Monitoring report form (Version 03.1)

Monitoring report

Title of the project activity	Heqing Solar Cooker Project II
Reference number of the project activity	5106
Version number of the monitoring report	1
Completion date of the monitoring report	04/01/2013
Registration date of the project activity	16/08/2011
Monitoring period number and duration of this monitoring period	1st 22/09/2011-31/12/2012
Project participant(s)	● Beijing Harmonious Energy Development Co., Ltd. ● Swedish Energy Agency ● Kingdom of Spain ● Asian Development Bank, as Trustee of the Asia Pacific Carbon Fund ● Asian Development Bank, as Trustee of the Future Carbon Fund ● Clean Air Capital Ltd
Host Party(ies)	China
Sectoral scope(s) and applied methodology(ies)	Sectoral scope: 1. Energy industries (renewable - / non-renewable sources) Selected methodology: AMS-I.C (Version 18, EB56), Thermal energy production with or without electricity
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	173,016 tCO_2e
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	143,956 tCO_2e

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

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The project installed 49,000 solar cookers for the poor rural residents in north-western China. The rating power of each solar cooker is 910W and the total capacity of the project is 44.59 MW. The project enabled the rural residents to efficiently substitute solar energy for the fossil fuel (coal) used in daily cooking and water boiling, avoiding CO_2 emission generated by fossil fuel consumption.

The project implementation started since registration by placing order, arrangement for distribution of cookers and training of the monitoring team members, etc. The solar cookers started generating emission reductions since 01/10/2011, which means that project operation commenced on 01/10/2011. The operation period for the project is 01/10/2011 - 31/12/2012 which is in the current (first) monitoring period. The total emission reductions achieved in this monitoring period is 143,956 tCO_2e.

A.2. Location of project activity

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The Project is located in Gaotai County and Linze County of Zhangye in Gansu province. The approximate locations of the centers of the townships in which the project is located are:

Linze County

Township	Longitude(E) Degree	Latitude(N) Degree
Shahe	100° 9'20.91"E	39° 8'52.05"N
Xinhua	100° 1'22.76"E	39°11'38.83"N
Banqiao	100°17'5.00"E	39°16'33.04"N
Pingchuan	100° 5'57.48"E	39°20'10.51"N
Liaoquan	100° 3'50.44"E	39°19'8.67"N
Yanuan	100°14'12.34"E	39°16'21.08"N
Nijiaying	100° 7'50.99"E	39° 1'49.03"N

Gaotai County

Township	Longitude(E) Degree	Latitude(N) Degree
Xiangdao	99°49'50.50"E	39°21'57.07"N
Heli	99°51'0.41"E	39°23'30.79"N
Nanhua	99°48'2.86"E	39°18'23.85"N
Xinba	99°52'46.83"E	39°14'37.51"N
Luotuocheng	99°37'29.90"E	39°21'9.83"N
Xuanhua	99°42'14.01"E	39°25'50.49"N
Heiquan	99°37'44.68"E	39°31'57.18"N
Luocheng	99°35'20.67"E	39°41'1.59"N

Each of the 49,000 solar cookers was installed in the yard of its user's home in a location where it can be fully exposed to sunshine.

A.3. Parties and project participant(s)

Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
People's Republic of China (host)	Beijing Harmonious Energy Development Co., Ltd.	No

Sweden	Swedish Energy Agency, Asian Development Bank, as Trustee of the Asia Pacific Carbon Fund, and Asian Development Bank, as Trustee of the Future Carbon Fund	Yes
Spain	Kingdom of Spain, and Asian Development Bank, as Trustee of the Asia Pacific Carbon Fund	Yes
Netherlands	Clean Air Capital Ltd	No

A.4. Reference of applied methodology

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Small-scale CDM baseline methodology "AMS-I.C.(Version 18, EB56), Thermal energy production with or without electricity". For more information regarding the methodology, please refer to the link: http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html

A.5. Crediting period of project activity

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Type: fixed crediting period
Crediting period: 22/09/2011-21/09/2021
Length: 10 years

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

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As stated in section A.1, the project started generating emission reductions on 01/10/2011.This means that the starting date of the project operation was 01 October 2011, which was in the current (first) monitoring period of the project. There is no event or situations that occurred during this monitoring period, which may impact the applicability of the methodology.

B.2. Post registration changes

B.2.1. Temporary deviations from registered monitoring plan or applied methodology

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None

B.2.2. Corrections

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None

B.2.3. Permanent changes from registered monitoring plan or applied methodology

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None

B.2.4. Changes to project design of registered project activity

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None

B.2.5. Changes to start date of crediting period

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The start date of the crediting period has been changed to 22 Sep. 2011. This change was approved by UNFCCC on 12 Dec. 2011.

B.2.6. Types of changes specific to afforestation or reforestation project activity

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Not applicable

SECTION C. Description of monitoring system

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According to methodology AMS-I.C. (Version 18, EB56) and the registered PDD, the following two parameters were monitored:

(a) Number of solar cookers in operation in the proposed project (parameter A), and

(b) The monthly operating time of each solar cooker (parameter B).

Monitoring Plan in PDD	Monitoring Process Implemented
<u>For number of solar cookers in operation in the proposed project (Parameter A):</u> **B.7.1 of PDD**: The initial value of this parameter will be determined by the sales contract of the solar cookers and then this parameter will be monitored, recorded, and archived at each monitoring period. **B.7.2 of PDD**: ● Sampling survey method will be used for the monitoring of parameter A. 79 sample users will be randomly selected from the 49,000 users within the project boundary. ● A monitoring team (Team A) will be set up to conduct the monitoring of the number of operating cookers of the sample users. ● The monitoring will be conducted during the last 3 months of each monitoring period. A table will be used for monitoring and recording this parameter. ● To track the solar cookers, the logo of	**<u>For number of solar cookers in operation in the proposed project (Parameter A):</u>** The sales contract will be presented to the verification team during the first verification.49, 000 solar cookers were ordered and installed initially. The logo of the project and the user name was put on each of the cookers during the distribution process. Since the length of this monitoring period is more than one year, to ensure the monitoring frequency to be at least once per year, the monitoring team conducted the monitoring of this parameter twice. Accordingly there were two sets of 79 sample users randomly selected using sampling survey method with MS Excel software. The two monitoring activities for parameter A were conducted as the following: (1) the first one was during 15 Aug. 2012 to 20 Aug. 2012, for the period of 22 Sep. 2011 to 31 Aug. 2012 (sub-period 1), and (2) the second one was during 1 Dec. 2012 to 7 Dec. 2012, for the period of 1 Sep. 2012 to 31 Dec. 2012 (sub-period 2)

the project will be put on each of the solar cookers involved in the project. Moreover, the name of the user will be put on the cooker that the user is going to receive.	The monitoring of this parameter was conducted by monitoring team A. Team A consisted of 2 people (one from local Rural Energy Station (Hereinafter "RES") and the other from project owner). The monitoring of this parameter involved visiting each of the 79 sample users by team A. During the visit, team A checked if the cooker is in operation, and if the logo of the project and the user name is on the cooker through visual observation and short conversation. After the visit to households, the monitoring results were recorded in the monitoring table substantially in the form shown in PDD section B.7.2.Clause 3. Then all the operational cookers were summed up to generate the total number of cookers in operation. All the monitoring data were collected, recorded and confirmed by the monitoring team and the personnel of RES, and then provided the records to the project owner.
For the monthly operating time of each solar cooker (Parameter B): **B.7.2 of PDD:** ● Sampling survey method will be used for the monitoring of parameter B. 79 sample users will be randomly selected from the 15 townships within the project boundary. ● A monitoring team (Team B) will be set up to conduct the daily monitoring of the operating hours of the sample users. ● The monitoring forms will be filled out daily by Team B members to record the daily usage data of these sample users. At least once a month Team B leader will collect monitoring forms from Team B members and the quality of data will be checked.	**For the monthly operating time of each solar cooker (Parameter B):** ● Sampling survey method was used for the monitoring of parameter B. To be more conservative and to match the two sub-periods defined in the monitoring of parameter A in the previous paragraphs, two sets of 79 samples were randomly selected using MS Excel Software as below: (1) The first set of 79 sample users was selected in September 2011 for the period from September 22, 2011 to August 31, 2012 (Sub-period 1); and (2) The second set of 79 sample users was selected in August 2012 for the period from September 1, 2012 to December 31, 2012 (Sub-period 1). ● There were 2 CDM groups (each consists of 1 person) monitoring this parameter and they record the operating hours of the sample users in monitoring forms. The monitoring personnel used phone call, SMS message, or visited the user face-to-face to get the data. At the end of each month during the monitoring period, the monitoring forms were collected and the paper documents were converted into electronic form and archived. The quality of data was checked by the "RES" and project owner separately.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante or at renewal of crediting period

Data / Parameter:	1.*R*

Unit:	W/m^2
Description:	Standard solar irradiance rate used to calculate rated power of solar cooker
Source of data:	National Standard of the People's Republic of China, GB No.: NY/T219-2003
Value(s) applied):	700
Purpose of data:	Calculation of baseline emissions
Additional comment:	

Data / Parameter:	2. η
Unit:	N/A
Description:	Solar cooker's thermal efficiency
Source of data:	National Standard of P.R. China (GB), GB No.: NY/T219-2003
Value(s) applied):	65%
Purpose of data:	Calculation of baseline emissions
Additional comment:	

Data / Parameter:	3. $\eta_{BL,thmeral}$
Unit:	N/A
Description:	Thermal efficiency for the traditional coal furnace
Source of data:	The highest value of measured data.
Value(s) applied):	14.6%
Purpose of data:	Calculation of baseline emissions
Additional comment:	

D.2. Data and parameters monitored

Data / Parameter:	1. n
Unit:	Not applicable
Description:	Number of solar cookers in operation in the proposed project
Measured/ Calculated / Default:	Measured and calculated.
Source of data:	Sales contract and invoice of the solar cookers and monitoring records of monitoring team

Value(s) of monitored parameter:	The following table shows the number of cookers in operation out of the 79 samples:

Township	Number	
	Data obtained in sub-period 1 (22/09/2011 ~ 31/08/2012)	Data obtained in sub-period 2 (01/09/2012 ~ 31/12/2012)
Shahe	8	12
Xinhua	6	8
Banqiao	11	9
Pingchuan	14	9
Liaoquan	1	2
Yanuan	7	9
Nijiaying	6	8
Xiangdao	1	2
Heli	2	1
Nanhua	5	4
Xinba	3	2
Luotuocheng	3	1
Xuanhua	5	7
Heiquan	6	4
Luocheng	1	1
Total number of cookers in operation out of the 79 sample users	**79**	**79**
Percentage of cookers in operation out of 79 sample users	**100%**	**100%**
Total number of operational cookers based on sample user result	**49,000**	**49,000**

Monitoring equipment:	Monitoring equipment is not necessary, and thus not used.
Measuring/ Reading/ Recording frequency:	At least once a year (Has been monitored twice during this monitoring period)
Calculation method (if applicable):	The percentage of number of solar cookers in operation out of the 79 samples was calculated, and then the number of solar cookers in operation in the proposed project was calculated by using the abovementioned percentage multiplying 49000, the total number of cookers.

QA/QC procedures:	● Before implementing the project, the personnel of monitoring teams were trained on how to properly conduct the monitoring process. ● The solar cookers used for the project were tested before the operation of the project by authorities to ensure their specs and quality meets the requirements of the project. ● There are maintenance and repair plan ready for the solar cookers. This plan will ensure the cookers in the project can remain in operational condition. ● For missing or damaged data record, zero value is used for the missing or damaged data, which is the most conservative approach.
Purpose of data:	Calculation of baseline emissions
Additional comment:	Records were kept in electronic form and paper form.

Data / Parameter:	2. t_i
Unit:	Hour
Description:	The monthly operating time of each solar cooker
Measured/ Calculated / Default:	Measured and calculated.
Source of data:	Usage time measured by the project monitoring team
Value(s) of monitored parameter:	Sep-2011: 0.00 Oct-2011: 33.84 Nov-2011: 74.88 Dec-2011: 98.71 Jan-2012: 86.41 Feb-2012: 66.62 Mar-2012: 67.93 Apr-2012: 118.36 May-2012: 116.47 Jun-2012: 132.72 Jul-2012: 145.58 Aug-2012: 136.64 Sep-2012: 128.98 Oct-2012: 129.69 Nov-2012: 133.28 Dec-2012: 120.19
Monitoring equipment:	Clock or watch No calibration requirement is specified in the registered PDD and the applied Methodology AMS-I.C version 18.
Measuring/ Reading/ Recording frequency:	● The usage time of cookers were measured and recorded daily ● At the end of each month, all the daily data of the past month were summarized to produce the monthly usage time.
Calculation method	(1) For each of the 79 sample users, measure and record their

(if applicable):	daily usage time, then sum up all the daily usage time in a month to get the monthly usage time of each user; (2) Sum up the monthly usage time of all the 79 users to get the total monthly usage time of the 79 users. (3) Divide the number obtained in (2) by 79 to get the average monthly operating time of each solar cooker.
QA/QC procedures:	Before implementing the project, the personnel of monitoring teams will be trained on how to properly conduct the monitoring process. The following process was conducted for missing or damaged data record: 1. The general principle is that zero value is used for the missing or damaged data. This is most conservative approach. The monitoring personnel were trained before the starting of the project operation to ensure that each team member is fully aware of and able to strictly follow this conservative principle. During the monitoring process, the monitoring personnel were required to strictly abide by the above conservative principle in data recording, i.e., use zero values for all the missing or damaged data. 2. If this is due to the working error of the monitoring personnel, further train the person until he or she can perform the job properly. And in the mean time, use zero value for the missing or damaged data; 3. If this is due to the inability or attitude of a particular worker in monitoring team, dismiss such worker and re-hire those with proper ability and attitude. And in the mean time, use zero value for the missing or damaged data; 4. If the monitoring team as a whole does not meet the job requirement of monitoring process, a new monitoring team that meets the requirement was created; 5. If the data reported by the user significantly higher than the normal range by common sense, the monitoring personnel asked for the reason If the reason belongs to one of the following: 1) holidays celebration, 2) wedding or funeral, or 3) family/friends party, the reason is considered to be valid. Then the reason is recorded along with the data. Otherwise, zero value is used for that day's data.
Purpose of data:	Calculation of baseline emissions
Additional comment:	Records were kept in electronic form and paper form.

Data / Parameter:	$3.R_i$
Unit:	W/m^2
Description:	Monthly solar irradiance rate in project region
Measured/ Calculated / Default:	Measured

Source of data:	Gansu Meteorological Service Centre
Value(s) of monitored parameter:	Month Value 1 409.5 2 502.6 3 636.2 4 738.3 5 799.1 6 813.1 7 828.8 8 767.6 9 695.7 10 537.3 11 411.4 12 363.7
Monitoring equipment:	Not applicable
Measuring/ Reading/ Recording frequency:	At least once a year with the latest available complete set of data obtained from relevant authoritative resources.
Calculation method (if applicable):	Not applicable
QA/QC procedures:	The data is from an official source. No additional QA/QC procedure is necessary.
Purpose of data:	Calculation of baseline emissions
Additional comment:	

Data / Parameter:	4.$EF_{FF,CO2}$
Unit:	tCO_2/TJ
Description:	Baseline emission factor of Coal
Measured/ Calculated / Default:	Default
Source of data:	IPCC2006, page 2.22, Table2.5
Value(s) of monitored parameter:	94.6
Monitoring equipment:	Not applicable
Measuring/ Reading/ Recording frequency:	Not applicable
Calculation method (if applicable):	Not applicable
QA/QC procedures:	The data is from an official source. No additional QA/QC procedure is necessary.
Purpose of data:	Calculation of baseline emissions

Additional comment:	

D.3. Implementation of sampling plan

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According to the registered PDD, simple random sampling (with sample size of 79) was used for number of solar cookers in operation in the proposed project (Parameter A) and the monthly operational time of each solar cooker (Parameter B). Since the monitoring period is more than one year, to be conservative, for each parameter, two sets of 79 sample users were randomly selected from users within the project boundary.

Checking reliability

Parameter A (Number of solar cookers in operation in the proposed project)

The monitoring result of this parameter is that all the cookers are operational for both sets of 79 sample users, This means that the proportion of operational cooker is 1, i.e., p = 1. According to "Best Practices Examples Focusing on Sample Size and Reliability Calculations"(EB67, Annex 6), paragraph 189, when p is very large (as in this case), a 90% confidence interval should be calculated as follows:

$$\frac{A - B}{C} \text{ to } \frac{A + B}{C}$$

Where:

$A=2np\hat{}+1.645^2$

$B=1.645\sqrt{1.645^2 + 4np\hat{}(1 - p\hat{})}$

$C=2(n+1.645^2)$

n is the sample size

$p\hat{}$ is the sample proportion calculated

In our case, for both 1st and 2nd sample set: n=79, p^=1

Putting the information together gives:

$\frac{A - B}{C}$=0.9669 $\frac{A + B}{C}$=1

Therefore, for the proportion of solar cookers in operation, the confidence interval is 0.9669 to 1, i.e., p = 0.98345 ± 0.01655 (Note: 0.98345 = (1 + 0.9669)/2, and 0.01655 = (1 - 0.9669)/2)

Relative precision is 0.01655/0.98345 = 1.68%

Therefore, the relative precisions of the data for the 1st and 2nd sample set are both 1.68%, both meeting the required precision of 10%.

Parameter B (The monthly operating time of each solar cooker)

According to "Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities" (EB69, Annex 5), paragraph 229-232, confidence/precision should be checked following the steps below:

(i) Standard error of the mean = $\sqrt{(1 - f)\frac{s^2}{n}}$

f is the sampling fraction – the proportion of the population that is sampled.
s^2 is the sample variance (s is the sample standard deviation) of the monthly usage hours per user
n is the sample size.

In our case, n = 79, and the population =49000.

Let s_1 denote the standard deviation of the monthly usage hours per user of the first sample set, and
s_2 denote the standard deviation of the monthly usage hours per user of the second sample set,

Using Excel, we can calculate the value of s_1 and s_2, as well as the mean value of the two sample sets as below:

s_1 = 30.1951

s_2 = 11.4378
Mean value of monthly usage hours per user (for 1st sample set) = 120.1334
Mean value of monthly usage hours per user (for 2nd sample set) = 128.0340

Putting all these pieces of information together gives:

Standard error of the mean (for 1st sample set) = $\sqrt{(1-\frac{79}{49000})\times\frac{s_1^{\,2}}{79}}$ = 3.3945

Standard error of the mean (for 2nd sample set) = $\sqrt{(1-\frac{79}{49000})\times\frac{s_2^{\,2}}{79}}$ = 1.2858

(ii) t-value
This value depends on the level of confidence and the size of the sample. The exact figure can be acquired from statistical tables for the t-distribution, or using standard statistical software. The value can also be derived in Microsoft Excel using the TINV function.

For a sample size of 79 and 90% confidence, using the TINV function in Microsoft Excel, the t-value is 1.6646.

(iii) Precision
The precision associated with an estimate is: t-value × standard error of the mean.

The precision of the monthly usage (in hours) per user, assuming 90% confidence, are therefore:

For 1st sample set: ± (1.6646×3.3945) = ±5.6505,
For 2nd sample set: ± (1.6646×1.2858) = ±2,1404.

The ratios of this relative to the mean monthly usage per user are:
For 1st sample set: 5.6505/120.1334 = 4.70%,
For 2nd sample set: 2.1404/128.0340 = 1.67%

Therefore, the relative precisions of the data over the monitoring period for the 1st and 2nd sample set are 4.70% and 1.67% respectively, both meeting the required precision of 10%.

The relative precision of data was also calculated on monthly basis using the above method. All the precision values calculated on monthly basis are smaller than the 10% precision value required, which gives additional assurance that the precision is within the required range. For details of these calculations, please refer to the attached Excel calculation sheet.

SECTION E. Calculation of emission reductions or GHG removals by sinks

E.1. Calculation of baseline emissions or baseline net GHG removals by sinks

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According to the registered PDD, the emission reduction can be calculated in the following table using the parameters below:

$BE_y = n^*\sum [910.0^*(R_i /700)^* t_i * 3.6 \times 10^{-9}] * EF\ CO_2 /\eta_{th}$ (i = 1, 2. …, 12)

Where:

R_i	R_i is the actual solar irradiance rate in month i in W/ m^2. The values adopted are parameter #3 in the data table D.2
t_i	t_i is the usage time of the solar cooker in month i in hours. The values adopted are parameter #2 in table D.2
n	The total number of solar cookers installed by the proposed project. The values adopted are both 49,000 (refer to parameter #1 in table D.2 for details).

EF CO_2 The CO_2 emission factor of coal (tCO_2e/ TJ). IPCC default emission factor of 94.6tCO_2e/TJ was adopted in the proposed project (refer to parameter #4 in table D.2).

η_{th} The efficiency of the coal-fired stove that would have been used in the absence of project activity. The value adopted is 14.6% (refer to parameter #3 in table D.1)

The result is summarized in the tables below:

From 22/09/2011 to 31/08/2012:

Month	Time Interval	Solar irradiance rate	Actual Power of Solar Cooker	Monthly Usage Time	Net Heat Supplied Monthly	CER Generated Monthly
		R_i	P_i = 910*(R_i/700) Equation (8) in PDD	t_i	HG_i = n*[P_i*t_i* (3.6 ×10^{-9})] Equation (6) in PDD	BE_i = HG_i*$EF\ CO_2$ /η_{th} Equation (5) in PDD
		(W/m^2)	(W)	(hour)	(TJ)	(tCO_2e)
2011-09	22/09/2011 – 30/09/2011	695.7	904.4	0.00	0.00000	0
2011-10	01/10/2011 – 31/10/2011	537.3	698.5	33.84	4.16946	2702
2011-11	01/11/2011 – 30/11/2011	411.4	534.8	74.88	7.06430	4577
2011-12	01/12/2011 – 31/12/2011	363.7	472.8	98.71	8.23242	5334
2012-01	01/01/2012 – 31/01/2012	409.5	532.4	86.41	8.11459	5258
2012-02	01/02/2012 – 29/02/2012	502.6	653.4	66.62	7.67842	4975
2012-03	01/03/2012 – 31/03/2012	636.2	827.1	67.93	9.91112	6422
2012-04	01/04/2012 – 30/04/2012	738.3	959.8	118.36	20.03923	12984
2012-05	01/05/2012 – 31/05/2012	799.1	1038.8	116.47	21.34220	13829
2012-06	01/06/2012 – 30/06/2012	813.1	1057.0	132.72	24.74644	16034
2012-07	01/07/2012 – 31/07/2012	828.8	1077.4	145.58	27.66951	17928
2012-08	01/08/2012 – 31/08/2012	767.6	997.9	136.64	24.05277	15585

Using Equation (4) in PDD, total Baseline Emissions in the sub-period 1 (22/09/2011 to 31/08/2012) of the monitoring period = $\sum BE_i$ = **105,628 tCO_2e**

From 01/09/2012 to 31/12/2012:

Month	Time Interval	Solar irradiance rate	Actual Power of Solar Cooker	Monthly Usage Time	Net Heat Supplied Monthly	CER Generated Monthly
		R_i	P_i = 910*(R_i/700) Equation (8) in PDD	t_i	HG_i = n*[P_i*t_i* (3.6 ×10^{-9})] Equation (6) in PDD	BE_i = HG_i*$EF\ CO_2$ /η_{th} Equation (5) in PDD
		(W/m^2)	(W)	(hour)	(TJ)	(tCO_2e)
2012-09	01/09/2012 – 30/09/2012	695.7	904.4	128.98	20.57736	13333
2012-10	01/10/2012 – 31/10/2012	537.3	698.5	129.69	15.97930	10354
2012-11	01/11/2012 – 30/11/2012	411.4	534.8	133.28	12.57393	8147
2012-12	01/12/2012 – 31/12/2012	363.7	472.8	120.19	10.02407	6495

Using Equation (4) in PDD, total Baseline Emissions in the sub-period 2 (22/09/2012 to 31/12/2012) of the monitoring period = $\sum BE_i$ = **38,328 tCO_2e**

Using Equation (4) in PDD, total Baseline Emissions in the monitoring period is:
105,628+ 38,328 = **143,956 tCO_2e**

Therefore, the total Baseline Emissions generated in the monitoring period is **143,956 tCO_2e.**

E.2. Calculation of project emissions or actual net GHG removals by sinks

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According to the registered PDD and the applied methodology, there is no project emission.

E.3. Calculation of leakage

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According to the registered PDD and the applied methodology, there is no project leakage.

E.4. Summary of calculation of emission reductions or net anthropogenic GHG removals by sinks

Item	Baseline emissions or baseline net GHG removals by sinks (t CO_2e)	Project emissions or actual net GHG removals by sinks (t CO_2e)	Leakage (t CO_2e)	Emission reductions or net anthropogenic GHG removals by sinks (t CO_2e)
Total	143,956	0	0	143,956

E.5. Comparison of actual emission reductions or net anthropogenic GHG removals by sinks with

estimates in registered PDD

Item	Values estimated in ex-ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (t CO_2e)	173,016	143,956

CERs estimated in ex-ante calculation of registered PDD

Month	Time Interval	Monthly CERs in registered PDD (tCO_2e)
2011-09	22/09/2011 – 30/09/2011	4014[1]
2011-10	01/10/2011 – 31/10/2011	10346
2011-11	01/11/2011 – 30/11/2011	7898
2011-12	01/12/2011 – 31/12/2011	6997
2012-01	01/01/2012 – 31/01/2012	7848
2012-02	01/02/2012 – 29/02/2012	9641
2012-03	01/03/2012 – 31/03/2012	12206
2012-04	01/04/2012 – 30/04/2012	14159
2012-05	01/05/2012 – 31/05/2012	15274
2012-06	01/06/2012 – 30/06/2012	15527
2012-07	01/07/2012 – 31/07/2012	15796
2012-08	01/08/2012 – 31/08/2012	14688
2012-09	01/09/2012 – 30/09/2012	13381
2012-10	01/10/2012 – 31/10/2012	10346
2012-11	01/11/2012 – 30/11/2012	7898
2012-12	01/12/2012 – 31/12/2012	6997
Total		**173,016**

E.6. Remarks on difference from estimated value in registered PDD

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The actual monitored emission reduction (ER) is 143,956 tCO_2e, which is lower than the estimated 173,016 tCO_2e in PDD. The lower actual ER is because the usage time of the cookers is generally lower than the estimated values in PDD in the first few months of this monitoring period, which leads to the lower actual ER value. The difference between the actual ER value and estimated value is reasonable

E.7. Actual emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

[1] The ex-ante calculation for September in registered PDD is 13381 tCO_2e, Sep 22~30 is 9 days. Thus, the ex-ante calculation for Sep 22~30 is 13381*(9/30) = 4014

Item	Actual values achieved up to 31 December 2012	Actual values achieved from 1 January 2013 onwards
Emission reductions or GHG removals by sinks (t CO_2e)	143,956	0

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Document information

Version	*Date*	*Description*
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 anthropogenic GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB70, 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	28 May 2010	EB 54, Annex 34. Initial adoption.

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