CLEAN DEVELOPMENT MECHANISM
SMALL-SCALE PROGRAM ACTIVITY DESIGN DOCUMENT FORM (CDM-SSC-CPA-DD)
Version 01

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NOTE:

(i) This form is for submission of CPAs that apply a small scale approved methodology using the provision of the proposed small scale CDM PoA.

(ii) The coordinating/managing entity shall prepare a CDM Small Scale Programme Activity Design Document (CDM-SSC-CPA-DD)[1,2] that is specified to the proposed PoA by using the provisions stated inthe SSC PoA DD. At the time of requesting registration the SSC PoA DD must be accompanied by a CDM-SSC CPA-DD form that has been specified for the proposed SSC PoA, as well as by one completed CDM-SSC CPA-DD (using a real case). After the first CPA, every CPA that is added over time to the SSC PoA must submit a completed CDM-SSC CPA-DD.

[1] The latest version of the template form CDM-CPA-DD is available on the UNFCCC CDM web site in the reference/document section.

[2] At the time of requesting validation/registration, the coordinating managing entity is required to submit a completed CDM-PoA-DD, the PoA specific CDM-CPA-DD, as well as one of such CDM-CPA-DD completed (using a real case).

SECTION A. General description of small scale CDM programme activity (CPA)

A.1. Title of the small-scale CPA:

Title: The XXX CPA of Henan Province Zhoukou City Rural Household Biogas Development Programme

Version: 09

Date: 28/12/20121

A.2. Description of the small-scale CPA:

Project Object:

The XXX CPA of Henan Province Zhoukou City Rural Household Biogas Development Programme (hereafter referred to as the CPA, CPAXXX or the project activity) belongs to Henan Province Zhoukou City Rural Household Biogas Development Programme (2007-2010) which is coordinated by Zhoukou New Energy Development Co., Ltd.[3] The CPA will set up XXX biogas digesters and their auxiliary facilities for gas collection and gas use (PVC pipe, pressure meter, desulphurization equipment, biogas stove, biogas light[4]etc.) for individual household during Stage I between XX/XXXX and XX/XXXX in XXX Town, XXX County, Zhoukou City, Henan Province.

The size of household biogas digesters under CPAXXX are XXXm^3 and the rated installed capacity of each biogas cook stoves is 3.26kWth, the livestock dung as the main feed organic waste will be transferred into biogas for cooking energy and biogas residues will be used for bio-fertilizer through continuous and high-efficient fermentation process.

Before implementation of the CPA:

Before implementation of the CPA, the dung in each rural household is treated in the deep pit. According to the survey implemented by Zhoukou City Rural Energy Office, the prevailing cooking fuel used in

[3] Zhoukou City Rural Energy Office designed the Programme of Zhoukou City Rural household Biogas Development in 2006. Zhoukou Coal Industry Company implemented the Programme voluntarily. For the purpose of the Programme implementation and CDM application, Zhoukou New Energy Development Company was especially set up on the basis of the team who is responsible for the biogas plants construction in Zhoukou Coal Company. After that, all the coordination and management work was done by the Zhoukou New Energy Development Co., Ltd.

[4]In some households, biogas is expected to be used not only for cooking, but also for illumination. In the actual monitoring, the monitoring systems i.e. biogas flow meters are equipped at the inlet of the thermal energy equipment i.e. biogas cooking stoves, the detailed monitoring approach regarding emission reductions as described in B.5.1

households of the CPA before installation of biogas digester is coal, and small fraction of LPG[5].

The renewable biogas used in the CPA displaces coal for cooking in rural areas, thus the CPA reduces GHG emissions by avoiding CO_2 emissions which would have been generated from combustion of coal or LPG during cooking.

Social and Environmental Benefits

As a renewable energy project, biogas application in rural areas is an important measure to build an economizing society and an environmentally amicable society, and an important approach of constructing harmonious rural villages. The contribution of the Programme to sustainable development[6] can be concluded in the following aspects:

a. **Social benefits:**

Avoids smoke hazards during cooking, and improves the living quality because of biogas application;

Avoids epidemic disease spread among people and animal because of innocuous treatment of dung.

b. **Environmental benefits:**

Improves the dung treatment system, avoid smoke in kitchens and smelly gas in toilets, which improves the living environment in rural areas;

Reduces GHG and pollutant emission because of using clean energy, which is in favor of environmental protection.

c. **Economic benefits:**

Reduces fuel, pesticide and fertilizer expenses;

Changes the traditional agriculture mode, and increases farmers' income;

Provides the working positions during the Programme operation.

d. **Technological benefits:**

Adopts more advanced anaerobic treatment to increase biogas generation and use, therefore reducing uncontrolled methane emissions;

Improves the technology of biogas digester maintenance management and biogas application.

A.3. Entity/individual responsible for the small-scale CPA:

Name of Party involved (*) (host indicates a host	Private and/or public entity(ies) project participants (*)(as applicable)	Kindly indicate if the Party involved wishes to be considered as project

[5]Based on the survey, fraction of LPG is only 0.67%. Coal and LPG are both considered in emission reduction calculation.

[6]*Evaluation on social & economic benefits of rural biogas projects in Henan Province/China Biogas, 2008,26(5).*http://d.wanfangdata.com.cn/Periodical_zgzq200805015.aspx

Party)		participant(Yes/No)
P.R.China	Zhoukou New Energy Development Co., Ltd.	No
The U.K.	Gazprom Marketing & Trading Limited	No

A.4. Technical description of the small-scale CPA:

A.4.1. Identification of the small-scale CPA:

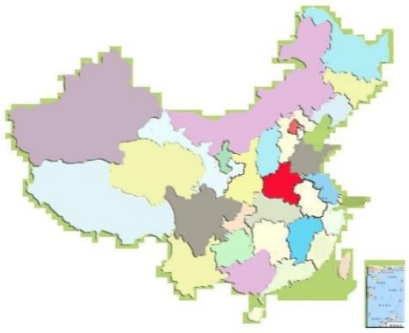
A.4.1.1. Host Party:

The People's Republic of China

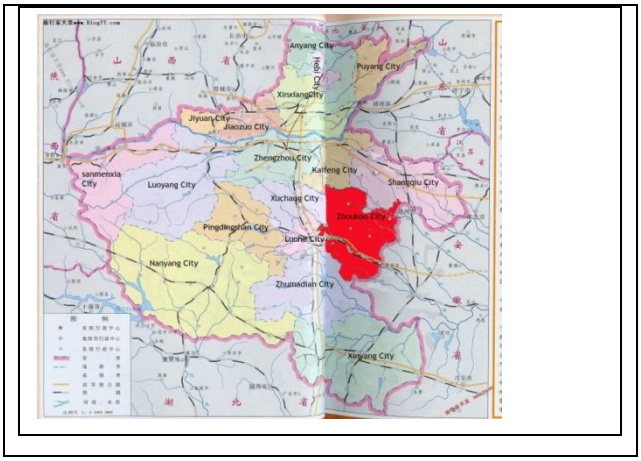
A.4.1.2. Geographic reference or other means of identification allowing the unique identification of the small-scale CPA (maximum one page):

As per paragraph 142 of CDM project standard (Ver. 01.0) and the PoA DD, the boundary of the Programme is Zhoukou City (the geographic coordinates are 114 °E to 115 °E and 33Nº to 34ºN) and all CPAs to be included in the Programme should be implemented in Zhoukou City.

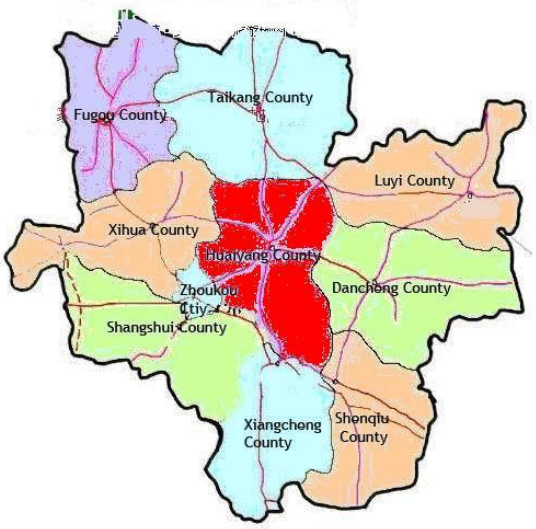
The CPA is located in XXX Town, XXX County, Zhoukou City, which is situated in Zhoukou City and meets the definition of the boundary. The geographical coordinates of XXX County are XXX°E to XXX°E and XXX°N to XXX°N. The detailed geographical location is labelled in Figure 1.



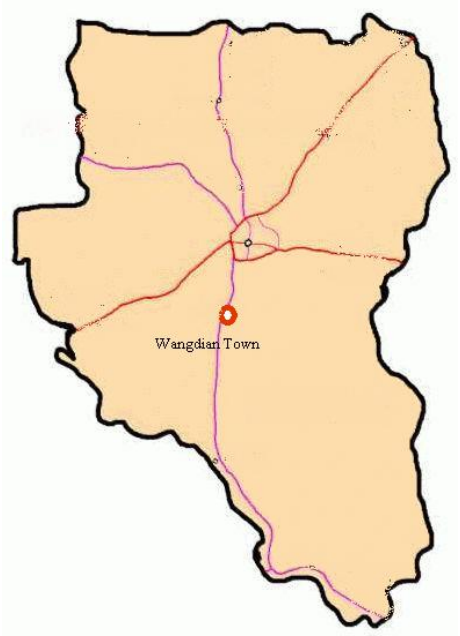
Henan Province in China



Zhoukou City in Henan Province



XXX County in Zhoukou City



XXX Town in XXX County

Figure 1. Location of the CPA

A.4.2. Duration of the small-scale CPA:

A.4.2.1. Starting date of the small-scale CPA:

DD/MM/YYYY[7], which is the date of installation of the first biogas digester in the CPA

A.4.2.2. Expected operational lifetime of the small-scale CPA:

10 years.

A.4.3. Choice of the crediting period and related information:

The fixed crediting period is adopted.

A.4.3.1. Starting date of the crediting period:

DD/MM/YYYY or the date of inclusion of the CPA in the registered PoA, whichever is later.

A.4.3.2. Length of the crediting period, first crediting period if the choice is renewable CP:

Not applicable.

A.4.4. Estimated amount of emission reductions over the chosen crediting period:

The fixed crediting period is adopted and in the crediting period (from DD/MM/YYYY to DD/MM/YYYY)the estimation of the emission reductions is presented in the following table.

Year	Estimated emission reductions (tCO_2e)
Year 1	XXX
Year 2	XXX
Year 3	XXX
Year 4	XXX
Year 5	XXX
Year 6	XXX
Year 7	XXX
Year 8	XXX
Year 9	XXX
Year 10	XXX
Total estimated emission reduction (tCO_2e)	XXX

[7] Please refer to the user's file with the name of "Zhoukou_XXX digester" which contains the date of the construction of biogas digester (XXXX/XXXX) , the supportive documents of "CPAXXX Database" and "Zhoukou Sample of Project Acceptance Certification";

As per paragraph 72 of EB 47th report, the CPAs with the starting date between 22/06/2007 and 30/12/2009 in the list can be included into the Programme. So, the CPA with the starting date later than 22/06/2007 should be included into the Programme.

Total number	10
Annual average over the crediting period of estimated reductions (tCO_2e)	XXX

A.4.5. Public funding of the CPA:

There is no public funding from Annex I countries available to the CPA.

A.4.6. Information to confirm that the proposed small-scale CPA is not a de-bundled component

According to the latest *Guidelines on assessment of de-bundling for SSC project activities (Ver. 03.0, Annex 13, EB 54th)*, if each of the independent subsystems/measures (e.g. biogas digester, solar home system) included in the CPA of a PoA is no greater than 1% of the small scale thresholds defined by the methodology applied and the subsystems/measures are indicated in the CPA-DDs to be each implemented at or in multiple locations (e.g., installed at or in multiple homes), then that CPA of PoA is exempted from performing de-bundling check i.e. considered as being not a de-bundled component of a large scale activity.

For the CPA, the installed capacity of each biogas stove is 3.26KWth, which is less than 1% of the scale thresholds defined by the methodology AMS-I.C. Ver. 19.0 (45MWth is defined as threshold in Methodology, so 1% should be 450kW). Meanwhile, each biogas digester is implemented separately and installed at different location in multiple households. So no de-bundling check needed in the SSC project activity.

A.4.7. Confirmation that small-scale CPA is neither registered as an individual CDM project activity or is part of another Registered PoA:

The CPA is not already registered as an individual CDM project activity or as part of another registered PoA.

SECTION B. Eligibility of small-scale CPA and Estimation of emissions reductions

B.1. Title and reference of the Registered PoA to which small-scale CPA is added:

Henan Province Zhoukou City Rural Household Biogas Development Programme (2007-2010).

B.2. Justification of the why the small-scale CPA is eligible to be included in the Registered PoA:

The proposed SSC-CPA is eligible for inclusion in the PoA because it meets each of the eligibility criteria outlined in section A.4.2.2. of the SSC-CDM-PoA-DD, as follows:

No	Eligibility Criteria	Situation of Project activity	Included?	Evidence
1	All the biogas digesters and their auxiliary equipment including the collection equipment and the biogas cook stoves under the proposed CPA should be located in the boundary of the Programme, i.e. within Zhoukou City (geographic coordinates are114 °E to 115 °E and 33Nº to 34ºN).	The biogas digesters and their auxiliary equipment under the CPA are located in XXX Town, XXX County, which is situated in Zhoukou City. And the geographical coordinates of XXX County are XXX N XXX E, which is within the scope o f 114 °E to 115 °E and 33Nº to 34ºN.	Yes	• Google earth
2	Each of the units installed should be registered in the database by using the unique ID number of the digester/household, which includes CPA number, digester's unique ID, user's address and location, commissioning date, biogas digester scale etc. Each CPA under the Programme should be have an individual database with the following information: - Name and address of the households where biogas units were installed under the CPA; - Date of commissioning; - Unique biogas plant registration number with the unique ID number of the household; - Size of the biogas unit installed. The digesters in all CPAs belonging to the Programme	The CPA with a name of "The XXX CPA of Henan Province Zhoukou City Rural Household Biogas Development Programme" has shown the ID number is No. XXX which has been uniquely identified. As per the database of the CPA, the unique ID number of the digester/household, which includes CPA number, digester's unique ID, user's address and location, commissioning date, biogas digester scale has been included to meet the eligibility criteria to avoid double counting[8].	Yes	CPA XXX database

[8] Please refer to the database of the CPA.

	should be uniquely identified to avoid double counting by above information.			
3	All the biogas digesters under the proposed CPA should be new-built ones and the size of digesters covering $8m^3$, $10m^3$, $12m^3$ and $15m^3$, which were used by household for cooking. The biogas digesters should be designed and constructed by a qualified construction team belonging to Zhoukou New Energy Development Co., Ltd. Zhoukou New Energy Development Co., Ltd. Should be inspected the quality of the biogas digester by sampling according to national quality standard[9] and Zhoukou City Rural Energy Office should be conducted an annual acceptance.	As per the database of the CPA, the biogas digesters under the CPA are new-built ones and the size is $XXXm^3$, which were used by household for cooking. The construction of biogas digesters has been checked, and the Acceptance Report of construction has been issued by Zhoukou City Rural Energy Office[10].	Yes	• Zhoukou Sample of Project Acceptance Certification
4	The Programme had commenced validation and global public comment period on 30/12/2009, and the list of special CPAs had been provided to DOE and UNFCCC secretariat prior to 31/01/2010[11]. As per paragraph 72 of EB 47th report, the CPAs with the starting date between 22/06/2007 and 30/12/2009 in the list can be included into the Programme. The starting date of the proposed CPA should be later than	The earlier date on which the first household biogas digester was constructed or the first CERs Transfer Contract was signed in the CPA was defined as the starting date of the CPA, and the first user's file or the first CERs Transfer Contract have been provided to check the starting date, i.e. the date that the first household biogas digester was constructed. The earlier date of above evidences is XX/XX/XXXX, which is either or later than 01/07/2007 and before	Yes	• XXX CPA CER transfer contract • Zhoukou Sample of Project Acceptance Certification • Original CPA list[13]

[9] Related China national standard for biogas construction: *GB/T 4750-2002 ; GB/T 4751-2002;GB/T 4752 2002*

[10] Please refer to the document with the name of Zhoukou Sample of Project Acceptance Certification.

[11] The list to support the starting date of CPAs had been submitted to DOE.

	01/07/2007 as the starting date of PoA.So, if the starting date of a CPA is before 30/12/2009, it should be confirmed that the proposed CPA is included in the list submitted to the UNFCCC.	30/12/2009, the CPA is included in the list submitted to the UNFCCC as per the eligibility criteria[12]		
5	The Programme was suitably in applying the methodology AMS-I.C. (Ver. 19.0), so the proposal CPA will be included to the Programme should be applicable to the AMS-I.C. (Ver. 19.0). The detailed applicability conditions to the methodology will be demonstrated in each CPA-DD.	The detailed applicability of the CPA to the methodology AMS-I.C. (Ver. 19.0) is listed in following table in "Justification the methodology is applicable to the CPA"..	Yes	• Section B.2. of the CPA-DD;
6	As per the latest demonstration of additionality outlined in "Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for PoA (Ver 0.2.1)", the Programme that consist of small-scale projects i.e. a biogas digester systems as CPAs shall include eligibility criteria derived from the relevant requirements of "Guidelines on the demonstration of additionality of small-scale project activities (Ver. 09)". As per the "Guidelines on the demonstration of additionality of small-scale project activities", documentation of	For the CPA, i.e. The XXX CPA of Henan Province Zhoukou City Rural Household Biogas Development Programme": 1) The CPA is composed of isolated biogas digesters; 2) The number of isolated biogas digesters is XXX; 3) The isolated biogas digesters generate gas to be used by households; 4) The installed capacity of each biogas stove is 3.65kWth, which is less 750kW. So the positive list is applicable for the CPA, and the CPA is additionality automatically.	Yes	• CPA XXX database • Emission Reduction Calculation • Boiogas Stove Specification

[13] The CPA list had been submitted to UNFCCC, please refer to Annex 3 of the PoA-DD.

[12]Please refer to the document of users' file of the CPA, which has been submitted to DOE.

	barriers is not required for the positive list of technologies and project types that are defined as automatically additional. The positive list includes the following, which applies to this PoA: (c) Project activities solely composed of isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs) and where the size of each unit is no larger than 5% of the small-scale CDM thresholds; To ensure that each CPA fits into this category, the following conditions are to be checked in each proposed CPA: 1) The CPA is composed of isolated biogas digesters; 2) The number of isolated biogas digesters in each CPA is less than 13,800; 3) The isolated biogas digesters generate gas to be used by households; 4) The installed capacity of each biogas stove is less than 750kW (this is 5 % of the small-scale CDM threshold).	Please refer to the section B.3. of the CPA-DD.		
7	For a certain CPA in the Programme, there is no public funding from Annex I parties involved in the Programme	The CPA received no public funding from Annex I parties.	Yes	• Declaration for POA with no ODA funding • Declaration for CPA XXX with

				no ODA funding • FSR of the Programme
8	According to footnote 5 of "Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for PoA" (Ver. 0.2.1), this is to re-test the validity of assumptions made at the PoA level. E.g. if there are some other applications and the target group for different usage. The target group at the PoA level is rural household, which can be checked by the database of household biogas digesters. Each CPA in the Programme utilizes biogas generated from biogas digesters to generate thermal energy, the target group is rural households and distribution is by direct installation. The application, target group and distribution mechanisms should be described according to the biogas digester database of the CPA to ensure if the re-test the validity is needed at the CPA level.	The CPA utilizes biogas generated from installed biogas digesters to generate thermal energy for household cooking in rural area of XXX Town, XXX County, Zhoukou City, i.e. rural households and direct installation. Therefore, the assumptions made at the PoA level are valid.	Yes	• CPA XXX database
9	The monitoring of data $n_{k,y}$ will be done through a statistically valid sample of the households where the monitoring samples will be chosen as per the relevant requirements for sampling in the "Standard for sampling and surveys for CDM Project activities and programme of activities Ver. 03.0"	Sampling will be carried out as per the sampling plan, please refer to the monitoring plan in section B.6.1. of the CPA-DD.	Yes	• Section B.6.1. of the CPA-DD • Section A.4.4.2 of the PoA-DD

	Meanwhile, the monitoring part of AMS-I.I. Ver. 3.0 will be adopted to carry out a monitoring procedure for the quantity of generated biogas for one typical biogas unit of the size k $B_{biogas,k,y}$ [14] .Five campaigns will be implemented per digester size in each year in each CPA based on the AMS-I.I. Ver. 3.0[15].			
10	For a certain CPA, the total rated thermal energy capacity of project equipment should be less than 45 MWth as per paragraph 43, AMS-I.C. Ver. 19.0. In the Project activity, the rated capacity of the biogas stove to be installed is up to 3.26 kWth[16], which means users' number in each proposed CPA should not exceed 13,800; The register database should be provide to ensure the users' number in the proposed CPA will be included to the PoA should be lower than 13,800.	The number of users i.e. the number of the biogas digesters under the CPA is XXX, which is less than 13,800.	Yes	• XXX database • Section A.2. of the CPA-DD
11	According to paragraph 7 of "Guidelines on Assessment of De-bundling for SSC Project Activities (Ver. 03.0)", if each of the independent subsystem/measures included in one or more CDM project activities in no great than 1%	The rated capacity of the biogas stove equipped with digester in the CPA is 3.26 kWth, which is no greater than 1% of 45MW and the biogas digester to be installed and implemented in multiple households in XXX Town,	Yes	• CPA XXX database • Biogas Stove Specification

[14] In line with clarification request 571: http://cdm.unfccc.int/Panels/ssc_wg/meetings/034/ssc_034_report.pdf

[15] As per paragraph 18 and table 1 of AMS-I.I. Ver. 3.0– "***Biogas/biomass thermal applications for households/small users".***

[16] According to the biogas stove specification

	of the small scale thresholds defined by the applied methodology and the subsystems/measures are indicated in the PDDs to be each implemented at or in multiple location, then the CDM project activities are exempted from performing a de-bundling check. i.e., considered as being not a de-bundled component of a large scale activity.	XXX County, XXX City.		

Justification the methodology is applicable to the CPA:

For a CPA in the Progrmme, the following conditions in the Methodology AMS-I.C. Ver. 19.0 are applicable:

- This project comprises renewable energy technologies i.e. a biogas digester system that supplies households with thermal energy that displaces currently used coal (or LPG) for cooking (relevant to paragraph 1, AMS-I.C. Ver. 19.0)
- In a certain CPA, the total installed/rated thermal energy generation capacity of the proposed project equipment is less than 45 MW thermal (see point 5 of Sector A. 4.2.2) (relevant to paragraph 43, AMS-I.C. Ver. 19.0)

As detailed below, the CPA meets each of the relevant applicability condition defined in AMS-I.C. Ver. 19.0 and hence the methodology is deemed applicable to the CPA.

No.	Applicability Conditions as per AMS-I.C. Ver. 19.0	Situation of this Project Activity
1	This methodology comprises renewable energy technologies that supply users with thermal energy that displaces fossil fuel use. These units include technologies such as solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel.	The CPA set up XXX biogas digesters using renewable Energy technology i.e. utilizing household biogas to generate thermal Energy for cooking by users in XXX Town, XXX County, Zhoukou City. In the absence of the household biogas technology, fossil fuel stoves would be used for cooking.
2	Biomass-based co-generating systems that produce heat and electricity are included in this category. For the purpose of this methodology Cogeneration shall mean the simultaneous generation of thermal energy and electrical and/or mechanical energy in one process. Project activities that produce heat and	This applicability condition is not relevant, since the CPA only involves heat generation but no electrical energy generation is involved

	power in separate element processes (for example heat from a boiler and electricity from a biogas engine) do not fit under the definition of cogeneration project.	
3	1. Emission reductions from a biomass cogeneration system can accrue from one of the following activities: (a) Electricity supply to a grid; (b) Electricity and/or thermal energy (steam or heat) production for on-site consumption or for consumption by other facilities; (c) Combination of (a) and (b).	This applicability condition is not relevant, since the CPA only involves heat generation but no electrical energy generation is involved
4	The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW thermal (see paragraph 6 for the applicable limits for cogeneration project activities)	As shown by the inclusion eligibility criteria of a CPA, the number of households in each CPA are less than 13,800 to meet the applicable limit, which does not exceed the limit of 45 MWth stipulated for the chosen methodology. The number of users i.e. the number of the biogas digesters under the CPA is XXX, which is less than 13,800.
5	For co-fired systems, the total installed thermal energy generation capacity of the project equipment, when using both fossil and renewable fuel shall not exceed 45 MW thermal (see Paragraph 6 for the applicable limits for cogeneration project activities).	The CPA does not involve co-fired system, so this applicability condition is not relevant.
6	The following capacity limits apply for biomass cogeneration units: (a) If the project activity includes emission reductions from both the thermal and electrical energy components, the total installed energy generation capacity (thermal and electrical) of the project equipment shall not exceed 45 MW thermal. For the purpose of calculating this capacity limit the conversion factor of 1:3 shall be used for converting electrical energy	This applicability condition is not relevant, since the CPA only involves emission reductions from heat generation but no electrical or mechanical energy generation is involved[17].

[17] Though some of the biogas from the digester will be used for illumination, the amount of biogas used for illumination will not be counted towards the emission reductions in the monitoring.

	to thermal energy (i.e., for renewable project activities, the maximal limit of 15 MW(e) is equivalent to 45 MWthermal output of the equipment or the plant); (b) If the emission reductions of the cogeneration project activity are solely on account of thermal energy production (i.e., no emission reductions accrue from electricity component), the total installed thermal energy production capacity of the project equipment of the cogeneration unit shall not exceed 45 MW thermal; (c) If the emission reductions of the cogeneration project activity are solely on account of electrical energy production (i.e., no emission reductions accrue from thermal energy component), the total installed electrical energy generation capacity of the project equipment of the cogeneration unit shall not exceed 15 MW.	
7	The capacity limits specified in the above paragraphs apply to both new facilities and retrofit projects. In the case of project activities that involve the addition of renewable energy units at an existing renewable energy facility, the total capacity of the units added by the project should comply with capacity limits in paragraphs 4 to 6 and should be physically distinct from the existing units.	The CPA does not involve addition of renewable energy units at an existing renewable energy facility, so this applicability condition is not relevant.
8	Project activities that seek to retrofit or modify an existing facility for renewable energy generation are included in this category.	The CPA set up XXX biogas digesters in households and utilizes the biogas to generate thermal energy for cooking. As per the database of the CPA, the biogas digesters under the CPA are new-built ones and the size is all XXXm^3, which don't involve any retrofit or modification of existing facility for renewable energy generation.
9	New Facilities (Greenfield projects) and project activities involving capacity additions compared to the baseline scenario are only eligible if they comply with the related and relevant requirements in the General Guidelines to SSC CDM methodologies.	As per paragraph 4(c) of the latest General Guidelines to SSC CDM methodologies (Ver. 17.0), the limit of 45MWth is the rated capacity of the biogas cook stoves. For the CPA, the total output capacity is XXX MWth (the rated capacity of each biogas cook stove is XXXkWth, and total XXX cook stoves included in the CPA) , which strictly controlled within 45 MWth

		to comply with the above requirements.
10	If solid biomass fuel (e.g. briquette) is used, it shall be demonstrated that it has been produced using solely renewable biomass and all project or leakage emissions associated with its production shall be taken into account in emissions reduction calculation.	This application condition is not relevant, since the CPA does not involve the application of solid biomass fuel including briquette.
11	Where the project participant is not the producer of the processed solid biomass fuel, the project participant and the producer are bound by a contract that shall enable the project participant to monitor the source of the renewable biomass to account for any emissions associated with solid biomass fuel production. Such a contract shall also ensure that there is no double-counting of emission reductions.	The CPA does not involve the production of solid biomass fuel, so this applicability condition is not relevant.
12	If electricity and/or steam/heat produced by the project activity is delivered to a third party i.e. another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into that ensures there is no double-counting of emission reductions.	Heat generation is solely used within the household and the small scale of the units makes any transfer or delivery of heat to a third party unfeasible and impractical, hence the criteria is not applicable.
13	If the project activity recovers and utilizes biogas for power/heat production and applies this methodology on a stand alone basis i.e. without using a Type III component of a SSC methodology, any incremental emissions occurring due to the implementation of the project activity (e.g. physical leakage of the anaerobic digester, emissions due to inefficiency of the flaring), shall be taken into account either as project or leakage emissions.	The CPA utilizes biogas to generate heat for cooking. The single methodology AMS-I.C. Ver. 19.0 was used in the CPA. Therefore, emissions from the physical leakage from the biogas digester are taken into account in the calculation of project emissions (see the section B.5.2 of the CPA-DD).
14	Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources provided: (a) Charcoal is produced in kilns equipped with methane recovery and destruction facility; or (b) If charcoal is produced in kilns not equipped with a methane recovery and destruction	This application condition is not relevant, since the CPA does not involve charcoal based biomass energy generation

	facility, methane emissions from the production of charcoal shall be considered. These emissions shall be calculated as per the procedures defined in the approved methodology AMS-III.K. Alternatively, conservative emission factor values from peer reviewed literature or from a registered CDM project activity can be used, provided that it can be demonstrated that the parameters from these are comparable e.g. source of biomass, characteristics of biomass such as moisture, carbon content, type of kiln, operating conditions such as ambient temperature.	

B.3. Assessment and demonstration of additionality of the small-scale CPA, as per eligibility criteria listed in the Registered PoA:

According to "Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for PoA (Ver 0.2.1)", the additionality demonstration of the CPA shall include eligibility criteria derived from the relevant requirements of "Guidelines on the demonstration of additionality of small-scale project activities (Ver. 09)".

As per the "Guidelines on the demonstration of additionality of small-scale project activities", documentation of barriers is not required for the positive list of technologies and project types that are defined as automatically additional. The positive list includes the following category, which applies to this PoA:

(c) Project activities solely composed of isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs) and where the size of each unit is no larger than 5% of the small-scale CDM thresholds;

The CPA is composed of XXX household biogas digesters, and the users of the biogas digesters are XXX households. So the positive list is applicable for the CPA, if the size of each unit is less than the 5% of the small-scale CDM threshold (this limit is 750kW installed capacity according to footnote 1 of the "Guidelines on the demonstration of additionality of small-scale project activities")

These conditions have been translated into the criteria for assessing the additionality of the CPA as described in section E.5.2 of this PoA-DD and the eligibility criteria as described in section A.4.2.2 of this PoA-DD. The criteria below shall be checked upon inclusion of the CPA to the PoA in order to demonstrate additionality of the CPA:

No	Criteria	Evidence
1	The CPA is composed of isolated biogas digesters;	The database of CPAXXX of XXX isolated biogas digesters with unique ID number has been

		submitted[18];
2	The amount of isolated biogas digesters is less than 13,800;	The database of CPAXXX of XXX isolated biogas digesters with unique ID number has been submitted;
3	The isolated biogas digester are only used by households;	The database of CPAXXX of XXX isolated biogas digesters with the name, address and location of household has been submitted;
4	The installed capacity of each biogas stove is less than 750kW.	The biogas stove specification with 3.26kWth has been submitted, which shows the installed capacity less than 750kW;

It can be concluded that the CPA meet the above criteria and is additionality automatically.

B.4. Description of the sources and gases included in the project boundary and proof that the small-scale CPA is located within the geographical boundary of the registered PoA.

The gases included in this CPA are described in Figure 2. The gases contained in the baseline scenario are carbon dioxide (CO_2) from thermal energy used for cooking.

The CPA aims to set up XXX biogas plants (digesters) and their auxiliary facilities for gas collection and gas use for individual household in XXX Town, XXX County. As per Methodology AMS-I.C. Ver. 19.0, the boundary of the CPA is the geographical and physical boundary of renewable energy production and consumption, in the CPA the boundary should be the physical and geographical site of these XXX biogas digesters and auxiliary facilities. Refer to demonstration of No. (1) in section B.2, XXX Town belongs to XXX County and XXX County belongs to Zhoukou City, i.e. the boundary of the CPA is located in the boundary of the PoA. The Figure 2 below shows a schematic representation of the boundary of each household.

[18] The database has been submitted to DOE.

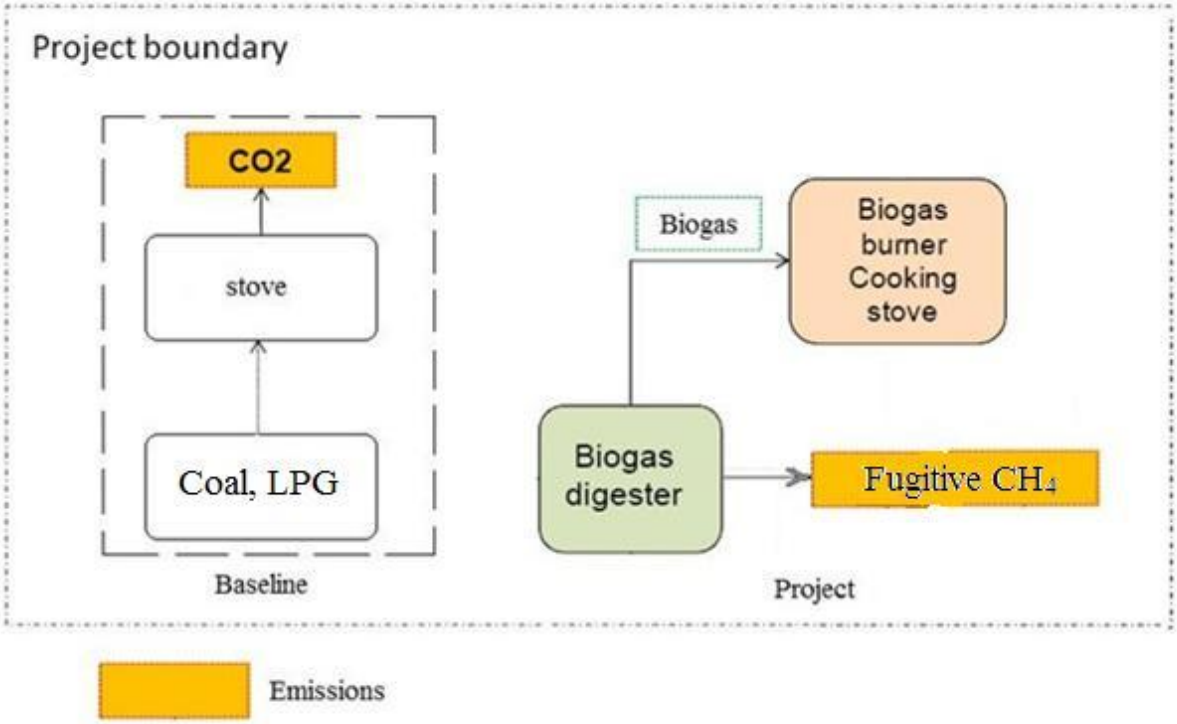


Figure 2. Project activity boundary

As per the methodology, the baseline GHG emissions within the boundary of the CPA are the emissions caused by heat generation from fossil fuels. Project emissions include fugitive methane emissions caused by physical leakage from manure treatment systems i.e. biodigesters. Detailed information is listed as follows:

	Source Emissions	**Gas**	**Included?**	**Justification / Explanation**
Baseline	Emission from thermal supply from fossil fuel combustion	CO_2	Included	Main emission source. The coal and LPG are used as cooking fuel in baseline
		CH_4	Excluded	Excluded for simplification
		N_2O	Excluded	Excluded for simplification
Project activity	Emission from physical leakage in manure treatment	CO_2	Excluded	Excluded for simplification
		CH_4	Included	Potential source of emissions in the project scenario. It is

	system			conservatively assumed that physical leakage of the biodigesters amounts to 10% of generated biogas
		N_2O	Excluded	Excluded for simplification

B.5. Emission reductions:

B.5.1. Data and parameters that are available at validation:

Data / Parameter:	$\eta_{BL,thermal,coal}$
Data unit:	%
Description:	The efficiency of the cook stove using coal that would have been used in the absence of the project activity
Source of data used:	*Edwards Reral.,2004,* *Improved Household Stoves in China: An Assessment of the National Improved Stove Program(NISP) and article in Energy Policy 32(2004) 395-411;* *Implication of changes in household stoves and fuel used in China*
Value applied:	47%
Justification of the choice of data or description of measurement methods and procedures actually applied :	The data corresponds to the highest of the measured efficiency values of this type of coal burners. The maximum efficiency is employed for conservativeness purposes
Any comment:	

Data / Parameter:	$\eta_{BL,thermal,LPG}$
Data unit:	
Description:	The efficiency of the cook stove using LPG that would been used in the absence of the project activity
Source of data used:	*Assumption*
Value applied:	100%
Justification of the choice of data or description of measurement methods and procedures actually applied :	Assumed the maximum efficiency for conservativeness purposes
Any comment:	-

Data / Parameter:	$EF_{coal,CO2}$
Data unit:	t CO_2/TJ

Description:	CO_2 emission factor per unit of coal
Source of data used:	*IPCC 2006 Revised Guidelines :Volume 02, Chapter 01,Table 1.3*
Value applied:	89.5 t CO_2/TJ
Justification of the choice of data or description of measurement methods and procedures actually applied :	According to the requirement of methodology, use IPCC 2006 default value.
Any comment:	-

Data / Parameter:	$EF_{LPG,CO2}$
Data unit:	t CO_2/TJ
Description:	The CO_2 emission factor of the LPG that would have been used in the baseline plant
Source of data used:	*IPCC 2006 Revised Guidelines :Volume 02, Chapter 01,Table 1.3*
Value applied:	63.07 t CO_2/TJ
Justification of the choice of data or description of measurement methods and procedures actually applied :	According to the requirement of methodology, use IPCC 2006 default value.
Any comment:	-

Data / Parameter:	NCV_{biogas}
Data unit:	KJ/m^3
Description:	The net calorific value of the biogas
Source of data used:	*Appendix IV, China energy Statistical Yearbook (2009)*
Value applied:	20,908 KJ/m^3
Justification of the choice of data or description of measurement methods and procedures actually applied :	Adopt the data from national or regional record if any, *China Energy Statistical Yearbook (2009) in the project activity*
Any comment:	*Appendix IV, China Energy Statistical Yearbook (2009)*

Data / Parameter:	η_{PJ}
Data unit:	%
Description:	The efficiency of the domestic biogas stove used in the project activity
Source of data used:	*China National Standard for Domestic Biogas, GB/T3606-2001*
Value applied:	55%
Justification of the choice of data or description of	The data is the lowest efficiency of a biogas stove according to *the China National Standard for Domestic Biogas, GB/T3606-2001*. The value of 55% is applied here for conservativeness purposes.

measurement methods and procedures actually applied :	
Any comment:	-

Data / Parameter:	GWP_{CH4}
Data unit:	tCO_2e / tCH_4
Description:	Global Warming Potential of methane
Source of data used:	*IPCC Second Assessment Report, 1995*
Value applied:	21
Justification of the choice of data or description of measurement methods and procedures actually applied :	Standard GWP for CH_4
Any comment:	-

Data / Parameter:	D_{CH4}
Data unit:	tCH_4 / m^3CH_4
Description:	Methane density
Source of data used:	As per AMS-III.D. Ver. 18.0 " methane recovery in animal manure management system"
Value applied:	0.00067
Justification of the choice of data or description of measurement methods and procedures actually applied :	In line with the factor indicated in AMS-III.D. Ver. 18.0 " methane recovery in animal manure management system"
Any comment:	-

Data / Parameter:	X_{CH4}
Data unit:	m^3 CH_4 / m^3 biogas
Description:	Fraction of methane in the biogas
Source of data used:	*AMS.III.D*
Value applied:	0.6
Justification of the choice of data or description of measurement methods and procedures actually applied :	Standard CH_4 content in biogas as per paragraph 26 in *AMS.III.D* Ver. 18.0
Any comment:	-

B.5.2. Ex-ante calculation of emission reductions:

The following steps were involved in the calculation of emission reductions:

Step 1: Calculate the baseline emissions;

Step 2: Calculate the project emissions;

Step 3: Calculate the leakage;

Step 4: Calculate the emission reductions.

Step 1. Calculate the baseline emissions (BE_y)

As per paragraph 16 of methodology AMS-I.C. Ver. 19.0, the simplified baseline is the fossil fuels consumption technologies that would have been used in the absence of the project activity times an emission factor for the fossils fuel displacement. According to paragraph 22 of the AMS-I.C. Ver. 19.0, the applicable equation to estimate the baseline emissions for the CPA is as follows:

$$BE_{thermal,\,CO_2,y} = (EG_{thermal,y} \,/\, \eta_{BL,thermal}) * EF_{FF,CO2} \qquad (1)$$

Where:

$BE_{thermal,\,CO_2,y}$	The baseline emissions from heat displaced by the project activity during the year y (tCO_2e)
$EG_{thermal,y}$	The net quantity of the heat supplied by the project activity during the year y; (TJ)
$\eta_{BL,thermal}$	The efficiency of the stove using fossil fuel (coal or LPG) that would have been used in the absence of the project activity; (%)
$EF_{FF,CO2}$	The CO_2emission factor of the fossil fuel (coal or LPG) that would have been used in the baseline stove; (tCO_2e/TJ)

Given that the biogas thermal energy is expected to displace either coal or LPG, depending on the baseline fuel used by the household, equation (1) can be adjusted to reflect for the two types of fuels that would be consumed in baseline scenario as follows:

$$BE_{thermal,\,CO_2,y} = (EG_{thermal,y} \,/\, \eta_{BL,thermal,coal}) * EF_{coal,CO2} * f_{coal} + (EG_{thermal,y} \,/\, \eta_{BL,thermal,LPG}) * EF_{LPG,CO2} * f_{LPG} \qquad (2)$$

Where:

$BE_{thermal,\,CO_2,y}$	The baseline emissions from heat displaced by the project activity during the year y (tCO_2e)
$EG_{thermal,y}$	The net quantity of heat supplied by the project activity during the year y; (TJ)
$\eta_{BL,thermal,coal}$	The efficiency of the coal stove that would have been used in the absence of the project activity
$\eta_{BL,thermal,LPG}$	The efficiency of the LPG stove that would have been used in the absence of the project activity
f_{coal}	The fraction of households using coal in the baseline scenario

f_{LPG}	The fraction of households using LPG in the baseline scenario
$EF_{coal,CO2}$	The CO_2 emission factor of the coal that would have been used in the baseline scenario; (tCO_2e/TJ)
$EF_{LPG,CO2}$	The CO_2 emission factor of the LPG that would have been used in the baseline scenario; (tCO_2e/TJ)

According to paragraph 43 of AMS.I.C Ver. 19.0, the maximum output capacity is less than 45kW thermal for household application. Given that the metering of thermal energy output is not possible, the output energy in baseline scenario can be estimated based on the consumption of biomass used in project activity (in terms of energy quantity) times the efficiency of the equipment employed in the project activity. This can be expressed according to the following equation (based on equation 9 of AMS.I.C. Ver. 19.0):

$$EG_{thermal,y} = HG_{PJ,y} = B_{biogas,PJ,y} * NCV_{biogas} * \eta_{PJ} \quad (3)$$

Where:

$EG_{thermal,y}$	The net quantity of heat supplied by the project activity during the year y; (TJ)
$HG_{PJ,y}$	The net quantity of thermal energy supplied by biogas generated in the project activity during the year *y*; (TJ)
$B_{biogas,PJ,y}$	The net quantity of the biogas consumed in the project activity during year *y*; (m^3)
NCV_{biogas}	The net calorific value of the biogas combusted in project activity (TJ/m^3)
η_{PJ}	Efficiency of the biogas stove measured using representative sampling methods or based on referenced literature values. The efficiency tests shall be conducted according to the guidance provided in the relevant national/international standards

Given that there are different sizes of biogas digesters installed, and that different sized digesters may generate a different amount of biogas (and consequently thermal energy), the net quantity of biogas ($B_{biogas,PJ,y}$) consumed in year *y* will be calculated as the sum of the biogas consumed by each cook stove depending on the size of biogas digester supplying that stove. The biogas consumed will be determined based on measurement campaigns for each different size of digester:

$$B_{biogas,PJ,y} = \sum_k [\, B_{biogas,k,y} * N_{k,0} * n_{k,y} \,] \quad (4)$$

Where:

$B_{biogas,PJ,y}$	The net quantity of biogas consumed in the project activity in year *y*; (m^3)
$N_{k,0}$	Total number of registered biogas units of the size *k* commissioned
$n_{k,y}$	Proportion of $N_{k,0}$ that remain operating at year *y* (fraction)
$B_{biogas,k,y}$	The net quantity of biogas supplied to the thermal energy equipment for one typical biogas unit of the size *k*
k	Index used to refer to the different sizes of biogas units according to the digester size (e.g. $8m^3$, $10m^3$, $12m^3$, $15m^3$, etc.)

Based on the information from the CPA XXX XXX Town database, the CPA includes XXX households using biogas. In the calculation of emission reductions, the value of $N_{k,0}$ is defined as XXX and the $n_{k,y}$ is given as 100% to obtain the value of baseline emission.

As per the professional literature named *Estimation of biogas production and effect of biogas construction on energy economy* published in 2010 in Transactions of the CSAE[19], the annual average biogas yields of household biogas digester in 2007 is 341m^3 in Xiangcheng county belongs to Zhoukou city Henan province, so, the value of $B_{biogas,k,y}$ is defined as 341m^3 for estimating the baseline emissions.

According to the results of the baseline fuel survey conducted in 2007 by Zhoukou New Energy Development Co., Ltd., it shows that the total amount of households involved survey is 1,353, the amount of households using coal as main fuel and using LPG as main fuel are 1,344 and 9 separately. So, the fraction of households using coal stove in the baseline i.e. the value of f_{coal} is 99.33%and thevalue of f_{LPG} is 0.67%.

Step 2: Calculate the project emissions (PE_y)

As per paragraph 13 of methodology AMS-I.C. Ver. 19.0, if the project activity utilizes biogas for power production and applies this methodology on a alone basis, any incremental emissions occurring by project activity e.g. physical leakage of the biogas digester shall be taken into account either as project emissions.

Given that the baseline emissions are calculated based on the amount of thermal energy actually supplied and that the units that are not in operation are monitored and discounted (if applicable) from the baseline emissions in Step 1, and considering that there are no other expected sources of GHG emissions as a consequence of the project activity, the project emissions will be calculated as the expected physical leakage of biogas as per 2006 IPCC Guideline for National Greenhouse Gas Inventories Volume 4 Chapter 10.

Project emissions due to physical leakage of biogas from the animal manure management systems used to produce, collect and transport the biogas to the point of combustion is estimated as 10% of the net quantity of biogas consumed[20]. The following equation can be used to determine the project emissions:

$$PE_y = B_{biogas,PJ,y} * GWP_{CH4} * D_{CH4} * X_{CH4} * 0.1 \quad (5)$$

Where:

$B_{biogas,PJ,y}$	The net quantity of biogas consumed in the project activity in year *y* (m^3)
GWP_{CH4}	Global Warming Potential (GWP) of CH_4 (21 tCO_2e / tCH_4)
D_{CH4}	CH_4 density (0.00067 t CH_4/m^3CH_4at room temperature (20℃) and 1 atm pressure)
X_{CH4}	Fraction of methane in the biogas (assumed to be 0.6 m^3 CH_4 / m^{3}biogas)

[19]http://www.cnki.com.cn/Article/CJFDTotal-NYGU201003049.htm

[20] By comparison AMS-III.D version 18.0.0 allows the use of a default value of 0.05m^3 biogas leaked/m^3 biogas produced.

Step 3: Calculate the leakage (LE_y)

The project activity is the new installation of biogas digesters. There is no need for trans-boundary transport of commissioned units in the CPA. According to AMS-I.C. Ver. 19.0, in this case, the leakage can be neglected, i.e. LEy=0.

Step 4: Calculate the emission reductions

According to the methodology of AMS-I.C. Ver. 19.0, the equation for calculation of *ERy* is shown as follows:

$$\mathbf{ER_y = BE_y - PE_y - LE_y} \qquad (6)$$

B.5.3. Summary of the ex-ante estimation of emission reductions:

According to the equation (4), the calculation of $B_{biogas,PJ,y}$ is as follows:

$B_{biogas,PJ,y}$ = XXX * 100% * 341 = XXX m^3;

According to the equation (3), the calculation of $EG_{thermal,y}$ is as follows:

$EG_{thermal,y}$ = XXX * 20,908 * 55% * 10^{-9} = XXX TJ;

According to the equation (2), the calculation of BE_y is shown as follows:

BE_y = XXX * 99.33% / 47% * 89.5 + XXX * 0.67% / 100% * 63.07 = XXX tCO_2e;

According to the equation (5), the calculation of PE_y is shown as follows: PEy= XXX * 21 *0.00067 * 0.6 *0.1 = XXX tCO_2e;

Based on the value of BE_y, PE_y and L_y,the value of ER_y is calculated as per equation (6):

ER_y= XXX - XXX -0 = XXX tCO_2e

A fixed crediting period (10yrs × 1) is adopted by the CPA. It is expected that the total emission reductions are XXX tCO_2e over the entire crediting period. XXX tCO2e will generate over the crediting period from DD/MM/YYYY to DD/MM/YYYY.

Year	Estimation of project activity emissions (tonnes of CO_2 e)	Estimation of baseline emissions (tonnes of CO_2 e)	Estimation of leakage (tonnes of CO_2 e)	Estimation of overall emission reductions(tonnes of CO_2 e)
1	XXX	XXX	0	XXX
2	XXX	XXX	0	XXX
3	XXX	XXX	0	XXX
4	XXX	XXX	0	XXX
5	XXX	XXX	0	XXX
6	XXX	XXX	0	XXX

7	XXX	XXX	0	XXX
8	XXX	XXX	0	XXX
9	XXX	XXX	0	XXX
10	XXX	XXX	0	XXX
Total (tCO_2e)	**XXX**	XXX	**0**	XXX

B.6. Application of the monitoring methodology and description of the monitoring plan:

As described in section E.1 and E.2 of the PoA-DD, due to AMS-I.C. adopted by the Programme not being explicit enough in terms of monitoring for biogas thermal applications for households, the SSC Working Group approved the clarification request regarding employing methodology AMS-I.I. (ver.3.0) that contains specific monitoring procedures for household applications (refer to clarification request 571)[21]. AMS-I.I shall only be utilised to determine the net quantity of biogas supplied to the thermal energy equipment ($B_{biogas,k,y}$).

B.6.1. Description of the monitoring plan:

Data and parameters that need to be monitored in the CPA are summarized and listed as shown in the following tables:

Data / Parameter:	$N_{k,0}$
Data unit:	
Description:	Number of registered biogas units of the size *k* commissioned in the CPA
Source of data to be used:	Records from the implementation of the PoA
Value of data applied for the purpose of calculating expected emission reductions in section B.5	There are XXX households in the CPA
Description of measurement methods and procedures to be applied:	At the time of installation all biogas utilization systems shall be inspected and undergo acceptance testing (commissioning) for proper operation in compliance with specifications. The installation date of each system shall be recorded.
QA/QC procedures to be applied:	To be cross-checked with the records in the database for the number of biogas units installed and commissioned
Any comment:	

Data / Parameter:	$n_{k,y}$
Data unit:	

[21]See paragraph 30 of report: http://cdm.unfccc.int/Panels/ssc_wg/meetings/034/ssc_034_report.pdf

Description:	Proportion of $N_{k,0}$ that remain operating at year *y* (fraction)
Source of data to be used:	Records from the annual monitoring campaign
Value of data applied for the purpose of calculating expected emission reductions in section B.5	100%
Description of measurement methods and procedures to be applied:	The CME will inspect that the biogas units are operational and in compliance with the requirement of maintenance procedures from the manufacturers at once every year during the crediting period. Monitoring will be done through a statistically valid sample of the households where the monitoring samples will be chosen as per the relevant requirements for sampling in the "Standard for sampling and surveys for CDM Project activities and programme of activities" Version 03.0. A 90/10 confidence precision will be used, this is in line with AMS I.I version 3 para 17 when annual inspection is chosen.
QA/QC procedures to be applied:	
Any comment:	

Data / Parameter:	$B_{biogas,k,y}$
Data unit:	(m^3)
Description:	The net quantity of biogas supplied to the thermal energy equipment for one typical biogas unit
Source of data to be used:	Monitoring through measurement campaigns during the crediting period of each CPA
Value of data applied for the purpose of calculating expected emission reductions in section B.5	341m^3
Description of measurement methods and procedures to be applied:	Gas meters are used to monitor accumulated biogas supplied to thermal energy equipment, installed at the inlet of the termal equipment. Measurement campaigns shall be undertaken at selected sitesand at least five campaigns per digester size shall be carried out in each year of the crediting period. Continuous measurement made for at least one month at a single digester is considered as a campaign as per AMS-I.I. Ver. 3.0– "***Biogas/biomass thermal applications for households/small users***". In accordance with AMS-I.I Ver. 3.0, monthly average values will be annualised taking into account seasonal variation in gas production which is

	mainly a function of ambient temperature.
QA/QC procedures to be applied:	A cross-check will be made with the theoretical amount of biogas to be generated to confirm the suitability of the measurements.
Any comment:	

Data / Parameter:	f_{coal}
Data unit:	
Description:	Fraction of households using coal as the main fuel for cooking in the baseline scenario
Source of data to be used:	Baseline fuel survey
Value of data applied for the purpose of calculating expected emission reductions in section B.5	99.33%
Description of measurement methods and procedures to be applied:	The type of fuel used in the absence of installation of a biogas unit is surveyed and recorded during the baseline survey.
QA/QC procedures to be applied:	To be cross-checked with the records in the baseline survey database as well as with f_{LPG}
Any comment:	

Data / Parameter:	f_{LPG}
Data unit:	
Description:	Fraction of households using LPG as the main fuel for cooking in the baseline scenario
Source of data to be used:	Baseline fuel survey
Value of data applied for the purpose of calculating expected emission reductions in section B.5	0.67%
Description of measurement methods and procedures to be applied:	The type of fuel used in the absence of installation of a biogas unit is surveyed and recorded during the baseline survey.
QA/QC procedures to be applied:	To be cross-checked with the records in the baseline survey database as well as with f_{coal}
Any comment:	

2. Monitoring Structure

In order to implement the monitoring plan effectively, the monitoring structure as per the Programme has

been established. The Biogas Station belonging to the CME takes full charge of the operation of the monitoring plan under the CPA and the specific person is designated.

The Biogas Station, managed by a Biogas Station Manager, will be running a Biogas Service Centre that will be in charge of the construction, operation, maintenance, training, data recording and supervision of the installed biogas units. And the monitoring work is carried out by the staff of Biogas Service Centre.

3. Data description:

The related description below will be followed for each of the parameters to be monitored throughout the duration of the project activity;

Parameter	Definition	Description
$N_{k,0}$	Number of registered biogas units of the size *k* commissioned	At the time of installation all project activity systems shall be inspected and undergo acceptance testing (commissioning) for proper operation in compliance with specifications. The installation date of each system shall be recorded.
$n_{k,y}$	Proportion of $N_{k,0}$ that remain operating at year *y* (fraction)	The CME will inspect that the biogas units chosen as a sample are operational and in compliance with the required maintenance procedures from the manufacturers at least once every year during the crediting period. Monitoring will be done through a statistically valid sample of the households where the systems are installed as per the relevant requirements for sampling in the "Standard for sampling and surveys for CDM Project activities and programme of activities" Version 03.0 A 90/10 confidence precision will be used, this is in line with AMS I.I version 3 para 17 when annual inspection is chosen.
$B_{biogas,k,y}$	The net quantity of biogas supplied to the thermal energy equipment for one typical biogas unit of the size *k*	Gas meters are used to monitor accumulated biogas supplied to thermal energy equipment. Measurement campaigns shall be undertaken at selected sites. At least five campaigns per digester size shall be carried out in each year of the crediting period. Continuous measurement made for at least one month at a single digester is considered as a campaign. In accordance with AMS-I.I Ver. 3.0, monthly average values will be annualised taking into account seasonal

		variation in gas production which is mainly a function of ambient temperature.
f_{coal}	Fraction of households using coal as the main fuel for cooking in the baseline scenario	The type of fuel used in the absence of installation of a biogas unit is surveyed and recorded during the baseline survey.
f_{LPG}	Fraction of households using LPG as the main fuel for cooking in the baseline scenario	The type of fuel used in the absence of installation of a biogas unit is surveyed and recorded during the baseline survey.

4. Sampling Plan

Sampling will be carried out in accordance with the "Standard for sampling and surveys for cdm project activities and programme of activities" (Version 03.0) EB69 and the sampling plan below is based on the recommended outline for a sampling plan contained in the "Guidelines for sampling and surveys for CDM project activities and programme of activities" (Version 2.0) EB69.

A. Sampling design

Objectives and reliability requirements

The objective is to determining the Proportion of registered biogas units of the size *k* commissioned in each CPA ($n_{k,y}$)that remain operating during the crediting period, with a 90/10 confidence/precision. This is as required by AMS I.I version 3, Para 17, when annual inspection is chosen.

Target population

The target population is rural household all registered biogas units of the size *k* commissioned in each CPA in Zhoukou City Rural Household Biogas Development Programme.

Sampling method

Based on para 8 of "Guidelines for sampling and surveys for CDM project activities and programme of activities" (Version 2.0), simple random sampling is selected as the target population (i.e. all rural household biogas units of the size *k* in the CPA) is homogeneous. That means each unit of the size *k* and associated equipment in a CPA is equally likely to be operational because the equipment is built and installed to the same specification and located in rural areas in the same province in China, so no variation in operation is expected. The units will also be subject to an independent acceptance test and annual inspection. In case of malfunctioning, maintenance can be provided by a qualified technician from the Biogas Service Centre supporting the assertion that each unit of size *k* in a CPA is equally likely to operate.

Sampling frame

The proposed CPA will have a database listing all of the biogas units installed under the CPA and the size (*k*) of each unit installed, this is described in more detail in the section 'C. Implementation' below. This database will be used as the sampling frame. This sampling frame includes all biogas units of the size k in

the proposed CPA, so it is suitable to be used with simple random sampling. Should the required precision and confidence not be achieved by the sample taken, additional records can be sampled as all biogas units will have records.

Sample size

Sampling requirements

The description of how to calculate the sample size required to achieve the required level of reliability is as follows:

1) The parameter value for sampling is the Proportion of registered biogas units of the size *k* commissioned in each CPA ($n_{k,y}$)that remain operating. As the percentage of units still in operation, it is described as yes/no data. Based on the distinction for types of data, it is a proportion value and the corresponding calculation method will be adopted.

2) The sampling size is estimated separately and independently for each of the CPAs included in the Programme. The target level of confidence and precision is 90/10 as per Para 17 of AMS I.I version 3, where annual inspection is chosen.

There is a local government requirement that the operation rate of biogas units must not be lower than 95%. However, in order to be conservative, 50% is used as the value that $n_{k,y}$ is expected to take in the sampling size calculation.

3) The parameter of interest ($n_{k,y}$) is a proportion so there is no need to specify a variance estimate.

Sampling calculation[22]

$$n \geqq Z^2*N*p(1-p) / ((N-1) * 0.1^2*p^2 + Z^2*p(1-p))$$

Where:

n	sample size
N	Total number of units in the population
P	Is the expected proportion
Z	confidence level- 1.654 represents 90% confidence, 1.96 represents 95% confidence
0.1	represents the 10% relative precision

Based on Para.12 of "Standard for Sampling and Surveys for CDM Project Activities and programme of activities" Version 03.0, if the sampling size calculation returns a value of less than 30 samples, a minimum sample size of 30 shall be chosen.

[22] As per the "Guidelines for sampling and surveys for CDM project activities and programme of activities" (Version 2.0) - Example 1- A simple random sample of a proportion.

Based on Para.16 of "Standard for Sampling and Surveys for CDM Project Activities and programme of activities", if the estimates from the actual samples fail to achieve the target minimum levels of precision, additional data collection or new sample should be performed to reach the required precision level.

B. Data to be collected

Field measurement

The biogas units belonging to the CPA will be inspected annually to confirm if they are functioning or not. Visits will be carried out by competent and trained technicians and results will be recorded in the appropriate forms, the form will indicate the unique ID number of the digester/household so that the record can be cross-checked against the database of the CPA. The results for the sample of units will be compiled at the end of each year or monitoring period.

At PoA level: The Statistic Department summarizes the statistic results submitted by the biogas stations.

QC/QA

To ensure the qualification and proper operation of household biogas units, a training system has been established. The specific training will be provided to technical advisors of each Biogas Service Centre by the Technology Department. The technical advisor will give guidance to the householders on how to use the biogas digester. The householders will also be provided with operation and maintenance instructions. Records regarding the training of the technical advisors from the Biogas Service Centres will be kept by the Technology Department.

Inspections will be conducted by qualified personnel from the Biogas Service Centre. In case of non-response a subsequent visit will be scheduled by the Biogas Service Centre. Should the non-response be confirmed the unit will be deemed to be 'no operation'. The record of the inspection will include the unique ID number of the digester/household so that it can be cross-checked against the database of the CPA to prevent out-of-population cases. The result of the inspection will be normal operation or no operation, so there is no possibility for outliers. The reliability of the sampling results will be checked by the DOE as part of the verification process..

Analysis

The results of the inspection will be recorded in the appropriate forms which are kept at the Biogas Service Centres. The information related to the sampled units will be requested by the CME to the Biogas Service Centres on a periodic basis. The CME will check the data and calculate the proportion of units in each sample that are operating and use these results as the values for $n_{k,y}$ in the emission reduction calculation for each CPA. The CME will also check that the required precision and confidence has been achieved by the sample taken, additional records will be sampled if this is not the case.

C. Implementation

CME of the PoA will arrange for staff of the Biogas Service Centers to check each unit at least once

every year, and record the operation situation (normal operation or no operation) of the digester.

All of the documents need to be kept until two years after the crediting period. The CME needs to reserve all of the maintenance and investigation record for DOE checking.

To avoid the double counting in the project activity:

Each of the units installed is registered in the database by using the unique ID number of the digester/household. Each CPA under the PoA will have an individual database with the following information:

- Name and address of the households where biogas units were installed under the CPA;
- Date of commissioning;
- Unique biogas plant registration number which is the unique ID number of the household;
- Size of the biogas unit installed.

Meanwhile, based on the baseline survey, biogas digester can provide enough energy to meet thermal requirement for cooking as an efficient technology used in rural households. If other new technology will be adopted to displace the biogas digester in any household during the crediting period, the household will be removed from the registered system under the CPA and all information related to the changing action will be updated timely.

As described in the QC/QA section above, the inspections will be conducted by qualified personnel from the Biogas Service Centre. In addition, personnel involved in the analysis of the data as described in the Analysis section above will receive relevant training on sampling methods and calculations.

Each of the biogas units will be constructed by a qualified construction team appointed by the CME. A construction contract signed between the CME and the construction team specifies the quality standard. The construction team will be supervised by at least one person who has been trained in biogas digester construction, operation and maintenance by the Technical Department.

5. Monitoring report

The CPA monitoring report will be completed by the CPA principal at the end of each monitoring period, whose main content includes:

1. PDD, including spreadsheet and support documents (hypothesis condition, data estimate, measurement method etc.), provided by CPA principal or download at UNFCCC website;
2. Monitoring plan;
3. Monitoring QC/QA report;
4. Qualification and experience of monitoring staff and calculating staff, including their major, title and work experience;
5. Number of biogas digesters under normal operation and CERs calculation;
6. Report confirmation, including confirmation on the process of monitoring and calculation submitted by CPA principal;
7. CPA management record (including data collection and management system), reflecting the reality of CPA monitoring management and process.

The monitoring report need to be submitted to statistic department of the CME for inspection at the end of each monitoring period.

C.1. Please indicate the level at which environmental analysis as per requirements of the CDM modalities and procedures is undertaken. Justify the choice of level at which the environmental analysis is undertaken:

Environmental analysis of the CPA is done at PoA level.

Given that there are no significant differences between each CPA or the regions where each CPA is implemented, and considering that there are no applicable regulations that require an environmental analysis at the CPA level, the Environmental Analysis at the PoA level has been conducted.

The environmental impact assessment (EIA) report including all potential environmental impacts at CPA and household levels had been submitted and approved by Henan Zhoukou Environmental Protection Bureau in August 2008. All mitigation measures had been taken into account by the Programme and no negative environmental impacts are expected.

Please refer to the section C of the PoA DD.

C.2. Documentation on the analysis of the environmental impacts, including transboundary impacts:

Environmental analysis of the CPA is done at PoA level thus skip over this section.

The possible environmental impact caused by the Programme has been analysis on PoA DD. The project activity utilized the waste from livestock house and toilet to generate renewable energy could improve the environmental condition of rural area and has no negative impact during operation period. Some mitigation measures had been employed during the construction period.

C.3. Please state whether an environmental impact assessment is required for a typical CPA, included in the programme of activities (PoA), in accordance with the host Party laws/regulations:

Environmental analysis of the CPA is done at PoA level thus skip over this section.

SECTION D. Stakeholders' comments

D.1. Please indicate the level at which local stakeholder comments are invited. Justify the choice:

Local stakeholder consultation of the CPA is done at PoA level.

As per requirements of the CDM modalities and procedures, the local stakeholder consultation can be done at PoA level or SSC-CPA level. Given that significant differences are not expected from CPA to CPA, the CME decided to conduct a stakeholder consultation at the PoA level.

D.2. Brief description how comments by local stakeholders have been invited and compiled:

Local stakeholder consultation of the CPA is done at PoA level.

The stakeholder consultation was conducted by CME in August 2007 and a questionnaire was distributed amongst a representative sample of households.

D.3. Summary of the comments received:

Local stakeholder consultation of the CPA is done at PoA level thus skip over this section.

All comments from local residents involved consultation had been summarized and demonstrated in section D.3 of PoA DD. There is no negative effects raised by all 943 stakeholders and 45 stakeholders requested the project activity be implemented as soon as possible.

Please refer to section D.3 of PoA DD regarding the detailed information.

D.4. Report on how due account was taken of any comments received:

Local stakeholder consultation of the CPA is done at PoA level thus skip over this section.

Annex 1

CONTACT INFORMATION ON ENTITY/INDIVIDUAL RESPONSIBLE FOR THE SMALL-SCALE CPA

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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

There is no public funding from Annex I Parties for this Project.

Annex 3

BASELINE INFORMATION

Please refer to section B.5.2.

Annex 4

MONITORING INFORMATION

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