



# VERIFICATION REPORT

1<sup>st</sup> Periodic Verification  
for the CDM Project Activity

## Ningxia Federal Solar Cooker Project

(UNFCCC Reference Number: 2924)

in

P.R.China

Report No. 01 997 9105046486-1ST VE

Version 02, 2011-12-29

TÜV Rheinland (China) Ltd.

**I. Project data:**

<b>Project title:</b>	<b>Ningxia Federal Solar Cooker Project</b>	
<b>Registration date:</b>	12-02-2010 (registration reference number: 2924)	
<b>Monitoring period:</b>	12-02-2010 to 31-10-2010 (first and last days included)	
<b>Methodology:</b>	AMS-I.C./ Version 13	
<b>Annual average emission reductions:</b>	Estimated: 32,318 tCO <sub>2</sub> e (during the monitoring period) <sup>1</sup>	Verified: 32,067 tCO <sub>2</sub> e
<b>GHG reducing measure/technology:</b>	Solar thermal	

Party	Project participants	Party considered a project participant
People's Republic of China (Host)	Ningxia Federal Intertrade Co.(Project Owner)	No
Finland	Ministry for Foreign Affairs of Finland (CER Buyer)	Yes

**II. Verification data:**

<b>Contract party:</b>	<b>Ningxia Federal Intertrade Co.</b>
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**Verification team**

Role	Full name	Appointed for Sectoral Scopes	Affiliation
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**III. Verification report data:**

Report No.: <b>01 997 9105046486-1st VE</b>	Current revision No.: <b>02</b>	Date of current revision: <b>2011-12-29</b>	Date of first issue: <b>2011-01-08</b>
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Final approval:  <input checked="" type="checkbox"/>	Released on:  <b>2011-12-30</b> <b>By: Dr. Mr. Praveen N. Urs</b>	Designated Operational Entity (DOE):  <b>TÜV Rheinland (China) Ltd.<sup>2</sup></b> Unit 707, AVIC Building, No.10B, Central Road, East 3rd Ring Road, Chaoyang District, Beijing, CHINA 100 022 Tel: +86 10 6566 6660-288  E-mail: GHG-DOE@bj.chn.tuv.com
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<sup>1</sup>The estimated CER of 32,318 tCO<sub>2</sub>e refers to the registered PDD, Section B.6.3, page 19-20, the CER varies month to month, thus, the estimated CER is equal to sum of CERs from Feb 12th to end of October. The monthly CER values calculated in PDD = Feb.: 1724 (2840\*17/28), Mar: 3249, Apr: 3674, May: 4013, Jun: 3969, Jul:4131, Aug: 4106, Sep: 4129, Oct: 3323, . The total ER=1724+3249+3674 +4013+3969+4131+4106+4129+3323 = 32,318 tCO<sub>2</sub>e.

<sup>2</sup> The DOE, TÜV Rheinland (China) Ltd. is effective from November 2011 and formerly called TÜV Rheinland Japan Ltd.

## Verification opinion — summary

The verification team assigned by the DOE (TÜV Rheinland (China) Ltd.) concludes that the CDM Project Activity “Ningxia Federal Solar Cooker Project” in P.R. China, as described in the registered PDD (version 19, 12<sup>th</sup> December 2009) and the monitoring report of this monitoring period (version 4, 31<sup>st</sup> October 2011), meets all relevant requirements of the UNFCCC for CDM project activities including article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakesh Accords) and the subsequent decisions by the COP/MOP and CDM Executive Board. The verification report and the verification protocol are summarizing the findings of the verification.

The document review of the registered project design documentation, registered validation report, and monitoring reports; and the subsequent follow-up interviews via on-site visit have provided DOE with sufficient evidence to determine the fulfillment of stated criteria.

The verification was executed in the following steps:

- Desk review of relevant documents

Doc 1	Registered PDD (registered no.: 2924), version 19, 12 <sup>th</sup> December 2009
Doc 2	Registered Validation Report, Version 04, 14 <sup>th</sup> December 2009
Doc 3	Monitoring Report (1 <sup>st</sup> Periodic Verification), Version 1, 1 <sup>st</sup> November 2010 (for GSP)

- On-site visit with stakeholder interviews (23<sup>rd</sup> to 25<sup>th</sup> November 2010)
- Issue of checklist with corrective action requests (CARs) and clarification requests (CLs) and the draft verification report & protocol
- Desk review of revised monitoring report (version 4, 31<sup>st</sup> October 2011)
- Review of proposed corrections and clarifications
- Issue of the final verification report & protocol

The project activity is bilateral CDM-project, with two voluntary project participants, i.e. Ningxia Federal Intertrade Co. (as the project owner) from host country (P.R. China) and Ministry for Foreign Affairs of Finland (as the CER Buyer) from the Finland.

The project is a newly-implemented solar cooker project with 14.7MW<sub>thermal</sub> total installed capacity. The project has been registered as a CDM project (No. 2924) with the approved starting crediting period from 12<sup>th</sup> February 2010. The crediting period for this verification is the 1<sup>st</sup> periodic verification from 12<sup>th</sup> February 2010 to 31<sup>st</sup> October 2010.

Emission reductions during the 1<sup>st</sup> monitoring period are,

The 1 <sup>st</sup> monitoring period:	12-02-2010 to 31-10-2010 (first and last days included)
Verified emissions	

Baseline Emissions:	32,067 tCO <sub>2</sub> e
Project Emissions :	0
Leakage:	0
Emission Reductions:	32,067 tCO <sub>2</sub> e

The project applied AMS-I.C/ Version 13 for the baseline and monitoring methodology for the proposed project. The monitoring process followed the requirement of AMS-I.C/ Version 13 and is demonstrated in the registered PDD.

According to the monitoring plan in the registered PDD, the 19,000 solar cookers of the project are monitored through (i) the number of system (i.e. the solar cookers) operating during the crediting period; and (ii) the average operating hours of a system during the crediting period by using the survey methods. The verification team confirms that the actual monitoring plan is not changed compared with the plan described in the registered PDD which has been approved by the EB. Hence, the actual monitoring plan is in compliance with the adopted CDM monitoring methodology AMS-I.C/ Version 13 by the project.

During on-site visit, the monitoring system is confirmed in place and the project activity has been generating GHG emission reductions. The GHG emission reductions during the 1<sup>st</sup> monitoring period are calculated without material misstatements. The collected monitoring data is considered creditable for verifying the amount of achieved GHG emission reductions, i.e. 32,067 tCO<sub>2</sub>e.

In summary, it is verification team's opinion that the project activity was correctly implemented according to selected monitoring methodology AMS-I.C./Version 13 and monitoring plan in registered PDD. The DOE therefore is pleased to issue a positive verification opinion expressed in the attached Certification statement.

**Abbreviations**

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CL	Clarification Request
CO <sub>2</sub>	Carbon Dioxide
CO <sub>2</sub> e	Carbon Dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EB	Executive Board
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse Gas
GWh	Giga Watt Hours
I	Interview
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
kW	Kilo Watt
kWh	Kilo Watt Hours
LoA	Letter of Approval
MoV	Means of Verification
MW	Mega Watt
MWh	Mega Watt Hours
NDRC	National Development and Reform Commission
NGO	Non Government Organisation
NXFI	Ningxia Federal Intertrade Co.
OSV	On Site Visit
PDD	Project Design Document
t	Tonne
UNFCCC	United Nations Framework Convention on Climate Change
VVM	Validation and Verification Manual
XRES	Xiji County Rural Energy Station

## TABLE OF CONTENTS

1.	INTRODUCTION .....	7
1.1	Objective	7
1.2	Scope	7
2.	METHODOLOGY .....	8
2.1	Desk review	8
2.2	On-site visit and follow-up interviews with project stakeholders	10
2.3	Resolution of outstanding issues	11
2.4	Internal quality control	13
3.	VERIFICATION FINDINGS.....	13
3.1	Project implementation	13
3.2	Compliance of the monitoring plan with the monitoring methodology	20
3.3	Compliance of the monitoring with PDD and monitoring plan	21
3.4	Assessment of data and calculation of greenhouse gas emission reductions	28
3.5	Issues remaining from the previous verification period	31
Appendix A: Verification Protocol		
Appendix B: Certification statement		
Appendix C: Certificates of Competence		

## **1. Introduction**

Ningxia Federal Intertrade Co. has commissioned the DOE TÜV Rheinland (China) Ltd. to perform the 1<sup>st</sup> periodic verification of the CDM Project Activity “Ningxia Federal Solar Cooker Project” in P.R.China (hereafter called “project activity”). The verifiers have reviewed the emission reduction data collected from 12<sup>th</sup> February 2010 to 31<sup>st</sup> October 2010. This report summarises the findings of the verification of the project, performed on the basis of paragraph 62 of the CDM modalities and procedures, as well as criteria given to provide for consistent project operations, monitoring and reporting and the subsequent decisions by the CDM Executive Board. Verification is required for all registered CDM project activities intending to confirm their achieved emission reductions and proceed with request for issuance of CERs.

### **1.1 Objective**

The purpose of verification is to review the monitoring results and verify that monitoring methodology was implemented according to monitoring plan and monitoring data, used to confirm the reductions in anthropogenic emissions by sources is sufficient, definitive and presented in a concise and transparent manner.

In particular, monitoring plan, monitoring report and the project's compliance with relevant UNFCCC and host Party criteria are verified in order to confirm that the project has been implemented in accordance with previously registered design and conservative assumptions, as documented.

### **1.2 Scope**

The verification comprises a review of the monitoring report over the monitoring period from 12<sup>th</sup> February 2010 to 31<sup>st</sup> October 2010, Based on registered PDD in part of the monitoring parameters and monitoring plan, emission reduction calculation spreadsheet, monitoring methodology/ies and all related evidence provided by project participant(s).

On-site visit and stakeholders interviews are also performed as part of the verification process.

## 2. Methodology

The verification consists of the following four phases:

1. Making the preliminary monitoring report/ Version 1 publicly available (<http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1250391250.34/view>)
2. Desk review of the monitoring report, the registered PDD, the registered validation report, previous verification report and monitoring report and other relevant documents;
3. On-site visit (including follow-up interviews with project stakeholders, when deemed necessary);
4. Resolution of outstanding issues and the issuance of the final Verification report and Certification statement.

The following sections outline each step in more detail.

### 2.1 Desk review

Table 1: The following table outlines the documentation reviewed during the verification:

/1.1/	Monitoring Report (MR), Version 1, 1 <sup>st</sup> November 2010 (for GSP)
/1.2/	(Revised) Monitoring Report, Version 4, 31 <sup>st</sup> October 2011
/2/	Registered PDD (registered no.: 2924), version 19, 12 <sup>th</sup> December 2009
/3/	Registered Validation Report, Version 04, 14 <sup>th</sup> December 2009
/4/	Emission reduction calculation spreadsheet (ER spreadsheet)
/5/	UNFCCC, Clean Development Mechanism Validation and Verification Manual (Version 01.2), EB55 Annex 1.
/6/	UNFCCC, AMS-I.C/Version 13, "Thermal energy for the user with or without electricity", EB38
/7/	Ningxia Federal Intertrade Co. (NXFI) and Xiji County Rural Energy Station (XRES), Service Agreement for project operation, inspection and management, 27 <sup>th</sup> January 2010
/8.1/	NXFI and Pengyang County Yongming Solar Cooker Factory, Solar Cooker Purchase Contract (Contract no.: 09CDMX001), October 2009
/8.2/	NXFI and Xiji County Dongfanghong Solar Energy Co., Ltd, Solar Cooker Purchase Contract (Contract no.: 09CDMX002), October 2009
/8.3/	NXFI and Pingluo County Ningwei Solar Cooker Co., Ltd., Solar Cooker Purchase Contract (Contract no.: 09CDMX003), October 2009
/8.4/	NXFI and Yinchuan Jiuyitong New Energy Science & Tech. Co., Ltd, Solar Cooker Purchase Contract (Contract no.: 09CDMX004), October 2009
/9.1/	Quality Supervision and Inspection Station for energy-saving products in Gansu Province (GQSI), Solar Cooker Testing Report (No: NYW2009-0107), 17 <sup>th</sup> July 2009 Remark: Product Manufacturer: Pengyang County Yongming Solar Cooker Factory
/9.2/	GQSI, Solar Cooker Testing Report (No: NYW2009-0106), 17 <sup>th</sup> July 2009 Remark: Product Manufacturer: Xiji County Dongfanghong Solar Energy Co., Ltd
/9.3/	GQSI, Solar Cooker Testing Report (No: NYW2009-0052), 6 <sup>th</sup> May 2009

	Remark: Product Manufacturer: Pingluo County Ningwei Solar Cooker Co., Ltd
/9.4/	GQSI, Solar Cooker Testing Report (No: NYW2010-0040), 21 <sup>st</sup> February 2010 Remark: Product Manufacturer: Yinchuan Jiuyitong New Energy Science & Tech. Co., Ltd.
/10/	Ningxia Federal Intertrade Co. (NXFI) – CDM Project Department, The list of project monitoring personnels
/11.1/	NXFI, Project Monitoring records for monitoring (a), 9 <sup>th</sup> October to 29 <sup>th</sup> October 2010 Remark: Monitoring (a) is to measure the numbers of solar cookers engaged in the project during the crediting period,
/11.2/	NXFI, Project monitoring records for monitoring (b), 12 <sup>th</sup> February to 31 <sup>st</sup> October 2010 Remark: Monitoring (b) is to measure the average operating hour of each solar cooker during the crediting period
/12/	XRES, daily usage time records done by monitoring personnel once per month (for crosschecking purpose), 12 <sup>th</sup> February to 31 <sup>st</sup> October 2010
/13/	NXFI and solar cooker users, Participation agreement and equipment receiving records, 1 <sup>st</sup> March ~ 25 <sup>th</sup> March 2010
/14/	NXFI and sampling users, Agreement for 310 sampling users, March 2010
/15/	NXFI, Solar cooker operation on-site training records, Feb - Mar 2010
/16.1/	NXFI, CDM monitoring training for XRES monitoring personnel, 24 <sup>th</sup> February 2010
/16.2/	NXFI, CDM monitoring training for NXFI's monitoring personnel, 26 <sup>th</sup> February 2010, 27 <sup>th</sup> February 2010
/16.3/	NXFI, CDM monitoring on-site training program for 310 sampling users about the reporting and recording of daily usage hour, February 2010
/17/	NXFI, Ningxia Federal Intertrade solar cooker project maintenance and repair method
/18/	NXFI, Technical Specifications of Solar Cooker for Ningxia Federal Solar Cooker Project, March 2009
/19/	China National Standard, Focusing type solar cooker standard (NY/T219-2003), 2003
/20/	19,000 Solar Cookers' sales receipts from 4 signed solar cooker manufacturers, 28 <sup>th</sup> to 30 <sup>th</sup> September 2010
/21/	UNFCCC, Guidelines for completing the monitoring report form (CDM-MR)/ Version 01, EB54, Annex 34
/22/	XRES, Monthly In-house Monitoring Records on solar cooker No. FLYM-V0742, Recorded by Fan Yuxiong 15 <sup>th</sup> April 2010.
/23/	User, Daily Report from Mobile Phone User November 2010.
/24/	User, Daily Report from Mobile Phone User Mr. Qi, 23, November 2010.
/25/	Xiji Government, the notification for the Supu Township renamed to Zhenhu Township, XiZhengFa (2010)No.56. 14 <sup>th</sup> April 2010
/26/	/26.1/ UNFCCC. "General guidelines for sampling and surveys for small-scale

		project (Version 01), EB50 Annex 30
	/26.2/	Standard for sampling and surveys for CDM project activities and Programme of Activities (Version 02.0), EB65 Annex 2
/27/	/27.1/	NXFI, Emission reduction calculation spreadsheet with monitoring records in 2 <sup>nd</sup> monitoring period
	/27.2/	On-site sampling calculation spreadsheet
/28/	Zhou Xuebo, "Statistics", Economic Science Press, Beijing, 1 <sup>st</sup> Edition December 2008	

## 2.2 On-site visit and follow-up interviews with project stakeholders

Table 2: The following table identifies the personnel who have been interviewed and/or provided additional information to the XRESent documentation:

	Date	Name and Title	Organization
/i/	2010/11/23 to 2010/11/25	Mr. Jiang Wei (General Manager) (Management ReXRESentative)	Ningxia Federal Intertrade Co. (Project Owner)
/ii/	2010/11/23 to 2010/11/25	Mr. Wang Runlin (Managing Director)	
/iii/	2010/11/23 to 2010/11/25	Mr. Zhang Bin (Monitoring Manager)	
/iv/	2010/11/23 to 2010/11/25	Ms. Ma Yan (Monitoring Staff) (monitoring data archive)	
/v/	2010/11/23 to 2010/11/25	Mr. Ning Ju (CDM Consultant)	Clean Air Trade Inc.
/vi/	2010/11/24	Ms. Liang Hui (Monitoring specialist for Supu Township)	Xiji County Rural Energy Station (XRES) (Operation Contractor)
/vii/	2010/11/24	Mr. Fan Lei (Monitoring specialist for Jiqiang township)	Xiji County Rural Energy Station (XRES) (operation contractor)
/viii/	2010/11/24	Mr. Niu Yancai (Farmer, sampling user)	Supu township ( now renamed to Zhenhu township)
/ix/	2010/11/24	Mr. Wu Dongling (Farmer, sampling user)	
/x/	2010/11/24	Mr. Yang Junyi (Farmer, sampling user)	
/xi/	2010/11/24	Mr. Gao Quancheng (Farmer, sampling user)	

/xii/	2010/11/24	Mr. Gao Junde (Farmer, sampling user)	
/xiii/	2010/11/24	Mr. Wang Shoubin (Farmer, sampling user)	

Table 3: Interview topic

	Date	Organization	Topic
/a/	2010/11/23 to 2010/11/25	Ningxia Federal Intertrade Co. (i.e. PP in host country)	<ul style="list-style-type: none"> <li>➤ Project design and implementation</li> <li>➤ Project related legal issues</li> <li>➤ Equipment Installation and starting of operation</li> <li>➤ Crediting Period for this verification</li> <li>➤ Monitoring plan and Procedures</li> <li>➤ QA and QC</li> <li>➤ Training history and records</li> <li>➤ Data collection and record keeping</li> <li>➤ Calibration schedule and records</li> <li>➤ Operation and Maintenance records</li> <li>➤ Missing Data handling</li> <li>➤ Emission Reductions Calculation</li> <li>➤ Management system</li> <li>➤ Approval by the host country</li> </ul>
/b/	2010/11/23	Clean Air Trade Inc (CDM Consultant)	<ul style="list-style-type: none"> <li>➤ Crediting Period for this verification</li> <li>➤ Monitoring plan and Procedures</li> <li>➤ QA and QC</li> <li>➤ Training history and records</li> <li>➤ Missing Data handling</li> <li>➤ Emission Reductions Calculation</li> <li>➤ Monitoring report</li> </ul>
/c/	2010/11/24	Xiji County Rural Energy Station (operation contractor), and users	<ul style="list-style-type: none"> <li>➤ Monitoring plan and Procedures</li> <li>➤ QA and QC</li> <li>➤ Training history and records</li> <li>➤ Missing Data handling</li> <li>➤ Data collection and record keeping</li> <li>➤ Operation and Maintenance records</li> </ul>

## 2.3 Resolution of outstanding issues

The objective of this phase of the verification is to resolve any outstanding issues which have to be clarified prior to final DOE's conclusions on the project implementation, monitoring practices and achieved emission reductions. In order to ensure transparency

a verification protocol is completed for the project activity. The protocol shows in transparent manner criteria (requirements), means of verification and resulting statements on verification actual project activity against identified criteria.

The verification protocol serves the following purposes:

- It organises in a table form, details and clarifies the requirements, which CDM project is expected to meet;
- It ensures a transparent verification process where the DOE will document how a particular requirement has been verified and the result of the verification.

The verification protocol consists of two tables. Table 1 reflects the verification requirements and reference to the materials used to verify the project activity against those requirements, as well as means of verification, reference to Table 2 and preliminary and final opinion of the DOE on every particular requirement. The completed verification protocol for this project is enclosed in Appendix A to this report.

Findings during the verification can be interpreted as a non-compliance with CDM criteria or a risk to the compliance. Corrective action requests (CARs) are raised, in case:

- (a) Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
- (b) Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
- (c) Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants.

Requests for clarification (CLs) are raised, if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

*A revised version of the monitoring report (version 4) has been submitted to the verification team for final opinion, which was revised based on the draft verification report and the issued CARs and CLs as well as FARs. The major changes include: clearly depict the monitoring personnels in monitoring group A and Group B in monitoring report; the monitoring data storage; and how to tackle the data missing and data damage.*

## 2.4 Internal quality control

The final verification report has to pass a technical review before being submitted to the project participants. The technical review will be performed by a technical reviewer qualified in accordance with TÜV Rheinland's qualification scheme for CDM validation and verification.

## 3. Verification findings

The findings of the verification are described in the following sections. The verification criteria (requirements), the means of verification and the results of validation are documented in detail in the verification protocol in Appendix A.

According to the VVM/ Version 01.2 /5/, i.e. clause 182(a) and 183, the verification team has to check the remaining issues from the previous validation /3/ or issues which are clearly defined for assessment in the PDD /2/. The validation report /3/, prepared by TÜV Rheinland Japan Ltd (the DOE), notes no open issues.

### 3.1 Project implementation

#### 3.1.1 The implementation of the project activity

**Verification Opinion:** Through document review (e.g. Monitoring Report /1/), on-site observation and interviews with the management representatives, monitoring personnels and participating users, the verification team can summarize the implementation of the project as below,

The project activity is a bilateral CDM project which involves two project participants (PPs) i.e. Ningxia Federal Intertrade Co. (NXFI, as the project owner) from host country and Ministry for Foreign Affairs of Finland (as the CER Buyer) from Finland.

#### **The starting date of operation of project activity and indicated monitoring period**

The verification team checks the starting date of crediting period among registered PDD /2/, the project page in UNFCCC and Monitoring Report /1/ and finds difference among them as following,

- In registered PDD /2/, Section C.2.2, it indicates 1<sup>st</sup> October 2009 as the starting date of crediting period;
- UNFCCC project page<sup>3</sup>, the project was registered as the CDM project (No.: 2924) on 12<sup>th</sup> Feb. 2010 and the crediting period starts from 12<sup>th</sup> Feb. 2010 to 11<sup>th</sup> Feb. 2020;
- In Monitoring Report /1/, the monitoring period is from 12<sup>th</sup> February 2010 to 31<sup>st</sup> October 2010.

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<sup>3</sup> UNFCCC, Project 2924: Ningxia Federal Solar Cooker Project  
(<http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1250391250.34/view>)

According to the definition of crediting period in latest “Glossary of CDM terms”, it states, the crediting period may only start after the date of registration of the proposed activity as a CDM project activity. For this project, the project registered on 12<sup>th</sup> February 2010 and also as the starting date of crediting period indicated in UNFCCC project page with 10-year fixed crediting period.

As the above, the verification team can conclude that the crediting period, i.e. **12<sup>th</sup> February 2010 to 11<sup>th</sup> February 2020** is reasonably demonstrated. **The crediting period for this 1<sup>st</sup> periodic verification is from 12<sup>th</sup> February 2010 to 31<sup>st</sup> October 2010 (including both the days).**

The project activity is to install 19,000 solar cookers which are located in the rural areas of Xiji County, Ningxia Hui Autonomous Region. The geographic coordinates of the project are ranging 105°19' to 106°04' E and 35°19' to 36°14' N with about 3,118km<sup>2</sup> project area. The project activity consists of 19,000 households from 19 townships (Shagou, Baiya, Huoshizhai, Xinying, Hongyao, Tianping, Pingfeng, Wangmin, Xinglong, Jiangtai, Shizi, Malian, Xitan, Xiaohe, Jiqiang, Piancheng, Majian, Zhenhu (formerly Supu), and Xinping of Xiji County. The total installed capacity is 14.7MW<sub>thermal</sub> which consists of 19,000 parabolic type solar cookers with 773.5W rated power per unit.

	Longitude(E)	Latitude(N)	Longitude(E)	Latitude(N)
Township	Deg Min Sec	Deg Min Sec	Degree	Degree
Shagou	105°52'29"E	36°07'55"N	105.8747	36.1319
Baiya	105°52'29"E	36°07'55"N	105.8747	36.1319
Huoshizhai	105°46'1"E	36°08'00"N	105.7669	36.1333
Xinying	105°39'9"E	36°04'45"N	105.6525	36.0792
Hongyao	105°29'59"E	36°00'56"N	105.4997	36.0156
Tianping	105°21'1"E	35°59'59"N	105.3503	35.9997
Pingfeng	105°33'0"E	35°44'0"N	105.5500	35.7333
Wangmin	105°42'59"E	35°45'57"N	105.7164	35.7658
Xinglong	105°48'17"E	35°44'36"N	105.8047	35.7433
Jiangtai	105°50'59"E	35°46'58"N	105.8497	35.7828
Shizi	106°01'01"E	35°43'0"N	106.0169	35.7167
Malian	106°01'06"E	35°48'43"N	106.0183	35.8119
Xitan	105°45'0"E	35°53'1"N	105.7500	35.8836
Xiaohe	105°50'59"E	35°53'0"N	105.8497	35.8833
Jiqiang	105°42'39"E	35°58'20"N	105.7108	35.9722
Piancheng	105°56'0"E	35°56'59"N	105.9333	35.9497
Majian	105°35'0"E	35°53'59"N	105.5833	35.8997
Zhenhu (formerly Supu)	105°35'0"E	35°51'58"N	105.5833	35.8661
Xinping	105°38'0"E	35°50'58"N	105.6333	35.8494

Through on-site observation and document check /11.1, 11.2/, the verification team observed that the solar cookers are installed in the yard of its user's home in a location where it can be fully exposed to sunshine, each of the solar cookers has 1.7m<sup>2</sup> of aperture area maximum 1.25m of height with the unique serial number. In addition, the

verification team confirms that the project activity is implemented within the project boundary (i.e. the 19 townships of Xiji County). No solar cooker is installed over the borderline (i.e. the project boundary).

### **Sampling for determining numbers of solar cookers to be visited on-site**

As per VVM /5/ para. 196, the verification team shall, by means of an on-site visit, assess that all physical features of the CDM project activity proposed in the registered PDD are in place and/or that the project participant has implemented and operated the proposed CDM project activity as per the registered PDD or the approved revised PDD.

According to the registered PDD in particular to the monitoring parameter (a) numbers of solar cooker systems in operation, and (b) average operation hours of a solar cooker system, the verification team considers the below criteria as the physical features of the project activities that shall be verified within the monitoring period.

- the solar cookers in place with good condition;
- the unique serial number of each solar cooker;
- the daily operation and maintenance practice;
- the handling procedure for any abnormal situation;
- Any maintenance required during the monitoring period.

Therefore, the verification team assessed

- the original monitoring records /11.1 -11.2/ to verify & to confirm the numbers of solar cooker systems in operation /11.1/, and operation hours of 310 sampled solar cooker systems /11.2/;
- the sampling plan for selecting the 310 sampling users (representing 310 solar cooker systems) for this monitoring period. PP, NXFI demonstrated to the verification team the sampling process: Randomly selected 310 sampling users via applying "Random" function of MS Excel for this 1<sup>st</sup> monitoring period. The sampling process was done in February 2010 before this 1<sup>st</sup> monitoring period. Then, PP signed agreements /14/ with 310 sampling users in March 2010 for stipulating the users' obligation in cooperating with the project monitoring programme before the monitoring commenced. By the above process, the verification team considers that PP conducted the sampling in accordance with registered PDD /2/ (i.e. 95/5 confidence/ precision level; sampling before the monitoring period, 310 sampling population). This complies with "Standard for sampling and surveys for CDM project activities and Programme of Activities" (Version 02.0) EB65 Annex 2 /26.2/ para. 21 (a) (b);
- in order to further verify the physical features of the project activities, a sampling for determining numbers of solar cookers to be visited was conducted on-site. The verification team applied simple random sampling method from an official source (i.e. Statistics 1<sup>st</sup> Edition /28/).
- According to the random sampling method /28/, the sampling size ( $n$ ) can be determined in following steps:

$$n = t^2 * \sigma^2 / \Delta x^2$$

Where

- a)  $t$  is the statistical factor corresponding to the confidence level; here the confidence level is selected as 90% which is complied with the Standard EB65 Annex 2 /26.2/ para. 9, so that  $t = 1.645$ ;
- b)  $\sigma$  is the standard deviation calculated from the latest available set of verified monitoring data, which is from the records of monitoring parameters (b) of 2<sup>nd</sup> monitoring period of a similar solar cooker project, called "Federal Intertrade Pengyang Solar Cooker Project" CDM registration no.: 2307 /27/, which is located nearest to the project activity. This is complied with the Standard EB65 Annex 2 para. 11 (c). According to the standard /26.2/,  $\sigma$  can be based on the results from similar studies. For this case, the verification team applied the latest and verified monitoring results of the nearby project (No.: 2307) /27.1/, so that  $\sigma = 6.601$ ;
- c)  $\Delta x$  is the allowed sampling error and taken as 10% of average value of total operation hours of a solar cooker system of that studies, so that  $\Delta x = 89.11$ ; Note that the verification team have considered variables from two monitoring parameter (a) numbers of solar cooker systems in operation, and (b) average operation hours of a solar cooker system, and then found that
  - since as all of solar cooker systems in operation within that monitoring period of Project 2307, the standard deviation comes from numbers of operating solar cooker systems is neglectable. The verification team also crosschecked this project's 1<sup>st</sup> monitoring period with same situation;
  - variable, i.e. operation hours of a solar cooker system in 309 sampling systems of Project 2307, comes from monitoring parameter (b) that provides continuous variable, then can provide a higher (i.e. conservative) standard deviation. Finally a conservative sampling size can be achieved. The verification team also crosschecked the operation hour characteristics of this project with similar situation.
  - Thus, the verification team considers average value of total operation hours of a solar cooker system to be the average  $x$ ,  $\Delta x = 10\% * \text{average } x = 89.11$ .

***The calculation result for the required sampling size  $n$  is 1. The calculation process is clearly demonstrated in the on-site sampling calculation spreadsheet /27.2/. The reason for this small sampling size is the similar total operation hours of each solar cooker system. By crosschecking the ER spreadsheet /4/ of the project activity, very similar characteristics were found. Thus, the verification team considers the sampling is appropriate.***

By considering the conservative approach, 6 solar cooker systems (or linked to 6 households) /viii-xiii/ are randomly selected by the verification team to visit. This oversampling is encouraged in the Standard /26/. The verification team visited the 6 households and checked the solar cookers and confirmed the below,

- all of the 6 solar cookers in place with good condition;
- the unique serial number of each solar cooker that was correctly referred to the signed participation agreement and equipment receiving records /13/;
- the daily operation and maintenance practice;
- the handling procedure for any abnormal situation;
- no maintenance required during the monitoring period, and so on.

From the above, the verification team considers that all physical features of the project have been sufficiently assessed via the scientific sampling method so that comply with VVM para. 196 /5/.

As observed on-site, interviews with project owner /i/, monitoring staff /vi-vii/ & users /viii-xiii/, and checked the operation records /11.1 -11.2/, the verification team confirms that the project is implemented continuously without abnormal situation, even no occurrence of maintenance during the monitoring period.

Table 4: Summary of generation units of the project activity

Physical Features of Items	Described in the registered PDD	Implementation of the project activity	Verification team's opinion
Numbers of solar cookers	19,000	19,000	Crosschecked from the monitoring report and monitoring records (a) /11.1/
National Standard	GB No.: NY/T219-2003	GB No.: NY/T219-2003	Checked from the standard /19/, which is applicable to the project activity and is confirmed correctly applied by the project owner during the project implementation.
Type and shape	Focusing and parabolic	Focusing and parabolic	Consistent to the National standard /19/ and also appeared in the technical specification of the solar cooker purchase contracts /8.1-8.4/.
Thermal Efficiency	At least 65%	At least 65%	Consistent to the National standard /19/ and also appeared in the technical specification of the solar cooker purchase contracts /8.1-8.4/.
Aperture (Light Collecting Area)	1.7 m <sup>2</sup>	1.7 m <sup>2</sup>	Consistent to the National standard /19/ and also appeared in the technical specification of the solar cooker purchase contracts /8.1-8.4/.
Rated power	773.5 W	445 W/m <sup>2</sup> or above	Consistent to the National standard /19/ and also appeared in the technical specification of the solar cooker purchase contracts /8.1-8.4/. 445 W/m <sup>2</sup> x 1.7m <sup>2</sup> =773.5W
Focus	600-750mm	600-750mm	Consistent to the National standard /19/ and also appeared in the technical specification of the solar cooker purchase contracts /8.1-8.4/.
Temperature in the focus area; and size of focus area	400°C or above; 50 to 200 cm <sup>2</sup>	400°C or above; 50 to 200 cm <sup>2</sup>	Consistent to the National standard /19/ and also appeared in the technical specification of the solar

			cooker purchase contracts /8.1-8.4/.
Maximum operation height and distance	1.25m and 0.8m respectively	1.25m and 0.8m respectively	Consistent to the National standard /19/ and also appeared in the technical specification of the solar cooker purchase contracts /8.1-8.4/.

*Through on-site visit & interviews, and document checking, the verification team considers that the implementation of project activity including equipment installation (i.e. 19,000 solar cookers) is consistent with the registered PDD and no diversion from the original plan has been found.*

### 3.1.2 The actual operation of the CDM project activity

**Verification Opinion:** The total installed capacity is 14.7MW<sub>thermal</sub> which consists of 19,000 parabolic type solar cookers with 773.5W rated power per unit.

#### **The starting date of operation of project activity and indicated monitoring period**

According to the PDD /2/ and the registered validation report /3/, it states that the project can be implemented under the revenue from registered as a CDM project. All of 19,000 solar cookers were distributed to 19,000 participant households evenly from 1<sup>st</sup> to 30<sup>th</sup> March 2010 via the manufacturers and the operation contractor /7/, i.e. Xiji County Rural Energy Station (XRES) which were after the registration as a CDM project. Therefore, the operation and monitoring of the project activity is started on 2<sup>nd</sup> March 2010.

The verification team confirmed the starting date by (i) on-site interview with users /viii–xiii/ ; and by document review (i.e. statistics for monitoring (b) between March 2010 and October 2010 /11.3/, and project monitoring records for monitoring (b) /11.2/). It clearly indicated the starting dates of operation (also as the monitoring, i.e. 2<sup>nd</sup> March 2010) of solar cookers for the 310 sampling households. It is noted that according to the registered PDD, the 310 sampling households are calculated from the surveying method (95% confidence level) to represent 19,000 participant households. The 310 sampling households were picked by random selection through applying the “Random” function in MS Excel. The list of randomly selected households was recorded by NXFI by capturing the screenshot, and was presented to the verification team during OSV to confirm its transparency. Therefore, the verification team considers that the starting dates of operation of 310 sampling households represent the starting dates of all participant households.

Before the starting of 1<sup>st</sup> monitoring period, the project owner implemented the following measures so as to ensure fulfilling the applied monitoring methodology AMS-I.C./ Version 13 and the monitoring plan stated in the registered PDD /2/;

1. Signing of the service agreement<sup>4</sup> /7/ dated 27<sup>th</sup> January 2010 for project operation, inspection and management with Xiji County Rural Energy Station (PRES); services include (i) distribution of solar cookers, (ii) operation management, (iii) monitoring & reporting, and (iv) communication channel between users and NXFI;
2. Signing of the solar cooker purchase contracts<sup>5</sup> with 4 suppliers since October 2009 /8.1/~8.4/;
3. Solar-cooker Testing Reports of solar cookers from 4 contracted solar cooker manufacturers /9.1/~9.4/;
4. Preparation of maintenance and repair manual, called "Ningxia Federal Intertrade solar cooker project maintenance and repair method" /17/;
5. Preparation of the Product Quality Control, Technical Specifications and Standards /18/ dated in March 2009, for quality assurance of product before installation;
6. Establishing the monitoring teams for monitoring (a) and monitoring (b) /10/;
7. Signed agreements with participating users /13/ when delivery of solar cookers with solar cooker serial number for identification and tracing;
8. Provided the CDM monitoring training to different groups of people, i.e. (i) XRES monitoring personnels /16.1/; (ii) NXFI's monitoring personnels /16.2/; and (iii) 310 sampling users /16.3/;
9. Provided the on-site operation training to participating users during the distribution of solar cookers;
10. Randomly selected 310 sampling users via applying "Random" function of MS Excel for 1<sup>st</sup> monitoring period and then signed agreements /14/ with 310 sampling users in March 2010 for stipulating the users' obligation in cooperating with the project monitoring programme just at the beginning of the monitoring period;

As the above and document review, verification team considers that the project activity operated normally in the way complying with the implementation plan and monitoring plan stipulated in the registered PDD /2/ and the monitoring programme has been performed in a transparent and comprehensive manner during the 1<sup>st</sup> monitoring period. The verification team confirms that the project has been implemented continuously in the monitoring period.

The 1<sup>st</sup> monitoring period is from 12<sup>th</sup> February 2010 to 31<sup>st</sup> October 2010, which falls into the approved crediting period of the project by UNFCCC. The monitoring data within the 1<sup>st</sup> monitoring period is provided and fully assessed by the verification team. The monitoring data for determining the GHG emission reductions are complete, correct and traceable. Detailed assessment is presented in Section 3.3.

### **QA/QC for handling missing or damaged data in monitoring plan**

<sup>4</sup> Note: the service agreement signed on 27<sup>th</sup> January 2010 is not a binding contract, which is effective when the project has been registered as a CDM project activity.

<sup>5</sup> Note: the 4 equipment purchase contracts signed in October 2009 are not binding contracts, which is effective when the order for supply.

It is noted by the verification team that there is no missing data or wrong data happened during the 1<sup>st</sup> monitoring period through the document review /11.1/~11.2/ and on-site interviews. The GHG emission reductions of the project activity do not need to consider the deduction due to the missing or damaged data. A FAR was raised to address the incomplete description in registered PDD about the QA/QC procedures on missing or/and damaged data.

Besides, there is no maintenance required for the solar cooker of the project activity. During on-site interviews with participating users /viii/~xiii/, they expressed that due to the useful solar cookers, they often keep the good condition of the solar cookers. For instance, they covered their solar cookers when rainy days; they swept the dust on the surface of the cooker regularly; they swept the snow during snowy weather; they added the lubricating oil to the handgrip if necessary and so on. The verification team confirms this from on-site observation.

### 3.2 Compliance of the monitoring plan with the monitoring methodology

**Verification Opinion:** By reviewing the monitoring plan in registered PDD /2/ and the monitoring report /1/, it complies with the requirement of applied monitoring methodology AMS-I.C./ Version 13. The applied AMS-I.C./ Version 13, clause 17 states that, if the emission reductions per system are less than 5 tonnes of CO<sub>2</sub> a year,

- (a) Recording the number of systems operating annually;
- (b) Estimating the hours of operation of an average system, if necessary using survey methods.

The monitoring plan of the project activity stated in the monitoring report is consistent with the registered PDD /2/ without any revision or deviation. The monitoring plan complies with the methodology AMC-I.C./ Version 13 as below,

According to the PDD /2/, the emission reductions per system (i.e. each solar cooker) are calculated as 2.1 tCO<sub>2</sub>e a year which is based on the baseline methodology AMS-I.C. so that clause 17 of AMS-I.C./ Version 13 is applicable to the project activity.

Two monitoring parameters, (a) record the number of systems operating annually ( $n$ ); and (b) estimate the hours of operation of an average system ( $t$ , unit: hour), have been put into the monitoring plan as the monitoring parameters.

Monitoring (a) is monitored at least once per year to determine the number of system operating during the 1<sup>st</sup> monitoring period. During OSV, PP reported that an on-site visit to all 19,000 users conducted by 10 Monitoring teams (2 person per team) from 9<sup>th</sup> October 2010 to 29<sup>th</sup> October 2010 to collect the data of number of system under operation within the 1<sup>st</sup> monitoring period. The relevant monitoring records /11.1/ has been checked by the verification team and confirmed valid and traceable.

Monitoring (b), as accepted in the monitoring methodology AMS-I.C/ Version 13, a survey method (i.e. 95% confidence level) is adopted by NXFI for determining the sampling size of estimating the hours of operation of an average system during the 1<sup>st</sup> monitoring period. According to the PDD /2/, a sample size of 310 is to be picked from the 19,000 solar cookers. The 310 sampling households were picked by random selection through applying the “Random” function in MS Excel.

The daily usage hour (accuracy to minutes) per household during the 1<sup>st</sup> monitoring period is recorded and monitored. The relevant monitoring record /11.2/ has been checked by the verification team and confirmed valid and traceable.

### 3.3 Compliance of the monitoring with PDD and monitoring plan

**Verification Opinion:** The verification team reviewed the monitoring plan stated in the monitoring report /1/ and conducted an on-site visit so as to (i) verify the compliance of the monitoring plan in the registered PDD /2/, and (ii) confirm the emission reductions during the 1<sup>st</sup> monitoring period.

#### 3.3.1 Monitored parameters

**Verification Opinion:** The verification team assessed the monitoring techniques and each monitoring value; and provide a short summary on the verification of every parameter listed in the monitoring plan and used for calculation of:

#### **Data and parameters determined at the registration and not monitored during 1<sup>st</sup> monitoring period**

According to the registered PDD, Section 6.2, there are 6 data/ parameters to be applied for estimating the emission reduction. All of data/ parameters are for baseline emissions since no project emission or leakage is required to calculate for the project activity as per AMS-I.C/Version 13. The 6 data/ parameters are as below,

According to the calculation formula of Baseline Emissions (BE<sub>y</sub>),

$$BE_y = HG_y * EF_{CO_2} / \eta_{th}$$

The annual baseline emissions are the sum of monthly baseline emissions, thus,

$$HG_y = \sum HG_i \quad (i = 1 \sim 12)$$

$$BE_y = \sum BE_i \quad (i = 1 \sim 12)$$

$$BE_i = HG_i * EF_{CO_2} / \eta_{th} \quad (i = 1 \sim 12)$$

Where            HG<sub>i</sub>: the net heat supplied in month i in TJ.  
                      BE<sub>i</sub>: the baseline emission in month i in tCO<sub>2</sub>e.

$$\text{Heat} = \text{Power} * \text{Time}$$

$$HG_i = n * [P_i * t_i * (3.6 \times 10^{-9})]$$

Where      n: the total number of solar cookers installed by the proposed project; and there are 19,000 sets solar cookers will be installed;  
                $P_i$ : the actual average power of the solar cooker in month i in W;  
                $t_i$ : the usage time of each solar cooker in month i in hour.

$$P_i = 773.5 * (R_i / 700)$$

Where      773.5W is the rated power of a solar cooker based on the China National Standard (GB No.: NY/T219-2003);  
               **Parameter 1:**  $R_i$  is the actual solar irradiance rate in month i in  $W/m^2$  (Refer to the Annex 3 of the PDD /2/, i.e. 2000-2007 average monthly solar irradiance value provided by Ningxia Hui Autonomous Region Meteorological Archives).

$$\text{Rated power of a solar cooker} = R * A * \eta_{\text{solar}} = 700 * 1.7 * 0.65 = 773.5W$$

Where      **Parameter 2:** R: the standard solar irradiance used for calculating rated power (i.e.  $700W/m^2$ );  
               **Parameter 3:** A: Light collection Area (i.e.  $1.7m^2$ );  
               **Parameter 4:**  $\eta_{\text{solar}}$ : thermal efficiency of solar cooker (i.e. 65%).

$$BE_y = n * \sum [773.5 * (R_i / 700) * t_i * (3.6 \times 10^{-9})] * EF_{CO_2} / \eta_{th}$$

Where      n: the total number of solar cookers installed by the proposed project (i.e. monitoring parameter (a));  
                $R_i$ : the actual solar irradiance rate in month i in  $W/m^2$  (the fixed value since as the ex-ante approach is selected);  
                $t_i$ : the usage time of each solar cooker in month i in hour (i.e. monitoring parameter (b));  
               **Parameter 5:**  $EF_{CO_2}$ : The  $CO_2$  emission factor per unit of coal (i.e. 94.6  $tCO_2e/TJ$ ; the fixed value since as the ex-ante approach is selected);  
               **Parameter 6:**  $\eta_{th}$ : The efficiency of the plant using fossil fuel (i.e. 15%) that would be used in the absence of the project activity.

All of 6 parameters have been applied in the monitoring report /1/ for calculating the baseline emissions.

### **Data and parameters monitored during the 1st monitoring period**

- Baseline emissions:

As per AMS-I.C/Version 13 and the registered PDD Section B.7.1, there are two monitoring parameters to be monitored during the monitoring period,

- n: the total number of solar cookers installed by the proposed project;
- $t_i$ : the usage time of each solar cooker in month i in hour.

Particulars of the monitoring parameters	Verifier Comments
$n$ – Number of solar cookers in operation	There are totally 19,000 solar cookers in operation during the monitoring period.
Data unit	As per PDD, not applicable
Measuring/ Reading/ Recording Frequency	It is monitored once during the last quarter of the monitoring period, i.e. 9 <sup>th</sup> October to 29 <sup>th</sup> October 2010 as per indication in the MR. this could comply with the requirement in chapter 7.2 in the PDD/2/
Source of data	Monitoring records for monitoring (a) /11.1/. Solar Cookers' sales receipts /20/ and sales contract from 4 suppliers/8.1/~8.4/.
Monitoring details	<p>As per PDD, the value of this parameter is determined <b>annual monitoring results</b> except initial value by sales contract and invoice of solar cooker. The verification team checked the signed sales contracts /8.1-8.4/ and the sales receipts /20/ and confirms that 19,000 solar cookers to be used for the project activity.</p> <p>For this monitoring period, all participating users of the project activity (i.e. 19,000 households) were visited by Monitoring teams during the monitoring period from 9<sup>th</sup> October to 29<sup>th</sup> October 2010 and confirmed all solar cookers (i.e. 19,000 solar cookers) are under operation and operated in good condition. The monitoring data is recorded in the table as per PDD Section B.7.2.clause 3.</p> <p>The monitoring procedure of the parameter is consistent with the monitoring plan in PDD.</p>
Monitoring equipment	No monitoring equipment is used for the parameter.
Calibration	Since no monitoring equipment is required, calibration is not applicable.
QA/QC measures	<ul style="list-style-type: none"> <li>(i) Valid product testing reports /9.1-9.4/ provided by the solar cooker suppliers shows that the provided solar cookers are qualified according to the national standard (GB: NY/T219-2003).</li> <li>(ii) The solar cookers will be maintained by the project owner within the project lifetime. It is found no maintenance requires within the monitoring period.</li> <li>(iii) Revised QA/QC procedures for handling missing or damaged data in the monitoring report are clearly indicated in the response to the FAR which was issued in this verification period. It is found that no missing or damaged data happened in the</li> </ul>

	monitoring period.
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Particulars of the monitoring parameters	Verifier Comments																				
$t$ – the average monthly operation hour of each solar cooker	<table border="1"> <thead> <tr> <th>Period (day/month/year)</th><th>Average Usage Time Per User in the Month (Hour)</th></tr> </thead> <tbody> <tr> <td>12/02/2010 – 28/02/2010</td><td>0</td></tr> <tr> <td>02/03/2010 – 31/03/2010</td><td>86.49</td></tr> <tr> <td>01/04/2010 – 30/04/2010</td><td>143.43</td></tr> <tr> <td>01/05/2010 – 31/05/2010</td><td>122.06</td></tr> <tr> <td>01/06/2010 – 30/06/2010</td><td>135.57</td></tr> <tr> <td>01/07/2010 – 31/07/2010</td><td>131.96</td></tr> <tr> <td>01/08/2010 – 31/08/2010</td><td>142.80</td></tr> <tr> <td>01/09/2010 – 30/09/2010</td><td>109.67</td></tr> <tr> <td>01/10/2010 – 31/10/2010</td><td>128.79</td></tr> </tbody> </table> <p>The average monthly operation hour is just the estimated value i.e.120 hours/ month (from February 2010 to Oct. 2010) in the PDD. And the actual operation is verified by the verification team to be valid. See the detailed explanation in Section 3.4.</p>	Period (day/month/year)	Average Usage Time Per User in the Month (Hour)	12/02/2010 – 28/02/2010	0	02/03/2010 – 31/03/2010	86.49	01/04/2010 – 30/04/2010	143.43	01/05/2010 – 31/05/2010	122.06	01/06/2010 – 30/06/2010	135.57	01/07/2010 – 31/07/2010	131.96	01/08/2010 – 31/08/2010	142.80	01/09/2010 – 30/09/2010	109.67	01/10/2010 – 31/10/2010	128.79
Period (day/month/year)	Average Usage Time Per User in the Month (Hour)																				
12/02/2010 – 28/02/2010	0																				
02/03/2010 – 31/03/2010	86.49																				
01/04/2010 – 30/04/2010	143.43																				
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01/07/2010 – 31/07/2010	131.96																				
01/08/2010 – 31/08/2010	142.80																				
01/09/2010 – 30/09/2010	109.67																				
01/10/2010 – 31/10/2010	128.79																				
Data unit - hour	The unit is consistent to the registered PDD and to the applied monitoring methodology AMS-I.C/ Version 13.																				
Measuring/ Reading/ Recording Frequency	Daily measuring, recording and monthly reporting																				
Source of data	<p>As per the PDD, it is determined by the results of sampling survey and the hour usage of determined sampling users to be monitored. The source of data is as below,</p> <ul style="list-style-type: none"> <li>(i) Agreement for 310 sampling users, March 2010 /14/;</li> <li>(ii) Monitoring records for monitoring (b) /11.2/;</li> </ul>																				
Monitoring details	<ul style="list-style-type: none"> <li>➤ 7 XRES monitoring personnels recorded the daily usage hours (accuracy to minutes) from the 310 sampling users;</li> <li>➤ The users reported to the monitoring personnels for the daily usage hours in the evening everyday via telephone or sms or face-to-face;</li> <li>➤ The daily usage hours were recorded and filled in the checklist by paper (as the raw data records);</li> <li>➤ One monitoring staff in XRES checked the filled checklists each month to verify any missing or</li> </ul>																				

	<p>wrong data and then submitted to the NXFI;</p> <ul style="list-style-type: none"> <li>➤ The filled checklist in the paper was computerized every month by the NXFI's monitoring staff to form electronic checklist (please see the ER spreadsheet /4/);</li> <li>➤ There are 7 monitoring groups (i.e. 6 CDM groups for direct recording and on-site checking and one group for data checking, one person per group) from XRES to take part 19 townships of the project activity. Each monitoring personnel is responsible for direct recording &amp; on-site visiting one or two townships which depends on the number of sampling users in those townships;</li> <li>➤ Every month, one of the monitoring personnels conducts an independent check at a sampling user's home by staying there for the whole daytime to take the daily usage hour of that user so as to crosscheck the validity and conservativeness of the data being reported by the user;</li> <li>➤ The daily usage hour taken by the monitoring personnels during the independent check /12/ was either the same as the time taken by users, or few minutes more than the time taken by users, which represented more conservative data reported by the users;</li> <li>➤ The original monitoring records are submitted to NXFI every month for data recording and management such as data archiving, data analysis, data computerizing and data checking;</li> <li>➤ Statistical analysis was done and average monthly operation hour of each solar cooker was calculated and demonstrated in the ER spreadsheet /4/ (i.e. Summary sheet), The monthly operation hour (accuracy to minute) of solar cookers from 310 sampling users was collected and sum-up and then divided by 310 (i.e. the total number of sampling users) to give a average monthly operation hour of each solar cooker. This complies with the monitoring plan in PDD.</li> </ul>
Monitoring equipment	Timer (e.g. clock, watch, phone-clock, etc)
Calibration	No calibration is specified as per the registered PDD, AMS-I.C or any local, national, international standards. No calibration requires.
QA/QC measures	The revised QA/QC procedures for handling missing or damaged data in the monitoring report /1/ are clear to quantify the emission reductions due to the missing or

	damaged data. It is found that no missing or damaged data happened in the monitoring period.
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*As the above, the verification team considers that the input values for two monitoring parameters are real, measureable, and conservative. The baseline emissions can be calculated based on the precisely collected data source.*

#### – Project emissions

According to the methodology AMS-I.C./ Version 13 and the registered PDD /2/, the project activity is a new installation of renewable solar cooker project, the project emissions are considered as zero, i.e.  $PE_y = 0$ , and thus no monitoring is required.

#### – Leakage emissions

According to the methodology AMS-I.C./ Version 13 and the registered PDD /2/, the project activity is a new installation of renewable solar cooker project, no equipment is transferred from another activity. The installed equipment not being transferred to other activity is verified as below,

As per PDD Section B.7.2 clause 3, “For the number of systems operating, a CDM group will be set up to track the number of operating solar cookers”. Solar cooker number will be put on each solar cooker before delivery to the users for identification”. The verification team confirms that the solar cooker number was marked in the signed participation agreement and equipment receiving records /13/ as well as on the back of the solar cooker for each participating user before delivery to the users. In addition, the verification team can trace the solar cooker number by randomly checking the solar cooker numbers in the solar cooker, its users and the monitoring records for sampling users. Thus, no leakage is required to be considered, i.e.  $Ly = 0$ .

### 3.3.2 Monitoring responsibility

**Verification Opinion:** During OSV, the project owner demonstrated the CDM monitoring organization of the project which was the same as Section B.7.2 of the PDD /2/. It can be classified into 4 categories as following,

1. **The director of CDM group**, Mr. Jiang Wei, who is also the general manager of NXFI, in-charge of the CDM project monitoring and management;
2. **CDM consultant**, Clear Air Trade Inc., Mr. Ning Ju, who is responsible for providing consultation services on CDM validation and verification of the project, including preparation of PDD /2/, Monitoring report and so on; directly reports to the Director;
3. **NXFI's CDM monitoring staff**, including (i) data checker, (ii) data analyst and (iii) data recording for the management of all monitoring data & records; (iv) monitoring team (11 persons) for monitoring parameter (a);

4. **Xiji County Rural Energy Station (XRES)**, who has 10 monitoring personnels including the Station Head Mr. Zhang, is responsible for monitoring (a) and (b). Monitoring team (a) (i.e. 10 groups and two person per group) works with NXFI's monitoring team for monitoring parameter (a); monitoring team (b) (i.e. 7 groups, one person per group) of XRES collects, records and checks the daily usage hours of the 310 sampling users and reports to NXFI on monthly basis.

During on-site interviews with --

- (i) NXFI's CDM monitoring staff /iii-iv/, they demonstrated the process of data collection and management from the XRES each month for monitoring parameter (b) and the monitoring process for monitoring parameter (a); also clearly explained the monitoring criteria (e.g. by visual inspection for checking the equipments' working condition) for monitoring parameter (a);
- (ii) monitoring team (b) of XRES /vi-vii/, they explained their responsibility for monitoring parameter (b), including (1) process of recording the daily usage hours of responsible sampling users; (2) process of independent check once per month; (3) users' reporting time and methods; and (4) procedures of handling missing or damaged data (remark: no missing data happened during the 1<sup>st</sup> monitoring period).

In addition, the verification team interviewed the sampling users /viii-xiii/ during OSV, they were all able to clearly demonstrated (i) *the procedures of using the solar cookers*, (ii) *the process of recording and reporting daily usage hours* as below,

- Calculating the accumulative usage hours (accuracy to minutes) by marking down the starting time and ending time of each time of using the solar cooker for no matter boiling water or cooking;
- Reporting the total daily usage hours (accuracy to minutes) to the monitoring personnels through phone call or face-to-face in every evening as well as msn;
- As trained by the project owner and XRES, they are able to demonstrate their reporting of usage time is done in conservative approach. For instance, if they miss one or two usage records for the day, they will skip these records and report the marked records; if they forget or miss the whole-day records, they will just report as "NO RECORD". Nonetheless, it is understood during OSV that there has been no missing data happened within the 1<sup>st</sup> monitoring period.

*Based on the interview results and the monitoring organization provided by NXFI /10/, the verification team confirms that the monitoring responsibility of each monitoring personnel was handled according to the monitoring plan of PDD /2/ and the responsible personnels are clearly aware of monitoring procedures and are capable to work on their responsibilities.*

### 3.3.3 Accuracy of equipment

**Verification Opinion:** Owing to the project nature, there is no need for use of any monitoring equipment/device in the project monitoring. The equipment accuracy would rely very much on the performance of the heat generation unit, i.e. the solar cooker itself.

The guarantee of the solar cooker performance before and during the project operation is being responsible by the manufacturers. The solar cooker manufacturers have to certify through passing the tests of solar cookers annually in accordance with the national standard for solar cooker (GB: NY/T219-2003) so as to ensure the quality of producing solar cookers every year. NXFI uses the following measures to ensure the installed solar cooker which is qualified and in expected performance;

1. Technical specification in the signed solar cooker purchase contracts /8.1-8.4/ lists out the requirement of supplying solar cookers (e.g. at least 65% thermal efficiency, see the summary table in Section 3.1.1 for details);
2. Valid product testing reports /9.1-9.4/ provided by the solar cooker suppliers shows that the solar cookers are qualified according to the national standard (GB: NY/T219-2003);
3. The product will be inspected and tested based on the “Technical Specifications of Solar Cooker for Ningxia Federal Solar Cooker Project” /18/, before the product delivery to site for installation;
4. Maintenance of the solar cookers is responsible by NXFI to ensure the performance of the solar cookers in operation. The verification team confirmed from the PP and users that no maintenance was required by far since project commencement, owing to the good quality assurance of solar cookers provided by the project owner.

*Therefore, the verification team considers that the equipment accuracy in the project during the 1<sup>st</sup> monitoring period has been achieved and guaranteed by the above measures.*

### **3.3.4 Deviation from and Revision of the registered monitoring plan**

**Verification Opinion:** As described above, no deviation from and revision of the registered monitoring plan in PDD /2/ is observed in the project activity .

*In summary, based on the above verification results, the monitoring of the project activity has been carried out in accordance with the monitoring plan contained in the registered PDD /2/.*

## **3.4 Assessment of data and calculation of greenhouse gas emission reductions**

**Verification Opinion:** During OSV, the verification team checked the implementation process and actual monitoring plan (including the monitoring parameters, organization, data monitoring, methods, data collection, equipment maintenance, revised QA/QC procedures for missing data handling) via document reviews and interviews with project participants, monitoring personnels and users; after that the verification team confirms that the implementation of the project activity and the monitoring plan are consistent with the registered PDD /2/ and the subsequent monitoring report.

### **The assessment of the uncertainty level of the data for calculating the emission reductions**

For measuring the monitoring parameter (a), the number of solar cookers operating during the 1<sup>st</sup> monitoring period was assessed once (i.e. 9<sup>th</sup> October 2010 to 29<sup>th</sup> October 2010) which fulfills the frequency of monitoring (i.e. once per year). The monitoring was conducted by 10 monitoring groups. Each group has two person, among them one is from NXFI and the other is from the independent contracting party, XRES to ensure the collected data has been crosschecked by each other. The uncertainty level of data for monitoring parameter (a) is low.

For measuring the monitoring parameter (b), the daily usage hours of 310 sampling users were firstly reported by the users everyday, then recorded by the monitoring personnels of XRES, next submitted the raw monitoring data to NXFI monthly. No missing data is found within the 1<sup>st</sup> monitoring period. The verification team checked the monitoring procedure, monitoring records and further interviewed the relevant monitoring personnels, and confirmed the uncertainty of data for monitoring (b) is low.

*Hence the verification team considers that the uncertainty level of monitoring data is low.*

### **Monitoring period**

#### **- Baseline emissions**

According to the registered PDD /2/, the baseline emissions (see the Section 3.3.1 for details) are calculated as,

$$BE_y = n * \sum [773.5 * (R_i / 700) * t_i * (3.6 \times 10^{-9})] * EF_{CO_2} / \eta_{th}$$

Where n: the total number of solar cookers installed by the proposed project (i.e. monitoring parameter (a));

R<sub>i</sub>: the actual solar irradiance rate in month i in W/m<sup>2</sup> (the fixed value since as the ex-ante approach is selected);

t<sub>i</sub>: the usage time of each solar cooker in month i in hour (i.e. monitoring parameter (b));

EF<sub>CO<sub>2</sub></sub>: The CO<sub>2</sub> emission factor per unit of coal (i.e. 94.6 tCO<sub>2</sub>e/TJ; the fixed value since as the ex-ante approach is selected);

η<sub>th</sub>: The efficiency of the cooker in Xiji County using fossil fuel (i.e. 15%) that would be used in the absence of the project activity.

There are two parameters, i.e. n: the total number of solar cookers installed by the proposed project; and t: the average usage time of each solar cooker. The following tables demonstrated the monitoring (a) and (b) and calculations of baseline emissions during the 1<sup>st</sup> monitoring period. The data is reference to the monitoring report /1/, registered PDD /2/ and crosschecked with the monitoring records /11.1/~11.2/, independent check records /12/ and ER spreadsheet /4/ on-site.

Calculation table 1: The number of solar cookers operating during the 1<sup>st</sup> monitoring period

Town No.	Name of townships involved	Number of Solar Cookers in
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		<b>Operation (in monitoring report /1/)</b>
1	Shagou	500
2	Baiya	399
3	Huoshizhai	1241
4	Xinying	949
5	Hongyao	700
6	Tianping	1157
7	Pingfeng	500
8	Wangmin	450
9	Xinglong	2585
10	Jiangtai	953
11	Shizi	1439
12	Malian	782
13	Xitan	855
14	Xiaohe	598
15	Jiqiang	2367
16	Piancheng	696
17	Majian	996
18	Zhenhu(formerly Supu) /25/	1134
19	Xinping	699
	<b>Total</b>	<b>19,000</b>

From the above table, the verification team verified the original monitoring records for monitoring (a) /11.1/ and found that the total number of solar cookers operating was correct.

Calculation table 2: The average usage hours per solar cooker (i.e. indicated per sampling user) during the 1<sup>st</sup> monitoring period

<b>Period (day/month/year)</b>	<b>Average Usage Time Per User in the Month (Hour)</b>
12/02/2010 – 28/02/2010	0
01/03/2010 – 31/03/2010	86.49
01/04/2010 – 30/04/2010	143.43
01/05/2010 – 31/05/2010	122.06
01/06/2010 – 30/06/2010	135.57
01/07/2010 – 31/07/2010	131.96
01/08/2010 – 31/08/2010	142.80
01/09/2010 – 30/09/2010	109.67
01/10/2010 – 31/10/2010	128.79
<b>Average</b>	<b>125.10</b>

From the calculation table 2, the verification team checked the original monitoring records /11.2/ and found that the average usage hours per solar cooker each month during the 1<sup>st</sup> monitoring period are correct and traceable.

Calculation table 3: Baseline emissions of the project activity during the 1<sup>st</sup> monitoring period

	<b>Solar</b>	<b>Actual Power</b>	<b>Monthly</b>	<b>Net Heat</b>	<b>CER</b>
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	irradiance rate (from PDD)	of Solar Cooker (from PDD)	Usage Time	Supplied Monthly	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
<b>Month</b>	(W/m <sup>2</sup> )	(W)	(hr)	(TJ)	(tCO <sub>2</sub> e)
12/02/2010 – 28/02/2010	496.4	548.5	0	0	0
01/03/2010 – 31/03/2010	567.9	627.5	86.49	3.71259	2341
01/04/2010 – 30/04/2010	642.3	709.7	143.43	6.96316	4391
01/05/2010 – 31/05/2010	701.5	775.2	122.06	6.47161	4081
01/06/2010 – 30/06/2010	693.8	766.6	135.57	7.10923	4484
01/07/2010 – 31/07/2010	722.1	797.9	131.96	7.20224	4542
01/08/2010 – 31/08/2010	717.9	793.3	142.80	7.74821	4887
01/09/2010 – 30/09/2010	721.9	797.7	109.67	5.98407	3774
01/10/2010 – 31/10/2010	581.0	642.0	128.79	5.65577	3567
<b>Total</b>					<b>32067<sup>6</sup></b>

The baseline emissions are calculated according to the approved equations, e.g.

$$BE_y = n \cdot \sum [773.5 \cdot (R_i / 700) \cdot t_i \cdot (3.6 \times 10^{-9})] \cdot EF_{CO_2} / \eta_{th};$$

*Since as the monitoring parameters (a) and (b) are correctly determined, the calculations are correct and traceable from the emission reduction calculation spreadsheet, the baseline emissions are equal to 32,067 tCO<sub>2</sub>e.*

#### – Project emissions

As verified in Section 3.3.1, according to the methodology AMS-I.C./ Version 13 and the registered PDD /2/, the project activity is a new installation of renewable solar cooker project, the project emissions are considered as zero, i.e.  $PE_y = 0$ , and thus no monitoring is required.

#### – Leakage emissions

<sup>6</sup> The total baseline emissions of 32,067 tCO<sub>2</sub>e were calculated by summing up the all the monthly baseline emissions and then the total being rounded down to its nearest integer.

As verified in Section 3.3.1, according to the methodology AMS-I.C./ Version 13 and the registered PDD /2/, the project activity is a new installation of renewable solar cooker project, no leakage is required to be considered, i.e.  $L_y = 0$ , and thus no monitoring is required.

The total emission reductions (ER<sub>y</sub>) during the 1st monitoring period are equal,

$$ER_y = BE_y - PE_y - L_y = 32,067 \text{ tCO}_2\text{e} - 0 - 0 = 32,067 \text{ tCO}_2\text{e}$$

### **Comparison with the estimated emission reduction in the registered PDD**

It is noted with the claimed emission reductions during the 1<sup>st</sup> monitoring period is 32,067 tCO<sub>2</sub>e, which is less than the estimated average emission reductions in the Section 6.3 of PDD (i.e. 32,318 tCO<sub>2</sub>e, 12<sup>th</sup> February to 31<sup>st</sup> October each year). The verification team verified and confirmed as below:

(i) The average usage hours per solar cooker are ranging 86.49 – 143.43 (average as 125.10) hours per month from 2<sup>nd</sup> March 2010 – 31<sup>st</sup> October 2010, which is the higher than the estimated 120 hours per month in the PDD. Referring to the PDD (i.e. Section 7.1, parameter 2 and footnote 22, in page 21), it states that,

“According to the Explanation on Solar Cooker Usage Time and Cooking Habits in Xiji County (by Bureau of Agriculture, Graze and Science & Technology of Xiji County, April 2008), to meet the daily cooking and water-boiling need of a rural family using solar cooker, the daily usage time of the solar cooker is at least 4 hours. Therefore the monthly usage is:  $4 \times 30 = 120$  hours.”

*Thus, it clearly states the estimated 120 hours/ month is the conservative estimation. The actual data can be higher than that.*

(ii) Referring to the PDD (i.e. Annex 3 Baseline Information), it provides the monthly average sunlight hours in Xiji county from 1998-2007<sup>7</sup>. By comparing with the actual monthly average usage hours per solar cooker, *the actual usage time is within and below than the monthly average sunlight hours (see the below table).*

	<b>Monthly Sunlight time in Xiji County as per PDD Annex 3</b>	<b>Actual Monthly Usage Time</b>
<b>Month</b>	Unit: Hour	Unit: Hour
2	167.3	0
3	197.6	86.49
4	219.7	143.43
5	235.6	122.06
6	232.2	135.57
7	220.8	131.96
8	204.7	142.80
9	254.3	109.67

<sup>7</sup> Data Source: Ningxia Meteorological Archive

10	159.7	128.79
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(iii) During on-site interviews with the sampling users /viii-xiii/, they expressed that they used their solar cookers every sunshine day from morning to afternoon owing to the easy use & stable performance of the solar cookers, and the incentive of reducing coal consumption, *The average daily usage hours were normally around 4-5 hours/day.* By crosschecking the raw data /11.2/ of daily usage hours, the daily usage hours for each sampling users were around 4-5 hours per day and the fluctuation range was less than one hour in general between the users.

**Conclusion:** Based on document review, i.e. PDD, monitoring records /11.2/, /12/, on-site interviews & observation, the verification team considers that the average daily usage hours are real, measurable and sometimes more than the estimated 4 hours/day & 120 hours/month. *Therefore, the claimed emission reductions are also real, measurable and not contradict to the PDD.*

By checking the additionality, referring to the PDD, it demonstrates that the almost income of the project comes from the sales of CERs. Without CERs revenue, the project itself is not financially feasible. Thus, more CERs generated will not affect the additionality of the project.

***As the above assessment, the verification team can confirm that the GHG emission reductions of the project activity as stated in the monitoring report /1/ is correct and achieved.***

### 3.5 Issues remaining from the previous verification period

Since this is the first verification of the project activity, this section is not applicable.

## **Appendix A**

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### **CDM Verification protocol**

Ningxia Federal Solar Cooker Project

in P.R. China

Report No. 01 997 9105046486-1st VE

**Table 1: Verification requirements**

(based on §56, §57 and §62 of the CDM Modalities and Procedures and on CDM Verification and Verification Manual, Annex 3 of EB51)

Checklist question	Ref.	MoV <sup>8</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
<b>1. Implementation</b>					
1.1 Have all physical features proposed in the registered PDD been implemented at the project site?	/2/ /3/ /8.1/-8.4/	DR I OSV	<p>Yes. The project activity is to install 19,000 solar cookers which are located in the northern rural areas of Xiji County, Ningxia Hui Autonomous Region. The project activity consists of 19,000 households from 19 townships (Xinping, Majian, Piancheng, Jiqiang, Xiaohe, Xitan, Malian, Shizi, Xinglong, Wangmin, Pingfeng, Tianping, Hongyao, Xinying, Huoshizhai, Baiya, Shagou, Jiangtai, Supu /25/) of Xiji County. The total installed capacity is 14.7MW<sub>thermal</sub> which consists of 19,000 parabolic type solar cookers with 773.5W rated power per unit.</p> <p>The verification team also checked the physical features of using equipment via signed contracts and on-site observation. A CL is raised since the invoice signed was before the signature of the solar cooker purchasing contract.</p> <p><b>CL02:</b> It seems not logic for the project solar cooker contracts signed in Oct. 2009 and the invoice is issued in September. Please</p>	<b>CL02</b>	OK (Refer to Table 2)

<sup>8</sup> MoV = Means of Verification, DR = Document Review, I = Interview, www = internet search.

Checklist question	Ref.	MoV <sup>8</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			<p>explain.</p> <p>Thus, the verification team can confirm the project activity has been implemented as described in registered PDD /2/.</p>		
<p>1.2 Has the project activity been operated in accordance with the project scenario described in the registered PDD and relevant guidance?</p> <p>Reference: &lt;<a href="http://cdm.unfccc.int/EB/033/eb33rep.pdf">http://cdm.unfccc.int/EB/033/eb33rep.pdf</a>&gt;, §75</p>	<p>/2/ /7/ /8.1- 8.4/ /13/ /14/</p>	<p>DR I OSV</p>	<p>Yes. The verification team has confirmed that the project activity has been operated in accordance with the project scenario described in the registered PDD /2/ and relevant guideline.</p> <p>By further review the register PDD/2/ in UNFCCC website and the monitoring report /3.2/, it is confirmed that the operation and monitoring of the project activity is started on 12<sup>th</sup> February 2010. The 1<sup>st</sup> monitoring period is from 12<sup>th</sup> February 2010 to 31<sup>st</sup> October 2010.</p>	OK	OK
<p>1.3 If the project activity is implemented on a number of different locations, has the Monitoring report provided the verifiable starting dates for each site?</p>	<p>/2/ /3/</p>	<p>DR</p>	<p>Idem. The project owner, NXFI distributed the solar cookers to 19,000 participant households evenly from 1<sup>st</sup> to 30<sup>th</sup> March 2010 via the manufacturers and the operation contractor /7/, i.e. Xiji County Rural Energy Station (XRES) which were after the registration as a CDM project. Therefore, the actual operation and monitoring of the project activity is started on 2<sup>nd</sup> March 2010. Nonetheless, the project is deemed 12<sup>th</sup> February 2010 due to the indicated starting date of crediting</p>	OK	OK

Checklist question	Ref.	MoV <sup>8</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			period of the project in UNFCCC's project page. The verification team confirmed the starting date of the project activity from the 1 <sup>st</sup> periodic verification report /3.1/ and its monitoring report /3.2/.		
<b>2. Monitoring plan and methodology</b>					
2.1 Is the monitoring plan established in accordance with the monitoring methodology?	/1/ /2/ /6/	DR	Yes. The monitoring plan complies with the requirement of applied monitoring methodology AMS-I.C./ Version 13. The applied AMS-I.C./ Version 13, clause 17 states that, if the emission reductions per system are less than 5 tonnes of CO <sub>2</sub> a year, (a) Recording the number of systems operating annually; (b) Estimating the hours of operation of an average system, if necessary using survey methods.	OK	OK
2.2 In case the implemented monitoring plan defers from the monitoring methodology, has any requests for revision to or deviation from the monitoring methodology been officially communicated to the CDM EB? Reference: < <a href="http://cdm.unfccc.int/EB/033/eb33rep.pdf">http://cdm.unfccc.int/EB/033/eb33rep.pdf</a> >, §84, §58	/1/ /2/ /3/ /5/ /6/	DR	Not applicable. No revision or deviation from the monitoring methodology is required.	OK	OK
2.2.1 Have the above changes to the monitoring plan been approved by the CDM EB?	/1/ /2/ /3/ /5/ /6/	DR	Idem.	OK	OK

Checklist question	Ref.	MoV <sup>8</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
<b>3. Monitoring and the monitoring plan</b>					
3.1 Is monitoring established in full compliance with the monitoring plan, contained in the registered PDD (or new monitoring plan approved by the CDM EB)?	/1/ /2/	DR I	<p>Yes. The verification team checked the actual monitoring via document check and on-site interviews with the project owner, NXFI, XRES monitoring personnels and participating users, and confirmed that the monitoring plan contained in the registered PDD /2/ has been strictly followed. A CL is raised to clarify the monitoring personels against the monitoring plan.</p> <p><b>CL01:</b> Please demonstrate the list of project monitoring personnel to verification team. How many personnel are allocated to Monitoring Group A and Group B separately?</p>	<b>CL01</b>	OK (Refer to Table 2)
3.2 Are all baseline emission parameters monitored and updated in accordance with monitoring plan, monitoring methodology and relevant CDM EB decisions?	/1/ /2/ /5/ /6/	DR	<p>According to the registered PDD /2/, the baseline emissions (see the Section 3.3.1 for details) are calculated as,</p> $BE_y = n * \sum [773.5 * (R_i / 700) * t_i * (3.6 \times 10^{-9})] * EF_{CO_2} / \eta_{th}$ <p>Where  n: the total number of solar cookers installed by the proposed project (i.e. monitoring parameter (a));  R<sub>i</sub>: the actual solar irradiance rate in month i in W/m<sup>2</sup> (the fixed value since as the ex-ante approach is selected);  t<sub>i</sub>: the usage time of each solar cooker in</p>	<b>CL03</b>	OK (Refer to Table 2)

Checklist question	Ref.	MoV <sup>8</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			<p>month i in hour (i.e. monitoring parameter (b));</p> <p>EFCO<sub>2</sub>: The CO<sub>2</sub> emission factor per unit of coal (i.e. 94.6 tCO<sub>2</sub>e/TJ; the fixed value since as the ex-ante approach is selected);</p> <p><math>\eta_{th}</math>: The efficiency of the plant using fossil fuel (i.e. 15%) that would be used in the absence of the project activity.</p> <p>There are two parameters to be monitored during the 1<sup>st</sup> monitoring period (n &amp; t<sub>i</sub>), others are fixed value as the ex-ante approach. All of them are according to the applied baseline and monitoring methodology AMS-I.D./ Version 13. Since no evidence was provided for showing each users were visited by the monitoring team as mentioned in the MR, a CL is raised.</p> <p><b>CL03:</b></p> <p>Please provide evidence to show that “during Oct. 9~29,2010, the monitoring team has visited once each of the users that received the solar cooker, and checked if the solar cookers received are in operation” which was indicated in the monitoring process on page 4 of MR version 1.</p>		
3.2.1 Was the monitoring equipment for baseline emission parameters controlled and monitoring	/1/ /2/ /6/	DR I	Yes. For monitoring (a), number of systems operating will be monitored at least once	OK	OK

Checklist question	Ref.	MoV <sup>8</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
results recorded as per approved frequency?			per year, no monitoring equipment is required.  For monitoring (b), average operating hours per system will be continuously measured and recorded monthly. The monitoring equipment is the timer (e.g. clock, watch).		
3.2.2 Was the monitoring equipment for baseline emission parameters calibrated in accordance with QA&QC procedures described in the registered monitoring plan?	/1/ /2/ /6/ /9.1- 9.4/ /17/ /18/	DR	Owing to the project nature, there is no need for use of any monitoring equipment/device in the project monitoring. The equipment accuracy would rely very much on the performance of the heat generation unit, i.e. the solar cooker itself. The guarantee of the solar cooker performance before and during the project operation is being responsible by the manufacturers. The solar cooker manufacturers have to certify through passing the tests of solar cookers annually in accordance with the national standard for solar cooker (GB: NY/T219-2003) so as to ensure the quality of producing solar cookers every year.	OK	OK
3.3 Are all project emission parameters monitored and updated in accordance with monitoring plan, monitoring methodology and relevant CDM EB decisions?	/2/ /6/	DR	According to the methodology AMS-I.C./ Version 13 and the registered PDD /2/, the project activity is a new installation of renewable solar cooker project, the project emissions are considered as zero, i.e. PE <sub>y</sub> = 0, and thus no monitoring is required.	OK	OK

Checklist question	Ref.	MoV <sup>8</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
3.3.1 Was the monitoring equipment for project emission parameters controlled and monitoring results recorded as per approved frequency?	/2/ /6/	DR	Idem.	OK	OK
3.3.2 Was the monitoring equipment for project emission parameters calibrated in accordance with QA&QC procedures described in the registered monitoring plan?	/2/ /6/	DR	Idem.	OK	OK
3.4 Are all leakage emission parameters monitored and updated in accordance with monitoring plan, monitoring methodology and relevant CDM EB decisions?	/2/ /6/	DR	According to the methodology AMS-I.C./ Version 13 and the registered PDD /2/, the project activity is a new installation of renewable solar cooker project, no leakage is required to be considered, i.e. $L_y = 0$ , and thus no monitoring is required.	OK	OK
3.4.1 Was the monitoring equipment for leakage emission parameters controlled and monitoring results recorded as per approved frequency?	/2/ /6/	DR	Idem	OK	OK
3.4.2 Was the monitoring equipment for leakage emission parameters calibrated in accordance with QA&QC procedures described in the registered monitoring plan?	/2/ /6/	DR	<b><u>FAR01</u></b> It is noted by the verification team that by referring to the PDD and on-site interviews, the QA/QC procedures for handling missing or damaged data is not clear enough to quantify in emission reductions of the project activity. There is no missing or damaged data happened to the indicated monitoring period, but should be clarify for further monitoring use. Please demonstrate the detailed procedures/ measures for handling the missing,	FAR01	OK (Refer to Table 2)

Checklist question	Ref.	MoV <sup>8</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			damaged data.		
3.5 Were all monitoring parameters available and verifiable through the whole monitoring period?	/1/ /2/ /6/ /11.1- 11.2/	DR I	<p>Yes. The verification team confirms that all monitoring parameters were available and verifiable through the 1<sup>st</sup> monitoring period (i.e. 12<sup>th</sup> February 2010 to 31<sup>st</sup> October 2010) as below,</p> <ul style="list-style-type: none"> <li>➤ monitoring records /11.1/ for monitoring (a);</li> <li>➤ monitoring records /11.2/ for monitoring (b);</li> <li>➤ and the data/ parameters not being monitored which are available in the registered PDD.</li> </ul>	OK	OK
3.5.1 In case, only partial monitoring data is available and PP(s) provide estimations or assumptions for the rest of data, was it possible to verify those estimations and assumptions? Reference: < <a href="http://cdm.unfccc.int/EB/026/eb26rep.pdf">http://cdm.unfccc.int/EB/026/eb26rep.pdf</a> >, §109(b)	/1/ /2/ /6/ /11.1- 11.2/	DR I	Not applicable. See 3.5	OK	OK
3.6 Was management and operation system established and operated in accordance with the monitoring plan?	/1/ /2/ /6/ /10/	DR I	During OSV, the project owner demonstrated the CDM monitoring organization of the project which was the same as Section B.7.2 of the PDD /2/. It can be classified into 4 categories as following,	<b>CL01</b>	OK (Refer to Table 2)

Checklist question	Ref.	MoV <sup>8</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			<ol style="list-style-type: none"> <li><b>The director of CDM group</b>, Mr. Jiang Wei, who is also the general manger of NXFI, in-charge of the CDM project monitoring and management;</li> <li><b>CDM consultant</b>, Clear Air Trade Inc., Mr. Ning Ju, who is responsible for providing consultation services on CDM validation and verification of the project, including preparation of PDD /2/, Monitoring report and so on; directly reports to the Director;</li> <li><b>NXFI's CDM monitoring staff</b>, including (i) data checker, (ii) data analyst and (iii) data recording for the management of all monitoring data &amp; records; (iv) monitoring team for monitoring parameter (a);</li> <li><b>Xiji County Rural Energy Station (XRES)</b>, who has 12 monitoring personnels including the Station Head Mr. Zhang, is responsible for monitoring (a) and (b). Monitoring team (a) (i.e. 10 groups and two person per group) works with NXFI's monitoring team for monitoring parameter (a); monitoring team (b) (i.e. 7 groups, one person per group) of XRES collects and records the daily usage hours of the 310 sampling users and reports to NXFI on monthly basis.</li> </ol> <p>Based on the interview results and the monitoring organization provided by NXFI</p>		

Checklist question	Ref.	MoV <sup>8</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			/10/, the verification team confirms that the monitoring responsibility of each monitoring personnel was handled according to the monitoring plan of PDD /2/ and the responsible personnels are clearly aware of monitoring procedures and are capable to work on their responsibilities.		
3.7 Was is it possible to verify that involved management and operation personal is fully aware of the responsibilities and perform all operations according to the registered monitoring plan and internally developed manuals?	/1/ /10/ /16.1-16.3/	DR I	Refer to CL01	<b>CL01</b>	OK (Refer to Table 2)
<b>4. Parameters</b>					
<b>4.1 Monitored parameter</b> Title: Indication: Units: Estimated value ( <i>ex-ante</i> ): Measured value ( <i>ex-post</i> ):	/1/ /2/ /6/ /11.1 - 11.2/	DR I OSV	Monitoring (a): Title: The number of solar cookers operating annually; Indication: n Unit: no Estimated value ( <i>ex-ante</i> ): 19,000 Measured value ( <i>ex-post</i> ): 19,000.  The parameter (a) was checked by the monitoring team (a) once per year to verify the number of systems in operation.  The verification team checked the monitoring records (a) /11.1/ and confirmed that the total number of systems in	<b>OK</b>	OK

Checklist question	Ref.	MoV <sup>8</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			<p>operation is correct.</p> <p>Monitoring (b):  Title: The average operating hour of each each system;  Indication: t  Unit: hour  Estimated value (<i>ex-ante</i>): 120 hr/ month  Measured value (<i>ex-post</i>): 127.60 – 166.88 hr/ month</p> <p>The parameter (b) was monitored by the XRES monitoring personnels everyday and reported to NXFI monthly.</p> <p>The verification team checked the monitoring records (b) /11.2/; the daily reporting records from the users to the XRES monitoring personnels; and crosschecked by interviews with users to confirm their using habit, reporting means, average daily usage hours, and thus, confirmed the data is real, conservative, and measureable.</p>		
4.2 <b>Default parameter</b> Title: Indication: Units:	/1/ /2/ /6/	DR	<b>There are totally 6 data/ parameters not being monitored and act as the default parameters. All of them are used for baseline emission calculation as below,</b>	<b>CL04</b>	OK (Refer to Table 2)

Checklist question	Ref.	MoV <sup>8</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion										
Default/Used value:			<p><b>-Baseline Emissions Equation:</b></p> $BEy = n * \sum [773.5 * (Ri / 700) * ti * (3.6 \times 10^9)] * EF_{CO_2} / \eta_{th}$ <p><b>Parameter 1:</b> Ri is the actual solar irradiance rate in month i in W/m<sup>2</sup> (Refer to the Annex 3 of the PDD /2/, i.e. 2000-2007 average monthly solar irradiance value provided by Ningxia Hui Autonomous Region Meteorological Archives).</p> <p><b>Parameter 2:</b> R: the standard solar irradiance used for calculating rated power (i.e. 700W/m<sup>2</sup>);</p> <p><b>Parameter 3:</b> A: Light collection Area (i.e. 1.7m<sup>2</sup>);</p> <p><b>Parameter 4:</b> <math>\eta_{solar}</math>: thermal efficiency of solar cooker (i.e. 65%).</p> <p><b>Parameter 5:</b> EFCO<sub>2</sub>: The CO<sub>2</sub> emission factor per unit of coal (i.e. 94.6 tCO<sub>2</sub>e/TJ; the fixed value since as the ex-ante approach is selected);</p> <p><b>Parameter 6:</b> <math>\eta_{th}</math>: The efficiency of the coal-fired stoves using fossil fuel (i.e. 15%) that would be used in the absence of the project activity.</p> <table><tr><td></td><td><i>Ri</i></td></tr><tr><td>Month</td><td>(W/m2)</td></tr><tr><td>2</td><td>167.3</td></tr><tr><td>3</td><td>197.6</td></tr><tr><td>4</td><td>219.7</td></tr></table>		<i>Ri</i>	Month	(W/m2)	2	167.3	3	197.6	4	219.7		
	<i>Ri</i>														
Month	(W/m2)														
2	167.3														
3	197.6														
4	219.7														

Checklist question	Ref.	MoV <sup>8</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion												
			<table><tr><td>5</td><td>235.6</td></tr><tr><td>6</td><td>232.2</td></tr><tr><td>7</td><td>220.8</td></tr><tr><td>8</td><td>204.7</td></tr><tr><td>9</td><td>254.3</td></tr><tr><td>10</td><td>159.7</td></tr></table> <p>The verification team confirms all of those default parameters which are consistent with those in registered PDD. However, a CL is raised for clarifying the right time for the test report.</p> <p><b>CL04:</b></p> <p>The solar cookers for the project were provided in March 2010, why one of the reports shows the test was conducted in July 2009. Please clarify.</p>	5	235.6	6	232.2	7	220.8	8	204.7	9	254.3	10	159.7		
5	235.6																
6	232.2																
7	220.8																
8	204.7																
9	254.3																
10	159.7																
5. Calculations																	
5.1 Have all the calculations related to the baseline emissions been carried according to the formulae and methods described in the registered PDD and applied methodology?	/1/ /2/ /6/ /11.1 - 11.2/	DR	The verification team confirms that appropriate formulae and methods have been used.	OK	OK												
5.2 Have all the calculations related to the project emissions been carried according to the formulae and methods described in the registered PDD and applied methodology?	/1/ /2/ /6/	DR	N/A. No calculation is needed for the project emission according to the AMS-I.C./ Version 13.	OK	OK												
5.3 Have all the calculations related to the leakage emissions been carried according to the formulae and methods described in the registered PDD and applied methodology?	/1/ /2/ /6/	DR	N/A. No calculation is needed for the leakage emission according to the AMS-I.C./ Version 13.	OK	OK												



Table 2: List of Requests for Corrective Action (CAR) and Clarification (CL)

No.	Type of request	Observation	Reference (Table 1)	Summary of project owner response	Verification team conclusion
1.	CL	<p><b><u>CL01:</u></b></p> <p>Please demonstrate the list of project monitoring personnel to verification team. How many personnel are allocated to Monitoring Group A and Group B separately?</p>	3.1	<p><b><u>1<sup>st</sup> Response from PP:</u></b></p> <p>The number of people for A type monitoring is 13 (one team leader and 6 groups, each of which consists of two people) ,</p> <p>and the number of people for B type monitoring is 5 (one team leader and 4 groups, each of which consists of one person)</p> <p><b><u>2<sup>nd</sup> Response from PP:</u></b></p> <p>Please see the attached "Overall monitoring record A and B" which contains the list of monitoring personnel.</p> <p>Please note that there is a correction on PP's last response: The number of people for A type monitoring is 20 (10 groups, each of which consists of 2 people).</p>	<p><b><u>Follow-up 1:</u></b></p> <p>Please provide the list of project monitoring personnel to verification team.</p> <p><b><u>Conclusion:</u></b></p> <p>Yes, the list of project monitoring personnel has been provided to verification team, There are 10 groups ( 2 member per group) of monitoring team for type A monitoring, 7 groups (1 member per group )of monitoring team for type B monitoring. The verification team confirms it is valid. This CL is therefore closed.</p>
2.	CL	<p><b><u>CL02:</u></b></p> <p>It seems not logic for the project solar cooker contracts signed in Oct. 2009 and the invoice is issued in September 2010. Please explain.</p>	1.1	<p>Actually the project was registered on 12 Feb. 2010, and the cooker distribution started in Mar 2011. The invoice is issued upon request. After the distribution of the cooker, the project owner was busy handling project monitoring and did not</p>	<p>Since the project was started after it was successful registered in the UNFCCC on 12<sup>th</sup> February 2010, the solar cookers were purchased and distributed to the final users in March 2010. The project owner can estimate the project can be</p>

				request the invoice until September 2010, which is why the receipt was provided in September 2010.	registered so the contract was signed in advance, but the implementation of the contract is the successful registration of the project. There is a delay of invoice delivery because the project owner is busy on the project monitoring issue. This explanation is acceptable. This CL is closed.
3.	CL	<b><u>CL03:</u></b> Please provide evidence to show that “during Oct. 9~29,2010, the monitoring team has visited once each of the users that received the solar cooker, and checked if the solar cookers received are in operation” which was indicated in the monitoring process on page 4 of MR version 1.	3.2	<b><u>1<sup>st</sup> Response from PP:</u></b> All the monitoring forms (for the monitoring of total numbers of cookers operating) have the date of visit, the signature of monitoring team who checked the cooker, and the status of the cooker. These monitoring forms are the evidence of the site visit during Oct. 9-29, 2010. <b><u>2<sup>nd</sup> Response from PP:</u></b> Please see the attached “Overall monitoring record A and B - Proj 2924” which contains the information above.	<b><u>Follow-up 1:</u></b> The “overall of the monitoring records” is too simple; please indicate the solar cooker quantities for each township or for each monitoring personnels in this record, this record should be signed with date by responsible person.  <b><u>Conclusion:</u></b> The detailed “Overall monitoring record A and B - Proj 2924” has been provided to verification team which includes the solar cooker quantity associated each townships or monitoring personnels, hence, this CL is closed.
4.	CL	<b><u>CL04:</u></b> The solar cookers for the project were provided in March 2010, why one of the reports shows the test was conducted in July 2009. Please	4.2	The testing report is the official accreditation of the quality of a particular product (e.g., solar cooker) from a particular manufacturer during a particular period, including the processes and materials involved, as well as the capability of producing	Yes, the test report from the national accredited institute shows the solar cooker can meet the national standard, that report shows manufacturer’s product can be considered as a product meeting the quality requirement

		clarify.		<p>that product by the manufacturer.</p> <p>With a testing report in July 2009, a manufacturer's product can be considered as a product meeting the quality requirement during 2009. The solar cookers for the project were made in late 2009. Therefore, these cookers can be considered as a product that meets the quality requirement.</p>	<p>during 2009 since normally the regular test was done once per year in China. Hence the explanation is clear and this CL is closed.</p>
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**Table 3: List of forward action requests (FARs)**

FAR number	Observation	Reference	Summary of project participants' response	Verification team conclusion
FAR1	<p><b><u>FAR01</u></b></p> <p>It is noted by the verification team that by referring to the PDD and on-site interviews, the QA/QC procedures for handling missing or damaged data is not clear enough to quantify in emission reductions of the project activity. There is no missing or damaged data happened to the indicated monitoring period, but should be clarify for further monitoring use. Please demonstrate the detailed procedures/ measures for handling the missing, damaged data.</p>	3.4.2	<p>According to PDD of the project, the following is the procedures for missing or damaged data. The future monitoring process will follow the following process:</p> <p>If the data record is missing, wrong or damaged, the following process will be conducted:</p> <p>1. The general principle is that zero value will be used for the missing, wrong or damaged data. This is most conservative approach. The monitoring personnel will be 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 will be required to strictly abide by the above conservative principle in data recording, i.e., use zero values for all the wrong, missing, or damaged data.</p> <p>2. If this is due to the working error of the CDM group personnel, further train the personnel until he or she can perform the job properly. And in the mean time, use zero value for the missing, wrong, or damaged data;</p>	<p>Yes, it is acceptable that using zero value for the missing, damaged and wrong data if it appears:</p> <p>As the monitoring person was trained before the project starting date. Once the monitoring person made mistakes, a re-training was planned for preventing it from re-occurring;</p> <p>Once the contracted entity (i.e. XRES) is not properly implementing the monitoring process, the project owner will ask the RES to change the persons or the groups.</p> <p>If the data reported by the user significantly deviates from the normal range, the monitoring personnel should ask for the reason and record such reason on the monitoring form.</p> <p>All the measures listed here are effective to make the monitoring data are precise, transparent, conservative and traceable. Hence, the measures for the CL so far is OK, the effectiveness should be followed in the following verification stages.</p>

			<p>3. If this is due to the inability or attitude of a particular worker in CDM group, dismiss such worker and re-hire those with proper ability and attitude. And in the mean time, use zero value for the missing, wrong, or damaged data;</p> <p>4. If a CDM group 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 CDM group according to the requirement of Ningxia Federal Intertrade Co.</p> <p>5. If the data reported by the user significantly deviates from the normal range, the monitoring personnel should ask for the reason and record such reason on the monitoring form.</p> <p>If the monitoring results are satisfactory in terms of correct reporting, data completeness and correct analysis, the data will be accepted for the monitoring report.</p>	
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## **Appendix B**

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Certification statement  
to the Verification Report 01 997 9105046486-1st VE

## Certification statement

TUV Rheinland (China) Ltd., the DOE, has performed the 1<sup>st</sup> periodic verification of the registered CDM project activity (No. 2924), “Ningxia Federal Solar Cooker Project” in P.R.China. The project activity is designed to generate emission reductions by utilizing the solar thermal energy from the designated solar cookers.

The verification was performed to identify the compliance of the project activity with implementation and monitoring requirements, and to verify the actual amount of achieved emission reductions.

The verification is based on:

- PDD/ Version 19, registered with the CDM Executive Board on 12-12-2009;
- Approved monitoring methodology AMS-I.C. “Thermal energy for the user with or without electricity”, Version 13;
- Monitoring report/ Version 4, dated 31<sup>st</sup> October 2011;

This statement covers verification period of around 8 months between 12<sup>th</sup> February 2010 and 31<sup>st</sup> October 2010.

The DOE has raised 4 clarifications and 0 corrective action requests, all of which have been successfully resolved by PPs. A Forward action request has been also raised and shall be addressed and verified during the next periodic verification.

The DOE, herewith certifies that the project activity, achieved emission reductions by sources of GHG equal to 32,067 tCO<sub>2</sub> and all monitoring requirements have been fulfilled.

2011-12-30

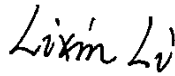
Date



Mr. Praveen N. Urs  
DOE Manager  
TÜV Rheinland (China) Ltd.

2011-12-30

Date



Ms. Lixin Li  
Technical Reviewer  
TÜV Rheinland (China) Ltd.

2011-12-29

Date



Mr. Harold Hai  
Team Leader  
TÜV Rheinland Hong Kong  
Ltd.

## **Appendix C**

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### Certificates of Competence

## Qualification

Hai, Harold /

### Emission Trading

#### United Nations Framework Convention on Climate Change

Auditor No.:  
(AuditorenRegNr)

Appointed:  
(Zugelassen)

☒ ja

Qualification Level: Auditor  
(Qualifikationsstufe)

External:  
(Externer)

☐ ja

Add. reviewer: ☐ yes  
(Zusätzlicher Prüfer)

EAC Scopes:  
(EAC Branchen)

CDM 13 - Waste handling and disposal  
CDM 01 - Energy industries (renewable - / non-renewable sources)

Add. qualification:  
(zus. Qualifikation)

First Appointment:  
(Erstberufung)

12/19/2007

Valid to:  
(Gültig bis)

09/25/2012

Remarks:

2010-10: revised to meet Accreditation Standard Ver.02:  
- CDM 01 limited to TA1.2 - Renewable Energies  
- CDM 13 limited to TA 13.1- Waste handling & disposal

Languages:

Chinese  
English  
Mandarin  
Chinese simplified  
Chinese traditional

### Experience Exchange

Date

Location

Remarks

Accreditation(s)

### Monitoring

Latest Monitoring:  
(letzte Beurteilung)

Next  
Monitoring:  
(nächste  
Beurteilung)

Remarks:

[View / Edit Monitoring](#)

## History of scope allocation

Date:	2010-04-15
Change:	CDM 01 Energy Industries added
By:	Manfred Brinkmann
Reason:	Scope 1: limited to renewable energies except biomass power generation / geothermal
Date:	2007-12-20
Change:	EAC CDM added
By:	Manfred Brinkmann
Reason:	

## History

Created:	12/19/2007 02:32:34 PM	Harold Hai/Hk/Chn/TUV
Modified:	01/31/2011 09:25:37 AM	Cuiping Deng/Bj/Chn/TUV
	01/04/2011 03:16:31 PM	Manfred Brinkmann/Jpn/TUV
	ZE9	Manfred Brinkmann/Jpn/TUV
	01/04/2011 03:16:11 PM	Manfred Brinkmann/Jpn/TUV
	ZE9	Manfred Brinkmann/Jpn/TUV
	01/04/2011 03:15:12 PM	
	ZE9	
	09/13/2010 02:53:26 PM	
	ZE9	

## Qualification

Huang, Minglong /

### Emission Trading

#### United Nations Framework Convention on Climate Change

Auditor No.:  
(AuditorenRegNr)

Appointed:  
(Zugelassen)

☒ ja

Qualification Level:  
(Qualifikationsstufe)

External:  
(Externer)

☐ ja

Add. reviewer: ☐ yes  
(Zusätzlicher Prüfer)

EAC Scopes:  
(EAC Branchen)

CDM 01 - Energy industries (renewable - / non-renewable sources)  
CDM 05 - Chemical industry  
CDM 11 - Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride  
CDM 12 - Solvents use

Add. qualification:  
(zus. Qualifikation)

First Appointment:  
(Erstberufung)

12/28/2009

Valid to:  
(Gültig bis)

12/27/2012

Remarks:

CDM 01 valid for TA1.2 - Renewable Energies  
CDM 5.1 / 11.1 / 12.1 - Chemical process industries

Languages:

Chinese  
Chinese simplified  
English  
Cantonese  
French

### Experience Exchange

Date

Location

Remarks

Accreditation(s)

### Monitoring

Latest Monitoring:  
(letzte Beurteilung)

Next  
Monitoring:  
(nächste  
Beurteilung)

Remarks:

## History of scope allocation

Date:  
Change:  
By:  
Reason:

Date: 2010-03-30  
Change: EAC CDM, CDM, CDM added  
By: Manfred Brinkmann  
Reason: Scope 1 / renewable energies (except biomass)

## History

Created:	01/13/2010 02:23:26 PM	Minglong Huang/Sz/Chn/TUV
Modified:	01/13/2011 03:46:27 PM	Manfred Brinkmann/Jpn/TUV
	ZE9	Manfred Brinkmann/Jpn/TUV
	01/13/2011 03:45:40 PM	Manfred Brinkmann/Jpn/TUV
	ZE9	Manfred Brinkmann/Jpn/TUV
	01/04/2011 03:27:57 PM	Manfred Brinkmann/Jpn/TUV
	ZE9	Manfred Brinkmann/Jpn/TUV
	01/04/2011 03:27:42 PM	Manfred Brinkmann/Jpn/TUV
	ZE9	Manfred Brinkmann/Jpn/TUV
	01/04/2011 03:26:53 PM	
	ZE9	
	01/04/2011 03:25:18 PM	
	ZE9	
	01/04/2011 03:24:11 PM	
	ZE9	
	03/30/2010 01:45:18 AM	
	ZE9	

## Qualification

Li, Lixin /

### Emission Trading

#### United Nations Framework Convention on Climate Change

Auditor No.:  
(AuditorenRegNr)

Appointed:  
(Zugelassen)

☒ ja

Qualification Level:  
(Qualifikationsstufe)

External:  
(Externer)

☐ ja

Add. reviewer: ☒ yes  
(Zusätzlicher Prüfer)

EAC Scopes:  
(EAC Branchen)

CDM 01 - Energy industries (renewable - / non-renewable sources)  
CDM 03 - Energy demand

Add. qualification:  
(zus. Qualifikation)

First Appointment:  
(Erstberufung)

09/06/2010

Valid to:  
(Gültig bis)

09/05/2013

Remarks:

Appointed as Technical Reviewer for  
TA 1.1, 1.2  
TA 3.1

Languages:

### Experience Exchange

Date

Location

Remarks

Accreditation(s)

### Monitoring

Latest Monitoring:  
(letzte Beurteilung)

Next  
Monitoring:  
(nächste  
Beurteilung)

Remarks:

### History of scope allocation

Date:  
Change:  
By:  
Reason:

Date:  
Change:  
By:  
Reason:

Date: 2010-11-08  
Change: EAC CDM, CDM added  
By: Manfred Brinkmann  
Reason: Appointed as Technical Reviewer for

## History

Created:	08/13/2010 11:09:24 AM	Lixin Li/Bj/Chn/TUV
Modified:	11/15/2010 04:02:03 PM	Lixin Li/Bj/Chn/TUV
	11/15/2010 04:01:56 PM	Lixin Li/Bj/Chn/TUV
	11/08/2010 09:36:09 AM	Manfred Brinkmann/Jpn/TUV
	ZE9	Manfred Brinkmann/Jpn/TUV
	11/08/2010 09:28:17 AM	Manfred Brinkmann/Jpn/TUV
	ZE9	Manfred Brinkmann/Jpn/TUV
	11/08/2010 09:28:07 AM	Lixin Li/Bj/Chn/TUV
	ZE9	
	11/08/2010 09:27:39 AM	
	ZE9	
	08/13/2010 11:09:41 AM	