



Indicative simplified baseline and monitoring methodologies
for selected small-scale CDM project activity categories

TYPE I - RENEWABLE ENERGY PROJECTS

Project participants shall apply the general guidelines to SSC CDM methodologies, information on additionality (attachment A to Appendix B) and general guidance on leakage in biomass project activities (attachment C to Appendix B) provided at <http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html> > *mutatis mutandis*.

I.K. Solar cookers for households**Technology/measure**

1. This methodology is for project activities that introduce solar cookers to individual households to be used for household cooking purpose (i.e. meal preparation, water heating and baking for household consumption). The use of the solar cookers will reduce or displace the use of the existing cookstove(s) and displace the consumption of fossil fuels (e.g. Kerosene or LPG) or non-renewable biomass (NRB).
2. The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW thermal, which is equivalent to a maximum total aperture area of 64000 m².¹
3. Solar cookers shall be demonstrated to be designed and constructed according to the requirements of a relevant national or international standard or in accordance with the most recent guidelines issued by a relevant national or international authority/organisation.
4. To foster continued and frequent use of the solar cookers:
 - (a) Participating households (solar cooker users) are required to pay at least a portion of the cost of the solar cooker;
 - (b) Participating households shall receive training for appropriate use of the type of solar cooker, at or before the time of distribution of the solar cookers. This training shall take into account local cooking habits (e.g. types of food prepared, customary mealtimes, etc.);
 - (c) A local organization shall be involved on an ongoing basis to assist in promoting and facilitating the continued use of the cookers.
5. If the selected crediting period is longer than the manufacturer-specified lifetime, then it shall be demonstrated that an ongoing maintenance and replacement program is in place, through which cookers that are no longer functioning, will be repaired or replaced.
6. For project activity that involves displacement of woody biomass (non-renewable biomass), requirements and procedure prescribed in AMS-I.E “Switch from Non-Renewable

¹ For thermal applications, the limit of 45 MWth is the installed/rated capacity of the thermal application equipment or device/s. Refer to the latest version of the “General Guidelines to SSC CDM methodologies”. The manufacturers’ specifications on the installed/rated thermal output may be used. In the absence of manufacturers’ specification the installed/rated thermal output shall be determined based on a lab test undertaken by a nationally approved/accredited laboratory or alternatively by a laboratory complying with the requirements of a relevant national or international standard, e.g. ISO/IEC 17025. Relevant national/international standards for testing shall be used.



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I.K. Solar cookers for households (cont)

Biomass for Thermal Applications by the User” are applicable for the determination of GHG emissions.

Boundary

7. The project boundary includes the solar cookers as well as baseline cook-stoves used in the participating households. Where woody biomass is used, the collection area of these biomass fuels is included in the project boundary.

Baseline emissions

8. The baseline emissions are determined as the quantity of fuel(s) used for cooking purposes in the participating households in the absence of the project solar cookers, times the appropriate emission factors for those fuels. When the displaced fuel is woody biomass (*non-renewable biomass*), relevant procedures from AMS-I.E can be used.

The baseline emissions BE_y are calculated as:

$$BE_y = \sum_k \sum_j N_{k,0} * n_{k,y} * FC_{BL,k,j} * NCV_j * EF_{FF,j} \quad (1)$$

Where:

BE_y	Baseline emissions in year y (tCO ₂)
k	Index for household type or cluster or stratification (e.g. stratified by household size, type of solar cookers introduced etc.)
j	Index for the type of baseline fuel consumed
$N_{k,0}$	Number of households provided with project solar cookers prior to year y
$n_{k,y}$	Proportion of households $N_{k,0}$ where solar cookers are demonstrated to be operational and in-use in year y (fraction)
$FC_{BL,k,j}$	Annual consumption of baseline fuel j (mass or volume unit per household for cooking) by household type k in the baseline scenario
NCV_j	Net calorific value of the fuel j (GJ/mass or volume unit)
$EF_{FF,j}$	CO ₂ emission factor of fuel j (tCO ₂ /GJ)

9. Annual household consumption of baseline fuel ($FC_{BL,k,j}$) shall be determined using one of the three methods (a), (b) or (c), described below:

- (a) *Ex post* Measurement Campaign: Consumption of baseline fuel ($FC_{BL,k,j}$) is determined in a measurement campaign for a minimum of 15 days per year at a representative sample of targeted users who have solar cookers but do not use them for the duration of the campaign. The days selected for measurement of fuel consumption shall take into account seasonal and weekday/weekend differences in



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fuel consumption (if any), or else the data from the measurement campaign shall be extrapolated in order to take into account the seasonal cooking patterns and fuel use. In locations where households use fossil fuels in standard unit weights/dimensions (e.g. honeycomb coal briquettes of 500g/unit), the counting of fossil fuel units used (e.g. number of briquettes) and the unit weight² (e.g. unit weight of coal briquette) may be used for the purpose of measurement. Fuel consumption data collected through sample-based measurements shall comply with the 90% confidence interval and 10% margin of error requirement. Households may be stratified into similar groups (*k*) or clusters according to the relevant characteristics of the sampled population (e.g. average income level, household occupancy, diet and cooking habits, climate/temperature zone, plus availability, price and type of fuel used). The latest version of “Standard for sampling and surveys for CDM project activities and programme of activities” shall be complied with;

- (b) *Ex ante* Measurement Campaign: Consumption of baseline fuel ($FC_{BL,k,j}$) is determined in a measurement campaign for a minimum of 90 days at a representative sample of targeted users before the acquisition/installation of the solar cookers. Fuel consumption is monitored using the same procedures and sampling requirements described in Option (a). This data on annual baseline fuel consumption obtained from households shall be cross checked with purchase receipt(s) submitted by the households. The values obtained are multiplied by 0.89³ to account for uncertainties;
- (c) A group of users not supplied with project equipment shall be set up as a control group. The control group shall be made up of households that are as similar to the project participant group as possible. Relevant parameters of influence pertaining to the project region shall be defined and the control group shall be set up taking into account these parameters (e.g. average income level, household occupancy, diet and cooking habits, climate/temperature zone, and the availability, price and type of fuel used).⁴ Fuel consumption of the control group is monitored throughout the crediting period, for a minimum of 15 days per year, using the same sampling requirements described in Option (a).

10. For determining the emission factors for fossil fuels, 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 emission factor shall be selected as per AMS-I.E.

² If the unit weight is not uniform in the project area (i.e. various sizes and weights of briquettes may be available in a project area with multiple manufacturers), the specific unit weights shall be applied.

³ To account for uncertainties of the method, estimated to be in the range 30-50% (See “Annex III Table of conservativeness factors”, page 25, FCCC/SBSTA/2003/10/Add.2, page 25).

⁴ Alternatively, a conservative approach may be adopted in the sampling design to account for these issues.



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Project emissions

11. The project emissions are determined as the quantity of fuel(s) used for cooking tasks in the participating households once the solar cookers have been introduced and are being used in these households, times the appropriate emission factor for those fuels. In the case of woody biomass, relevant procedures from AMS-I.E can be used.

12. Project emissions from any continued use of fossil fuel j are calculated by:

$$PE_y = \sum_k \sum_j N_{k,0} * n_{k,y} * FC_{PJ,k,j} * NCV_j * EF_{FF,j} \quad (2)$$

Where:

PE_y	Project emissions in year y (tCO ₂)
$FC_{PJ,k,j}$	Annual consumption of fossil fuel j (mass or volume unit per household for cooking) by household type k in the project scenario

13. $FC_{PJ,k,j}$ is determined in a measurement campaign for a minimum of 30 days per year (to take into account variations in weather conditions that would impact use of solar cookers) at a representative sample of targeted users. Measurement procedures shall follow those described in para 9(a).

14. For solar cookers equipped with a solar tracking system that consumes electricity, CO₂ emissions from electricity consumption shall be accounted for as project emissions using the latest version of the “Tool to calculate baseline, project and/or leakage emissions from electricity consumption”. The electricity use of auxiliary loads may be calculated based on the rated power consumption rate and conservatively estimated auxiliary load run-time(s).

Leakage

15. Leakage is to be considered if the solar cookers introduced by the project activity are transferred from users outside the project boundary.

16. Leakage related to the non-renewable woody biomass saved by the project activity shall be assessed according to the requirements provided in AMS-I.E.

Emission reductions

17. Emission reductions are calculated based on the reduced quantity of fuel consumption. Emission reductions, ER_y are determined as:

$$ER_y = BE_y - PE_y - LE_y \quad (3)$$

Where:

ER_y	Emission reductions in year y (tCO ₂)
BE_y	Baseline emissions in year y (tCO ₂)



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PE_y Project emissions in year y (tCO₂)

LE_y Leakage in year y (tCO₂)

Monitoring

18. A unique marking shall be placed on each solar cooker in order to track the solar cookers. A data log of all users and the corresponding marking of their solar cooker(s), the date that households have acquired and begun using their solar cooker(s), along with a record of training that users have received, shall be kept. This list should also include the details on which the sampling practices are designed.

19. Monitoring shall include an on-site check of all solar cookers or a representative sample thereof, on either an annual or biennial basis to check if they are still operating or are replaced by an equivalent in service solar cooker. In any given year, emission reductions can only be claimed for households with solar cookers that are demonstrated to be operational and in-use.

20. When biennial inspection is chosen, the inspections shall be done in years 3, 5, 7, etc. and the results of such inspections can be applied to crediting years 3 and 4, 5 and 6 and 7, etc. A statistically valid sample of the residences where the cookers are in use shall be used to determine the percentage of systems operating. Such sampling shall take into consideration occupancy and demographic differences, as per the relevant requirement for sampling in the “Standard for sampling and surveys for CDM project activities and programme of activities”.

21. When biennial inspection is chosen, a 95% confidence interval and 10% margin of error shall be achieved for the sampling parameter. If annual inspection is chosen, then a 90% confidence interval and 10% margin of error shall be achieved.

22. Relevant parameters shall be monitored as indicated in the Table below. The applicable requirements specified in the “General Guidelines to SSC CDM methodologies” (e.g. calibration requirements, sampling requirements) are also an integral part of the monitoring guidelines specified below and therefore shall be referred to by the project participants.

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Table 1: Parameters for monitoring during the crediting period

No.	Parameter	Description	Unit	Monitoring/ recording frequency	Measurement methods and procedures
1	$N_{k,0}$	Number of households provided with solar cookers in year y		As per paragraph 18	As per paragraph 18
2	$n_{k,y}$	Proportion of $N_{k,0}$ still using solar cooker in year y (fraction)		As per paragraph 19	As per paragraph 19
4	$FC_{BL,k,j}$	Annual consumption of baseline fossil fuel j	Physical units, mass or volume	As per paragraph 9	As per paragraph 9
5	$FC_{PJ,k,j}$	Annual consumption of fossil fuel type j by household k	Physical units, mass or volume	As per paragraph 13	As per paragraph 13

Project activity under a programme of activities

23. The methodology is applicable to a programme of activities.

24. If the NRB that would have been used in the baseline is to be replaced by the solar cookers, the relevant requirement for PoAs in AMS-I.E shall be followed.

History of the document

Version	Date	Nature of revision
01.0	EB 66, Annex 55 2 March 2012	Initial adoption.
Decision Class: Regulatory Document Type: Standard Business Function: Methodology		