Monitoring report form for CDM project activity
(Version 06.0)

Complete this form in accordance with the instructions attached at the end of this form.

MONITORING REPORT		
Title of the project activity	Efficient Wood Fuel Stove-Cooking-Sets, Lesotho	
UNFCCC reference number of the project activity	5482	
Version number of the PDD applicable to this monitoring report	3	
Version number of this monitoring report	1	
Completion date of this monitoring report	21/03/2019	
Monitoring period number	7	
Duration of this monitoring period	01/12/2017 – 30/11/2018 both days included	
Monitoring report number for this monitoring report	1	
Project participants	Solar Lights atmosfair gGmbH Deutsche Post AG	
Host Party	Lesotho	
Sectoral scopes	3: Energy demand	
Applied methodologies and standardized baselines	AMS II.G., version 3 , "Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass"; N/A	
Amount of GHG emission reductions or net anthropogenic GHG removals achieved by the project activity in this monitoring period	Amount achieved before 1 January 2013	Amount achieved from 1 January 2013
	0	28,654
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	37,332	

SECTION A. Description of project activity

A.1. General description of project activity

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The purpose of the project activity is the dissemination of efficient fuel wood stoves and heat retaining polypropylene boxes in several districts of Lesotho, at subsidized prices. Users are households who previously used inefficient, traditional fireplaces.

The efficient fuel wood stove that was deployed is a portable stove developed and prefabricated by a German manufacturer and assembled locally, called SAVE80. The SAVE80 system also consists of custom-fit pots, pans and a heat-retaining box ('Wonderbox'). Design and brand name of the SAVE80 system may develop over time, for simplicity the system is hereafter referred to as the SAVE80 system. The project is implemented by the Lesotho based company Solar Lights and the German carbon offset organization atmosfair gGmbH (hereinafter referred to as "atmosfair").

The efficient fuel wood stove that were deployed is a portable stove made of stainless steel developed and prefabricated by a German manufacturer and assembled locally to create employment and income. The efficient fuel wood stove is called SAVE80. The SAVE80 system also consists of custom-fit pots, pans and a heat-retaining box ('Wonderbox').

The SAVE80 model has a nominal effective thermal power of 1.5 kW. As per specification of the manufacturer, the SAVE80 system needs only about 250 g of small brittle sticks of wood to bring 6 liters of water to the boil, 80% less than traditional fireplaces.

The design ensures preheating of the air and a complete combustion with very little visible smoke and only small amounts of ash. Industrial production allows constant quality standards.

The SAVE80 system also includes a heat-retaining box ('Wonderbox'), where food can be transferred after reaching the boiling temperature, and where it will continue to simmer until it is well cooked. The Wonderbox allows important energy savings in addition to the savings by the SAVE80. However, these energy savings will not be taken into account for calculating emission reductions. This significantly increases the overall conservativeness of the emission reduction calculations.

A.2. Location of project activity

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(a) Host Party:

Lesotho

(b) Region/ State/ Province:

The project activity is located in the so-called foothills region of the country, limited by the highlands in the east and the lowlands in the west. In the north the boundary stretches out from (28°39'E, 28°35'S), near to the border of South Africa, to (27°30'E,30°05S) in the southern part of Lesotho.

The project location includes parts of the districts Berea, Maseru, Leribe, Mohale's Hoek, Mafeteng and Butha-Buthe.

(c) City/ Town/ Community:

The project activity is implemented in all villages and households in the above described target areas, who want to participate in the CDM project ("eligible households"). "Eligible households" are households who confirm that fuel wood has been used for cooking purposes.

(d) Physical/ Geographical location:

The project area is demarcated by so called EA Codes, which were defined within the Population Census 2006. Each EA Code area is situated entirely within a community council boundary. The EA Codes consist of a unique 9 digit identifier code:

1st and 2nd digits in the code = district
3rd and the 4th digits in the code = constituency
5th and the 6th digits in the code = community council
7th digit in the code = geographical zone
8th and the 9th digits in the code = EA number

For the list of all EA Codes forming the project area, see Annex 5 of the PDD.

The coordinates of Solar Lights' main office in Maseru are:
29°20'55.1"S 27°27'27.5"E

A.3. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Lesotho (host)	Solar Lights (private entity)	No
Germany	atmosfair gGmbH (private entity)	No
Germany	Deutsche Post AG	No

A.4. Reference to applied methodologies and standardized baselines

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AMS II.G., version 3, "Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass"

http://cdm.unfccc.int/methodologies/DB/UFM2QB70KFMWLVO7LJN8XD1O2RKHEK

A.5. Crediting period type and duration

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Fixed crediting period (10 years)

Start of crediting period: 29/08/2012

End of crediting period: 28/08/2022

SECTION B. Implementation of project activity

B.1. Description of implemented project activity

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a) Description of the installed technology, technical processes and equipment

The SAVE80 is a portable stove made of stainless steel, developed and prefabricated by a German manufacturer and assembled locally to create employment and income. The initial model has a specified thermal efficiency of 52% and nominal effective thermal power of about 1.5 kW. As per specification of the manufacturer, the SAVE80 needs only about 250 g of small brittle sticks of

wood to bring 6 litres of water to the boil, 80% less than traditional fire places. The design ensures preheating of the air and a complete combustion with no visible smoke and only small amounts of ash. The SAVE80 system also consists of custom-fit pots, pans and a heat retaining box ('Wonderbox'), where food can be transferred after reaching the boiling temperature, and where it will continue to simmer until it is well cooked. The Wonderbox allows important energy savings in addition to the savings by the Save80. However, these energy savings have not been taken into account for calculating emission reductions, which is increasing the overall conservativeness of the Emission Reduction calculations.

(b) Information on the implementation and actual operation of the project activity, including relevant dates (e.g. construction, commissioning, continued operation periods, etc.).

The following table lists the number of SAVE80 systems delivered under the project activity and considered for monitoring period seven. It refers to the distribution from the starting date of the project activity until the end of the seventh monitoring period (01.12.2017 – 30.11.2018).

Month	ICS delivered and considered for MP7
Delivered until 01/12/2017 (Date of last delivery: 03/03/2016)	9,982
December 2016	0
January 2017	0
February 2017	0
March 2017	0
April 2017	0
May 2017	0
June 2017	0
July 2017	0
August 2017	0
September 2017	0
October 2017	0
November 2017	0
Total	**9,982**

B.2. Post-registration changes

B.2.1. Temporary deviations from the registered monitoring plan, applied methodologies or standardized baselines

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No temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline have been approved or submitted during this monitoring period.

B.2.2. Corrections

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No corrections to project information or parameters fixed at validation have been approved during this monitoring period or submitted with this monitoring report.

B.2.3. Changes to the start date of the crediting period

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No changes to the start date of the crediting period have been approved during this monitoring period or submitted with this monitoring report.

B.2.4. Inclusion of monitoring plan

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No monitoring plan has been included during this monitoring period or submitted with this monitoring report with regards to the registered PDD.

B.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools

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No permanent changes from the registered monitoring plan, or permanent deviation of monitoring from the applied methodology, applied standardized baseline or other applied standards or tools have been approved during this monitoring period or submitted with this monitoring report.

B.2.6. Changes to project design

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No changes to the project design of the registered project activity have been approved during this monitoring period or submitted with this monitoring report.

SECTION C. Description of monitoring system

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Data collection procedures and organisational structure

The monitoring consists of three stages:

1. (Continuous) Sales monitoring
2. Sample surveys after the end of the monitoring period and prior to verification
3. Data compilation, quality control and drafting of the Monitoring Report

1. Sales monitoring

Sales monitoring served to determine the adjusted total number of SAVE80 deployed until period y (N_y)

The SAVE80 deployment and sales monitoring data flow process incl. organisational structure is illustrated in the following diagram:

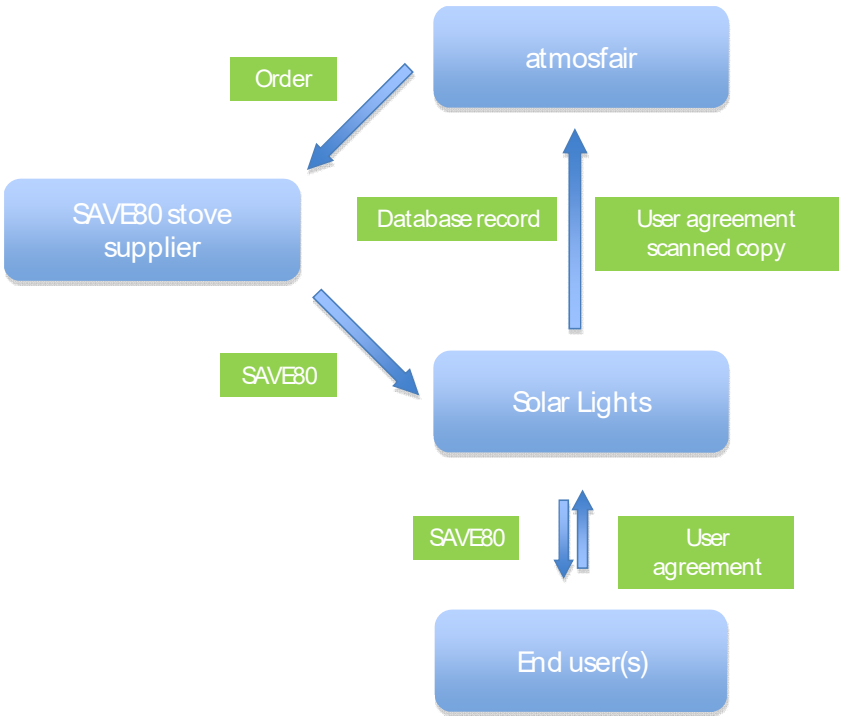

Diagram 1: Sales monitoring flow chart

Data generation:
Every end user acknowledged receipt of a SAVE80 on a user agreement. The following information is provided:

- Name and contact details of the user
- Serial number of the SAVE80 sold
- Deployment date

Data recording:
Solar Lights collected the user agreements from the end users and entered the information into an electronic database (the "sales records database").

Data aggregation and reporting:
Solar Lights submitted both the user agreements (scans) and the electronic datasets to atmosfair. atmosfair checked for inconsistencies and instructed Solar Lights to take corrective action where necessary.

2. Sample surveys

After the end of the monitoring period and prior to the verification, sample surveys were conducted that served to determine the:

- Statistically adjusted drop out from total population of SAVE80 in period y (DO_y)
- Adjustment factor for continued use of baseline appliance of SAVE80 users in period y (CB_y)
- Adjusted average efficiency of the SAVE80 system being deployed (η_{new})

The sample survey data flow incl. organisational structure is illustrated in the following line diagram:

Diagram 2: Sample survey flow chart

Data generation:
atmosfair drew a random sample from the sales records database and submitted the electronic sample incl. user details to the monitoring team. The monitoring team conducted the surveys (user interviews and efficiency tests) at the end user locations.

Data recording:
The monitoring team recorded the information from the user interviews on questionnaires and from the efficiency tests on data entry forms.

Data aggregation and reporting:
The monitoring team submitted the questionnaires and the data entry forms to atmosfair. atmosfair checked for inconsistencies and instructed the monitoring team to take corrective action if necessary. atmosfair aggregated and reported the results in the monitoring spot check database.

For the detailed sampling plan, see Section D.3

3. Data compilation
atmosfair finally transferred the parameter values from the sales records database and from the spot check database to an Excel spreadsheet containing the equations to calculate the emission reductions of the monitoring period. The so achieved values were reported in the monitoring report.

For all three steps above the following roles and responsibilities apply:

Role	Responsibility	Entity
Database administrator	The database administrator is responsible for updating and maintaining all electronic databases: Input of user information from sales agreements into the electronic database	Solar Lights
Monitoring team	The monitoring team conducts the user interviews and efficiency tests during the periodic sampling and reports the results to the database administrator (Sample Survey at end user location).	Solar Lights
Data compilation	atmosfair transfers data gathered by the monitoring team and from the electronic database into the emission reduction calculation spreadsheet to calculate the specific emission reductions for this monitoring period.	atmosfair

atmosfair assigned staff members from Solar Lights to perform the data collection. Training was provided for the monitoring team prior to conducting the monitoring to ensure that the qualification and experience of all persons involved is adequate for the specific tasks to be performed.

Emergency procedures for the monitoring system
atmosfair and Solar Lights have implemented a system of cross-checks to ensure data quality. There is a separation of roles for every step of the data generation, aggregation & recording, calculation and reporting between those who are responsible and those who are controlling the respective step.

In particular, the database administrator checked correctness and consistency between information on the user agreements and the corresponding sales database record. In case inconsistencies were detected, the database administrator instructed the Solar Lights team to search for the error source. If the error source could be found, the information was corrected accordingly, if not, the database record was removed from the database.
Furthermore, the database administrator checked the correctness and consistency of all sampling data collected and processed in in this Monitoring Period.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante

(Copy this table for each data or parameter.)

Data/Parameter	$B_{y,appliance}$
Unit	tonnes/year
Description	Quantity of Biomass used in the absence of the project activity (per appliance)
Source of data	Baseline Survey
Value(s) applied	3.71908
Choice of data or measurement methods and procedures	$B_{y,appliance}$ is derived from a survey of local usage **(**Baseline Survey, see Section B.4. Step 1 of registered PDD).
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	

Data/Parameter	η_{old}
Unit	%
Description	Efficiency of the baseline system being replaced
Source of data	AMS II.G. version 3 default value
Value(s) applied	0.10
Choice of data or measurement methods and procedures	According to AMS II.G. a default value of 0.10 can be used “if the replaced system is a three stone fire, or a conventional system with no improved combustion air supply or flue gas ventilation system i.e., without a grate or a chimney” (see also Section B.4, Step 2 of the PDD).
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	

Data/Parameter	$NCV_{biomass}$
Unit	TJ/t
Description	Net calorific value of non-renewable biomass that is substituted
Source of data	AMS II.G. version 3 default value
Value(s) applied	0.015
Choice of data or measurement methods and procedures	This is the IPCC default value for wood fuel as provided by AMS II.G, version 03, par. 5.
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	

Data/Parameter	$EF_{projected\_fossilfuel}$
Unit	t CO_2/TJ
Description	Emission factor for the substitution of non-renewable biomass by similar consumers
Source of data	AMS II.G. version 3 default value
Value(s) applied	81.6
Choice of data or measurement methods and procedures	According to AMS II.G., par. 5, the value of 81.6 t CO_2/TJ is to be taken as emission factor for the substitution fuel likely to be used instead of fuelwood (see also Section B.4. Step 4 of the registered PDD).
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	

Data/Parameter	$f_{NRB, y}$
Unit	fraction
Description	Fraction of woody biomass saved by the project activity in period y that can be established as non-renewable biomass
Source of data	FAO (2010): Global Forest Resources Assessment 2010, Country Tables Lesotho, Table 3b – Special designation and management categories http://www.fao.org/forestry/20262-1-27.pdf; expert interviews.
Value(s) applied	0.98
Choice of data or measurement methods and procedures	The shares of renewable and non-renewable woody biomass has been determined by using nationally approved data and studies according to AMS.II.G. par. 8-12 (see Section B.4. Step 3 of registered PDD).
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	

Data/Parameter	L_y
Unit	fraction
Description	Leakage adjustment factor period y
Source of data	AMS II.G. version 3 adjustment factor for leakages (par. 13)
Value(s) applied	0.95
Choice of data or measurement methods and procedures	According to AMS II. G., par. 13, B_{old} can be multiplied by a net to gross adjustment factor of 0.95 to account for leakage in which case surveys are not required.
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	

D.2. Data and parameters monitored

(Copy this table for each data or parameter.)

Data/Parameter	η_{new}
Unit	%
Description	Adjusted average efficiency of the SAVE80 system being deployed
Measured/calculated/ default	Calculated from sample survey
Source of data	Sample survey

<table>
<tr><td>Value(s) of monitored parameter</td><td>
<table>
<tr><th>Test</th><th>Results</th></tr>
<tr><td>Test 1: Stove ID 1033</td><td>42.22</td></tr>
<tr><td>Test 2: Stove ID 1759</td><td>42.64</td></tr>
<tr><td>Test 3: Stove ID 4425</td><td>45.97</td></tr>
<tr><td>Test 4: Stove ID 5034</td><td>43.95</td></tr>
<tr><td>Test 5: Stove ID 5618</td><td>46.05</td></tr>
<tr><td>Test 6: Stove ID 6127</td><td>43.61</td></tr>
<tr><td>Test 7: Stove ID 6379</td><td>44.44</td></tr>
<tr><td>Test 8: Stove ID 6621</td><td>42.34</td></tr>
<tr><td>Test 9: Stove ID 8346</td><td>44.86</td></tr>
<tr><td>Test 10: Stove ID 8861</td><td>44.09</td></tr>
<tr><td>Test 11: Stove ID 9406</td><td>44.73</td></tr>
<tr><td>Test 12: Stove ID 9642</td><td>44.01</td></tr>
<tr><td>Average:</td><td>44.08</td></tr>
</table>
</td></tr>
<tr><td>Monitoring equipment</td><td>
<table>
<tr><td></td><td><u>Weighing Scale</u></td></tr>
<tr><td>Type</td><td>KD 8000</td></tr>
<tr><td>Accuracy class</td><td>+/- 1 g</td></tr>
</table>
<table>
<tr><td></td><td><u>Thermocouple</u></td></tr>
<tr><td>Type</td><td>Greisner GMH 3710</td></tr>
<tr><td>Accuracy class</td><td>+/- 0.03°C</td></tr>
</table>
</td></tr>
<tr><td>Measuring/reading/recording frequency</td><td>Annually</td></tr>
<tr><td>Calculation method (if applicable)</td><td>Monitoring of the statistically adjusted average efficiency involves two steps:

Step 1: Sample survey and efficiency testing amongst appliances deployed

Step 2: Calculation of the adjusted average efficiency at 90% confidence level and 10% precision (annual inspections) following the statistical standard approach for a heterograde test of independent units that have a standard normal distribution.

ηnew is determined following the Water Boiling Test (WBT) protocol v.3.0[1], performed by a dedicated monitoring team. Tests are reported in spreadsheet templates.</td></tr>
<tr><td>QA/QC procedures</td><td>All formulas applied to determine the statistical precision are standard formula. Furthermore, according to AMS II.G, par.22 the sampling error has to be deducted (“...the lower bound of a 90% confidence interval of the parameter value may be chosen”) in the event that 90/10 precision could not be achieved because of a small sample size. No deductions have to be made if 90/10 precision is achieved by sampling a proper number of appliances.

Solar Lights and atmosfair will further cross-check results with literature values, or specifications from manufacturer, if available.

Data will be collected using the standard procedures and will be stored for the crediting period and an additional two years.</td></tr>
<tr><td>Purpose of data/parameter</td><td>Baseline emission calculation</td></tr>
<tr><td>Additional comments</td><td></td></tr>
</table>

[1] http://www.pciaonline.org/node/1048

Data/parameter:	**N_y**
Unit	n/a
Description	Adjusted total number of SAVE80 deployed
Measured/calculated/default	Calculated
Source of data	Sales Records Database
Value(s) of monitored parameter	9,669
Monitoring equipment	User agreements and sales records database
Measuring/reading/recording frequency:	Continuous monitoring and recording of n_i
Calculation method (if applicable):	The total number of SAVE80 deployed until period y is calculated annually and based on information monitored through the Sales Records Database. $N_y = \sum_{i=1}^{y} n_i \cdot OT_{adjustedi,y}$

Parameter	Description
ni	Number of SAVE80 deployed in period i as reported in the Sales Records Database and adjusted to account for delays between sales date and first use. Every SAVE80 starts to operate (deployment date) the day after the SAVE80 was delivered.
$OT_{adjust,i,y} = \begin{cases} 1 & ,i < y \\ \frac{d_{averagey}}{mp_{length}} & ,i = y \end{cases}$	Adjustment factor for reduced operational time of SAVE80 deployed in period y
daverage,y	Average numbers of days that SAVE80 deployed in period y have been operational in period y as determined by respective deployment dates of SAVE80 counted for n_y. Deployment dates are determined mutatis mutandis as in the context of n_i above.
mplength	Length of monitoring period y

QA/QC procedures:	Data will be collected using the standard procedures and will be stored for the crediting period and an additional two years.
Purpose of data/parameter	Baseline emission calculation
Additional comments:	

Data/parameter:	**DO_y**
Unit	%
Description	Statistically adjusted drop out from total population of SAVE80 in period y
Measured/calculated/default	Calculated from sample survey
Source of data	Sample survey
Value(s) of monitored parameter	3.53
Monitoring equipment	Questionnaire
Measuring/reading/recording frequency:	Annually

Calculation method (if applicable):	Monitoring of the statistically adjusted drop out involves two steps: Step 1: Sample survey amongst SAVE80 deployed Step 2: Calculation of the adjusted drop out rate at 90% confidence level and 10% precision (annual inspections) following the statistical standard approach for a homograde test of independent units that have a standard normal distribution. The Drop outs are determined through interviews where it will be checked if the appliances are still operational, performed by a dedicated monitoring team. Interviews are reported in a questionnaire. Checks are conducted until the required precision (10%) for this parameter is achieved. All questionnaires and information gathered during the sampling by the monitoring team are handed over to Solar Lights and atmosfair that takes care of entering the information to an electronic database and updating sample databases where appropriate.
QA/QC procedures:	All formulas applied to determine the statistical precision used are standard formula. Furthermore, according to AMS II.G, par.22 the sampling error has to be deducted ("...the lower bound of a 90% confidence interval of the parameter value may be chosen") in the event that 90/10 precision could not be achieved because of a small sample size. No deductions have to be made if 90/10 precision is achieved by sampling a proper number of SAVE80. Data will be collected using the standard procedures and will be stored for the crediting period and an additional two years.
Purpose of data/parameter	Baseline emission calculation
Additional comments:	

Data/parameter:	**CB_y**
Unit	%
Description	Adjustment factor for continued use of baseline appliance of SAVE80 users in period y
Measured/calculated/default	Calculated from sample survey
Source of data	Sample survey
Value(s) of monitored parameter	93.75
Monitoring equipment	Questionnaire
Measuring/reading/recording frequency:	Annually

<table>
<tr><td>Calculation method (if applicable):</td><td>Monitoring of the adjustment factor for continued use of baseline appliance involves two steps:

Step 1: Sample survey amongst SAVE80 deployed and in operation

Step 2: Calculation of the adjustment factor for the continued use of baseline appliance at 90% confidence level and 10% precision (annual inspections) following the statistical standard approach for a homograde test of independent units that have a standard normal distribution.

The data obtained in Step 1 is:

<table>
<tr><th>Parameter</th><th>Unit</th><th>Description</th></tr>
<tr><td>nCB,y</td><td>-</td><td>Total number of SAVE80 users (with operational appliance) checked during sampling for which a valid result was obtained.</td></tr>
<tr><td>xk</td><td>0 < xk < 1</td><td>Results from sampling to adjust for the continued use of baseline appliance of SAVE80 users. k ranges from 1 to nCB,y.</td></tr>
</table>

x_k is determined through interviews, performed by a dedicated monitoring team accordingly. Interviews are reported in a questionnaire.
If a user with an operational stove reports that he continues to use the baseline appliance for cooking or water heating, it is determined

• $n_{baseline}$: how often the baseline appliance has been used per week in average (only the use of woody biomass is relevant)

• n_{total}: how often both the baseline appliance and the SAVE80 system has been used per week in average (only the use of woody biomass is relevant)

xk is then calculated as:
$$x_k = 1 - \frac{n_{baseline}}{n_{total}}$$

In Step 2 the following calculations shall be performed:
$$CB_y = \frac{1}{n_{CB,y}} \sum_{k=1}^{n_{CB,y}} x_k$$

Checks are conducted until the required precision (10%) for this parameter is achieved. All questionnaires and information gathered during the sampling by the monitoring team are handed over to Solar Lights and atmosfair that takes care of entering the information to an electronic database and updating sample databases where appropriate. $nCB_{,y}$ is determined implicitly during the procedure described above.</td></tr>
<tr><td>QA/QC procedures:</td><td>All formulas applied to determine the statistical precision used are standard formula. Furthermore, according to AMS II.G , par.22 the sampling error has to be deducted (“...the lower bound of a 90% confidence interval of the parameter value may be chosen”) in the event that 90/10 precision could not be achieved because of a small sample size. No deductions have to be made if 90/10 precision is achieved by sampling a proper number of SAVE80.
Data will be collected using the standard procedures and will be stored for the crediting period and an additional two years.</td></tr>
<tr><td>Purpose of data/parameter</td><td>Baseline emission calculation</td></tr>
<tr><td>Additional comments:</td><td></td></tr>
</table>

D.3. Implementation of sampling plan

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(a) Description of implemented sampling design;

As per the registered PDD, the sampling procedure has to be a simple random sampling process which randomly samples households across the project activity. Though the monitoring team undertook the monitoring of the parameters simultaneously and on the same sample, different sample sizes applied since the confidence/precision of the parameter depend on the variation of the obtained values.

Ny is monitored through sales records for all appliances deployed till the end of the Monitoring period, whereas the other parameters were determined through a sample survey. Monitoring of the parameters *DOy* and *CBy* was done by personal interviews of stove users using a common questionnaire. The users in the sample were selected via a computerized randomizer from the sales records database. The computerized randomizer produced an unsorted sample list i.e. a list of 94 Save80 users. The sample was drawn on the 20/12/2018.

In accordance with the Monitoring Plan of the registered PDD and to reduce monitoring efforts a single sample is drawn from the sales records database based on which the parameters DOy and CBy shall be monitored. This does not imply that for each of the parameters the same number of users/Save80 systems has to be monitored during sampling.

Out of the 94 sampled Save80 stoves, the users of 86 stoves could be contacted and an interview was performed to determine DOy, which is more than the required minimum sample size for DOy. In order to determine CBy, all sample stoves which were in use during the monitoring period were considered, which is a total of 82 stoves out of the 86 stoves that could be reached.

The first 14 households from the unsorted sample list (94 users), which was drawn on the 20/12/2018, were contacted for the Water Boiling Tests (WBTs). Since two of the households from the 14 randomly selected stove IDs could not be contacted, a total of 12 tests were conducted, which is in line with the required minimum sample size for η_{new}. Monitoring of the parameter η_{new}, was done by applying the water boiling test (WBT) protocol (Berkeley Air Monitoring Group Water Boiling Test (WBT) v.3.0. The equipment used during the WBT fulfilled the requirements. The Water Boiling Tests were performed by a dedicated monitoring team at the households' sites.

(b) Collected data, analysis of the same and demonstration on whether the confidence/precision has been met

The following tables summarise the collected data, give the analysis of the same and the demonstration on whether the confidence/precision has been met.

Parameter	N	Result	Standard deviation	Confidence	Precision	Lower bound applicable?
η_{new}	12	44.08 %	1.26	90 %	2.27 %	No
DO_y	85	3.53 %	N/A	90 %	3.40 %	No
CB_y	82	93.75 %	N/A	90 %	4.67 %	No

SECTION E. Calculation of emission reductions or net anthropogenic removals

E.1. Calculation of baseline emissions or baseline net removals

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Please note that the methodology AMS II.G., ver. 3 does not provide specific equations for calculation of Baseline emissions, project emissions or leakage, only for Emission reductions. As Leakage was considered ex-ante, B_{old} was adjusted to account for the quantified leakage.

E.2. Calculation of project emissions or actual net removals

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Not applicable, as methodology AMS II.G., v3 does not consider project emissions.

E.3. Calculation of leakage emissions

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Leakage Adjustment Factor Ly as per the methodology is applied to the project activity to calculate Emission Reductions of this Monitoring Period.

E.4. Calculation of emission reductions or net anthropogenic removals

	Baseline GHG emissions or baseline net GHG removals (t CO_2e)	Project GHG emissions or actual net GHG removals (t CO_2e)	Leakage GHG emissions (t CO_2e)	GHG emission reductions or net anthropogenic GHG removals (t CO_2e)		
				Before 01/01/2013	From 01/01/2013	Total amount
Total	28.654	Not applicable	Not applicable	0	28.654	28.654

Equations used for calculation of emission reductions, in line with the AMS II. G., ver. 3:

$$ER_y = B_{y,savings} \cdot f_{NRB,y} \cdot NCV_{biomass} \cdot EF_{projected\_fossilfuel}$$

Parameter	Unit	Description
ER_y	tCO_2	Emission reductions of the project activity in period *y*
$B_{y,savings}$	t	Quantity of biomass that is saved in tonnes in period y
$f_{NRB,y}$	%	Fraction of woody biomass saved by the project activity in period y that can be established as non-renewable biomass
$NCV_{biomass}$	TJ/t	Net calorific value of the non-renewable woody biomass that is substituted
$EF_{projected\_fossilfuel}$	tCO_2/TJ	Emission factor for the substitution of non-renewable woody biomass by similar consumers

$B_{y,savings}$ is calculated according to the following approach (AMS II.G., par. 6, Option 2, equation 3):

$$B_{y,savings} = B_{old} \cdot (1 - \frac{\eta_{old}}{\eta_{new,y}})$$

Parameter	Unit	Description
$B_{y,savings}$	t	Quantity of woody biomass that is saved in period y

B_{old}	t	Quantity of woody biomass used in the absence of the project activity
η_{old}	%	Efficiency of the baseline system being replaced
η_{new}	%	Efficiency of the system being deployed as part of the project activity

B_{old} is calculated according to the following formula:

$$B_{old} = B_{y,appliance} \cdot N_y \cdot (1 - DO_y) \cdot CB_y \cdot \frac{mp_{length}}{365} \cdot L_y$$

Parameter	Unit	Description
B_{old}	T	Quantity of woody biomass used in the absence of the project activity
$B_{y,appliance}$	t/year	Average annual consumption of woody biomass per appliance
N_y	-	Total number of appliances deployed in period y
DO_y	%	Statistically adjusted drop out from total population of appliances in period y
CB_y	%	Adjustment factor for continued use of baseline appliance of SAVE80 users in period y
mp_{length}	Days	Length of monitoring period y
L_y	%	Leakage adjustment for period y

E.5. Comparison of emission reductions or net anthropogenic removals achieved with estimates in the registered PDD

Amount achieved during this monitoring period (t CO_2e)	Amount estimated ex ante (t CO_2e)
28.654	37,332

E.6. Remarks on increase in achieved emission reductions

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The actual values achieved during this monitoring period are lower than estimated in the PDD. A central reason is that the ex-ante assumption for the total number of stoves (Ny) is higher than the actual number of operational stoves. It was estimated that 14,530 stoves would be operational, but only 9,982 stoves are in the distribution database hence the ex ante estimated emission reductions are higher than the achieved emission reductions.

Document information

Version	*Date*	*Description*
06.0	7 June 2017	Revision to: • Ensure consistency with version 01.0 of the "CDM project standard for project activities" (CDM-EB93-A04-STAN); • Make editorial improvements.
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: • Include provisions related to delayed submission of a monitoring plan; • Provisions related to the Host Party; • Remove reference to programme of activities; • Overall editorial improvement.
04.0	25 June 2014	Revisions to: • Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1; • Change the reference number from *F-CDM-MR* to *CDM-MR-FORM*; • Editorial improvement.
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB 70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01.0	28 May 2010	EB 54, Annex 34. Initial adoption.

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