

MONITORING REPORT

**Federal Intertrade Pengyang Solar Cooker Project
(UNFCCC Reference number: 2307)**

1 November 2009 to 30 April 2010

Version: 1, 14 May 2010

**Project Participants:
Ningxia Federal Intertrade Co.
SwissRe Global Markets Limited**

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1. Introduction

The purpose of this Monitoring Report for Federal Intertrade Pengyang Solar Cooker Project is to calculate the emission reductions achieved by the project activity in the period covered by this report, and to serve as the basis for the verification of these reductions and issuance of the CERs.

1.1 Monitoring period

1 November 2009 to 30 April 2010 (both the days included)

1.2 Document details

Version: 1

Date: 14 May 2010

2. Project Description

2.1 Title

Federal Intertrade Pengyang Solar Cooker Project (UNFCCC Reference number: 2307)

2.2 Technical Details

The project installs 17,000 solar cookers for the poor rural residents in mountainous area in northwestern China. The rating power of each solar cooker is 773.5W and the total capacity of the proposed project is 13.1 MW. The proposed project will enable the rural residents to efficiently substitute solar energy for the fossil fuel (coal) used in daily cooking and water boiling, avoiding CO₂ emission that would be generated by fossil fuel consumption.

CDM Methodology: The project uses the approved small-scale CDM baseline methodology “AMS-I.C (Version 12, EB33), Thermal energy for the user with or without electricity”.

2.3 Geographic Location

The Project is located in seven townships (Luowa, Jiaocha, Wangwa, Xiaocha, Fengzhuang, Caomiao, and Mengyuan) in mountainous northern rural area of Pengyang County, Ningxia Hui Autonomous Region, China. This location is within east longitude 106°30'-106°55' and north latitude 35°57'-36°16'.

2.5 Key Dates of the Project

CDM Registration Date: 25 March 2009

CDM Crediting Period: 27 March 2009 – 26 March 2019

This Monitoring Period: 1 November 2009 – 30 April 2010 (both the days included)

3. Monitoring Process

According to methodology AMS-I.C. (Version 12, EB33) and the registered PDD, the following two parameters were monitored:

- (a) the number of solar cookers in operation, and
- (b) the average operating time of each solar cooker.

Monitoring Plan in PDD	Monitoring Process Implemented
<p><u>For the number of solar cookers in operation:</u></p> <p>B7.1 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 annually.</p> <p>B7.2 of PDD: The monitoring of total number of operating solar cookers will be conducted annually during the last quarter of each year. A checklist will be used for monitoring and recording this parameter.</p>	<p><u>For the number of solar cookers in operation:</u></p> <p>The sales contract has been presented to the verification team during the first verification.</p> <p>During the monitoring period, the monitoring team has visited each of the users that received the solar cooker, and checked if the solar cookers received are in operation.</p> <p>Please note that the PDD assumes that the monitoring periods are full calendar years. This is why it states that the monitoring of total number of operating solar cookers will be conducted annually during the last quarter of each year. In reality, because the monitoring period is a not a full calendar year, the monitoring of total numbers of operating cookers has been adjusted accordingly to be at the end of the actual monitoring period.</p>
<p><u>For the average operating time of each solar cooker:</u></p> <p>B7.2 of PDD:</p> <ul style="list-style-type: none"> ● Sampling survey will be utilized in the monitoring. 309 sample users will be randomly selected from the seven townships within the project boundary. ● A number of CDM groups will be set up to conduct the daily monitoring of the operating hours of the sampled users. Each CDM group will consist of 1~5 people and each person will be responsible for the monitoring and recording of 5~20 sampled users. The monitoring forms will be filled out daily by the CDM group. ● At least once a month the monitoring form will be collected and the quality of data will be checked. At least once a month, the CDM group will choose one family and stay for an entire day in this family' home to monitor the detailed usage of the solar cooker. 	<p><u>For the average operating time of each solar cooker:</u></p> <ul style="list-style-type: none"> ● Sampling survey method was used and 309 samples were randomly selected using Excel. The selected 309 samples and the selected process has been presented to DOE verification team ● There are 4 CDM groups (each consists of 1 person) directly monitoring and recording the operating hours of the 309 sample users. Please note that the number of users each monitoring person handled is more than 5~20 users as planned in PDD, because the ways of collecting data has been diversified – the monitoring personnel used phone call and text message to get the data, which significantly improved the efficiency. In addition, there are another two CDM groups (each consists of 2 people) that checked the quality of the data, converted the paper file into electronic form, and archived the data. ● At the end of each month during the monitoring period, the monitoring form was collected, the quality of data was checked, and the data on paper was converted to electric form. In each month of the monitoring period, the monitoring team chose one family and

	recorded the detailed usage of the solar cooker at this family throughout the day.
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For the monitoring of (a), from 10 March 2010 to 5 April 2010, the monitoring team has visited each of the users that received the solar cooker, and checked if the solar cookers received are in operation.

The monitoring result of the solar cookers in operation is summarized below:

Table 1

Township name	Number of Solar Cookers in Operation
Wangwa	4114
Fengzhuang	880
Xiaocha	1006
Mengyuan	4618
Luowa	1485
Jiaocha	1265
Caomiao	3632
Total	17,000

For the monitoring of (b), according to PDD, 309 sample users were randomly selected from the 17000 users that received the solar cookers. The daily usage time of solar cooker in each of the 309 sample user's home were recorded by the monitoring team. The summary of the monitoring data is listed in the following table:

Table 2

Period (day/month/year)	Average Usage Time Per User in the Month (Hour)
2009 Nov: 01/11/2009 - 30/11/2009	140.75
2009 Dec: 01/12/2009 - 31/12/2009	154.15
2010 Jan: 01/01/2010 - 31/01/2010	166.88
2010 Feb: 01/02/2010 - 28/02/2010	145.41
2010 Mar: 01/03/2010 - 31/03/2010	156.46
2010 Apr: 01/04/2010 - 30/04/2010	127.44

The original records will be kept for at least 2 years after the end of the crediting period of the project.

During the monitoring period, there was no solar cooker repair request received from the users.

Monitoring Organization:

The overall monitoring of the project was managed by the project owner, Ningxia Federal Intertrade Co. (“NFI”), and the monitoring process was co-implemented by NFI and the Rural Energy Station (“RES”) of the Bureau of Agriculture, Graze and Science & Technology of Pengyang County. The consultant to the monitoring process was Clean Air Trade, Inc.

Mr. Wei Jiang, General Manager of NFI, served as the director of the monitoring process, responsible for overall planning, management, and coordination of the monitoring process.

The main working process consists of data recording, data checking/analyzing, and data archiving. Data recording was mainly conducted by RES under the instruction and close cooperation of NFI. Data checking/analyzing and data achieving were conducted by NFI. Clean Air Trade, Inc. served as the consultant for the monitoring. The following are detailed positions involved in the process:

Position	Entity conducting the work	Responsibilities
Data Recording:	RES (with the instruction and cooperation of NFI)	Communicating with the sample users, collecting and recording data.
Data Checking/Analyzing	NFI	Checking data and converting the paper file into electronic form
Data Archiving	NFI	Archiving and maintaining the monitoring data files.
CDM Consultant	Clean Air Trade, Inc.	Consulting on the design and implementation of the monitoring process to ensure the monitoring process meet the requirement of CDM.

4. Quality assurance and quality control measures

Before implementing the project, Ningxia Federal Intertrade Co., Ltd. trained the personnel of monitoring teams 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, Ningxia Federal Intertrade Co., the project owner, has the right to require that RES create new monitoring team according to the requirement of Ningxia Federal Intertrade Co.

5. If the data reported by the user significantly higher than the normal range, the monitoring personnel should ask 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.

In each month of the entire monitoring period, one user in the 309 sample users was monitored in detail. The monitoring personnel stayed at this family for the entire day to conduct independent monitoring of the usage time of the solar cooker in parallel with the user's own monitoring. Then the result by the monitoring personnel was compared with the user's own monitoring result of that day. In all months of the monitoring period, the observed usage time by the monitoring personnel was no less than that by the user, which proved that the user's own monitoring was valid and conservative.

5. Emission reduction calculations

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

$$EF_{CO_2} = 94.6 \text{ tCO}_2\text{e/TJ}$$

$$\eta_{th} = 15\%$$

t_i : average monthly usage time of the solar cooker (as listed in the Table 2), monitored value

$n = 17000$ (as listed in Table 1), monitored value

Table 3

	Time Interval	Solar irradiance rate	Actual Power of Solar Cooker	Monthly Usage Time	Net Heat Supplied Monthly	CER Generated Monthly
		R_i	$P_i = 773.5 \cdot (R_i / 700)$ Equation (8) in PDD	t_i	$HG_i = n \cdot [P_i \cdot t_i \cdot (3.6 \times 10^{-9})]$ Equation (6) in PDD	$BE_i = HG_i \cdot EF_{CO_2} / \eta_{th}$ Equation (5) in PDD
Month		(W/m ²)	(W)	(hour)	(TJ)	(tCO ₂ e)
2009-11	01/11/2009 – 30/11/2009	402.6	444.9	140.75	3.83216	2417
2009-12	01/12/2009 – 31/12/2009	398.5	440.3	154.15	4.15432	2620
2010-01	01/01/2010 – 31/01/2010	397.6	439.3	166.88	4.48706	2830
2010-02	01/02/2010 – 28/02/2010	519.6	574.2	145.41	5.10954	3222

2010-03	01/03/2010 – 31/03/2010	521.8	576.6	156.46	5.52115	3482
2010-04	01/04/2010 – 30/04/2010	601.6	664.8	127.60	5.19132	3270

Using Equation (4) in PDD, total CER in the monitoring period = $\sum BE_i$ = **17840 tCO₂e**

Therefore, the total CERs generated in the monitoring period is **17840 tCO₂e**.