



**CLEAN DEVELOPMENT MECHANISM**  
**SMALL-SCALE PROGRAM OF ACTIVITIES DESIGN DOCUMENT FORM**  
**(CDM-SSC-PoA-DD) Version 01**

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**SECTION A. General description of small-scale program of activities (PoA)**

**A.1 Title of the small-scale program of activities (PoA):**

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

Version: 09

Date: 28/12/2012

**A.2. Description of the small-scale program of activities (PoA):**

**1. General operating and implementing framework of PoA**

Henan Province Zhoukou City Rural Household Biogas Development Programme (2007-2010) (hereafter referred to as the Programme, the PoA) is located in Zhoukou City, Henan Province. The Programme is coordinated by Zhoukou New Energy Development Co., Ltd.<sup>1</sup>(hereafter referred to as the Coordinating and Managing Entity or CME). The Programme aims to displace fossil fuels (particularly LPG and coal) traditionally used for cooking with renewable biogas thermal energy, therefore reducing greenhouse gas emissions by avoiding CO<sub>2</sub> emissions which would be generated from combustion of fossil fuels during cooking. The biogas will be generated in biogas digesters to be constructed at a household level as part of the Programme.

The Programme was expected to develop 600,000 biogas digesters and their auxiliary facilities for gas collection and gas use (PVC pipe, pressure meter, desulphurization equipment, biogas stove<sup>2</sup>, etc) during the period between 2007 and 2010 (and potentially later depending on successfully raising funds). Due to shortage of capital, the total number of biogas digesters installed is less than originally planned, to the end of 2010 a total of 268,220 digesters have been installed<sup>3</sup>.

Detailed information about the Programme is listed as follows<sup>4</sup>:

<b>Year</b> <b>Number</b> <b>Location</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>Total</b>
Chuanhui District	596	0	2,648	3,244

<sup>1</sup>Zhoukou City Rural Energy Office designed the program of Zhoukou City Rural household Biogas Development. Zhoukou Coal Company implemented the program voluntarily. For the purpose of the Program 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.

<sup>2</sup>In some households, biogas is expected to be used not only for cooking, but also for illumination. Actually, the monitoring systems (i.e. biogas flow meters) are equipped at the inlet of the thermal energy equipment (i.e. biogas cooking stoves) and the amount of biogas used for illumination will not be count into monitoring, the detailed monitoring approach regarding emission reductions as described in A.4.4

<sup>3</sup>Refer to the Last Implementation of CPA issued by ZhoukouCity Energy Office.

<sup>4</sup> The timeline of CDM consideration as follows: The Zhoukou household biogas project plan was finished in August 2006; Due to no revenue, the programme had taken CDM into consideration in October 2006; The first biogas digester was constructed from 01/07/2007, which is chosen as the starting date of the PoA.



Shangshui County	6,779	3,124	3,544	13,447
Xihua County	11,885	3,734	2,210	11,885
Luyi County	26,591	10,877	8,365	45,833
Fugou County	12,170	5,965	5,965	24,325
Taikang County	19,499	12,013	9,163	40,675
Huaiyang County	15,103	10,529	7,599	33,231
Shenqiu County	13,561	9,309	7,238	30,108
Dancheng County	12,973	8,552	6,607	28,132
Xiangcheng County	17,103	11,803	8,434	37,340
Total	130,316	75,906	61,998	268,220

In order to promote the Programme implementation, the CME has established a management system, which includes financial planning, capital management, surveys, Certified Emission Reductions (CERs) distribution, quality control and quality assurance (QC/QA), training, information management system, construction, digester maintenance and management and monitoring.

## 2. Policy/measure or stated goal of the PoA

The goal of the Programme is to implement biogas digesters in rural households in Zhoukou City, Henan Province, China in order to supply households with biogas for cooking displacing fossil fuels and therefore reducing greenhouse gas emissions.

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<sup>5</sup> 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

<sup>5</sup> 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](http://d.wanfangdata.com.cn/Periodical_zgzq200805015.aspx)



protection.

Through developing, building and putting into operation biogas digesters utilizing pig and household manure as raw material, the project reduces greenhouse gas emissions (GHG) in the following way: The produced biogas replaces conventional coal or LPG as fuel for cooking. Previously un-captured methane from anaerobic digestion is now being captured and destroyed.

**c. Economic benefits:**

Reduces fuel, pesticide and fertilizer expenses;

Changes the traditional agriculture mode, and increases farmers income;

Provides 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.

**3. Confirmation that the proposed PoA is a voluntary action by the coordinating/managing entity**

There is no mandatory law to force rural households to install biogas digesters for cooking purposes. Therefore, it is a voluntary action of Zhoukou New Energy Development Co., Ltd. to carry out the Programme.

**A.3. Coordinating/managing entity and participants of SSC-POA:**

1. Zhoukou New Energy Development Co., Ltd. is the Coordinating / Managing Entity for the project activities under the Programme of Activities
2. The Project Participants submitted in relation to the proposed Programme of Activities are:

Name of Party involved (*) (host indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
P.R.China	Zhoukou New Energy Development Co., Ltd.	No
The U.K.	Gazprom Marketing & Trading Limited	No

The Project Participants listed above may or may not be involved in the project activities described in this document.



**A.4. Technical description of the small-scale program of activities:**

**A.4.1. Location of the program of activities:**

**A.4.1.1. Host Party(ies):**

The People's Republic of China

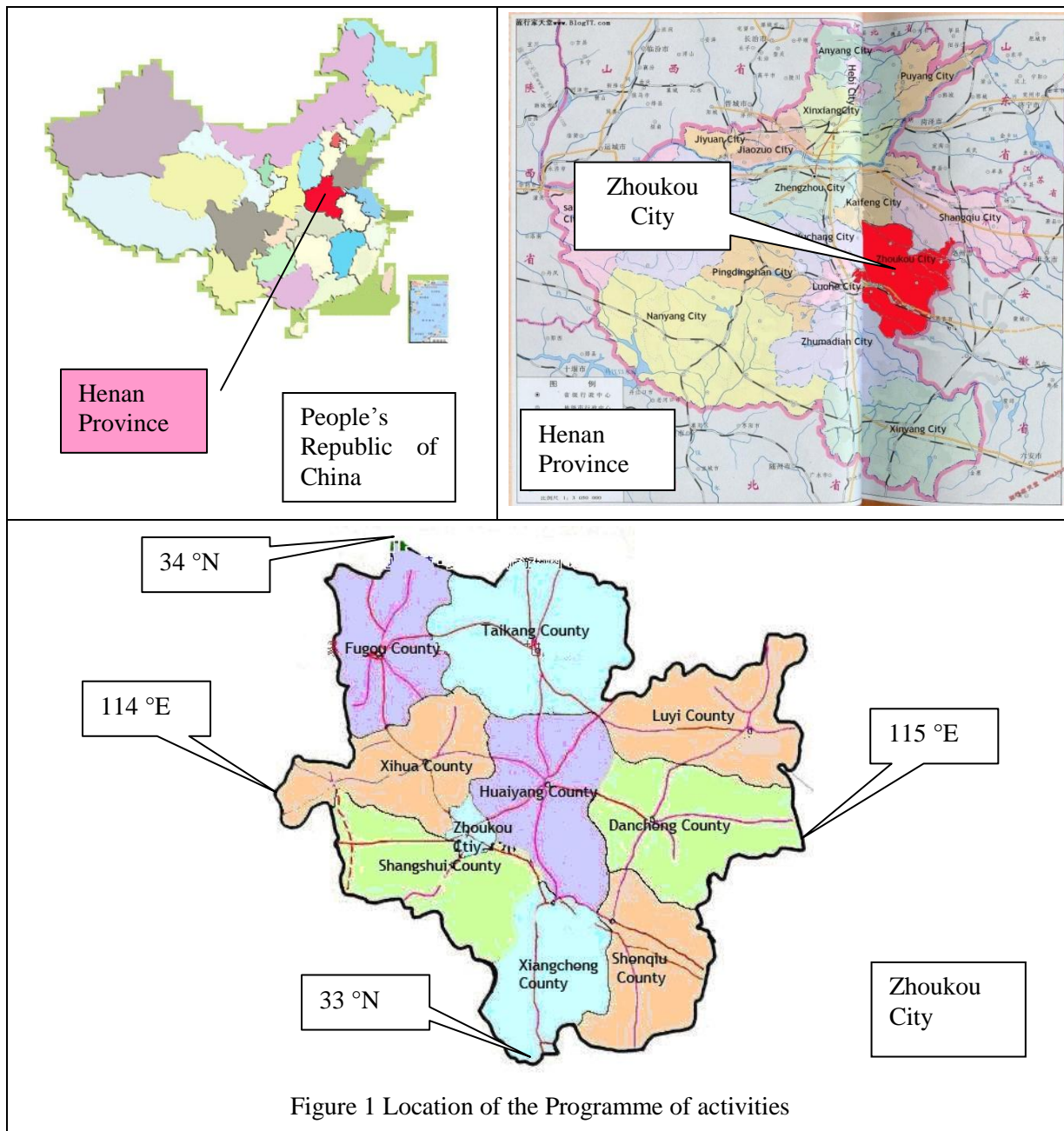
**A.4.1.2. Physical/ Geographical boundary:**

As per paragraph 142 of CDM project standard (Ver. 01.0), the boundary of the Programme is defined in terms of a geographical area within which all CPAs to be included in the Programme will be implemented. The Programme and all CPAs to be included in the Programme are implemented in Zhoukou City and all applicable local policies and regulations concerned are same in Zhoukou City for identification of baseline, so the geographical boundary of the whole Zhoukou administrative area delineates the boundary of the Programme.

Zhoukou City is located in the southeast of Henan Province P.R.China. It is 140km long from east to west and 135km long from north to south. The geographic coordinates are 114 °E to 115 °E and 33N° to 34°N. The total area of the city is 11,959km<sup>2</sup>, covering 7% of the area of Henan province. It contains 8 counties, 1 county-level city, and 1 district, which is Luyi County, Taikang County, Dancheng County, Huaiyang County, Xihua County, Fugou County, Shangshui County, Shenqiu County, Xiangcheng City, Chuanhui District<sup>6</sup>. A detailed graphical description of the location is shown in Figure 1 below:

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<sup>6</sup><http://www.henan.gov.cn/hngk/system/2006/09/04/010004415.shtml>



**A.4.2. Description of a typical small-scale CDM Program Activity (CPA):**

A typical CDM Project Activity (CPA) under this Programme consists of a group of domestic biogas units installed at individual households. Each biogas unit is comprised by the following elements: (1) a biogas digester, to be fed mostly with manure and agricultural residues; (2) biogas collection equipment (PVC pipeline, pressure meter, desulphurization equipment, etc.) and; (3) a biogas cook stove. The total



number of installed biogas units per each individual CPA will remain below the small-scale threshold of 45MW thermal as per the small-scale methodology AMS-I.C. Ver. 19.0.

The use of biogas units will displace the fuel for cooking which would have been used in the absence of the project, which is mostly coal and in some cases LPG, thereby reducing GHG emissions. In addition, the CPA will provide households with a clean form of energy for cooking.

**A.4.2.1. Type and category(ies) and Technology/ measures to be employed by the SSC-CPA:**

Using Appendix B to the Simplified Modalities and Procedures for Small-scale CDM Project Activities, the type and category applicable to the Programme is defined as follows:

Type I: Renewable energy projects;

Category I.C.: Thermal energy production with or without electricity;

The monitoring procedures of the following category will also be utilised:

Category I.I.: Biogas/biomass thermal applications for households/small users.

All CPAs to be included under the Programme adopt biogas for thermal use, a renewable energy resource displacing the traditional fossil fuels (coal and LPG) originally used at households for cooking. The technology used in the Programme includes three main components which are a biogas generation system, collection system and utilization system.

The technical description of each component is described below:

**1. Biogas generation system:**

The biogas digesters design will be based on the technical standards established by the Chinese government. The design and construction of the digesters is certified by a technician accredited by the Ministry of Agriculture. The digester is installed below the pigpen. The digester will ferment excreta from pigs that are housed in the livestock rooms above the digester. To facilitate the supply of excreta, the inlet of biogas digester will be directly connected to the livestock room so that the dung can directly drain to the digester. In addition, a toilet will be installed in each household next to the livestock room so that human excreta are also treated in the digester. The retention time of slurry inside the biogas digesters is around 3-6 months.

The mechanics of biogas generation can be described as follows:

The captured gas is stored in the upper part of the digester tank (gas storage area) which is constructed as an arc ship. Generation of biogas will gradually increase the pressure in the stored area. When the volume of the captured gas is larger than the amount consumed, the pressure in the gas storage will increase and slurry will be pushed into the outlet chamber. If the gas consumed exceeds gas availability, the slurry level drops and the fermented slurry flows back into fermentation chamber;

The placement of the digester tank (underground fermentation) keeps the temperature in the tank relatively stable ensuring that the slurry can be fermented at adequate temperatures throughout the year without requiring additional heating;

The bottom of the digester inclines from the material-feeding inlet to the material-outlet, allowing free flow of the slurry; The digester has been designed to allow the effluent to be removed without breaking the gas seal, taking the effluent liquid out through the outlet chamber.

The type and parameter of the reactor are listed in following table as follows:

Parameter	unit	Value
<b>Reactor</b>		



configuration type	-	Concreted or glass-steel
size	m <sup>3</sup>	8-15
<b>Fermentation technics</b>		
filling	-	inoculating liquid:manure:water=1:2:5
temperature	°C	Above 20
concentration	%	6-10
PH	-	6.8-7.4

**2. Collection system:**

The collection system includes the biogas collection and the residue collection. The biogas collection system is composed of a gas tube, pipe connector and switch. The residue collection system is composed of a discharging tube and residue absorption-transfer car.

**3. Utilization system:**

The captured biogas will be routed to a biogas burner stove. A pressure indicating device is installed to ensure proper control of gas flow at the flare, by the user. A sulfide capture device is also installed to clean the gas before burning. After the dehydrating and desulfurizing treatment, the biogas will be used for cooking. The residue will be stored in aerobic conditions at the fertilizer-storage room and used for bio-fertilizer.

Special maintenance procedures have been developed to ensure proper operation of the biogas system and proper utilization of digested slurry throughout the lifetime of the digester. This includes cleaning the sulfide capture device and periodic controls and replacements of burners.

Detailed process is showed in Figure 3.

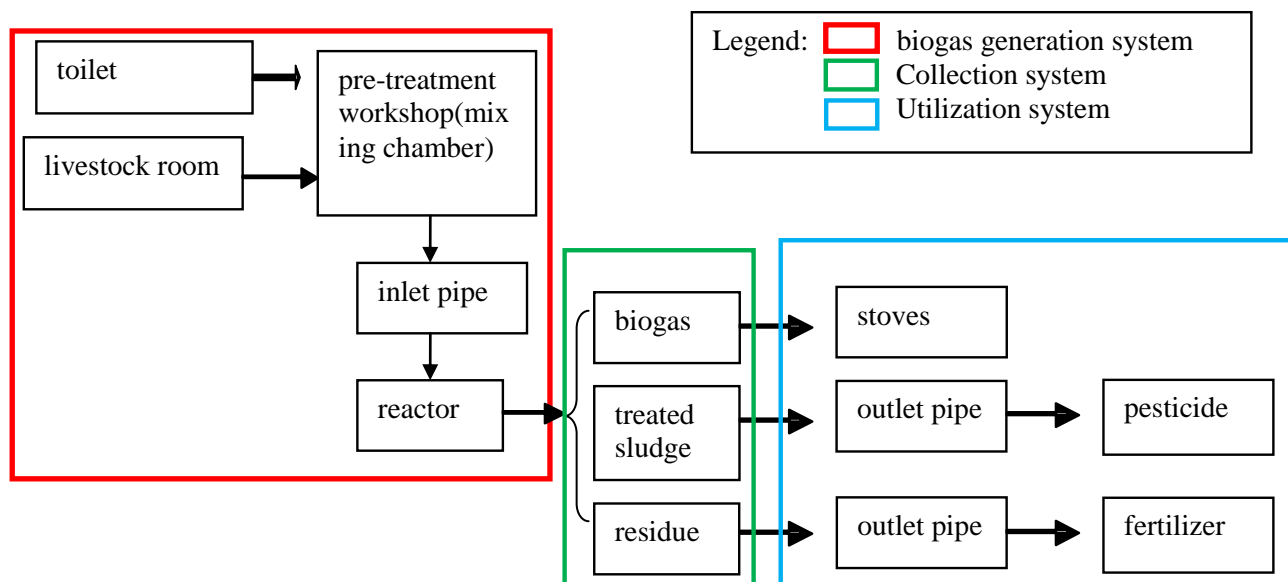


Figure 3. Sketch of the dynamic biogas fermentation process





All main equipments in the Programme are domestically produced, the raw materials are purchased from the local market and digesters are constructed on-site, while the biogas stoves are manufactured by a domestic supplier.<sup>7</sup> The Programme involves no technology and installations from Annex I countries.

The technology used by the Programme is environmentally sound; when compared with the traditional fuels used in the area, the biogas digester and stove are renewable, clean and sustainable. This technology does not generate any pollution such as SO<sub>2</sub>, ash, slag; and by using animal manure as feedstock in the digester, the technology also allows for a clean way to treat livestock wastes.

**A.4.2.2. Eligibility criteria for inclusion of a SSC-CPA in the PoA:**

As per “Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for PoA” (Ver. 02.1), the eligibility criteria for inclusion of a CPA in the PoA are follows:

<b>Applicability Conditions as per Eligibility Criteria</b>	<b>Applicability</b>	<b>Eligibility Criteria</b>	<b>Evidence Example</b>
a) The geographical boundary of the CPA including any time-induced boundary consistent with the geographical boundary set in the PoA;	Included	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 are 114 °E to 115 °E and 33N° to 34°N).	<ul style="list-style-type: none"> <li>• CPA-DD</li> </ul>
b) Conditions that avoid double counting of emission reductions like unique identification of product and end-user locations (e.g. programme logo) ;	Included	<p>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.</p> <p>Each CPA under the Programme should be have an individual database with the following information:</p> <ul style="list-style-type: none"> <li>- Name and address of the households where biogas units were installed under the CPA;</li> <li>- Date of commissioning;</li> <li>- Unique biogas plant registration</li> </ul>	<ul style="list-style-type: none"> <li>• Database of household biogas digesters</li> </ul>

<sup>7</sup><http://xny.xundaco.com/newEbiz1/EbizPortalFG/portal/html/product.html>;

[http://www.xundaco.com/newEbiz1/EbizPortalFG/portal/html/CategoryList.html?ProductMultiCategoryPicker210\\_action=Searchcategory&ProductPicker\\_action=Searchcategory&CategoryID=c373e91bf8ee2d4d8f7f1ba707124ede#](http://www.xundaco.com/newEbiz1/EbizPortalFG/portal/html/CategoryList.html?ProductMultiCategoryPicker210_action=Searchcategory&ProductPicker_action=Searchcategory&CategoryID=c373e91bf8ee2d4d8f7f1ba707124ede#)



		<p>number with the unique ID number of the household;</p> <p>- Size of the biogas unit installed.</p> <p>The digesters in all CPAs belonging to the Programme should be uniquely identified to avoid double counting by above information.</p>	
<p><b>c)</b> The specifications of technology/measures including the level and type of service, performance specifications including compliance with testing/certifications;</p>	<p>Included</p>	<p>All the biogas digesters under the proposed CPA should be new-built ones and the size of digesters covering 8m<sup>3</sup>, 10m<sup>3</sup>, 12m<sup>3</sup> and 15m<sup>3</sup>, which were used by household for cooking.</p> <p>The biogas digesters should be designed and constructed by a qualified construction team belonging to Zhoukou New Energy Development Co., Ltd.</p> <p>Zhoukou New Energy Development Co., Ltd. Should be inspected the quality of the biogas digester by sampling according to national quality standard<sup>8</sup> and Zhoukou City Rural Energy Office should be conducted an annual acceptance<sup>9</sup>.</p>	<ul style="list-style-type: none"> <li>• Project Acceptance Certification</li> </ul>
<p><b>d)</b> Conditions to check the start date of the CPA through documents evidence;</p>	<p>Included</p>	<p>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 should be provided to check the starting date.</p> <p>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<sup>10</sup>.</p> <p>As per paragraph 72 of EB 47<sup>th</sup> 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</p>	<ul style="list-style-type: none"> <li>• CERs Transfer Contract</li> <li>• Project Acceptance Certification</li> <li>• Original CPA list<sup>11</sup></li> </ul>

<sup>8</sup> Related China national standard for biogas construction: *GB/T 4750-2002 ; GB/T 4751-2002;GB/T 4752 2002*

<sup>9</sup> Please refer to the document with the name of Zhoukou Sample of Project Acceptance Certification which has been submitted to DOE

<sup>10</sup> The list to support the starting date of CPAs had been submitted to DOE.

<sup>11</sup> The CPA list had been submitted to UNFCCC, please refer to Annex 3 of the PoA-DD.



		<p>later than 01/07/2007 as the starting date of PoA.</p> <p>Therefore, 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.</p>	
<p>e) Conditions that ensure compliance with applicability and other requirements of single or multiple methodology/ies applied by CPAs;</p>	<p>Included</p>	<p>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).</p> <p>The detailed applicability conditions to the methodology will be demonstrated in each CPA-DD.</p>	<ul style="list-style-type: none"> <li>• CPA-DD</li> </ul>
<p>f) The conditions that ensure that CPAs meet the requirements pertaining to the demonstration of additionality;</p>	<p>Included</p>	<p>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 02.1)”, 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)”.</p> <p>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, which applies to this PoA:</p> <p>(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;</p> <p>To ensure that each CPA fits into this category, the following conditions are to be checked in each proposed CPA:</p> <p>1) The CPA is composed of isolated</p>	<ul style="list-style-type: none"> <li>• Database of household biogas digesters</li> <li>• Emission Reducion Calculation</li> <li>• Boiogas Stove Specification</li> </ul>



		<p>biogas digesters;</p> <p>2) The amount of isolated biogas digesters is less than 13,800;</p> <p>3) The isolated biogas digesters generate gas to be used by households;</p> <p>4) The installed capacity of each biogas stove is less than 750kW.</p>	
<p><b>g)</b> The PoA-specific requirements stipulated by the CME including any conditions related to undertaking local stakeholder consultations and environmental impact analysis;</p>	<p>Excluded</p>	<p>The Programme has undertaken local stakeholder consultations and environmental impact analysis covering all CPAs based on specific CDM requirement stipulated by the CME under the PoA level.</p> <p>In China, only a real project activity or a project plan needed to conduct a local stakeholder consultations and environmental impact analysis. In the Programme, each CPA is just an aggregate of many household biogas digesters utilizing biogas as fuel for cooking, which is unrequested by related law and policy under the CPA level.</p> <p>So the local stakeholder consultations and environmental impact analysis just be undertaken for the whole PoA.</p>	<p>N/A</p>
<p><b>h)</b> Conditions to provide an affirmation that funding from Annex I parties, if any, does not result in a diversion of official development assistance;</p>	<p>Included</p>	<p>For a certain CPA in the Programme, there is no public funding from Annex I parties involved in the Programme.</p>	<ul style="list-style-type: none"> <li>• Declaration for POA with no ODA funding</li> <li>• Declaration for CPA with no ODA funding</li> <li>• FSR of the Programme</li> </ul>
<p><b>i)</b> Where applicable, target group (e.g. domestic/commercial/industrial, rural/urban, grid connected/off-grid) and distribution mechanisms (e.g. direct installation);</p>	<p>Included</p>	<p>According to footnote 5 of “Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for PoA” (Ver. 02.1), 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.</p> <p>For a certain CPA in the Programme,</p>	<ul style="list-style-type: none"> <li>• Database of household biogas digesters</li> <li>• CPA-DD</li> </ul>



		project activity just utilizes biogas generated from installed biogas digesters to generate thermal energy. 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.	
<b>j)</b> Where applicable, the conditions related to sampling requirements for a PoA in accordance with the approved guidelines/standard from the Board pertaining to sampling and surveys;	Included	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” 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 $k$ $B_{biogas,k,y}$ <sup>12</sup> . Five campaigns will be implemented per digester size in each year in each CPA based on the AMS-I.I. Ver. 3.0 <sup>13</sup> .	<ul style="list-style-type: none"> <li>• CPA-DD</li> </ul>
<b>k)</b> Where applicable, the conditions that ensure that every CPA in aggregate meets the small-scale or microscale threshold criteria and remains within those thresholds throughout the crediting period of the CPA;	Included	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 kW <sup>14</sup> , 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.	<ul style="list-style-type: none"> <li>• Database of household biogas digesters</li> <li>• CPA-DD</li> </ul>
<b>l)</b> Where applicable, the requirements for the debundling check, in case CPAs belong to	Included	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	<ul style="list-style-type: none"> <li>• Biogas Stove Specification</li> <li>• CPA-DD</li> </ul>

<sup>12</sup> In line with clarification request 571: [http://cdm.unfccc.int/Panels/ssc\\_wg/meetings/034/ssc\\_034\\_report.pdf](http://cdm.unfccc.int/Panels/ssc_wg/meetings/034/ssc_034_report.pdf)

<sup>13</sup> As per paragraph 18 and table 1 of AMS-I.I. Ver. 3.0– “*Biogas/biomass thermal applications for households/small users*”.

<sup>14</sup> According to the biogas stove specification



<p>small-scale (SSC) or microscale project categories.</p>		<p>great than 1% 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.</p> <p>For certain CPA, the rated capacity of independent subsystems i.e. the biogas stove equipped with digester in the Programme is up to 3.26 kW, which is no greater than 1% of the small scale thresholds (45MW) defined by applied methodology (AMS I.C.), and the biogas digester to be installed and implemented in multiple households, the CPA is exempted from performing a de-bundling check, i.e., the CPA considered as being not a de-bundled component of a large scale activity.</p>	
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**A.4.3. Description of how the anthropogenic emissions of GHG by sources are reduced by a SSC-CPA below those that would have occurred in the absence of the registered PoA (assessment and demonstration of additionality):**

**1. The proposed PoA is a voluntary coordinated action**

The proposed Programme is a voluntary and coordinated action intended to improve the living standards of a rural population in Zhoukou city of Henan Province of China by facilitating adoption of more environmentally friendly technology for the treatment of their organic waste and that will provide them with a source of clean energy reducing indoor and outdoor pollution associated with the combustion of coal and LPG. Participation in the Programme is entirely voluntary and is encouraged by the CME through direct invitation to the eligible farm households and explaining them the advantages of joining the Programme. The Programme is in line with Article 18 of the Law of the People’s Republic of China on Renewable Energy<sup>15</sup> which encourages the development and utilization of renewable energy (including biogas) in China. Also, the proposed Programme adopts the principle of Article 4 of the Rural Biogas Engineering Construction Plan in China that states that the adoption of biogas engineering construction is to be “voluntarily decided by households”. Hence, the voluntary nature of this Programme has been defined<sup>16</sup>.

<sup>15</sup> <http://www.china.com.cn/chinese/law/798072.htm>; and the main content of article 18 of the Law as follows: the state encourages the development and utilization of renewable energy in rural areas. Local government should promote the technology on biomass energy conversion including biogas utilization, household solar, small wind and hydro together with relevant department according to local actual condition.

<sup>16</sup> The Agriculture Bureau of Zhoukou City has confirmed that there is no law/regulation to mandate the construction or installation of biogas digesters in the region.



**2. If the PoA is implementing a voluntary coordinated action, it would not be implemented in the absence of the PoA**

The implementation of the proposed Programme involves a significant investment and ongoing Operation & Maintenance (O&M) costs and does not generate any revenue for the CME. Given that each of the CPAs to take part in this Programme will be financed and implemented by the same entities, that the conditions between one CPA and another do not differ significantly, and that a high degree of homogeneity is expected among CPAs, the project participants choose to demonstrate the additionality at the PoA level. In line with the applicable rules, the demonstration of additionality at the PoA level will be complemented with an additionality assessment at the CPA level by showing that the CPAs cannot be implemented in the absence of this PoA because of the barriers demonstrated in this section. Indeed, the demonstration of additionality at the PoA and CPA level will guarantee that every CPA included at any point in time into the PoA would not have occurred in the absence of CDM related income.

In the absence of the proposed PoA, the voluntary coordinated actions outlined above would not be implemented: On the one hand, implementing the Programme entails high investment and considerable ongoing costs and on the other hand, the only income to be generated by the project activity would be the CDM revenue. In contrast, the continuation of the baseline situation (i.e. continuation of cooking with coal or LPG) would require no investment, neither from the CME nor from the households, and would not face any additional barriers. As a result, in the absence of the CDM revenue expected from this PoA, incentives would remain at an insufficient level to undertake the actions and investments entailed in this Programme. Below a complete demonstration of additionality according to the applicable guidelines below for small scale CDM project activities.

***Justification of methodology***

The additionality of the PoA is demonstrated using demonstration of additionality outlined in the latest “Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for PoA” (Ver. 0.2.1, Annex 5 of EB 70). As per the standard, PoA that consist of small-scale projects 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 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;

This PoA is composed entirely of isolated units and the users of the technology are households. Each biogas digester will provide gas to one household to be used in a single stove up to 3.26kW. According to footnote 1 of the “Guidelines on the demonstration of additionality of small-scale project activities” the size of each unit should be less than 750 kW, so it is clear that the units that will be installed as part of this PoA will be much smaller than 5% of the small-scale CDM threshold.



Therefore it can be concluded that the technology employed by this PoA is automatically additional and documentation of barriers is not required.

CDM consideration

The timeline of the Programme is as follows:

**Timeline of the Programme**

Date	Key Events
08/2006	Zhoukou household biogas project plan was finished
10/2006	Board meeting to decide to develop the Project as a CDM PoA was held in Zhoukou Coal Company
01/07/2007	The first biogas digester belonging to the Zhoukou Programme was constructed, the date was chosen as the starting date of the Programme
21/07/2007	Notification regarding stakeholder consultation meeting was issued
12/2007	Consultation meeting including CDM baseline scenario survey was held
15/09/2008	The transfer contract of project was signed between Zhoukou Coal Company and Zhoukou New Energy Development Co., Ltd.
12/2008-12/2009	The PDDs are writing and the original design documents have been completed <sup>17</sup> ; Meanwhile, the PP began to find the buyer <sup>18</sup> .
30/12/2009	Programme starts public comment period
13/07/2010	Programme approved by the DNA of China and the LOA was obtained <sup>19</sup> ;

**A.4.4. Operational, management and monitoring plan for the program of activities (PoA):**

**A.4.4.1. Operational and management plan:**

The proposed Programme involves a range of operational and management activities intended to facilitate the implementation and management of each CPA and to ensure the successful implementation of the whole Programme.

**1. Operating/Managing Structure**

**a. PoA level**

<sup>17</sup> The public notification regarding the approval of the Programme was issued by DNA of China on 12/05/2010 after a long-term documents including PDDs reviewing. Please refer to: [http://cdm.ccchina.gov.cn/website/CDM/pdf/Item\\_new/Item\\_new5483.pdf](http://cdm.ccchina.gov.cn/website/CDM/pdf/Item_new/Item_new5483.pdf).

<sup>18</sup> Refer to the ERPA, which was signed on 11/05/2010 after a long-term negotiation between the Gazprom and Zhoukou New Energy Development Co., Ltd.

<sup>19</sup> Refer to the LOA issued by DNA of China on 13/07/2010.





Zhoukou New Energy Development Co., Ltd. as the CME is in charge of the operation and implementation of the Programme. A whole management system has been built to insure the implementation of the Programme, check the features of potential CPAs and ensure that each CPA meets requirements and eligibility criteria (see section A.4.2.2 of PoA-DD).

1) Establishment of Management Body Structure and definition of responsibilities of personnel

A clear Management Body Structure has been set up which is shown in below Figure.

The person is in charge of the Programme appointed by CME and responsible for issues related to CDM projects including establishing a plan including implementation, monitoring and training, reviewing the competencies of personnel and supervising the project implementation.

The CME has two departments that will be actively involved in the implementation of the Programme: (1) the Technology Department and (2) the Statistics Department. The person from Technology Department is responsible for the design and construction of biogas digesters belonging to the Programme, training of technical advisors from biogas stations, maintaining biogas digesters and managing the treated residue/liquid; the person from Statistics Department is responsible for managing the project capital, creating and summarising all users' files of the CPAs and information of biogas digesters submitted by the biogas stations under the Programme.

2) Procedure for technical review of inclusion of CPAs

Firstly, the biogas Service Centres had write down the information including the name, address and the ID number of users, the type, unique registered number and the date for construction or replacement of biogas units. Secondly, the CME will check the information and summary an outline for each CPA based on above information. Then the CME will submit the outline and description to the CDM consultant to conduct a technical review to check if the CPA meets the eligibility criteria for inclusion of CPAs (see section A.4.2.2 of PoA-DD).

3) Procedure for avoiding double counting

Each of the units installed is registered in the database by using the unique ID number of the digester/household. Each CPA under the Programme 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, the information submitted by each Biogas Station to the CME to update the registered system and the CME performs periodical detailed assessments to avoid double accounting of the households taking part in each CPA. The CME compares the registry database with the list of project activities that are under validation or registered at the UNFCCC to make sure that the households included in the Programme are not taking part in any other CDM project activity or any other voluntary scheme.

4) Records for training and control process for each CPA under the PoA

The record regarding training technical advisors from biogas stations was saved by the Technology Department permanently.

The record on control process including all users' files and management scheme, construction and maintenance scheme of biogas digesters, financing and capital management scheme will be preserved by the Statistics Department permanently.



All original documents involving ID information, monitoring data, maintenance and construction related to the CPA will be stored by the Biogas Service Centres in paper-based version for checking at least two years after the end of the crediting period.

5) Measures for improving the management system level continuously:

- The continued maintenance and management to biogas digesters from the construction date is the main point. The registered system will be updated timely with the most recent data from each biogas service center, e.g. the information of biogas digesters no longer working;
- With the introduction of CDM revenue, better service can be provided through specific training to technical advisors and detail guidance regarding how to use biogas digester more correctly and fully;
- During the actual implementation of the monitoring plan, the person in charge of the Programme will assess the convenience of the procedures for inclusion of CPAs and avoiding double counting, supervise the implementation of CPA registry systems, and collect points and suggestions of the staff from each Biogas Service Centre timely. The feasible suggestions related to management system will be employed to improve the management of the Programme continually.

*b. CPA level*

Moreover, in order to properly manage each individual CPA, a Biogas Station will be set up per each CPA. The responsibility description regarding each position arranged in Biogas Station and Biogas Service Centre as follows:

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.

As the main person in charge of the CPA, the manager will take full responsible of issues related to the CPA, guiding the implementation of the monitoring plan and training plan, supervising the results of monitoring and training, recording and checking the data including CPA numbers, the users' files and exclusive ID of each digester and householder, ensuring that the process of inclusion of CPA and the quality of biogas digesters by sampling should fully meet eligibility criteria;

The technical advisor of a Biogas Service Centre is responsible for implementation of each individual CPA, giving detailed guidance for constructing and maintaining biogas digesters to households and managing the treated liquid and residue.

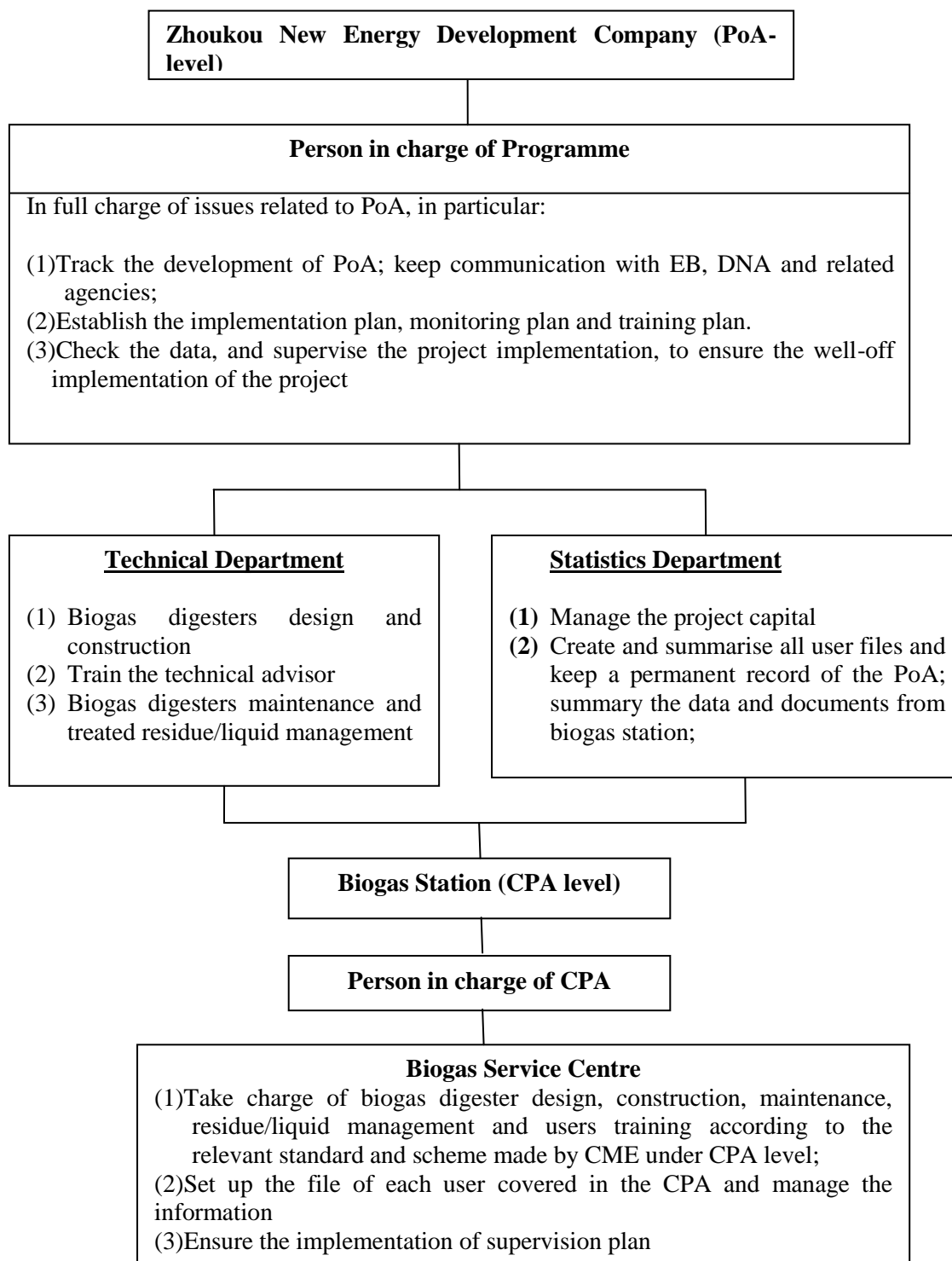




Figure 4. Management Body Structure and its Responsibility

## 2. Design Stage of Operating/Managing Plan

### *a. Conceptualization of the Programme of Activities*

In August 2006, the Zhoukou City Rural Energy Office envisioned and conceptualized a plan to develop and deploy biogas in the rural area of Zhoukou. According to this plan, 600,000 biogas digesters would be constructed in the Stage I among medium- and low-income rural households in the period between 2007 and 2010.

### *b. Setup of a coordinating and managing entity*

In order to efficiently implement the Programme, a Coordinating and Managing entity was set up with the aim of designing and implementing the Programme including (1) a financial and capital plan; (2) a carbon finance and carbon-revenue-distribution plan; (3) a quality control and assurance plan; (4) a capacity building plan; (5) a plan for information management; (6) a construction plan; (7) an operation and maintenance plan and (8) a monitoring plan.

## 3. Implementation Stage of the Programme of Activities

### *a. Baseline determination*

In August 2007, the coordinating/managing entity commissioned the Zhoukou City Rural Energy Office to undertake the necessary research in order to determine the baseline fuels within the project boundary. Through a survey conducted among over 1400 households, the office determined that the fuel predominantly used for cooking before the project activity was coal and, in the absence of the project activity, coal would remain as the predominant source of fuel for cooking. LPG was found to be used in a few households.

### *b. Local stakeholder consultations*

In August 2007, the coordinating/managing entity undertook a series of stakeholder consultations within the project boundary in order to ensure the suitability of the project activity and the level of acceptance among the target households. Over 900 households selected randomly took part in the stakeholder consultation process.

### *c. Communication and awareness activities*

The CME undertook a series of activities in the local area with the aim of creating awareness about climate change amongst the target population and improving the level of participation in the Programme.

The documents covering the main information of the 1400 households named Zhoukou baseline survey summary including households with no biogas digester and biogas digester installed had been stored and administered in a dedicated computer-based database. All paper-based result about the stakeholder consultation and training records has been stored by the Statistics Department.

## 4. Implementation stage of the CDM Project Activities

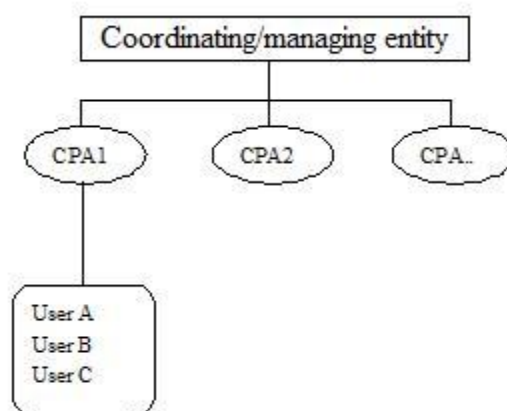
### *a. CPA registry system*

The registry system involving all CPAs will be built in a dedicated computer-based database by the



Statistics Department. Each CPA included in the registry has unique identifying information such as ID information, CPA number, name, etc. The information for each CPA in the database also contains specific information about each household user that takes part in the Programme to avoid the duplication of records. The records for each individual household include; address, household name, unique ID for the biogas unit, size and commissioning date etc. The CME also makes sure that each of the households taking part in the Programme and recorded in the registry system has also signed a waiver of the CER rights in favour of Zhoukou New Energy Development Co., Ltd. who is in charge of distributing the CER revenues.

The figure below illustrates the structure of the dedicated database:



b. *Construction of the biogas unit*

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, performance requirements, penalizations, rights and responsibilities for each of the biogas units constructed.

c. *Quality Control / Quality Assurance*

The CME is in charge of performing spot inspections on a representative sample of biogas units to make sure that the units meet the quality and performance standards as established in the construction guidelines and contract.

d. *Double accounting and de-bundling check*

Using the registry system described above, the CME performs periodical detailed assessments to avoid double accounting of the households taking part in each CPA. The CME compares the registry database with the list of project activities that are under validation or registered at the UNFCCC to make sure that the households included in the Programme are not taking part in any other CDM project activity or any other voluntary scheme.

According to “Guidelines on Assessment of De-bundling for SSC Project Activities (Ver. 03.0)” (EB 54, Annex 13, Paragraph 7), each of the individual measures conforming the Programme are exempted from performing de-bundling check (refer to section A.4.2.2. of PoA-DD).



## 5. Operational stage of the CDM Project Activities / Post-validation activities

### a. *O&M Activities*

A robust Operation & Maintenance (O&M) plan has been designed by the CME to make sure that the biogas units operate in optimal conditions. The O&M plan includes a strong capacity building programme (including TV shows, broadcasts, workshops, etc.) to make sure that the users operate the biogas units adequately. The O&M plan also contemplates regular visits to the households from qualified technicians in order to supervise and advise on the operation of the biogas units. Finally, the CME has set up dedicated “hotlines” to provide support to the users of the units and to attend service requests. The O&M activities are managed by the Biogas Service Centres established at the CPA level.

After the Operation and Maintenance of the biogas units, the Biogas Service Centres will be responsible to complete and submit the information including the date of replacement and the number of biogas units, the name and address and the ID number, the type and unique biogas units registered number. The information will be confirmed by the Biogas Station and submitted to CME for updating the registered system. All documents and maintenance records will be stored by the Biogas Service Centres in paper-based version.

### b. *Monitoring*

As described in the following section, a robust monitoring system has been put in place by the CME to oversee the functioning of the whole Programme including specific measurement of key parameters as defined in the applicable baseline and monitoring methodology. The monitoring includes direct metering, and regular surveys to make sure that technology installed is being used. For a detailed description of the monitoring plan please look at the following section.

### c. *Information management*

All information and monitoring data related to the Programme will be managed and stored by CME. The original records and photographs under the CPA will be kept by the Biogas Station for DOE’s checking. All documents mentioned above will be stored for at least two years after the end of the crediting period.

#### **A.4.4.2. Monitoring plan:**

##### **1. Purpose**

At the level of the whole Programme activities, the purpose of the monitoring plan is to be in full charge of issues related to the monitoring items, making sure the monitoring procedure is reasonable and reliable.

##### **2. Monitoring Structure**

At PoA level: as the CME, Zhoukou New Energy Development Co., Ltd. takes charge of designing the whole monitoring plan, which include sampling plan, monitoring measures, QA/QC system, training plan etc.

In order to implement the monitoring plan effectively, the specific person in charge of the Programme is designated by Zhoukou New Energy Development Co., Ltd. to make sure the implementation of monitoring plan and keep in touch with EB, DNA and other relevant parties.

At CPA level: each biogas station takes charge of monitoring at CPA level, and a specific person is designated. The monitoring work is carried out by the staff of the biogas service centres.



### 3. Technical Training

To ensure the monitoring data is reasonable and reliable, Zhoukou New Energy Development Co., Ltd sets up a technological department to take charge of monitoring staff training, which will ensure the standardization of the monitoring procedure and the reliability of monitoring results.

### 4. Data Collection and Management

This monitoring plan is proposed as per methodology AMS-I.C. Ver. 19.0, methodology AMS-I.I. Ver. 3.0 (in line with clarification request 571<sup>20</sup>).

#### A. Monitoring object:

The parameters that need to be monitored in each CPA are as follow:

- i. Number of registered biogas units of the size  $k$  commissioned in each CPA ( $N_{k,0}$ )
- ii. Proportion of  $N_{k,0}$  that remain operating at year  $y$  ( $n_{k,y}$ )
- iii. The net quantity of biogas supplied to the thermal energy equipment for one typical biogas unit of the size  $k$  ( $B_{biogas,k,y}$ )
- iv. The fraction of households using coal as the main fuel for cooking in the baseline scenario ( $f_{coal}$ )
- v. The fraction of households using LPG as the main fuel for cooking in the baseline scenario ( $f_{LPG}$ )

#### B. Data description:

The relevant descriptions below will be followed for each of the parameters to be monitored throughout the duration of the Programme:

Parameter	Definition	Description
$N_{k,0}$	Number of registered biogas units of the size $k$ commissioned in each CPA	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 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”.

<sup>20</sup>[http://cdm.unfccc.int/Panels/ssc\\_wg/meetings/034/ssc\\_034\\_report.pdf](http://cdm.unfccc.int/Panels/ssc_wg/meetings/034/ssc_034_report.pdf)



		A 90/10 confidence precision will be used 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 $k$	The value of biogas quantity can be obtained through the gas flow meters installed at the inlet of 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.
$f_{coal}$	The 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. The value will be cross-checked with the records in the baseline survey database as well as with $f_{LPG}$ .
$f_{LPG}$	The 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. The value will be cross-checked with the records in the baseline survey database as well as with $f_{coal}$ .

## 5. 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 determine 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 as required by AMS I.I version 3, Para 17, when annual inspection is chosen.

#### Target population

The target population is rural household 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

Each CPA under the PoA 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:

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.

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.

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

#### *Sampling calculation<sup>21</sup>*

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

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

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<sup>21</sup> 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.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.

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**

At CPA level: 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.

## 6. Monitoring report

A CPA monitoring report will be completed at the end of each monitoring period, whose main content will include:

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 will be submitted to the Statistics Department of the CME for inspection at the end of each monitoring period.



The CME will prepare a Monitoring Report for each CPA and will submit them to the DOE for inspection at the end of each monitoring period.

**A.4.5. Public funding of the program of activities (PoA):**

There is no public funding from Annex I parties for this programme of activities.



**SECTION B. Duration of the program of activities (PoA)**

**B.1. Starting date of the program of activities (PoA):**

01/07/2007, the date when the first household biogas digester belonging to the Programme was constructed

**B.2. Length of the program of activities (PoA):**

28 years.



## SECTION C. Environmental Analysis

**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:**

1. Environmental Analysis is done at PoA level X
2. Environmental Analysis is done at SSC-CPA level

The Programme utilizes household biogas generated from biogas digesters using manure and biomass residual to produce thermal for cooking. In china, a project activity or project programme was requested to conduct the environmental analysis before starting up the project activity according to the national policy and regulation. So the Environmental Analysis was done under a 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, it is deemed appropriate to undertake an Environmental Analysis at the PoA level.

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

The *environmental impact assessment report* is approved by Henan Zhoukou Environmental Protection Bureau in August 2008.

According to the *environmental impact assessment report*, the possible environmental impact caused by this program and the corresponding measures are as follow:

### 1. Environmental impact assessment of construction period

The construction work includes 8-15 m<sup>3</sup> new biogas digesters construction, livestock houses, toilets and kitchens reconstruction. The project is dispersed in each courtyard of rural household, with small-scale and short-period construction character. Moreover, there is no large-size machine and limited construction material (dust, sand, cement etc.) to use during construction. Therefore, there is no waste water produced by this project during construction period, and in order to avoid fugitive dust from construction material (dust, sand, cement etc.) and garbage at construction spot and dust loss caused by raining, shading measure will be taken. So this project has tiny impact on surrounding environment.

Besides, due to the simple and dispersed construction, the environmental impact of this project is transitory, and will disappear with the ending of construction.

### 2. Environmental impact assessment of operation period

#### (1) Waste gas

The biogas produced by this project is purified by dehydration and desulphurization treatment, and used for cooking and lighting. Biogas is clean energy and there is no waste gas such as dust, NO<sub>x</sub> and SO<sub>2</sub> produced.

#### (2) Waste water



This project entails waste utilization, which utilize the dung and domestic waste produced in rural households' daily life to produce biogas. The by-product biogas slurry contains plenty element N, P, K, which is in favour of plant and animal growth.

(3) Solid waste

Biogas slurry and biogas residue are used broadly in crop planting and as an additive in feedstuff, some of them even used for feeding fish and planting edible fungus directly. Therefore, the biogas slurry and biogas residue produced by this project could become useful material.

(4) Noise

There is no equipment with noise produced when operation using in this project, so there is no noise produced to impact on environment.

Concluding by the analysis above, this project is utilization of the waste from livestock house and toilet. This clean project could improve the sanitation condition of rural area, with no negative impact on the environment.

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

In accordance with the regulations of the host part and given the nature of the project, there is no need for an Environmental Impact Assessment (EIA) at the CPA level. However, the CME will make sure that each CPA is performed according to the environmental conditions indicated in the EIA performed at the PoA level and making sure that any environmental disturbance is minimized.



**SECTION D. Stakeholders' comments**

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

1. Local stakeholder consultation is done at PoA level X
2. Local stakeholder consultation is done at SSC-CPA level

Given that not differentiated impacts or significant differences are expected from CPA to CPA, the CME decided to conduct a stakeholder consultation at the PoA level. The stakeholder consultation was conducted through a questionnaire distributed amongst a representative sample of households who took part in the consultation – all of them residing in the area comprised within the project boundary.

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

A stakeholder consultation was held by the coordinating / managing entity in August 2007. The input from the stakeholders was collected through a questionnaire distributed amongst 943 stakeholders, all of them residing in the area comprised within the project boundary. With a response rate of 100%, the questionnaire was designed to find out the following aspects about the Programme:

- Attitudes of stakeholders' to the implementation of the PoA;
- Positive effects caused by construction and operation of the PoA deemed by the stakeholders;
- Negative effects caused by construction and operation of the PoA deemed by the stakeholders;
- Suggestion for reducing negative effects.

**D.3. Summary of the comments received:**

The main findings of the stakeholder consultation are summarized below:

1. 99.25% of stakeholders support the construction of this PoA, none of the stakeholders opposed the construction of this PoA;
2. The possible positive effects of the PoA mentioned by the stakeholders include pollution reduction, environment improvement (99.25%), premium energy supply (99.36%), savings (99.25%), additional generation of fertilizers (99.82%);
3. There were no negative effects of the PoA raised by the stakeholders;
4. Moreover, 45 stakeholders requested that the PoA be implemented as soon as possible.

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

The stakeholder consultation exercise shows that this PoA is supported by the local population to whom the Programme is targeted. Given that all of the comments received were positive, there was no need to amend the PoA-DD or the implementation of the Programme.





**SECTION E. Application of a baseline and monitoring methodology**

**E.1. Title and reference of the approved SSC baseline and monitoring methodology applied to a SSC-CPA included in the PoA:**

AMS-I.C. Ver. 19.0– “*Thermal energy for the user with or without electricity*”

For more information, please refer to:

<http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html>

The monitoring procedures of the following methodology will also be utilised:

AMS-I.I. Ver. 3.0– “*Biogas/biomass thermal applications for households/small users*” (the use of which is in line with clarification request 571<sup>22</sup>)

For more information, please refer to:

<http://cdm.unfccc.int/methodologies/DB/WUQJXBTJOPY9Y6BOD16CMYEJGA6J58>

**E.2. Justification of the choice of the methodology and why it is applicable to a SSC-CPA:**

For a CPA in the PoA, 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 4, AMS-I.C. Ver. 19.0)

As detailed below, a typical expected SSC-CPA meets each of the relevant applicability conditions defined in AMS-I.C. Ver. 19.0 and hence the methodology is deemed applicable to the SSC-CPAs covered under this PoA.

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.	As described in section A.4.2.1, the CDM Project Activities covered under this PoA employed renewable Energy technology i.e. household biogas to generate thermal Energy for cooking by users. In the absence of the household biogas technology, fossil fuel stoves would be

<sup>22</sup> [http://cdm.unfccc.int/Panels/ssc\\_wg/meetings/034/ssc\\_034\\_report.pdf](http://cdm.unfccc.int/Panels/ssc_wg/meetings/034/ssc_034_report.pdf)



		used widely as baseline scenario. In some households of the Programme, biogas is expected to be used not only for cooking to displace the fossil fuel stoves, but also for illumination. Actually, the monitoring systems (i.e. biogas flow meters) are installed at the inlet of the biogas cooking stoves and thus the amount of biogas used for illumination is excluded, and not relevant to the Programme.
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 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.	This applicability condition is not relevant, since the Project activity only involves heat generation but no electrical energy generation is involved
3	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 Project activity 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)	To satisfy this point, and as shown by the inclusion criteria of a CPA, the number of households in each CPA is less than 13,800 thus the total installed thermal energy generation capacity of each CPA of the project activity is about 44.98MW <sub>th</sub> <sup>23</sup> , which does not exceed the limit of 45 MW <sub>th</sub> stipulated for the chosen methodology.  As per the point k) of Eligibility Criteria (refer to the section A.4.2.2 of PoA-DD), the register database will be provided to ensure the users' number in the proposed CPA is be lower than 13,800.

<sup>23</sup>Refer to point 5, Sector A4.2.2 of the PDD.



		<p>The division of the proposed CPA was identified by the CME and the CDM consultant, taking the number of biogas digesters and the scale of the CPA into consideration to meet above inclusion criteria (the related technical review procedures refer to the section A.4.4.1 of PoA-DD).</p>
<p><b>5</b></p>	<p>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).</p>	<p>The Project activity does not involve co-fired system, so this applicability condition is not relevant.</p>
<p><b>6</b></p>	<p>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 to thermal energy (i.e., for renewable project activities, the maximal limit of 15 MW(e) is equivalent to 45 MW<sub>thermal</sub> 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.</p>	<p>This applicability condition is not relevant, since the Project activity only involves emission reductions from heat generation but no electrical or mechanical energy generation is involved<sup>24</sup>.</p>

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<sup>24</sup> Though the Project activity involves electrical energy generation for illumination, the amount of biogas used for illumination will not be counted in the monitoring.



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 Project activity 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 project activity aims to establish several new facilities i.e. biogas digesters in households in rural area of Zhoukou City and utilizes the biogas by renewable biomass residue and manure to generate thermal energy for cooking. As per the point c) of eligibility criteria (see section A.4.2.2 of the PoA-DD), the biogas digesters under the proposed CPA should be new-built to meet the inclusion criteria, 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 each CPA to be included in the Programme which establishes several new biogas digesters for thermal application and the total output capacity be 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 Project activity 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 Project activity 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 project activity utilizes biogas to generate heat for cooking. The single methodology AMS-I.C. Ver. 19.0 was used in the Programme. Therefore, emissions from the physical leakages from the biogas digester are taken into account in the calculation of project emissions (see the section E.6.2 of the PoA-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 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.	This application condition is not relevant, since the Project activity does not involve charcoal based biomass energy generation

The monitoring part i.e. paragraph 16, 17 and 18 of the methodology of AMS-I.I. Ver. 3.0– “*Biogas/biomass thermal applications for households/small users*” will be borrowed as monitoring procedure in the Programme (which is in line with clarification request 571<sup>25</sup>).

For more information, please refer to:

<http://cdm.unfccc.int/methodologies/DB/WUQJXBTJOPY9Y6BQD16CMYEJGA6J58>

<sup>25</sup>Paragraph 30 of the meeting report: [http://cdm.unfccc.int/Panels/ssc\\_wg/meetings/034/ssc\\_034\\_report.pdf](http://cdm.unfccc.int/Panels/ssc_wg/meetings/034/ssc_034_report.pdf)



No.	Applicability Conditions as per AMS-I.I.Ver. 3.0	Situation of this Project Activity
1	This category comprises activities for generation of renewable thermal energy using renewable biomass or biogas for use in residential, commercial, institutional applications. Examples of these technologies that displace or avoid fossil fuel use include but are not limited to biogas cook stoves. Biomass briquette cook stoves, small scale baking and drying systems, water heating, or space heating systems.	As described in section A.4.2.1, the CDM Project Activities covered under this PoA employed renewable Energy technology i.e. household biogas to generate thermal energy for cooking by users. In the absence of the household biogas technology, fossil fuel stoves would be used widely as baseline scenario.
2	The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW thermal.	To satisfy this point, and as shown by the inclusion criteria of a CPA, the number of households in each CPA is less than 13,800 thus the total installed thermal energy generation capacity of each CPA of the project is about 44.98MW <sub>th</sub> <sup>26</sup> , which does not exceed the limit of 45 MW <sub>th</sub> stipulated for the chosen methodology.
3	Each unit (e.g. cook stove, heater) shall have a rated capacity equal to or less than 150 kW thermal. <sup>3</sup> Projects that include units with rated capacity greater than 150 kW thermal may explore AMS I.C .Thermal energy production with or without electricity.	As per the inclusion criteria of adding a SSC-CPA to the PoA, the rated capacity of the biogas stove to be installed is up to 3.26 kW
4	<p>For the specific case of biomass residues processed as a fuel (e.g. briquettes, wood chips), it shall be demonstrated that:</p> <p>(a) It is produced using solely renewable biomass<sup>27</sup> (more than one type of biomass may be used). Energy use for renewable biomass processing (e.g. shredding and compacting in the case of briquetting) may be considered as equivalent to the upstream emissions associated with the processing of the displaced fossil fuel and hence disregarded;</p> <p>(b) The “General guidance on leakage in biomass project activities” (attachment C to Appendix B of 4/CMP.1 Annex II) shall be</p>	This application condition is not relevant, since the Project does not involve biomass residues processed as a fuel.

<sup>27</sup> Refer to EB 23, annex 18 for the definition of renewable biomass.



	<p>followed;</p> <p>(c) The project participant can monitor the mass, moisture content and NCV of the resulting biomass fuel, through sampling that meets the confidence/precision level of 90/10;</p> <p>(d) Where the project participant is not the producer of the renewable fuel, the project participant and the producer are bound by a contract that shall enable the project participant to monitor the source of renewable biomass to account for any emissions associated with biomass production (as per 4(b) above). Such a contract shall also ensure that there is no double counting of emission reductions.</p>	
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**E.3. Description of the sources and gases included in the SSC-CPA boundary**

As per methodology AMS-I.C. Ver. 19.0, the boundary of the CPA is the geographical and physical boundary of renewable energy production. For each CPA in the PoA, the boundary is delineated as the geographical and physical boundary of the biogas units installed including the biogas digester, the collection equipment and the biogas cooking stove.

The source of GHG emissions included in or excluded from the project boundary is shown in the table below:

	Source Emissions	Gas	Included?	Justification / Explanation
<b>Baseline</b>	CH <sub>4</sub> emissions from uncontrolled anaerobic degradation of the manure and agricultural residues used for biogas generation	CH <sub>4</sub>	Excluded	Although this is a considerable source of GHG emissions in the baseline scenario, it is not being considered in the project boundary for conservativeness and simplification purposes.
	CO <sub>2</sub> emissions from fossil fuel-based thermal energy generation displaced due to the project activity	CO <sub>2</sub>	Included	Main emission sources of the Project baseline scenario. The coal and LPG are used as cooking fuel in baseline.
		CH <sub>4</sub>	Excluded	Excluded for simplification
		N <sub>2</sub> O	Excluded	Excluded for simplification.



<b>Project activity</b>	Physical fugitive methane	CH <sub>4</sub>	Included	Potential source of emissions in the Project scenario. It is conservatively assumed that physical leakage of the biodigesters amounts to 10% of generated biogas.
		CO <sub>2</sub>	Excluded	Excluded for simplification.
		N <sub>2</sub> O	Excluded	Excluded for simplification.

**E.4. Description of how the baseline scenario is identified and description of the identified baseline scenario:**

As per paragraph 16 of AMS-I.C. Ver. 19.0, the simplified baseline corresponds to the fuel consumption of the technologies that would have been used in the absence of the project activity times an emission factor for the fossil fuel displaced. In the baseline fuel study conducted by the CME in August 2007, it was found that the fossil fuels predominantly used for cooking before implementation of the project activity were coal and LPG. Hence, the baseline emissions correspond to the GHG emissions associated to the coal and LPG that would have been combusted in absence of the project activity for cooking purposes.

In the baseline fuel study conducted by the CME, it was also found out that in the baseline scenario, dung would be anaerobically treated in deep pits generating CH<sub>4</sub> and N<sub>2</sub>O emissions. With the installation of bio-digesters in the households taking part in the Programme, the emissions associated with the anaerobic treatment of dung in deep pits would be avoided. However, these emission reductions are not accounted for for conservativeness purposes.

Finally, the biogas digesters installed as part of the project activity will also be generating bio-fertilizer that will replace chemical fertilizer thus reducing N<sub>2</sub>O emissions associated with the fertilizer production. However, these emission reductions are also dismissed in order to be conservative.

**E.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the SSC-CPA being included as registered PoA (assessment and demonstration of additionality of SSC-CPA):**

**E.5.1. Assessment and demonstration of additionality for a typical SSC-CPA:**

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 of the demonstration of additionality of small-scale project activities (Ver. 09)”.

As per the “Guidelines of 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;

For the CPAs included in the PoA, each individual CPA is composed of several household biogas digesters, and the users of the biogas digesters are 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 a 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. By assessing these key factors for all new CPAs that will be included in the PoA, the CME can assure that all CPAs included are additional.

**E.5.2. Key criteria and data for assessing additionality of a SSC-CPA:**

The criteria below shall be checked upon inclusion of a 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 of each CPA with unique ID number of biogas digesters need to provided;
2	The amount of isolated biogas digesters is less than 13,800;	The database of each CPA with the total number of biogas digesters need to provided;
3	The isolated biogas digester are only used by households;	The database of each CPA with the name, address and location of household need to provided;
4	The installed capacity of each biogas stove is less than 750kW.	The biogas stove specification with the installed capacity of biogas stoves adopted in each CPA and the emission reduction calculation file with emissions reduced by each biogas digester need to provided <sup>28</sup> ;

<sup>28</sup> According to the methodology adopted by the Project, the emission reduction calculated by following equations:  
 $ER_y = BE_y - PE_y - L_y$ ;  $BE_y = (EG_{thermal,y} * f_{coal} / \eta_{BL,thermal,coal}) * EF_{coal,CO2} + (EG_{thermal,y} * f_{LPG} / \eta_{BL,thermal,LPG}) * EF_{LPG,CO2}$  ;  
 $EG_{thermal,y} = HG_{PJ,y} = B_{biogas,PJ,y} * NCV_{biogas} * \eta_{PJ}$  ;



**E.6. Estimation of Emission reductions of a CPA:**

**E.6.1. Explanation of methodological choices, provided in the approved baseline and monitoring methodology applied, selected for a typical SSC-CPA:**

In accordance with AMS-I.C. Ver. 19.0, the simplified baseline corresponds to the fuel consumption of the technologies that would have been used in the absence of the project activity times an emission factor for the fossil fuel displaced. According to paragraph 22 of the same methodology, the applicable equation to estimate the baseline emissions for a typical CPA is:

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

Where:

$BE_{thermal,CO_2,y}$  The baseline emissions from heat displaced by the project activity during the year y (tCO<sub>2</sub>)

$EG_{thermal,y}$  The net quantity of heat supplied by the project activity during the year y (TJ)

$EF_{FF,CO_2}$  The CO<sub>2</sub> emission factor of the fossil fuel that would have been used in the baseline plant; tCO<sub>2</sub>/TJ, obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used

$\eta_{BL,thermal}$  The efficiency of the plant using fossil fuel that would have been used in the absence of the project activity

The following table describes the application of the above equation in this Programme:

Equation component	Provisions as per AMS-I.C.Ver. 19.0	Applicability to the Project Activity
$BE_{thermal,CO_2,y}$	The baseline emissions from heat displaced by the project activity during the year y (tCO <sub>2</sub> e)	Given that the project activity is expected to displace fossil fuel generated thermal energy with renewable thermal energy (from biogas) the baseline emissions corresponds to the baseline scenario applicable to the expected CPAs.
$EG_{thermal,y}$	AMS-I.C.Ver. 19.0 does not include any specific provisions for the calculation of the net quantity of heat supplied by the project activity.	Although metering of thermal energy output is not plausible, the project participants proposed the method described in Section E.6.2 for the determination of $EG_{thermal,y}$

The value 341 m<sup>3</sup>/per household of  $B_{biogas,PJ,y}$  was adopted in calculation is based on the Paper of “Estimation of biogas production and effect of biogas construction on energy economy” according related EB prior calculation rule;



$EF_{FF, CO_2}$	The CO <sub>2</sub> emission factor of the fossil fuel that would have been used in the baseline plant; tCO <sub>2</sub> /TJ, obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used	Given that coal and LPG were the fuels predominantly used in the baseline, a valid emission factor will be used for the calculation of baseline emissions.
$\eta_{BL,thermal}$	<p>For household or commercial applications/systems, whose maximum output capacity is less than 45 kW thermal and where it can be demonstrated that the metering of thermal energy output is not plausible, as in the case of cooking stoves, gasifiers, driers, water heaters etc., efficiency of the baseline units shall be determined by adopting one of the following criteria:</p> <p>(a) Highest measured operational efficiency over the full range of operating conditions of a representative sample of units with similar specifications, using baseline fuel.</p> <p>The efficiency tests shall be conducted following the guidance provided in relevant national / international standards;</p> <p>(b) Highest of the efficiency values provided by two or more manufacturers for units with similar specifications using the baseline fuel;</p> <p>(c) Highest efficiency from referenced literature values or default efficiency of 100%.</p>	<p><u>Coal fired stoves</u></p> <p>The efficiency of the coal-fired stoves to be replaced <math>\eta</math> is taken to be <b>47 %</b>. This corresponds to the highest of the measured efficiency values of this type of coal burners. The data is based on the Chinese version of <i>The Water Boiling Test</i> in which the amount of heat energy transferred to a pot of water is compared to the amount in the fuel consumed. The used data is elaborated in the report: <i>Edwards R, et al., 2004, Improved Household Stoves in China: An Assessment of the National Improved Stove Program (NISP) and article in Energy Policy 32 (2004) 395–411; Implications of changes in household stoves and fuel use in China</i><sup>29</sup>.</p> <p><u>LPG fired stoves</u></p> <p>The default efficiency <math>\eta</math> for LPG fired stoves is taken to be 100%</p>

**E.6.2. Equations, including fixed parametric values, to be used for calculation of emission reductions of a SSC-CPA:**

The steps of emission reductions calculation involve the following steps:

- Step 1: Calculate the baseline emission;
- Step 2: Calculate the activity emission;
- Step 3: Calculate the activity leakage GHG emissions;
- Step 4: Calculate the activity emission reduction.

<sup>29</sup>[http://www.bioenergylists.org/stovesdoc/Smith/Edwards/04\\_edwards\\_1.pdf](http://www.bioenergylists.org/stovesdoc/Smith/Edwards/04_edwards_1.pdf)



**Step 1. Calculate the baseline emission ( $BE_y$ )**

As per AMS-I.C. Ver. 19.0, paragraph 16, the simplified baseline is the fuel consumption of the technologies that would have been used in the absence of the Programme times an emission factor for the fossils fuel displaced, and according to paragraph 22, equation 2, for steam/heat produced using fossil fuels the baseline emissions are calculated as follows:

$$BE_{thermal, CO_2, y} = (EG_{thermal, y} / \eta_{BL, thermal}) * EF_{FF, CO_2} \quad \text{(Eq. 1)}$$

Where:

$BE_{thermal, CO_2, y}$	The baseline emissions from heat displaced by the project activity during the year y (tCO <sub>2</sub> e)
$EG_{thermal, y}$	The net quantity of steam/heat supplied by the project activity during the year y; (TJ)
$\eta_{BL, thermal}$	The efficiency of the plant using fossil fuel that would have been used in the absence of the project activity
$EF_{FF, CO_2}$	The CO <sub>2</sub> emission factor of the fossil fuel (coal or LPG) that would have been used in the baseline plant; tCO <sub>2</sub> /TJ, obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used

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 as follows to reflect for the two types of fuels that would have been consumed in the baseline scenario:

$$BE_{thermal, CO_2, y} = (EG_{thermal, y} / \eta_{BL, thermal, coal}) * EF_{coal, CO_2} * f_{coal} + (EG_{thermal, y} / \eta_{BL, thermal, LPG}) * EF_{LPG, CO_2} * f_{LPG} \quad \text{(Eq. 2)}$$

Where:

$BE_{thermal, CO_2, y}$	The baseline emissions from heat displaced by the project activity during the year y (tCO <sub>2</sub> e)
$EG_{thermal, y}$	The net quantity of steam/heat supplied by the project activity during the year y; (TJ)
$\eta_{BL, thermal, coal}$	The efficiency of the cook stove using coal that would have been used in the absence of the project activity
$\eta_{BL, thermal, LPG}$	The efficiency of the cook stove using LPG 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
$EF_{coal, CO_2}$	The CO <sub>2</sub> emission factor of the coal that would have been used in the baseline plant; tCO <sub>2</sub> /TJ, obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used



$EF_{LPG,CO_2}$	The CO <sub>2</sub> emission factor of the LPG that would have been used in the baseline plant; tCO <sub>2</sub> /TJ, obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used
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As per paragraph 43 of AMS-I.C. Ver. 19.0, for household applications, whose maximum output capacity is less than 45 kW thermal and where it can be demonstrated that the metering of thermal energy output is not possible, as in the case of rural stoves, the project output energy shall be estimated based on consumption of biomass (in terms of energy quantity) times the efficiency of the project equipment. This is also valid for biogas thermal energy and can be expressed according to the following equation (based on equation 9 of AMS-I.C.Ver. 19.0):

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

(Eq. 3)

Whereby:

$EG_{thermal,y}$	The net quantity of steam/heat supplied by the project activity during the year y; (TJ)
$HG_{PJ,y}$	The net quantity of thermal energy supplied by the project activity using biogas during the year y (TJ)
$B_{biogas,PJ,y}$	The net quantity of the biogas consumed in year y (m <sup>3</sup> )
$NCV_{biogas}$	The net calorific value of the biogas (TJ/m <sup>3</sup> )
$\eta_{PJ}$	Efficiency of the project equipment measured using representative sampling methods or based on referenced literature values. The efficiency tests shall be conducted following 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:

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

(Eq. 4)

Whereby:

$B_{biogas,PJ,y}$	The net quantity of biogas consumed in year y (m <sup>3</sup> )
$N_{k,0}$	Number of registered biogas units of the size k commissioned in each CPA
$n_{k,y}$	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 <sup>3</sup> , 10m <sup>3</sup> , 12m <sup>3</sup> , 15m <sup>3</sup> , etc.)
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**Step 2: Calculate the project activity emission ( $PE_y$ )**

As per paragraph 13 of methodology AMS-IC. Ver. 19.0, if the project activity utilizes biogas for power production and applies this methodology on a stand alone basis, any incremental emissions occurring by project activity e.g. physical leakage of the biogas digester shall be taken into account 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<sup>30</sup>. The following equation can be used to determine the project activity emissions:

$$B_{biogas,PJ,y} * GWP_{CH4} * D_{CH4} * X_{CH4} * 0.1 \tag{Eq. 5}$$

Whereby:

$B_{biogas,PJ,y}$	The net quantity of biogas consumed in year $y$ (m <sup>3</sup> )
$GWP_{CH4}$	Global Warming Potential (GWP) of CH <sub>4</sub> (21 tCO <sub>2</sub> e / tCH <sub>4</sub> )
$D_{CH4}$	CH <sub>4</sub> density (0.00067 tCH <sub>4</sub> /m <sup>3</sup> CH <sub>4</sub> at room temperature (20°C) and 1 atm pressure)
$X_{CH4}$	Fraction of methane in the biogas (assumed to be 0.6 m <sup>3</sup> CH <sub>4</sub> / m <sup>3</sup> )

**Step 3: Calculate the activity leakage GHG emissions ( $LE_y$ )**

The project activity is the installation of new biogas digesters. There is no need for trans-boundary transport of the commissioned or decommissioned units. Hence, according to AMS-IC. Ver.19, in this case, the leakage can be neglected, i.e.  $LE_y=0$ .

**Step 4: Calculate the activity emission reduction**

$$ER_y = BE_y - PE_y - LE_y$$

<sup>30</sup>By comparison AMS-III.D version 18.0.0 allows the use of a default value of 0.05m<sup>3</sup> biogas leaked/m<sup>3</sup> biogas produced.



**E.6.3. Data and parameters that are to be reported in CDM-SSC-CPA-DD form:**

<b>Data / Parameter:</b>	$\eta_{BL,thermal,coal}$
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:	<i>Edwards R et al.,2004, Improved Household Stoves in China: An Assessment of the National Improved Stove Program (NISP)and article in Energy Policy 32 (2004) 395–411; Implications of changes in household stoves and fuel used in China.</i>
Value applied:	47%
Justification of the choice of data or description of measurement methods and procedures actually applied :	Refer to Para 18, E.6.1
Any comment:	

<b>Data / Parameter:</b>	$\eta_{BL,thermal,LPG}$
Data unit:	
Description:	The efficiency of the cook stove using LPG that would have been used in the absence of the project activity
Source of data used:	<i>Assumption</i>
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:	

<b>Data / Parameter:</b>	$EF_{coal,CO_2}$
Data unit:	tCO <sub>2</sub> /TJ
Description:	CO <sub>2</sub> emission factor per unit of coal
Source of data used:	<i>IPCC 2006 Revised Guidelines :Volume 02, Chapter 01,Table 1.3</i>
Value applied:	89.5tCO <sub>2</sub> /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 ( <a href="http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf">http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf</a> ).
Any comment:	-



Data / Parameter:	$EF_{LPG,CO_2}$
Data unit:	tCO <sub>2</sub> /TJ
Description:	The CO <sub>2</sub> emission factor of the LPG that would have been used in the baseline plant
Source of data used:	<i>IPCC 2006 Revised Guidelines :Volume 02, Chapter 01,Table 1.3</i>
Value applied:	63.07 tCO <sub>2</sub> /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:	TJ/m <sup>3</sup>
Description:	The net calorific value of the biogas
Source of data used:	<i>Appendix IV, China Energy Statistical Yearbook (2009)</i>
Value applied:	20,908 KJ/m <sup>3</sup>
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, <i>China Energy Statistical Yearbook (2009) in this project</i>
Any comment:	<i>P 508, Appendix IV,China Energy Statistical Yearbook (2009)</i>

Data / Parameter:	$\eta_{PJ}$
Data unit:	%
Description:	The efficiency of the domestic biogas stove in the project activity
Source of data used:	China National Standard for Domestic Biogas , <i>GB/T3606-2001</i>
Value applied:	55%
Justification of the choice of data or description of measurement methods and procedures actually applied :	The datum is the lowest efficiency of a biogas stove according to the China National Standard for Domestic Biogas, <i>GB/T3606-2001</i> , the rated thermal efficiency of a biogas stove should be above 55%. To keep the conservativeness, the value 55% is applied here.
Any comment:	-

Data / Parameter:	$GWP_{CH_4}$
Data unit:	tCO <sub>2</sub> e / tCH <sub>4</sub>
Description:	Global WarmingPotentialof methane
Source of data used:	<i>IPCC Second Assessment Report, 1995</i>
Value applied:	21
Justification of the	Standard GWP for CH <sub>4</sub>





choice of data or description of measurement methods and procedures actually applied :	
Any comment:	

Data / Parameter:	$D_{CH_4}$
Data unit:	$tCH_4/m^3$
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 $tCH_4/m^3CH_4$
Justification of the choice of data or description of measurement methods and procedures actually applied :	In line with the factors indicated in AMS-III.D. Ver. 18.0 of “Methane recovery in animal manure management systems;
Any comment:	

Data / Parameter:	$X_{CH_4}$
Data unit:	$m^3 CH_4 / m^3$
Description:	Fraction of methane in the biogas
Source of data used:	
Value applied:	0.6 $m^3 CH_4 / m^3$
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 “methane recovery in animal manure management system”
Any comment:	

**E.7. Application of the monitoring methodology and description of the monitoring plan:**

As described in section E.1 and E.2, 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. that contains specific monitoring procedures for household applications (refer to clarification request 571)<sup>31</sup>. AMS-I.I shall only be utilised to determine the net quantity of biogas supplied to the thermal energy equipment ( $B_{biogas,k,y}$ ).

**E.7.1. Data and parameters to be monitored by each SSC-CPA:**

<sup>31</sup>See paragraph 30 of report: [http://cdm.unfccc.int/Panels/ssc\\_wg/meetings/034/ssc\\_034\\_report.pdf](http://cdm.unfccc.int/Panels/ssc_wg/meetings/034/ssc_034_report.pdf)



<b>Data / Parameter:</b>	$N_{k,0}$
Data unit:	
Description:	Number of registered biogas units of the size $k$ commissioned in each 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	Depending on the size of the CPA
Description of measurement methods and procedures to be applied:	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.
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:	

<b>Data / Parameter:</b>	$f_{coal}$
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% <sup>32</sup>
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:	

<b>Data / Parameter:</b>	$f_{LPG}$
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<sup>32</sup> 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 the value of  $f_{LPG}$  is 0.67%. The supportive document of “Zhoukou Baseline Survey Summary” has been submitted to DOE.



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:	

<b>Data / Parameter:</b>	$n_{k,y}$
Data unit:	
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	Depending on the size of the CPA
Description of measurement methods and procedures to be applied:	<p>The CME will inspect that the biogas units chosen as sample are operational and in compliance with the required maintenance procedures from the manufacturers at least once every year during the crediting period.</p> <p>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 Ver. 03.0 ” using a 90% confidence interval and a 10% margin of error and the monitoring systems.</p> <p>Records will be keep at the Biogas Service Centre for at least two years after the end of the crediting period.</p>
QA/QC procedures to be applied:	
Any comment:	

<b>Data / Parameter:</b>	$B_{biogas,k,y}$
Data unit:	( $m^3$ )
Description:	The net quantity of biogas supplied to the thermal energy equipment for one



	typical biogas unit of the size $k$
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 <sup>3</sup>
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 thermal equipment. Measurement campaigns shall be undertaken at selected sites and at least five campaigns per digester size (8m <sup>3</sup> , 10m <sup>3</sup> , 12m <sup>3</sup> and 15m <sup>3</sup> ) 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– <i>“Biogas/biomass thermal applications for households/small users”</i> . 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 crosscheck will be made with the theoretical amount of biogas to be generated to confirm the suitability of the measurements.
Any comment:	

**E.7.2. Description of the monitoring plan for a SSC-CPA:**

**1. Monitoring object:**

The purpose of the monitoring plan is to monitor and measure the key parameters necessary to estimate the amount of biogas generated per CPA. Using the amount of biogas generated and the fuel that would have been used in the baseline scenario, an estimation of emission reductions can be made according to Section E.6.2 of this document.

Details of the SSC-CPA monitoring plan will be described for each SSC-CPA but shall comprise the procedures outlined in this section.

**2. Data description:**

The related description below will be followed for each of the parameters to be monitored throughout the duration of the crediting period of each CPA:

<b>Parameter</b>	<b>Definition</b>	<b>Description</b>
$N_{k,0}$	Number of registered biogas units of the size $k$ commissioned in each CPA	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.



$f_{coal}$	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.
$n_{k,y}$	Proportion of $N_{k,0}$ that remain operating at year $y$ (fraction)	<p>The CME will inspect that the biogas units are operational and in compliance with the required maintenance procedures from the manufacturers at least once every year during the crediting period.</p> <p>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 Ver. 03.0” using a 90% confidence interval and a 10 % margin of error.</p>
$B_{biogas,k,y}$	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-III 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.

### 3. Data Management

The biogas station will be in charge of collecting and analysing the monitoring data. The biogas stations will submit the results and accompanying documentation to the CME at the end of each year during the crediting period.

The data will be archived electronically and be stored for 2 years after the end of the crediting period of each SSC-CPA by the CME.

### 4. QC/QA

The project entity will implement QA&QC measures to calibrate and guarantee the accuracy of metering. The metering devices will be calibrated and inspected properly and periodically as per standard industry norms and requirements. The meter readings will be readily accessible for the Designated Operational Entity (DOE) carrying out the verification of monitoring data.



To ensure the reliability of monitoring result, the measures to guarantee the quality are as follows:

- Zhoukou City Rural Energy Office will re-check the sampling result every year by choosing 1-2 CPA

### 5. Monitoring report

A CPA monitoring report will be completed at the end of each monitoring period, whose main content will include:

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 will be submitted to the statistics department of the CME for inspection at the end of each monitoring period.

<b>E.8 Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity(ies)</b>
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The application of the baseline study and monitoring methodology of the Programme was completed on 22/09/2012 by Mr. Hongbo Chen

Entity: Research Centre of Urban Development and Environment Research Centre for Sustainable Development Chinese Academy of Social Sciences

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The person/entity is not project participant listed in Annex 1.



**Annex 1**

**CONTACT INFORMATION ON COORDINATING/MANAGING ENTITY and PARTICIPANTS IN THE PROGRAM of ACTIVITIES**

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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**

The detailed baseline is described in E.6.2.

The Original CPA list submitted to UNFCCC attached below. The eligibility criteria of each individual CPA will be assessed during the process of CPA inclusion.

<b>Henan Province Zhoukou City Rural Household Biogas Development Programme (2007-2010)</b>				
<b>China</b>				
<b>No.</b>	<b>Title</b>	<b>Description of CPA<sup>33</sup></b>	<b>Location</b>	<b>Start date</b>
1	The 1 <sup>st</sup> CPA of Henan Province Zhoukou City Rural Household Biogas Development Programme (2007-2010)	The CPA will set up 1021 biogas digesters and their auxiliary facilities for gas collection and gas use (PVC pipe, pressure meter, desulphurization equipment, biogas oven, biogas light etc.) for individual household during Stage I between Jul. 2007 and Dec.2007 in Wangdian Town, Huaiyang County, Zhoukou City, Henan Province. For the	Wangdian Town, Huaiyang County, Zhoukou City, Henan Province	Jul. 2007

<sup>33</sup> Please note that the number of units in the description of some of the CPAs in this list exceed the limit of the number of units per CPA in eligibility criteria (f), this will need to be resolved before such CPAs are added to the PoA. The first CPA has fewer than 13,800 units and therefore complies with all of the eligibility criteria and the PPs have decided to proceed with the validation of the PoA and the first CPA.



		consideration of the additionality, the main users of the Programme are rural households with medium and lower income.		
2	The 2 <sup>nd</sup> CPA of Henan Province Zhoukou City Rural Household Biogas Development Programme (2007-2010)	The CPA will set up 15293 biogas digesters and their auxiliary facilities for gas collection and gas use (PVC pipe, pressure meter, desulphurization equipment, biogas oven, biogas light etc.) for individual household during Stage I between Jul. 2007 and Dec.2007 in Jiangcun Town, Baitan Town, Cuiqiao Town, Caoli Town, Jiuyuan Town, Chaigang Town, Gucheng Town, Liansi Town, Biangang Town, Daxin Town, Lvtan Town, Baotun Town, Dalizhuang Town, Chengjiao Town, Nongmuchang Fugou County and Changying Town, Zhimawa Town and Banqiao Town, Taikang County, Zhoukou City, Henan Province. For the consideration of the	Jiangcun Town, Baitan Town, Cuiqiao Town, Caoli Town, Jiuyuan Town, Chaigang Town, Gucheng Town, Liansi Town, Biangang Town, Daxin Town, Lvtan Town, Baotun Town, Dalizhuang Town, Chengjiao Town, Nongmuchang, Fugou County and Changying Town, Zhimawa Town and Banqiao Town, Taikang County, Zhoukou City, Henan Province	Jul. 2007



		<p>additionality, the main users of the Programme are rural households with medium and lower income.</p>		
3	<p>The 3<sup>rd</sup> CPA of Henan Province Zhoukou City Rural Household Biogas Development Programme (2007-2010)</p>	<p>The CPA will set up 15740 biogas digesters and their auxiliary facilities for gas collection and gas use (PVC pipe, pressure meter, desulphurization equipment, biogas oven, biogas light etc.) for individual household during Stage I between Jul. 2007 and Dec.2007 in Qingji Town, Yangmiao Town, Zhuanlou Town, Longqu Town, Wangji Town, Gaoxian Town, Dutang Town, Xunmukou Town, Daxu Town, Fucaolou Town, Zhangji Town, Machang Town, Zhukou Town, Matou Town, Gaolang Town, Chengjiao Town, Maozhuang Town, Chengguan Town, Wulikou Town, Taikang County Zhoukou City, Henan Province. For the consideration of the additionality, the main users of the Programme are</p>	<p>Qingji Town, Yangmiao Town, Zhuanlou Town, Longqu Town, Wangji Town, Gaoxian Town, Dutang Town, Xunmukou Town, Daxu Town, Fucaolou Town, Zhangji Town, Machang Town, Zhukou Town, Matou Town, Gaolang Town, Chengjiao Town, Maozhuang Town, Chengguan Town, Wulikou Town, Taikang County Zhoukou City, Henan Province</p>	<p>Jul. 2007</p>



		rural households with medium and lower income.		
4	The 4 <sup>th</sup> CPA of Henan Province Zhoukou City Rural Household Biogas Development Programme (2007-2010)	The CPA will set up 15771 biogas digesters and their auxiliary facilities for gas collection and gas use (PVC pipe, pressure meter, desulphurization equipment, biogas oven, biogas light etc.) for individual household during Stage I between Jul. 2007 and Dec.2007 in LaozhongTown, Taikang County and Xinzhan Town, Zhuji Town, Fengtang Town, Qilao Town, Zhengji Town, Xuwan Town, Liuzhentun Town, Dalian Town, Lutai Town, Doumen Town, Lincai Town, Bailou Town, Anling Town, Caohe Town, Chengguan Town, Yuangzhongchang Town, Nongchang Town, Gedian Town, Huangji Town, Huaiyang County, Zhoukou City, Henan Province. For the consideration of the additionality, the main users of	LaozhongTown, Taikang County and Xinzhan Town, Zhuji Town, Fengtang Town, Qilao Town, Zhengji Town, Xuwan Town, Liuzhentun Town, Dalian Town, Lutai Town, Doumen Town, Lincai Town, Bailou Town, Anling Town, Caohe Town, Chengguan Town, Yuangzhongchang Town, Nongchang Town, Gedian Town, Huangji Town, Huaiyang County, Zhoukou City, Henan Province	Jul.2007



		the Programme are rural households with medium and lower income.		
5	The 5 <sup>th</sup> CPA of Henan Province Zhoukou City Rural Household Biogas Development Programme (2007-2010)	The CPA will set up 15400 biogas digesters and their auxiliary facilities for gas collection and gas use (PVC pipe, pressure meter, desulphurization equipment, biogas oven, biogas light etc.) for individual household during Stage I between Jul. 2007 and Dec.2007 in Sitong Town, Huaiyang County and Xinji Town, Tangji Town, Gaoji Town, Xuanwu Town, Qiuji Town, Mudian Town, Yanghukou Town, Jiatan Town, Songhe Town, Chengjiao Town, Chengguan Town, Luyi County, Zhoukou City, Henan Province. For the consideration of the additionality, the main users of the Programme are rural households with medium and lower income.	Sitong Town, Huaiyang County and Xinji Town, Tangji Town, Gaoji Town, Xuanwu Town, Qiuji Town, Mudian Town, Yanghukou Town, Jiatan Town, Songhe Town, Chengjiao Town, Chengguan Town, Luyi County, Zhoukou City, Henan Province	Jul.2007
6	The 6 <sup>th</sup> CPA of	The CPA will set up 15953	Shiliang Town, Renji Town,	Jul.2007



	Henan Province Zhoukou City Rural Household Biogas Development Programme (2007-2010)	biogas digesters and their auxiliary facilities for gas collection and gas use (PVC pipe, pressure meter, desulphurization equipment, biogas oven, biogas light etc.) for individual household during Stage I between Jul. 2007 and Dec.2007 in Shiliang Town, Renji Town, Zhangdian Town, Zhaocun Town, Guantang Town, Wobei Town, Shengtiezhong Town, Mapu Town, Taiqinggong Town, Zhengjiaji Town, Wangpiliu Town, Luyi County and Zhangwan Town, Jishui Town, Dancheng County, Zhoukou City, Henan Province. For the consideration of the additionality, the main users of the Programme are rural households with medium and lower income.	Zhangdian Town, Zhaocun Town, Guantang Town, Wobei Town, Shengtiezhong Town, Mapu Town, Taiqinggong Town, Zhengjiaji Town, Wangpiliu Town, Luyi County and Zhangwan Town, Jishui Town, Dancheng County, Zhoukou City, Henan Province	
7	The 7 <sup>th</sup> CPA of Henan Province Zhoukou City	The CPA will set up 15953 biogas digesters and their auxiliary facilities for gas collection and gas use (PVC	Dingcun Town, Shicao Town, Nanfeng Town, Shuanglou Town,	Jul.2007



	<p>Rural Household Biogas Development Programme (2007-2010)</p>	<p>pipe, pressure meter, desulphurization equipment, biogas oven, biogas light etc.) for individual household during Stage I between Jul. 2007 and Dec.2007 in Dingcun Town, Shicao Town, Nanfeng Town, Shuanglou Town, Huji Town, Lilou Town, Qiandian Town, Dongfeng Town, Baji Town, Baima Town, Ningping Town, Qiuqu Town, Chengjiao Town, Gongye District, Xincheng District, Jizhong Town, Wutai Town, Hugang Town, Yilu Town, Mingnan Office, Mingbei Office, Dancheng County and Bianlukou Town, Beiyangji Town, Baiji Town, Beicheng Town, Xinji Town, Zhidian Town, Liuwan Town, Shenqiu County, Zhoukou City, Henan Province. For the consideration of the additionality, the main users of the Programme are rural households with medium and lower income.</p>	<p>Huji Town, Lilou Town, Qiandian Town, Dongfeng Town, Baji Town, Baima Town, Ningping Town, Qiuqu Town, Chengjiao Town, Gongye District, Xincheng District, Jizhong Town, Wutai Town, Hugang Town, Yilu Town, Mingnan Office, Mingbei Office, Dancheng County and Bianlukou Town, Beiyangji Town, Baiji Town, Beicheng Town, Xinji Town, Zhidian Town, Liuwan Town, Shenqiu County, Zhoukou City, Henan Province</p>	
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8	The 8 <sup>th</sup> CPA of Henan Province Zhoukou City Rural Household Biogas Development Programme (2007-2010)	The CPA will set up 15526 biogas digesters and their auxiliary facilities for gas collection and gas use (PVC pipe, pressure meter, desulphurization equipment, biogas oven, biogas light etc.) for individual household during Stage I between Jul. 2007 and Dec.2007 in Huaidian Town, Zhouying Town, Chengguan Town, Hongshan Town, Fujing Town, Zhaodeying Town, Liufu Town, Dongcheng Town, Daxing Zhuang Town, Fengying Town, Shicao Town, Fanying Town, Liuzhuangdian Town, Lianchi Town, Lilaozhuang Town, Shenqiu County and Fuji Town, Guanhui Town, Xinqiao Town, Wangmingkou Town, Zhengguo Town, Moling Town, Xiangcheng City, Zhoukou City, Henan Province.  For the consideration of the additionality, the main users of the Programme are rural	Huaidian Town, Zhouying Town, Chengguan Town, Hongshan Town, Fujing Town, Zhaodeying Town, Liufu Town, Dongcheng Town, Daxing Zhuang Town, Fengying Town, Shicao Town, Fanying Town, Liuzhuangdian Town, Lianchi Town, Lilaozhuang Town, Shenqiu County and Fuji Town, Guanhui Town, Xinqiao Town, Wangmingkou Town, Zhengguo Town, Moling Town, Xiangcheng City, Zhoukou City, Henan Province	Jul.2007
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		households with medium and lower income.		
9	The 9 <sup>th</sup> CPA of Henan Province Zhoukou City Rural Household Biogas Development Programme (2007-2010)	The CPA will set up 15868 biogas digesters and their auxiliary facilities for gas collection and gas use (PVC pipe, pressure meter, desulphurization equipment, biogas oven, biogas light etc.) for individual household during Stage I between Jul. 2007 and Dec.2007 in Sandian Town, Dingji Town, Gaosi Town, Lizhai Town, Jialing Town, Huanyuan Office, Dongfang Office, Lianhua Office, Guangwu Office, Qianfoge Office, Yongfeng Town, Sundian Town, Fanji Town, Nandun Town, Xiangcheng City and Huangzhai Town, Weiji Town, Huji Town, Pingdian Town, Yuanlao Town, Guqiang Town, Lianji Town, Huahe Town, Yaoji Town, Baisi Town, Shuzhuang Town, Dawu Town, Bacun Town, Laocheng Office, Xincheng	Sandian Town, Dingji Town, Gaosi Town, Lizhai Town, Jialing Town, Huanyuan Office, Dongfang Office, Lianhua Office, Guangwu Office, Qianfoge Office, Yongfeng Town, Sundian Town, Fanji Town, Nandun Town, Xiangcheng City and Huangzhai Town, Weiji Town, Huji Town, Pingdian Town, Yuanlao Town, Guqiang Town, Lianji Town, Huahe Town, Yaoji Town, Baisi Town, Shuzhuang Town, Dawu Town, Bacun Town, Laocheng Office, Xincheng Office, Dongcheng	Jul. 2007



		Office, Dongcheng Office, Chengguan Office, Nongchang, Shangshui County, Zhoukou City, Henan Province. For the consideration of the additionality, the main users of the Programme are rural households with medium and lower income.	Office, Chengguan Office, Nongchang, Shangshui County, Zhoukou City, Henan Province	
10	The 10 <sup>th</sup> CPA of Henan Province Zhoukou City Rural Household Biogas Development Programme (2007-2010)	The CPA will set up 12720 biogas digesters and their auxiliary facilities for gas collection and gas use (PVC pipe, pressure meter, desulphurization equipment, biogas oven, biogas light etc.) for individual household during Stage I between Jul. 2007 and Dec.2007 in Tangzhuang Town, Tanzhuang Town, Haogang Town, Zhangming Town, Dengcheng Town, Shangshui County, Xihuan County and Chuanhui District, Zhoukou City, Henan Province. For the consideration of the additionality, the main users of the Programme are rural	Tangzhuang Town, Tanzhuang Town, Haogang Town, Zhangming Town, Dengcheng Town, Shangshui County, Xihuan County and Chuanhui District, Zhoukou City, Henan Province	Jul. 2007



		households with medium and lower income.		
11	The 11 <sup>th</sup> CPA of Henan Province Zhoukou City Rural Household Biogas Development Programme (2007-2010)	The CPA will set up 15998 biogas digesters and their auxiliary facilities for gas collection and gas use (PVC pipe, pressure meter, desulphurization equipment, biogas oven, biogas light etc.) for individual household during Stage I between Jan. 2008 and Dec.2008 in Fugou County and Changying Town, Zhimawa Town, Banqiao Town, Qingji Town, Yangmiao Town, Zhuanlou Town, Longqu Town, Wangji Town, Gaoxian Town, Dutang Town, Xunmukou Town, Yangmiao Town, Zhuanlou Town, Longqu Town, Wangji Town, Gaoxian Town, Dutang Town, Xunmukou Town, Daxu Town, Fucaolou Town, Zhangji Town, Machang Town, Xunmukou Town, Daxu Town, Fucaolou Town, Zhangji Town, Machang Town, Zhukou Town, Matou Town, Gaolang Town, Chengjiao Town, Taikang County, Zhoukou City, Henan Province. For the consideration of the additionality, the main users of the Programme are rural households with medium	Fugou County and Changying Town, Zhimawa Town, Banqiao Town, Qingji Town, Yangmiao Town, Zhuanlou Town, Longqu Town, Wangji Town, Gaoxian Town, Dutang Town, Xunmukou Town, Daxu Town, Fucaolou Town, Zhangji Town, Machang Town, Zhukou Town, Matou Town, Gaolang Town, Chengjiao Town, Taikang County, Zhoukou City, Henan Province	Jan. 2008



		and lower income.		
12	The 12 <sup>th</sup> CPA of Henan Province Zhoukou City Rural Household Biogas Development Programme (2007-2010)	The CPA will set up 15619 biogas digesters and their auxiliary facilities for gas collection and gas use (PVC pipe, pressure meter, desulphurization equipment, biogas oven, biogas light etc.) for individual household during Stage I between Jan. 2008 and Dec.2008 in Huaiyang County and Mangzhuang Town, Chengguan Town, Wulikou Town, Laozhong Town, Taikang County and Xinji Town, Tangji Town, Gaoji Town, Luyi County, Zhoukou City, Henan Province. For the consideration of the additionality, the main users of the Programme are rural households with medium and lower income.	Huaiyang County and Mangzhuang Town, Chengguan Town, Wulikou Town, Laozhong Town, Taikang County and Xinji Town, Tangji Town, Gaoji Town, Luyi County, Zhoukou City, Henan Province	Jan.2008
13	The 13 <sup>th</sup> CPA of Henan Province Zhoukou City Rural	The CPA will set up 15859 biogas digesters and their auxiliary facilities for gas collection and gas use (PVC pipe, pressure meter,	Xuanwu Town, Qiuji Town, Mudian Town, Yanghukou Town, Jiatan Town, Songhe Town, Chengjiao	Jan.2008



	<p>Household Biogas Development Programme (2007-2010)</p>	<p>desulphurization equipment, biogas oven, biogas light etc.) for individual household during Stage I between Jan. 2008 and Dec.2008 in Xuanwu Town, Qiuji Town, Mudian Town, Yanghukou Town, Jiatan Town, Songhe Town, Chengjiao Town, Chengguan Town, Shiliang Town, Renji Town, Zhangdian Town, Zhaocun Town, Guantang Town, Wobei Town, Shengtiezhong Town, Mapu Town, Taiqinggong Town, Zhengjiaji Town, Wangpiliu Town, Luyi County and Zhangwan Town, Jishui Town, Nanfeng Town, Baima Town, Dingcun Town, Hugang Town, Ningping Town, Wutai Town, Shuanglou Town, Huji Town, Baji Town, Dancheng County, Zhoukou City, Henan Province.</p> <p>For the consideration of the additionality, the main users of the Programme are rural households with medium and</p>	<p>Town, Chengguan Town, Shiliang Town, Renji Town, Zhangdian Town, Zhaocun Town, Guantang Town, Wobei Town, Shengtiezhong Town, Mapu Town, Taiqinggong Town, Zhengjiaji Town, Wangpiliu Town, Luyi County and Zhangwan Town, Jishui Town, Nanfeng Town, Baima Town, Dingcun Town, Hugang Town, Ningping Town, Wutai Town, Shuanglou Town, Huji Town, Baji Town, Dancheng County, Zhoukou City, Henan Province</p>	
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		lower income.		
14	The 14 <sup>th</sup> CPA of Henan Province Zhoukou City Rural Household Biogas Development Programme (2007-2010)	The CPA will set up 15548 biogas digesters and their auxiliary facilities for gas collection and gas use (PVC pipe, pressure meter, desulphurization equipment, biogas oven, biogas light etc.) for individual household during Stage I between Jan. 2008 and Dec.2008 in Lilou Town, Chengjiao Town, Gongye District, Xincheng District, Jizhong Town, Mingnan Office, Mingbei Office, Qiandian Town, Shicao Town, Qiuqu Town, Yilu Town, Dongfeng Town, Dancheng County, Shenqiu County and Fuji Town, Guanhui Town, Xinqiao Town, Wangmingkou Town, Xiangcheng City, Zhoukou City, Henan Province. For the consideration of the additionality, the main users of the Programme are rural households with medium and lower income.	Lilou Town, Chengjiao Town, Gongye District, Xincheng District, Jizhong Town, Mingnan Office, Mingbei Office, Qiandian Town, Shicao Town, Qiuqu Town, Yilu Town, Dongfeng Town, Dancheng County, Shenqiu County and Fuji Town, Guanhui Town, Xinqiao Town, Wangmingkou Town, Xiangcheng City, Zhoukou City, Henan Province	Jan.2008



15	The 15 <sup>th</sup> CPA of Henan Province Zhoukou City Rural Household Biogas Development Programme (2007-2010)	The CPA will set up 15958 biogas digesters and their auxiliary facilities for gas collection and gas use (PVC pipe, pressure meter, desulphurization equipment, biogas oven, biogas light etc.) for individual household during Stage I between Jan. 2008 and Dec.2008 in Zhengguo Town, Moling Town, Sandian Town, Dingji Town, Gaosi Town, Lizhai Town, Jialing Town, Huanyuan Office, Dongfang Office, Lianhuan Office, Guangwu Office, Qianfoge Office, Yongfeng Town, Sundian Town, Fanji Town, Nandun Town, Xiangcheng City, and Shangshui County, Xihuan County, Chuanhui District, Zhoukou City, Henan Province. For the consideration of the additionality, the main users of the Programme are rural households with medium and lower income.	Zhengguo Town, Moling Town, Sandian Town, Dingji Town, Gaosi Town, Lizhai Town, Jialing Town, Huanyuan Office, Dongfang Office, Lianhuan Office, Guangwu Office, Qianfoge Office, Yongfeng Town, Sundian Town, Fanji Town, Nandun Town, Xiangcheng City, and Shangshui County, Xihuan County, Chuanhui District, Zhoukou City, Henan Province	Jan.2008
16	The 16 <sup>th</sup> CPA	The CPA will set up 15190	Fugou County and	Jan.2009





	of Henan Province Zhoukou City Rural Household Biogas Development Programme (2007-2010)	biogas digesters and their auxiliary facilities for gas collection and gas use (PVC pipe, pressure meter, desulphurization equipment, biogas oven, biogas light etc.) for individual household during Stage I between Jan. 2009 and Dec.2009 in Fugou County and Taikang County, Zhoukou City, Henan Province. For the consideration of the additionality, the main users of the Programme are rural households with medium and lower income.	Taikang County, Zhoukou City, Henan Province	
17	The 17 <sup>th</sup> CPA of Henan Province Zhoukou City Rural Household Biogas Development Programme (2007-2010)	The CPA will set up 15363 biogas digesters and their auxiliary facilities for gas collection and gas use (PVC pipe, pressure meter, desulphurization equipment, biogas oven, biogas light etc.) for individual household during Stage I between Jan. 2009 and Dec.2009 in Huaiyang County and Shenqiu County, Zhoukou City, Henan Province. For the	Huaiyang County and Shenqiu County, Zhoukou City, Henan Province	Jan.2009



		consideration of the additionality, the main users of the Programme are rural households with medium and lower income.		
18	The 18 <sup>th</sup> CPA of Henan Province Zhoukou City Rural Household Biogas Development Programme (2007-2010)	The CPA will set up 15123 biogas digesters and their auxiliary facilities for gas collection and gas use (PVC pipe, pressure meter, desulphurization equipment, biogas oven, biogas light etc.) for individual household during Stage I between Jan. 2009 and Dec.2009 in Dancheng County and Luyi County, Zhoukou City, Henan Province. For the consideration of the additionality, the main users of the Programme are rural households with medium and lower income.	Dancheng County and Luyi County, Zhoukou City, Henan Province	Jan.2009
19	The 19 <sup>th</sup> CPA of Henan Province Zhoukou City Rural Household	The CPA will set up 15843 biogas digesters and their auxiliary facilities for gas collection and gas use (PVC pipe, pressure meter, desulphurization equipment,	Xiangcheng City, Xihuan County, Shangshui County and Chuanhui District, Zhoukou City, Henan Province	Jan.2009



	Biogas Development Programme (2007-2010)	biogas oven, biogas light etc.) for individual household during Stage I between Jan. 2009 and Dec.2009 in Xiangcheng City, Xihuan County, Shangshui County and Chuanhui District, Zhoukou City, Henan Province. For the consideration of the additionality, the main users of the Programme are rural households with medium and lower income.		
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**Annex 4**

**MONITORING INFORMATION**

The detailed monitoring plan is described in E.7.2, there is no other additional information.

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