**PROJECT DESIGN DOCUMENT FORM
FOR SMALL-SCALE CDM PROJECT ACTIVITIES (F-CDM-SSC-PDD)
Version 04.1**

PROJECT DESIGN DOCUMENT (PDD)

Title of the project activity	Federal Intertrade Haiyuan Solar Cooker Project
Version number of the PDD	14
Completion date of the PDD	08/08/2013
Project participant(s)	Ningxia Federal Intertrade Co., Ltd. Swiss Re Global Markets Limited Post 2012 Carbon Credit Fund CV
Host Party(ies)	China
Sectoral scope(s) and selected methodology(ies)	Sectoral scope: 1. Energy industries (renewable - / non-renewable sources) Selected methodology: AMS-I.C. Version 14, EB46 - Thermal energy production with or without electricity
Estimated amount of annual average GHG emission reductions	33,482tCO_2e

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

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"Federal Intertrade Haiyuan Solar Cooker Project" (the proposed project) is located on the dry land of southern Ningxia in northwestern China. Implemented by Ningxia Federal Intertrade Co., Ltd, the proposed project will install 17,000 solar cookers for the poor rural residents in mountainous area with a rural population of 359.7 thousands or 80,818 households[1]. The project will cover 21% of the households in the project region. The rating power of each solar cooker is 773.5W and the total capacity of the proposed project is 13.1495 MW. The proposed project will enable the rural residents to efficiently substitute solar energy for the fossil fuel (coal) used in daily cooking and water boiling, avoiding CO_2 emission that would be generated by fossil fuel consumption. It is estimated that 33,482 tCO_2e emission reductions will be produced annually.

The development of the proposed project is in line with the priority choice of Chinese energy sector, and it will facilitate the sustainable development of the project site as well as the host country in the following aspects:

- Providing rural residents with a clean, practical and convenient way to meet the energy demand of their daily cooking;
- Improving the indoor hygiene of rural residents;
- Improving the living condition and quality of rural residents;
- Mitigating GHG emission.

The mountainous area in southern Ningxia is one of the poorest regions in China. The area belongs to state-level poor area of China and the per capita annual income in this area is around Chinese Yuan (CNY) 1584[2] or 176 Euro[3]. The dry land of this region is experiencing severe desertification and the ecological environment there is extremely vulnerable[4].

The rural Haiyuan region is an ideal region for utilizing solar energy. Located at high altitude, this region has many sunny days. It is one of the most suitable regions in China for utilizing solar energy.

The proposed project will provide 17,000 solar cookers to the rural residents in this region. The project will be managed and financed by Ningxia Federal Intertrade Co., Ltd.

The proposed project will significantly contribute to sustainable development of this region. It will serve as a model for future project and stimulate the interests of investors in solar energy projects. It will promote the use of clean energy, educate and train the rural population on solar energy technology, and build awareness in environmental protection among the rural population. Those who will be directly benefited from the proposed project are 17,000 low-income households or at least 68,000 villagers (average household has 4-5 people[5]). The poor rural residents will get clean and reliable energy supply for their daily cooking. The technology and experience gained from this project can be transferred to future projects. The experienced personnel trained by this project can assist other projects in the future.

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[1] *The Atlas of Resource and Environment in Ningxia Hui Autonomous Region*, SinoMaps Press, 2006.

[2] *Ningxia Survey Data*, National Statistis Bureau Ningxia Survey Team, Ningxia News Press, 2007

[3] 1 Euro = 9 CNY as of April 2009

[4] The Encyclopaedia of Ningxia, Ningxia People's Publishing House, 1998

[5] According to "The Family Planning Regulations of Ningxia Hui Autonomous Region", in the rural area of Haiyuan County, one couple can have 2 children. If the couple is minority, they can have 3 children. Moreover, some couples live together with their parent(s) to take care of them, This is why on average one household has 4-5 people.

A.2. Location of project activity
A.2.1. Host Party(ies)
>>
China

A.2.2. Region/State/Province etc.
>>
Ningxia Hui Autonomous Region

A.2.3. City/Town/Community etc.
>>
Haiyuan County

A.2.4. Physical/ Geographical location
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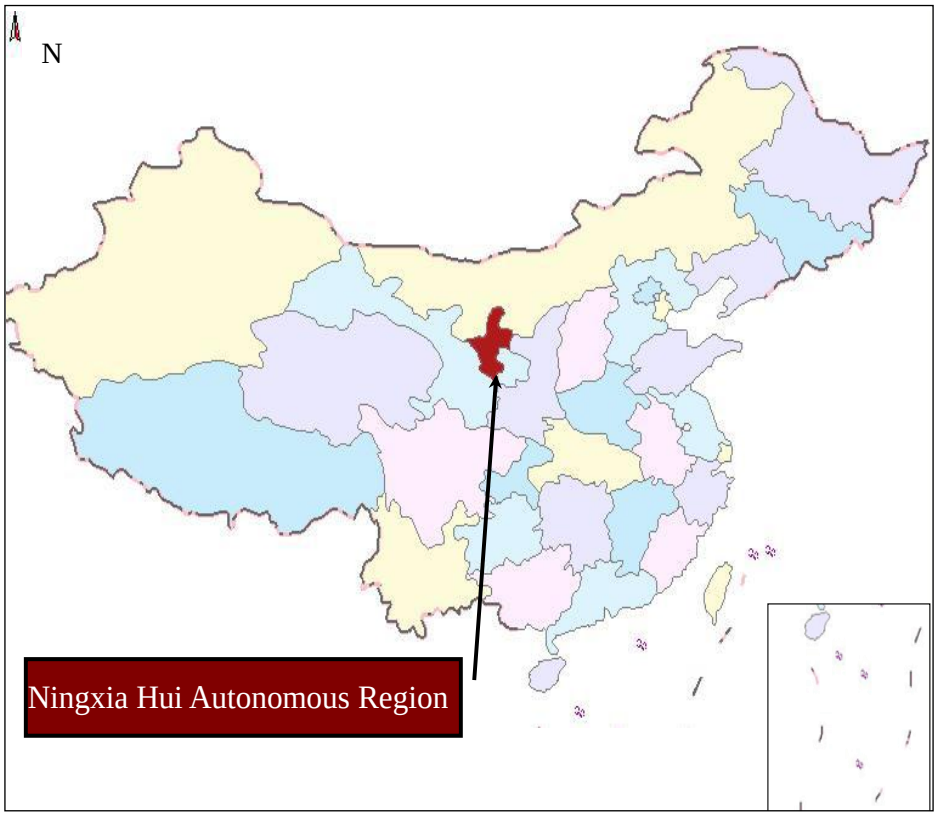
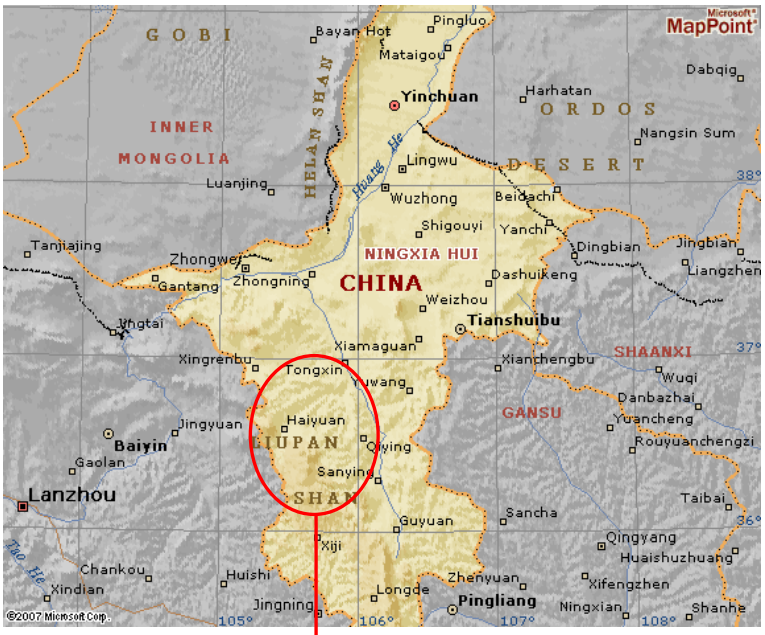
The areas involved in the proposed project include rural area of Haiyuan County in Ningxia Hui Autonomous Region. The project is implemented in the 16 townships of Haiyuan County. The approximate locations of these townships are shown in the table below Figure 1. The details are illustrated in the following 3 maps in Figure 1.





See detailed map next page

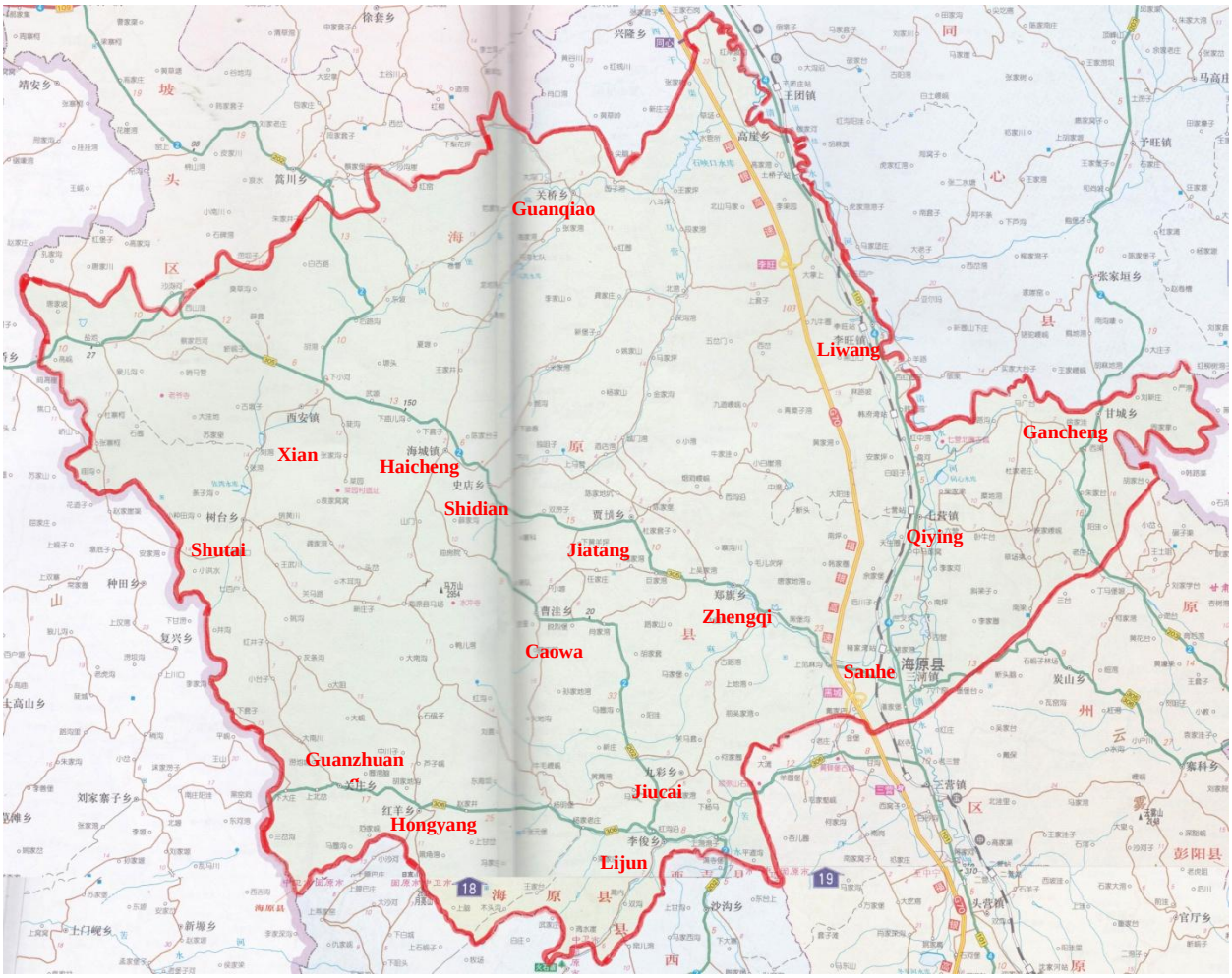


Figure1: Geographic Location of Federal Intertrade Haiyuan Solar Cooker Project

Township name	Location of township center	
Shidian	36 °31'47.00"N	105 °41'7.00"E
Lijun	36 °13'47.03"N	105 °52'40.26"E
Jiucai	36 °17'21.73"N	105 °54'21.69"E
Shutai	36 °30'2.07"N	105 °26'14.80"E
Zhengqi	36 °26'51.75"N	105 °57'25.60"E
Jiatang	36 °31'14.70"N	105 °49'20.96"E
Caowa	36 °25'27.34"N	105 °45'1.49"E
Hongyang	36 °15'45.52"N	105 °37'10.75"E
Guanzhuang	36 °16'59.04"N	105 °33'1.56"E
Xian	36 °35'43.43"N	105 °28'33.37"E
Haicheng	36 °33'32.78"N	105 °38'36.85"E
Guanqiao	36 °46'46.49"N	105 °47'25.30"E
Liwang	36 °40'4.71"N	106 °06'25.22"E
Gancheng	36 °35'8.26"N	106 °20'34.13"E
Sanhe	36 °22'13.84"N	106 °05'33.08"E
Qiying	36 °30'10.39"N	106 °09'17.69"E

A.3. Technologies and/or measures

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The proposed project is to install 17,000 parabolic type solar thermal cookers for rural users in Ningxia Hui Autonomous Region in China, replacing coal used previously for cooking and water boiling. This will lead to a reduction of coal consumption and consequently a reduction of CO_2 emission. The rating power of each solar cooker is 773.5 Watt[6]. Therefore, the total size of the project is 13.1495 MW ($773.5 \times 17{,}000 \times 10^{-6}$), below the 45 MW limit of small-scale CDM project.

The parameters of the solar cookers engaged in the proposed project are listed below:

Item	Value	Justifications
Focus（mm）	600 ~ 750	National Standard of P.R. China (GB), GB No.: NY/T219-2003
Aperture (Light Collecting) Area(m^2)	1.7	National Standard of P.R. China (GB), GB No.: NY/T219-2003
Rating Power(W)	773.5	National Standard of P.R. China (GB), GB No.: NY/T219-2003, calculation based on the footnote below
Thermal Efficiency (%)	At least 65%	National Standard of P.R. China (GB), GB No.: NY/T219-2003
Temperature in the focus area(℃)and the size of focus area (cm^2)	The area with temperature beyond 400 ℃ is between 50cm^2 and 200cm^2	National Standard of P.R. China (GB), GB No.: NY/T219-2003
Maximum operational height (m)	1.25	National Standard of P.R. China (GB), GB No.: NY/T219-2003
Maximum operational distance (m)	0.8	National Standard of P.R. China (GB), GB No.: NY/T219-2003
Weight(kg)	60	Required by the project owner

The above choice of solar cookers parameters is based on National Standard of P.R. China (GB) for solar cookers (GB No.: NY/T219-2003).

All the equipments engaged in the proposed project are domestic, and no technology transfer is involved.

[6] 773.5 watts is calculated based on Chinese National Standard (GB), GB No.: NY/T219-2003 as below:

$R = 700$ w/m^2, $A = 1.7m^2$, $\eta = 65\%$ (For the justification of the values of R, A, and η, refer to section B6.2)

Rating power = $R \cdot A \cdot \eta = 773.5$ w.

A.4. Parties and project participants

Table 1. Information of project participants

Party involved (host) indicates a host Party	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
People's Republic of China (host)	Ningxia Federal Intertrade Co., Ltd.	No
Netherlands	Swiss Re Global Markets Limited	No
Switzerland	Post 2012 Carbon Credit Fund CV	No

Detailed contact information on the Participants and other Parties are provided in Appendix 1.

A.5. Public funding of project activity

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There is no official funding involved in the proposed project.

A.6. Debundling for project activity

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There is not a registered small-scale CDM project activity or an application to register another small-scale CDM project activity whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point. This is confirmed by the official documents issued by Xiji Agriculture, Graze, and Science & Technology Bureau and Haiyuan Agricultural Bureau.

Therefore, the proposed project activity is not a debundled component of a large scale project activity.

SECTION B. Application of selected approved baseline and monitoring methodology

B.1. Reference of methodology

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The methodology applied for this project is the approved small-scale CDM baseline methodology "AMS-I.C (Version 14, EB46), Thermal energy production with or without electricity". For more information regarding the methodology, please refer to the link:
http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html

B.2. Project activity eligibility

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The methodology AMS-I.C is applicable to this small scale CDM project activity because：

- The proposed project supplies individual households or users with solar cookers that allow the user

to use renewable (solar) energy to displace coal used for cooking and water-boiling.

- The installation capacity of the proposed project is 13.1495 MW, which is within the limit of 45 MW stipulated for the chosen (small-scale) methodology.
- The proposed project only uses solar energy without any fossil fuels and it does not involve any biomass or co-fired system.
- The heat produced by the project is captured and used by the solar cookers only, and it does not involve in delivery to another facilities within the boundary.
- The proposed project is a new project using new solar cookers and it does not seek to retrofit or modify any existing facility for renewable energy generation.

B.3. Project boundary

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The physical and geographic boundary of the proposed project includes 16 townships in Haiyuan County in Ningxia Hui Autonomous Region, China.

Table 2. Description of emission sources and GHG categories of the proposed project

	Source of Emission	Gas	Included/Excluded	Instruction
Baseline	Coal-fired cooking and water-boiling	CO_2	Included	Main emission source
		CH_4	Excluded	Excluded for simplicity; being conservative
		N_2O	Excluded	Excluded for simplicity; being conservative
Project Activities	Project Activity Emission	CH_4	Excluded	There is no CH_4 emission
		CO_2	Excluded	There is no CO_2 emission
		N_2O	Excluded	There is no N_2O emission

B.4. Establishment and description of baseline scenario

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According to small-scale CDM baseline methodology AMS-I.C (Version 14, EB46), Thermal energy production with or without electricity, "For renewable energy technologies that displace technologies using fossil fuels, the simplified baseline is the fuel consumption of the technologies that would have been used in the absence of the project activity times an emission coefficient for the fossil fuel displaced."

In the absence of the proposed project, the rural residents would continue to use the coal-fired stoves for their daily cooking and water-boiling as usual. According to a recent official document from local government[7] and China Energy Statistical Yearbook (2006), all the rural residents in the project site use coal for their daily cooking and water-boiling. The document from local government also confirms that in the project site 1) cutting wood and vegetation is illegal so that the rural residents there do not use firewood for cooking and water-boiling, 2) electricity is only used for lighting, not for cooking and water-boiling, 3) the availability of straw is limited and all the straw there are used for feeding animals, and 4) the dominant activity is agriculture and all the animal wastes are used for fertilizers in the fields. Therefore, the baseline scenario of the proposed project is that the 17,000 households continue to cook and boil water with coal-fired stoves. The simplified baseline is the coal consumption of the existing stoves times the emission coefficient of coal.

B.5. Demonstration of additionality

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[7] *Explanation on the population and rural fuel usage of Haiyuan County*,by Bureau of Agriculture and Graze of Haiyuan County, the governmental branch in charge of rural affairs in Haiyuan County

The following table is the project timeline which clearly demonstrated that CDM has been seriously considered in the decision to implement the proposed project since its very early development stage. As a matter of fact, CDM is the only reason for the implementation of the proposed project, i.e., the creation of the project was entirely incentivized by CDM. Therefore, it is obvious that the project owner was well aware of CDM prior to the project start date and continuing and real actions were taken to secure CDM status for the project.

Date	History of CDM development
24 June 2007	Signed consulting service agreement for CDM project development
23 February 2008	Shareholder meeting minute about CDM project development (including this proposed project)
30 October 2008	Signed the Emission Reductions Purchase Agreement (ERPA) with CER buyer.
April 2009	Letter of Approval from DNA (i.e. NDRC) of P.R. China
1 June 2009	Signing of CDM validation contract with DOE
1~4 September 2009	DOE on-site validation for the CDM project
26 October 2009	Letter of Approval from DNA of the Netherlands

According to Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities (version 06), compared with the baseline scenario, the proposed project faces obvious barrier.

Investment Barrier

If the proposed project were carried out without CDM, the total upfront project investment by the project owner would be about Chinese Yuan (CNY) 5.68 million and after such investment the project would not generate any revenue to the project owner throughout the entire project life. The projected financial statement of the proposed project without CDM is as below (Note: positive and negative monetary values mean cash flowing in and out, respectively):

Parameters (without CDM):

Project Lifetime[8]:	10	Years
Equipment[9]:	-510	$\times 10^4$ CNY
Project Development Cost[10]	-16	$\times 10^4$ CNY
Implementation Cost[11]	-51	$\times 10^4$ CNY
Contribution from the user[12]	51	$\times 10^4$ CNY

[8] The confirmation letters from solar cooker vendors confirmed that the cookers can be used for at least 10 years.

[9] According to the confirmation letters from solar cooker vendors, the upfront equipment cost includes transportation, installation and maintenance for the first 3 years. According to the agreement signed between the project owner and the users, the equipment distributed by the project will belong to the users and the project owner will not recover the equipment after the crediting period. Therefore, there is no residual value left for the project owner.

[10] Includes feasibility study, coordinating with government and equipment vendors, develop project documents, managing cooker manufacturing and distribution, and user training, etc.

[11] The cost of implementing the project, including project and logistic management, local distribution and transportation of the solar cookers, training of users, and other implementation-related works.

Subtotal Investment	-526	$\times 10^4$ CNY
Contingency (8% of investment)	-42	$\times 10^4$ CNY
Total Upfront Investment:	-568	$\times 10^4$ CNY
Annual maintenance cost [13]:	-35	$\times 10^4$ CNY
Annual Inflation Rate[14]:	4%	
Income Tax Rate[15]:	25%	
Net Present Value of Project[16]:	-785	$\times 10^4$ CNY

As shown above, the Net Present Value (NPV) of the proposed project without CDM is -7.85 million CNY. Therefore, the project faces obvious investment barrier. According to Annex 34 of EB 35, investment barrier is one of the valid barriers that can be used to demonstrate the additionality of the project. The reason why financial indicator method (rather than simple cost analysis) is selected for the investment barrier analysis is that during implementation stage the project will have a small amount of cash contributions (from the user) that can be used to offset a small part of the upfront investment. In fact, because without CDM the project does not generate any revenue after its implementation, no matter how the variables (investment cost, maintenance cost, discount rate, etc.) vary, the NPV will always be negative. Thus, it is unnecessary to conduct sensitivity analysis. It is obvious that without CDM revenue the proposed project is not financially attractive at all. Therefore, the project faces obvious investment barrier.

In contrast, if the project is implemented as a CDM project, the CER revenue will make the project become financially attractive as shown below (Note: the meanings of the terms in this section are the same as those in "without CDM" section unless explained otherwise):

Parameters (with CDM):

Project Lifetime:	10	Years
CDM Crediting period:	10	Years
Equipment:	-510	$\times 10^4$ CNY
CDM Project Development Cost[17]:	-194	$\times 10^4$ CNY

[12] The contribution from the solar cooker user (to cover the implementation cost), 30 CNY for each cooker.

[13] According to the confirmation letters from solar cooker vendors, for the first 3 years the annual maintenance cost is 20 CNY per cooker. Then we assume that starting from the 4th year, the maintenance cost is adjusted by annual inflation rate of 4%. Therefore, for the 4th year, the annual maintenance cost = 17000*20*(1+4%) = 35 $\times 10^4$ CNY. From the 5th year to the 10th year, each year the maintenance cost is increased by 4% based on the maintenance cost of the previous year.

[14] The 4% annual inflation rate reflects the inflation rate of China. This is the average monthly inflation in China for the past 3 years. Data source: http://www.tradingeconomics.com/Economics/Inflation-CPI.aspx?Symbol=CNY
Since the maintenance cost of the first 3 years are already included in the upfront equipment cost, the maintenance costs are inflation-adjusted annually during 4th to 10th year of the project;

[15] The standard corporate income tax rate in China is 25%.

[16] The discount rate used to calculate the NPV is 3.60%. This is based on the recent Chinese Yuan (CNY) deposit rate (December 2008) for 5 year is 3.60%. The source is the website of Bank of China: http://www.boc.cn/finadata/lilv/fd31/200812/t20081222_508225.html. According to Annex 58 of EB 51, required/expected returns on equity can be used as benchmark for equity IRR, To the project owner, the capital cost of the investment on the project is the opportunity cost of depositing the same amount of fund to the bank. Thus, the expected return on investment is the bank deposit rate. This is why the deposit rate was used as the discount rate.

Implementation Cost	-51	$\times 10^4$ CNY
Contribution from the user	51	$\times 10^4$ CNY
Subtotal Investment	-704	$\times 10^4$ CNY
Contingency (8% of investment)	-56	$\times 10^4$ CNY
Total Upfront Investment:	-760	$\times 10^4$ CNY
Annual maintenance cost:	-35	$\times 10^4$ CNY
Annual Inflation Rate:	4%	
Income Tax Rate:	25%	
Expected CER Price:	9.5	EUR
Project NPV at 3.6%	519	$\times 10^4$ CNY
Project IRR:	16.6%	

The project will be implemented in the dry land experiencing severe desertification[18]. As a result, in the project region there is very limited amount of vegetation available. Coal is abundant in the region[19]. As explained in section B.4, the common and dominant practice in the project region is using coal for cooking and water-boiling. Such common practice has been confirmed[20] by the Bureau of Agriculture of Haiyuan County (BAH), the governmental branch in charge of rural affairs. According to the confirmation from BAH, all the rural residents within the project boundary use coal for their daily cooking and water-boiling purpose. Hence, the proposed project is obviously additional compared to such common practice.

If the project can be successfully registered as a CDM project, then the CDM revenue will provide the only financial incentive to the project developers, transforming an otherwise financially unattractive project into an attractive one. As a matter of fact, the proposed project will not be started until it is successfully registered with EB. Therefore, CDM revenue is absolutely crucial to the successful implementation of this project. The successful registration of the project will serve as a model for future project and stimulate the interests of investors in similar projects.

Moreover, the successful registration of the proposed project will promote the use of clean energy in rural areas, educate and train the rural population on solar energy technology, and build awareness in environmental protection among the rural population.

B.6. Emission reductions

B.6.1. Explanation of methodological choices

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The emission reduction ER_y during a given year *y* is calculated as follow:

[17] Includes CDM consulting/commission cost, PDD development, DOE validation, and EB registration fees.

[18] *The Encyclopaedia of Ningxia*, Ningxia People's Publishing House, 1998

[19] According to the website of National Development and Reforming Commission (NDRC) of China, (http://www.sdpc.gov.cn/dffgwdt/t20060607_72051.htm), Ningxia has plenty of coal reserves. The proven coal reserve is 31.56 billion tonnes. The per capita coal reserve ranks the first in China.

[20] *Explanation on the population and rural fuel usage of Haiyuan County*, by Bureau of Agriculture and Graze of Haiyuan County, the governmental branch in charge of rural affairs in Haiyuan County.

$$ER_y = BE_y - PE_y - L_y \quad (1)$$

Where:

ER_y the emission reductions produced by the proposed project.

BE_y the baseline emissions from heat displaced by the project activity during the year y in tCO_2e.

PE_y the emissions produced by the proposed project.

L_y the leakage produced by the proposed project.

Step 1: Estimate the Emission of All Kinds of Greenhouse Gas in the Project activity (PE_y)

The implementation of the proposed project will not produce any GHG emission, i.e. PE_y=0.

Step 2: Estimate the Leakage

The solar cookers to be used in the proposed project will be directly purchased from the manufacturers. The project participants will not transfer the solar cookers out of the proposed project activity during the entire project life. The project implementation and monitoring plan will ensure that 1) only the households that currently do not have solar cooker will receive the new solar cookers, and 2) if the recipient no longer wants to use the cooker, he/she must immediately return the cooker back to the project owner, and the project owner will immediately give this returned cooker to someone else who does not have a cooker. Therefore, according to AMS-I.C., the energy generating equipment (solar cookers) is neither transferred from another activity, nor is it transferred to another activity. As a result, it is not necessary to consider the leakage in the proposed project, i.e. $L_y = 0$.

Step 3: Estimate the Baseline Emission (BE_y)

According to AMS-I.C., the baseline emission of the proposed project (BE_y) could be calculated by the following formula:

$$BE_y = HG_y * EF\ CO_2 / \eta_{th} \quad (2)$$

Where:

BE_y the baseline emissions from heat (generated by burning coal) displaced by the project activity during year y in tCO2e.

HG_y the net quantity of heat supplied by the project activity during the year y in TJ.

$EF\ CO_2$ the CO_2 emission factor of coal (tCO_2e/ TJ).

η_{th} the efficiency of the coal-fired stove that would have been used in the absence of project activity

The annual net quantity of heat supplied by the project, HG_y, is the sum of 12 monthly net heat supplied, and consequently the annual baseline emission of the project, BE_y, is the sum of 12 monthly baseline emission.

$$HG_y = \sum HG_i \quad (i = 1,2, \ldots, 12) \quad (3)$$

$$BE_y = \sum BE_i \quad (i = 1,2, \ldots, 12) \quad (4)$$

$$BE_i = HG_i * EF\ CO_2 / \eta_{th} \quad (i = 1,2, \ldots, 12) \quad (5)$$

where HG_i is the net heat supplied in month i in TJ

BE_i is the baseline emission in month i in tCO2e

According to basic physics principle,

Heat = Power*Time

The monthly net heat supplied by the cooker is the product of its actual power in that month and its usage time in that month, i.e.:

$$HG_i = n * [P_i * t_i * (3.6 \times 10^{-9})] \quad (6)$$

Where n is the total number of solar cookers installed by the proposed project. The value adopted is 17,000;

P_i is the actual average power of the solar cooker in month i in W

t_i is the usage time of each solar cooker in month i in hours. The value adopted is 120 (4 hours per day for 30 days, see section B7.1 parameter #2 for details)

3.6×10^{-9} is the conversion factor between "W*h" and "TJ", i.e., 1 W*h = 3.6×10^{-9} TJ (Note: 1h = 3600s, 1 W*h = 3600 W*s = 3600 J = 3.6×10^{-9} TJ)

Combine (5) and (6), we get

$$BE_i = n * [P_i * t_i * (3.6 \times 10^{-9})] * EF\ CO_2 / \eta_{th} \quad (i = 1,2, \ldots, 12) \quad (7)$$

The actual power of the solar cooker P_i is proportional to the solar irradiance rate under which the cooker is operated. The rating power 773.5W is calculated under the "standard solar irradiance rate" of 700 W/m^2 according to Chinese national standard. Therefore, the actual power of the cooker is its rating power times the ratio of actual solar irradiance rate and 700 W/m^2:

$P_i = 773.5 * (R_i/700)$ (8)

Where R_i is the actual solar irradiance rate in month *i* in W/ m^2. The values adopted are in section B6.2 parameter #3;

Substitute (8) in (7), then substitute (7) in (4), we have

$$BE_y = n*\sum [773.5*(R_i /700)* t_i * 3.6 \times 10^{-9}] * EF\ CO_2 /\eta_{th} \quad (i = 1, 2. \ldots, 12) \quad (9)$$

Where:

R_i R_i is the actual solar irradiance rate in month *i* in W/ m^2. The values adopted are in section B6.2 parameter #3;

t_i t_i is the usage time of the solar cooker in month *i* in hours. The value adopted is 120 (4 hours per day for 30 days, refer to section B7.1 parameter #2 for details)

n The total number of solar cookers installed by the proposed project. The value adopted is 17,000.

$EF\ CO_2$ the CO_2 emission factor of coal (tCO_2e/ TJ). IPCC default emission factor of 94.6tCO_2e/TJ will be adopted in the proposed project.

η_{th} the efficiency of the coal-fired stove that would have been used in the absence of project activity. The value adopted is 15% (refer to section B6.2 parameter #6 for details).

B.6.2. Data and parameters fixed ex ante

Data / Parameter	1.EF CO_2
Unit	tCO_2/TJ
Description	Baseline emission factor of Coal
Source of data	IPCC2006, page 2.22, Table2.5
Value(s) applied	94.6
Choice of data or Measurement methods and procedures	The testing data for local coal is not available and the IPCC default value is deemed to reasonably represent local circumstances. In this case, according to paragraph 35 of AMS-I.C. (version 14), IPCC default emission factor can be used.
Purpose of data	Calculation of baseline emissions
Additional comment	

Data / Parameter	2.R
Unit	W/m^2
Description	Standard solar irradiance rate used to calculate rating power of solar cooker
Source of data	National Standard of the People's Republic of China, GB No.: NY/T219-2003
Value(s) applied	700
Choice of data or Measurement methods and procedures	According to National Standard of P.R. China (GB), GB No.: NY/T219-2003, for calculating the rating power of solar cookers, 700 W/m^2 should be used for as the standard value of solar irradiance rate.
Purpose of data	Calculation of baseline emissions
Additional comment	

Data / Parameter	$3.R_i$
Unit	W/m^2
Description	Monthly solar irradiance rate in project region
Source of data	Ningxia Meteorological Archives
Value(s) applied	Month Value* (Also refer to Appendix 4 for details) 1 388.5 2 451.2 3 532.1 4 593.0 5 673.4 6 720.6 7 678.5 8 604.0 9 594.1 10 566.4 11 373.4 12 367.0 *1999-2008 Data
Choice of data or Measurement methods and procedures	Ningxia Meteorological Archives is the official source for Ningxia meteorological data.
Purpose of data	Calculation of baseline emissions
Additional comment	

Data / Parameter	4.A
Unit	m^2
Description	Solar cooker's light-collecting area
Source of data	Project owner
Value(s) applied	1.7
Choice of data or Measurement methods and procedures	According to the technical specifications of all the solar cookers, and this specification of light-collecting area is set by the project developer as the manufacturing requirement for all solar cookers.
Purpose of data	Calculation of baseline emissions
Additional comment	

Data / Parameter	5. η
Unit	
Description	Solar cooker's thermal efficiency
Source of data	Solar cooker testing report from Ningxia Department of Agriculture and Graze, Rural Energy Station
Value(s) applied	65%
Choice of data or Measurement methods and procedures	This is the requirement of National Standard of P.R. China (GB), GB No.: NY/T219-2003. The project owner will also require in the technical specification that the solar cookers to be manufactured for this project have an efficiency of 65%.
Purpose of data	Calculation of baseline emissions
Additional comment	

Data / Parameter	6. η_{th}
Unit	
Description	Thermal efficiency for the traditional coal furnace
Source of data	1) The on-site measurement data of thermal efficiency of rural coal stoves in Ningxia by the Energy Saving Monitoring Technical Service Center of Ningxia Hui Autonomous Region, the provincial authority in charge of collecting and monitoring energy usage data in Ningxia. 2)"Clean Energy for Development and Economic Growth: Biomass and Other Renewable Energy Options to Meet Energy and Development Needs in Poor Nations", United Nations Development Programme (UNDP), 2002 http://www.undp.org/energy/publications/2002/2002b.htm
Value(s) applied	15%
Choice of data or Measurement methods and procedures	For reference #1: According to paragraph 18 of methodology AMS-I.C.(version 14), the efficiency of the baseline units shall be determined by adopting one of the following criteria: (a) Highest measured efficiency of a unit with similar specifications, (b) Highest of the efficiency values provided by two or more manufacturers for units with similar specifications, (c) Maximum efficiency of 100%. As the provincial authority in charge of collecting and monitoring energy usage data in Ningxia, Energy Saving Monitoring Technical Service Center

	of Ningxia Hui Autonomous Region ("ESMTS of Ningxia") conducted a measurement of efficiency for rural coal stove in Ningxia from May 2007 to October 2007. During this period, ESMTS of Ningxia measured the thermal efficiencies of 100 coal stoves at rural residents' home across 7 counties (including Haiyuan county where our project is located) in Ningxia. The 7 counties are located closely together with very similar climate condition, living condition, and living habits. Therefore, the coal stoves measured by ESMTS of Ningxia are very similar to those involved in the proposed Project. The method of the measurement was Chinese National Standard "*Method for testing household coal and stoves*" (GB 6412-86). The measurement results are: the highest efficiency is 15.0%, the lowest efficiency is 9.6%, and the average is 12.3%. The highest measured efficiency value (15%) was confirmed by ESMTS of Ningxia in its official letter titled"*Explanation on rural stoves in Ningxia*"(dated 2 April 2008) and later elaborated in another official letter titled "*The explanation on the thermal efficiency measurement data of domestically-used rural coal-stove in southern mountainous region of Ningxia*"（Dated 27 February 2009). With the above measurement data, according to option (a) of paragraph 18 of methodology AMS-I.C.(version 14), 15% shall be chosen as the baseline thermal efficiency for the coal stoves. For reference #2: Paragraph 2 in page 8: The most common method of cooking throughout rural areas of the developing world is the open hearth or three-stone fire, which typically transfers only 5-15 per cent of the fuel's energy into the cooking pot. Following conservative principle, the value of 15% shall be taken because it will lead to the least emission reduction.
Purpose of data	Calculation of baseline emissions
Additional comment	

B.6.3. Ex-ante calculation of emission reductions

>>

According to B.6.1, the emission reduction (ER_y) of the project activity in a given year *y* is the difference between the baseline emission and the sum of project emission (PE_y) and emission from leakage (L_y). The calculation formula is as following:

$$ER_y = BE_y - PE_y - L_y$$

Since both of the project emission and leakage within the boundary are zero, the emission reduction of the proposed project is equal to the baseline emission, i.e.:

$$ER_y = BE_y$$

where BE_y is the CO_2 emission from the continued usage of coal-fired stoves in the absence of the proposed activity and its value is equal to the emission reduction.

According to the formulas (3), (5), (6), and (8) in B6.1, the calculation result is tabulated as below:

Month	Solar irradiance rate	Actual Power of Solar Cooker	Monthly Usage Time	Net Heat Supplied Monthly	CER Generated Monthly
	R_i	P_i = 773.5*(R_i/700) Equation (8)	t_i	HG_i = n*[P_i*t_i* (3.6 ×10^{-9})] Equation (6)	BE_i = HG_i*$EF\ CO_2$ /η_{th} Equation (5)
	(W/m^2)	(W)	(hour)	(TJ)	(tCO_2e)
1	388.5	429.3	120	3.15272	1988
2	451.2	498.6	120	3.66154	2309
3	532.1	588.0	120	4.31806	2723
4	593.0	655.3	120	4.81227	3035
5	673.4	744.1	120	5.46472	3446
6	720.6	796.3	120	5.84776	3688
7	678.5	749.7	120	5.50611	3473
8	604.0	667.4	120	4.90153	3091
9	594.1	656.5	120	4.82119	3041
10	566.4	625.9	120	4.59640	2899
11	373.4	412.6	120	3.03019	1911
12	367.0	405.5	120	2.97825	1878

Using Equation (4), total annual CER = BE_y = $\sum BE_i$ = **33482**

Therefore, the annual emission reduction (ER_y) of the proposed project is estimated to be 33,482 tCO_2e, i.e.,

$ER_y = BE_y$

= 1988+2309+2723+3035+3446+3688+3473+3091+3041+2899+1911+1878 = **33,482** tCO_2e

B.6.4. Summary of ex-ante estimates of emission reductions

The net emission reduction induced by the proposed project activity in the 10-year crediting period (1 June 2010 – 31 May 2020) is estimated to be 334,820 tCO2e.

Year	Baseline emissions (tCO_2 e)	Project emissions (tCO_2 e)	Leakage (tCO_2 e)	Emission reductions (tCO_2 e)
1 Jun. 2010 – 31 May 2011	33,482	0	0	33,482
1 Jun. 2011 – 31 May 2012	33,482	0	0	33,482
1 Jun. 2012 – 31 May 2013	33,482	0	0	33,482
1 Jun. 2013 – 31 May 2014	33,482	0	0	33,482
1 Jun. 2014 – 31 May 2015	33,482	0	0	33,482
1 Jun. 2015 – 31 May 2016	33,482	0	0	33,482
1 Jun. 2016 – 31 May 2017	33,482	0	0	33,482
1 Jun. 2017 – 31 May 2018	33,482	0	0	33,482
1 Jun. 2018 – 31 May 2019	33,482	0	0	33,482
1 Jun. 2019 – 31 May 2020	33,482	0	0	33,482
Total	**334,820**	0	0	**334,820**
Total number of crediting years	**10**			
Annual average over the crediting period	334,82	0	0	334,82

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

Data / Parameter	1. n
Unit	
Description	Number of solar cookers engaged in the proposed project
Source of data	Sales contract and invoice of the solar cookers. Annual monitoring result
Value(s) applied	17,000
Measurement methods and procedures	The initial value of this parameter will be determined by the sales contract of the solar cookers and then this parameter will be monitored, recorded, and archived annually. The details of monitoring of this parameter is in section B7.2
Monitoring frequency	Annually
QA/QC procedures	Refer to B.7.2
Purpose of data	Calculation of baseline emissions
Additional comment	Record will be kept in electronic form and paper form.

Data / Parameter	2. t_i
Unit	Hour
Description	The monthly operating time of each solar cooker
Source of data	To be determined by the result of the sampling survey
Value(s) applied	120[21]

[21] According to the *Explanation on Solar Cooker Usage Time and Cooking Habits in Haiyuan County* (by Bureau of Agriculture of Haiyuan County), 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*30 = 120 hours.

Measurement methods and procedures	The monitoring will be conducted daily on the selected sample users determined at the beginning of each year. The data will be summarized, analyzed, and archived monthly by the CDM Department of Ningxia Federal Intertrade Co., Ltd.
Monitoring frequency	Daily
QA/QC procedures	Refer to B.7.2
Purpose of data	Calculation of baseline emissions
Additional comment	Record will be kept in electronic form and paper form.

B.7.2. Sampling plan

>>

For number of solar cookers engaged in the proposed project (n) and the monthly operating time of each solar cooker (t_i), sampling survey will be utilized in the monitoring.

According to "Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities" EB69, Annex5, the sampling plan is the following:

Sampling design

	n	t_i
Objectives and reliability requirements	Determining the total number of solar cookers operating during the crediting period, and with a 90/10 confidence/precision.	Determining the average monthly operating time of solar cookers during the crediting period, and with a 90/10 confidence/precision.
Target population and sampling frame	The 17,000 solar cookers to be installed in the proposed project.	
Sampling method	Simple random sampling will be used[22]. The sampling tool is Microsoft Excel, a reliable and widely accepted tool for random sampling.	

Sample size:

For n (Number of solar cookers engaged in the proposed project), according to "Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities" EB69, Annex5 para. 48-57, sample size calculation is the following:

$$m \geq \frac{1.645^2 N \times p(1-p)}{(N-1) \times 0.1^2 \times p^2 + 1.645^2 p(1-p)}$$

Where:

m Sample size

N Total number of solar cookers to be installed in the proposed project (17,000)

[22] The project will be implemented in the townships within Haiyuan County. The situations of these townships are very similar to each other. The villagers in Haiyuan County are homogeneous. Therefore, simple random sampling method will be used. Therefore, simple random sampling is suited to be selected as the sampling method for both n and t_i.

p Our expected proportion(0.8)[23]

1.645 Represents the 90% confidence required

0.1 Represents the 10% relative precision (0.1×0.5 = 0.05 = 5% points either side of *p*)

Substituting in our values gives:

$$m \geq \frac{1.645^2 \times 17{,}000 \times 0.8 \times 0.2}{(17{,}000-1) \times 0.1^2 \times 0.8^2 + 1.645^2 \times 0.8 \times 0.2} = 68$$

The expected response rate from the sample users is 95%[24]. Then scale up this number we get the sample size 68/95% = 72.

For t_i (the monthly operating time of each solar cooker), according to "Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities" EB69, Annex5 para. 82-85, sample size calculation is the following:

$$m \geq \frac{1.645^2 NV}{(N-1) \times 0.1^2 + 1.645^2 V}$$

Where:

$$V = \left(\frac{SD}{mean}\right)^2$$

m Sample size

N Total number of solar cookers to be installed in the proposed project (17,000)

mean Our expected mean (120 hours)[25]

SD Our expected standard deviation (67.65 hours)[26]

1.645 Represents the 90% confidence required

0.1 Represents the 10% relative precision

Substituting in our values gives:

$$V = \left(\frac{67.65}{120}\right)^2 = 0.32$$

$$m \geq \frac{1.645^2 \times 17{,}000 \times 0.32}{(17{,}000-1) \times 0.1^2 + 1.645^2 \times 0.32} = 86$$

The expected response rate from the sample users is 95%[27]. Then scale up this number we get the sample size 86/95% = 91.

[23] According to previous monitoring result of this project, the proportion of operating solar cookers was far larger than 0.8, therefore, 0.8 is conservative to be applied in the calculation.

[24] According to previous monitoring result of this project, the response rate from users was far more than 95%, therefore, 95% is conservative to be applied in the calculation.

[25] The mean value is provided by an official document from the local government (refer to footnote 21)

[26] According to EB69, Annex 5, para. 42, the standard deviation can be estimated as the range (maximum – minimum) divided by 4. The wider the range is, the bigger the standard deviation is, and thus the bigger and more conservative the sample size is. It is obvious that the widest possible range of the monthly usage hours is the monthly sunlight time provided in Appendix 4. To make the most conservative estimate of sample size, the longest monthly sunlight time (270.6 hours in May) was taken. Therefore, the largest possible standard deviation = (270.6-0)/4 = 67.65 hours.

Hence, 72 sample users (for n) and 91 sample users (for t_i) will be randomly selected from the sampling frame at the beginning of each year during the crediting period.

Data to be collected

1. Field measurements and analysis

	n	t_i
Field measurements	Field measurement objective: Total number of solar cookers operating out of the sample users. Method of measurement: Visual inspections[28] Timing and frequency of measurement: Annually monitored during the last quarter[29] of each monitoring period, but at least once per year, i.e., the interval of the measurements is no more than one year.	Field measurement objective: Usage time of the cookers for each of the sample users. Method of measurement: Respondent self-reports, and operational logs[30] Frequency of measurement: Daily monitored during each monitoring period.
Analysis	The percentage of operating solar cookers out of the sample users will be calculated, and then the total number of operating cookers in the proposed project will be calculated by using the abovementioned percentage multiplying the total number of cookers (17,000).	The daily usage time of the cookers of all the sample users will be summed up for each month in the monitoring period ("the total monthly usage time"), then the average monthly usage time of the cookers will be calculated by dividing the total monthly usage time by the sample size.

2. Monitoring Method

For the number of systems operating, a monitoring team (Team A) will be set up to track the number of operating solar cookers out of sample size. The monitoring of total number of operating solar cookers

[27] According to previous monitoring result of this project, the response rate from users was far than 95%, therefore, 95% is conservative to be applied in the calculation.

[28] According to paragraph 35(e) of Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities (Version 2.0), practitioners are expected to select the most effective information-gathering method. The implementer should decide on what would be the most reliable and cost-effective method for collecting the data, depending on the variables of interest. Alternative methods include visual inspections, physical measurements, respondent self-reports, and operational logs. This project will be implemented in remote rural areas. For this project, the most reliable and cost effective method to collect the data will be visual inspections, respondent self-reports, and operational logs.

[29] The time period selected (last 3 months of each monitoring period) is conservative to be applied, and the parameter is not subject to seasonal fluctuations.

[30] Please refer to footnote 21.

will be conducted once during each monitoring period. A table which is substantially in the form of the following will be used for monitoring and recording this parameter.

Total number of solar cookers operating

Sample User Name	If this solar cooker exists and is operational, check "√"	Date of Checking	Checked by	Note
Number of operational solar cookers			Summarized by:	
Number of non-operational solar cookers				

For t_i (the monthly operating time of each solar cooker), the format of the monitoring form to be used to record the daily operating time of solar cooker is substantially in the form below:

The Operating Time of Solar Cookers

Year and Month

Sample user name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total

B.7.3. Other elements of monitoring plan

>>

The objective of the monitoring plan is to ensure the successful monitoring of the emission reduction of the proposed project during the crediting period.

The project implementation is scheduled to take place in first half of 2010. The implementation will start with the tender bidding process of the solar cookers. Several solar cooker manufacturers will be selected for the project. Then the selected solar cooker vender will start delivering solar cookers to the users from their inventory and start making the remaining cookers required for the project. Please note that the actual implementation plan will depend on the registration date of the proposed project.

The project implementation and monitoring plan will ensure that 1) only the households that currently do not have solar cooker will receive the new solar cookers, and 2) if the recipient no longer wants to use the cooker, he/she must immediately return the cooker back to the project owner, and the project owner will immediately give this returned cooker to someone else who does not have a cooker.

1. Monitoring Organization

The overall monitoring of the project will be managed and implemented by the project owner, Ningxia Federal Intertrade Co., Ltd., with the cooperation of Rural Energy Station of the Bureau of Agriculture and Graze of Haiyuan County (Hereinafter "RES"). The monitoring teams will be recruited and managed by the project owner and RES. The candidates will be carefully screened to ensure that each member of the monitoring teams has the proper ability to perform the monitoring task. The monitoring teams will be trained and supported by the CDM Department of the project owner and experienced CDM consultants. The project owner will work closely with RES to ensure proper equipment installation, training of the users, monitoring, document preservation, and maintenance.

2. Data Monitored

According to methodology AMS-I.C., if the emissions reduction per system is less than 5 tonnes of CO_2 a year:

(a) Recording annually the number of systems operating (evidence of continuing operation, such as on-going rental/lease payments could be a substitute); and

(b) Estimating the annual hours of operation of an average system, if necessary using survey methods. Annual hours of operation can be estimated from total output (e.g. tonnes of grain dried) and output per hour if an accurate value of output per hour is available.

In the proposed activity, the emission reduction from each solar cooker is 33482/17000 = 1.97 < 5 tCO_2e. Therefore, what need to be monitored are the number of solar cookers in operation and the average operating time of each solar cooker.

Procedures for Administering Data Collection and Minimizing Non-sampling Errors:

A monitoring team (Team B) will be set up to conduct the daily monitoring of the operating hours of the sample users. The monitoring forms will be filled out daily by Team B to record the daily usage data of these sample users. At least once a month the monitoring forms will be collected from Team B and the quality of data will be checked. Then average usage time per user will be calculated based on these data. At least once a month, Team B will choose one family in the sample users and stay for an entire day in this family's home to monitor the detailed usage of the solar cooker. Before implementing the project, Ningxia Federal Intertrade Co., Ltd. will train the personnel of monitoring teams on how to properly conduct the monitoring process

If the data record is missing or damaged, the following makeup process will be conducted:

1. The general principle is that zero value will be used for the missing 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 missing or damaged data.

2. If this is due to the working error of the monitoring personnel, further train the person until he or she can perform the job properly. And in the mean time, use zero value for the missing or damaged data;

3. If this is due to the inability or attitude of a particular worker in monitoring team, dismiss such worker and re-hire those with proper ability and attitude. And in the mean time, use zero value for the missing or damaged data;

4. If the monitoring team as a whole does not meet the job requirement of monitoring process, Ningxia Federal Intertrade Co., Ltd., the project owner, has the right to require that RES create new monitoring team according to the requirement of Ningxia Federal Intertrade Co., Ltd.

5. If the data reported by the user significantly higher than the normal range, the monitoring personnel should ask for the reason If the reason belongs to one of the following: 1) holidays celebration, 2) wedding or funeral, or 3) family/friends party, the reason is considered to be valid. Then the reason is recorded along with the data. Otherwise, zero value will be used for that day's data.

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

Implementation:

The sampling process will start as soon as the target population is determined and will finish before the beginning of the monitoring period. Before the beginning of each monitoring period, a new round of random sampling will be conducted among the 17,000 users to generate two new sets of sample users which will be monitored during the forthcoming monitoring period.

The monitoring data will be collected throughout the entire crediting period of the proposed project. As to who will conduct the data collection and analyses, please refer to Section 1 (Monitoring Organization) and Section a (Data Collection) below.

To track the solar cookers, the logo[31] of the project will be put on each of the solar cookers distributed to the users. A list of all the users to whom the solar cookers solar cookers were distributed will be kept. Then during the monitoring of total number of operating solar cookers, the monitoring team will check if the logo of the project is on the solar cooker. This way, it can be ensured that no solar cooker will be transferred without being tracked. For the transfer of solar cookers, the monitoring team will ensure that the transferee is within the project boundary of the proposed project, and will record the transferor, transferee, and the time of transfer.

a. Data collection

The CDM Department of Ningxia Federal Intertrade Co., Ltd., the project owner, will summarize the data on monitoring forms collected from the monitoring teams. For the monitoring of total number of

[31] In the PDD used for Global Stakeholder Consultation, it was stated that an index number will be put on each solar cooker to ensure that all the solar cookers are indeed from the proposed project rather than other sources. But during the implementation of previous projects of the same kind, this index system turned out to be very inconvenient, cumbersome, and costly from both production and operation point of view. The revised identification system proposed in the current version of PDD is to put a project identification logo to all the solar cookers distributed by the proposed project. The revised identification system can achieve the same purpose of the original system - if a solar cooker is from other sources, it will not have the logo of this project.

systems operating, the data collection and summarization will be done after this monitoring task is finished, and for the monitoring of average usage time, the data collection and summarization will be done at the end of every month in the monitoring period. The project owner will check the data to make sure that the data are legible, uniform in format, complete, and effective. Then calculate the total numbers of solar cookers in operation and the average operating time of the sample users.

All the monitoring data will be converted to electric form. All the original records will be kept for at least 2 years after they are created. Electronic document should be backed up on CD and hard copies should be printed out for further backup. In addition, sales invoices or receipts of the solar cookers should be saved for the verification of DOE.

b. Maintenance

The project owner will be responsible for the repair of the solar cookers distributed. If the user's solar cooker has a problem, the solar cooker will be repaired for free.

SECTION C. Duration and crediting period
C.1. Duration of project activity
C.1.1. Start date of project activity
>>
15 May 2010 (Planned tender bidding process start date)

C.1.2. Expected operational lifetime of project activity
>>
10 years

C.2. Crediting period of project activity
C.2.1. Type of crediting period
>>
Fixed crediting period

C.2.2. Start date of crediting period
>>
1 June 2010 or registration date, whichever is later

C.2.3. Length of crediting period
>>
10 years

SECTION D. Environmental impacts
D.1. Analysis of environmental impacts
>>

The project has completed the "The registration form for the environmental impact on construction projects" with the local environmental authority. The project has obtained the approval from the environmental authority.

It is a characteristic of such projects that there are no emissions or wastes. The solar cookers have a long lifetime, and all parts are totally recyclable.

Solar cooking has a high potential for reducing GHG emission and smoke by using clean energy and avoiding burning coal. CDM makes solar cooking accessible to poor people who particularly suffer from the environmental deterioration caused by GHG emission.

The environmental impacts of the project may be summarized as follow:

- Prevention of resource depletion caused by consumption of coal;
- Avoidance of indoor air pollution from smoke of traditional stove;
- Diminishing GHG emission;
- Diminishing risks of fires caused by coal-fired stoves.

One of the main positive environmental impacts of the project will be the rising awareness among rural populations about environmental challenges, enabled by the sustainable technology and by the accompanying educational program.

According to the opinion of the local environmental authority, the project has positive environmental impacts and it has no negative environmental impact.

SECTION E. Local stakeholder consultation
E.1. Solicitation of comments from local stakeholders
>>

In 2008, Mr. Wei Jiang, General Manger of Ningxia Federal Intertrade Co., Ltd., the owner of the proposed project, visited the Rural Energy Station under the Bureau of Agriculture of Haiyuan County (Thereinafter "RES"), the local government branch in charge of the rural energy sector. Mr. Jiang proposed the project to RES and the initial feedback was very positive. In the subsequent meetings with RES, the feasibility and implementing plan of the proposed project was discussed in detail.

In December 2008, Ningxia Federal Intertrade Co., Ltd. conducted stakeholder survey on the rural residents in places where the project was planned to carry out. The surveys were done by randomly visiting the villagers as well as assembling the villagers and interviewing them. Totally 100 survey forms (corresponding to more than 80% confidence level according to the statistical method used in B7.2) were distributed and collected. The backgrounds of the local villagers surveyed are: Gender: 78% male and 22% female; Age: 13% less than 30, 43% between 30 and 40, 26% between 40 and 50, 18% more than 50; Education: 47% elementary school, 27% junior high school, 18% senior high school, 8% two-year college or higher. The comments of local stakeholders in the form of the result of questionnaires are summarized in the following paragraphs and will be available to DOE.

The questionnaire included the following contents:

1. Brief introduction of the proposed project;

2. The survey invites the rural residents and local government to participate;

3. Basic information and education level of the person surveyed

4. Survey questions:

1) Do you know about the Project?

(Know a lot; Know some; Never heard of it)

2) Which positive effect will be brought on your life by the proposed project (multiple choices allowed):

(Save energy; Reduce pollution; Save expenses; Enhance the living condition; Other)

3) Which negative effect will be brought by the proposed project?

(Inconvenient to use, Inconvenient to repair, Occupy space, Other)

4) The significance of negative effect brought by this project

(Considerable effect, some partial effect which can be resolved, basically no effect)

5) The overall impacts of the proposed project?

(Positives far outweigh negatives, Basically no impact, Negatives far outweigh positives)

6) Do you support the proposed project?

(Support, Oppose, Doesn't matter to me)

5. Signature and date

E.2. Summary of comments received

>>

The survey results are:

1) Do you know about the Project?

(Know a lot: 21%; Know some: 79%; Never heard of it: 0%)

2) Which effect will be brought on your life by the proposed project (multiple choices allowed)?

(Save energy: 76; Reduce pollution: 83; Reduce expenses: 80; Enhance the living condition: 26. Note: the value reported here are the numbers of selections on each choice)

3) Which negative effect will be brought by the proposed project?

(Inconvenient to use: 0%, Inconvenient to repair: 0%, Occupy space: 11%, None: 89%)

4) The significance of negative effect brought by this project

(Considerable effect: 0%, some partial effect which can be resolved: 0%, basically no effect: 100%)

5) The overall impacts of the proposed project?

(Positives far outweigh negatives: 100%, Basically no impact: 0%, Negatives far outweigh positives: 0%)

6) Do you support the proposed project?

(Support: 100%, Oppose: 0%, Doesn't matter to me: 0%)

In summary of the key result, 100% of those surveyed supported the project and thought that its positive impacts far outweighed the negative impacts.

E.3. Report on consideration of comments received

>>

The stakeholders (including local government and local residents) strongly supported the proposed project. Therefore, it is not necessary to make any adjustment on the current implementation plan.

SECTION F. Approval and authorization

>>

The project and project participants have been approved and authorized by DNAs of host Party and other Parties involved. The approval letters are available at the time of submitting the PDD to the validating DOE. The approval letters and authorizations are available on the UNFCCC CDM web site. (http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1269331222.21/view)

- - - - -

Appendix 1: Contact information of project participants

Organization	Ningxia Federal Intertrade Co., Ltd.	
Street/P.O. Box	High Technology Zone	
Building	No.34, Chuang-xin Garden	
City	Yinchuan	
State/Region	Ningxia Hui Autonomous Region	
Postcode	750002	
Country	People's Republic of China	
Telephone	+86-951-5070212	
Fax	+86-951-5070300	
E-mail	nx.jiangw@yahoo.com.cn (for Wei Jiang) or ju.ning@cleanairtrade.com (for Ju Ning)	
Website		
Contact person	Wei Jiang	Ju Ning (alternative contact)
Title	General Manager	
Salutation	Mr.	Mr.
Last name	Jiang	Ning
Middle name		
First name	Wei	Ju
Department		
Mobile		
Direct fax	+86-951-5070300	+1-212-994-9638
Direct tel.	+86-951-5070212	+1-703-598-8032
Personal e-mail		

Organization	Swiss Re Global Markets Limited
Street/P.O. Box	14th Floor, 30 St Mary Axe
Building	
City	London
State/Region	
Postcode	EC3A 8EP
Country	United Kingdom
Telephone	+44 (0) 207933 4122
Fax	+44 (0) 207933 5000
E-mail	douglas_irving@swissre.com
Website	
Contact person	Daniel Troy
Title	
Salutation	Mr.
Last name	Troy
Middle name	

First name	Daniel
Department	
Mobile	
Direct fax	
Direct tel.	
Personal e-mail	

Organization	Post 2012 Carbon Credit Fund CV
Street/P.O. Box	13-17 Dawson Street
Building	c/- Conning Asset Management (Europe) Limited
City	Dublin
State/Region	
Postcode	
Country	Ireland
Telephone	+44 20 7337 1931
Fax	+44 20 7337 1941
E-mail	Markus_vanderburg@conning.com
Website	
Contact person	Markus Van der Burg
Title	
Salutation	Mr.
Last name	Van der Burg
Middle name	
First name	Markus
Department	
Mobile	
Direct fax	
Direct tel.	
Personal e-mail	

Appendix 2: Affirmation regarding public funding

No official funds are involved in the proposed project.

Appendix 3: Applicability of selected methodology

The applicability of selected methodology is in B.2. There is no additional information in this section.

Appendix 4: Further background information on ex ante calculation of emission reductions

1999-2008 Solar Irradiance Data in Haiyuan County[32]

Month	Monthly solar insolation (MJ/m^2)	Sunlight time (hour)	Solar irradiance rate (W/m^2)
1	299	213.8	388.5
2	353	217.3	451.2
3	468	244.3	532.1
4	526	246.4	593.0
5	656	270.6	673.4
6	695	267.9	720.6
7	651	266.5	678.5
8	546	251.1	604.0
9	419	195.9	594.1
10	429	210.4	566.4
11	305	226.9	373.4
12	294	222.5	367.0
Annual Total	5641	2833.6	553.0

[32] Data from Ningxia Meteorological Archive, April 2009

Appendix 5: Further background information on monitoring plan

The monitoring plan is in B.7.2. There is no additional information in this section.

Appendix 6: Summary of post registration changes

The distribution of solar cookers was extended to 6 additional townships in the same (Haiyuan) County. These 6 townships were not initially included in the registered PDD, but all of them belong to Haiyuan County. Therefore, the project boundary was changed from 10 townships to 16 townships in Haiyuan.

According to EB70 Annex2 "Clean Development Mechanism Project Standard" (version 02.0) Appendix 1:

Proposed or actual changes to the project design of a registered CDM project activity that do not adversely impact any of the following do not require prior approval by the Board:

(a) The applicability and application of the applied methodology under which the project activity has been registered;
(b) The additionality of the project activity;
(c) The scale of the project activity.

In this case, extending distribution of cookers to additional townships in Haiyuan County does not adversely impact any of the above items, and therefore does not require prior approval by the Board.

The registered monitoring plan is changed. The nature and extent of the non-conforming monitoring is the following:

According to the applied methodology, survey method can be used in the monitoring of number of systems operating. Therefore, for number of solar cookers engaged in the proposed project (n), instead of monitoring all the solar cookers (17,000), sampling survey will be utilized in the monitoring.

"Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities" (EB69, Annex5) has been available since 13 September 2012. Sample size calculation formulas are provided in this document. In order to be in accordance with the new guideline, sample size of n (number of solar cookers engaged in the proposed project) and t_i (the monthly operating time of each solar cooker) are calculated based on the formulas in this guideline. The calculation results are:

For n: sample size is 72

For t_i: sample size is 91

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