is measured using a census or representative sample (in compliance with the "Standard for sampling and surveys for CDM project activities and programme of activities") of the residences participating in the project (treatment group) and compared with energy use (for each fuel type) of a control group of non-participating residences (control group). The difference in energy use between the participating residences and the control group residences is used to determine energy savings and emission reductions. Appropriate statistical analysis shall be conducted on the obtained data, based on the study design chosen, in order to achieve unbiased, reliable and conservative estimates of energy savings and emission reductions;

(c) Use of **"Existing Data From Registered CDM Projects"**

This option is only applicable when a suppressed demand scenario exists per the requirements of paragraph 18 of this methodology. In such a case, credible data sources that depict the energy consumption level in the baseline scenario could be used. These data sources include data produced in other registered CDM projects (e.g. data in the same geographical area and with the same purpose of determining space heating consumption). Such data shall be documented to be applicable to the climate, residential building characteristics, fuel source market and fuel availability, and residential resident demographics within the project boundary.

18. Each energy source in the emission baseline is multiplied by its emission factor. For the electricity displaced, the emission factor is calculated in accordance with provisions

under the “Tool to calculate the emission factor for an electricity system”. For fossil fuels, the IPCC default values for emission coefficients may be used. For non-renewable biomass (NRB), the quantity of NRB used, emission factor used for NRB, and the baseline emission calculation are determined following the procedure provided in AMS-II.G.

5.2.1. Baseline emissions under suppressed demand scenario

19. A suppressed demand scenario (a minimum living standard of adequate space heating and indoor air temperatures is not met prior to project implementation) is deemed to exist, if one or more of the following conditions are observed:

    (a) For projects implemented in rural areas, the country electrification rate is below 20 per cent;[2]

    (b) Animal dung is the most common fuel used in the project area;

    (c) The project activity is in Least Developed Countries (LDCs) or Small Island Developing States (SIDs);

    (d) The conditions applicable for special underdeveloped zone (SUZ) provided in the "Guidelines for demonstrating additionality of microscale project activities".

20. If a suppressed demand scenario is determined to exist, than a suppressed demand factor of 1.20 can be used to make a suppressed demand correction in one of the following manners:

    (a) In the case that a “Baseline Measurement Survey” is used to define baseline energy consumption, the baseline suppressed demand factor is multiplied by the baseline energy consumption to determine a suppressed demand corrected baseline energy consumption;

    (b) In the case that a “Treatment Group versus Control Group Survey” approach is used to determine energy savings, the baseline suppressed demand factor is multiplied by the control group energy consumption to determine a suppressed demand corrected baseline energy consumption;

    (c) In the case that the “Use of Existing Data From Registered CDM Projects” is used to define baseline energy consumption, and if the existing data does not include consideration of suppressed demand, the baseline suppressed demand factor is multiplied times the baseline energy consumption depicted in the existing data to determine a suppressed demand corrected baseline energy consumption.

5.3. Project emissions

21. Each type of fuel and the quantity, by fuel type, consumed by the system(s) affected by the project activities shall be monitored. Project emissions shall be determined by multiplying the quantity of the energy consumed by its emission factor. For the electricity displaced, the emission factor is calculated in accordance with provisions under "Tool to

[2] The most recent available data on the electrification rates shall be used to demonstrate compliance with the 20 per cent threshold. In no case shall data be used if older than three years than the date of commencement of validation of the project activity.

calculate the emission factor for an electricity system". For fossil fuel displaced, the emission factor from reliable local or national data shall be used. IPCC default values shall be used only when country or project specific data are documented to be either not available or not reliable. For NRB, the quantity of NRB used, emission factor used for NRB, and the project emission calculation are determined by following AMS-II.G.

5.4. Leakage

22. If the energy efficiency technology is equipment transferred from another activity or if the existing equipment is transferred to another activity, leakage is to be considered.

23. Leakage relating to the non-renewable woody biomass shall be assessed as per the relevant procedures of “AMS-II.G: Energy efficiency measures in thermal applications of non-renewable biomass".

5.5. Emission reductions

24. Emission reductions are the difference between baseline emissions and project emissions by subtracting the emissions due to leakage. Emission reductions can only be calculated for the percentage of new project equipment or products or the percentage of modified equipment or products that are determined to be still operating per the most recent survey conducted per the requirements of paragraph 17.

6. Monitoring methodology

25. Monitoring shall include surveying of all new equipment or products or all the modified equipment or products, or a representative sample thereof, at least once every two years (biennial), to determine what percentage of the equipment is still operating or has been replaced by equivalent equipment.

26. A statistically valid sample of the locations where the systems are deployed, with consideration, in the sampling design, of occupancy and demographics differences can be used to determine parameter values used to determine emission reductions, as per the relevant requirements for sampling in the "Standard for sampling and surveys for CDM project activities and programme of activities". When biennial inspection is chosen a 95 per cent confidence interval and a 10 per cent margin of error requirement shall be achieved for the sampling parameter. When annual inspection is chosen, a 90 per cent confidence interval and a 10 per cent margin of error requirement shall be achieved for the sampled parameters. In cases where survey results indicate that 90/10 precision or 95/10 precision is not achieved, the lower bound of a 90 per cent or 95 per cent confidence interval of the parameter value may be chosen as an alternative to repeating the survey efforts to achieve the 90/10 or 95/10 precision.

27. Monitoring shall include measuring and recording energy consumption and any other data necessary to document independent variables that influence energy consumption (e.g. indoor and outdoor air temperatures). In case sampling method is used, the relevant requirements for sampling in the "Standard for sampling and surveys for CDM project activities and programme of activities" shall be followed. Energy consumption data shall be documented, at a minimum, on a monthly basis.

28. With respect to monitoring the monthly quantity of biomass used during the project, the relevant monitoring procedure provided in AMS-II.G shall be followed.

6.1. Project activity under a programme of activities

29. The following conditions apply for use of this methodology in a project activity under a programme of activities:

30. Leakage emissions resulting from fuel extraction, processing, liquefaction, transportation, re-gasification and distribution of fossil fuels outside of the project boundary shall be considered, as per methodological tool “Upstream leakage emissions associated with fossil fuel use”. In case leakage emissions in the baseline situation are higher than leakage emissions in the project situation, leakage emissions will be set to zero.

31. In case the project activity involves the replacement of equipment, and the leakage effect of the use of the replaced equipment in another activity is neglected because the replaced equipment is scrapped, an independent monitoring of scrapping of replaced equipment needs to be implemented. The monitoring should include a check if the number of project activity equipment distributed by the project and the number of scrapped equipment correspond with each other. For this purpose scrapped equipment should be stored until such correspondence has been checked. The scrapping of replaced equipment should be documented and independently verified.

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Document information

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