



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

CONTENTS

- A. General description of small-scale programme of activities (SSC-PoA)
- B. Duration of the small-scale programme of activities
- C. Environmental Analysis
- D. Stakeholder comments
- E. Application of a baseline and monitoring methodology to a typical small-scale CDM Programme Activity (SSC-CPA)

Annexes

- Annex 1: Contact information on Coordinating/managing entity and participants of SSC-PoA
- Annex 2: Information regarding public funding
- Annex 3: Baseline information
- Annex 4: Monitoring plan

NOTE:

- (i) This form is for the submission of a CDM PoA whose CPAs apply a small scale approved methodology.
- (ii) At the time of requesting registration this form must be accompanied by a CDM-SSC-CPA-DD form that has been specified for the proposed PoA, as well as by one completed CDM-SSC-CPA-DD (using a real case).



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

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

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Title: Biogas Development Programme at household/ small farm level in Gansu Province

Version: 03

Date: 19/09/2012

Version No.	Date	Description and reason of revision
01	30/08/2011	GSC version
02	11/04/2012	The first revised version based on CAR&CL.
03	19/09/2012	The second revised version based on CAR&CL.

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

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1. General operating and implementing framework of PoA

Biogas Development Programme at household/ small farm level in Gansu Province (hereafter referred to as the PoA) is located in Gansu Province, P. R. China, which is coordinated by Lanzhou Hualong Poultry Breeding Co. (hereafter referred to as the CME). The Programme aims to reduce a large amount of greenhouse gases (GHG) by setting up biogas digesters and their auxiliary facilities for gas collection and gas utilization. The targeted group of the PoA covers individual households/small farms located in Gansu Province, P. R. China.

In the biogas digester, the main feed organic waste, i.e. livestock waste, will be decomposed into biogas for cooking or cooking and lighting¹, and biogas residues for bio-fertilizer.

Prior to the implementation of the Programme, the livestock waste utilized in the PoA would be left to decay anaerobically emitting methane to the atmosphere and the households would use fossil fuel as fuel for cooking, this is also the baseline scenario.

2. Policy measure or stated goal of the PoA

Stated goal of the proposed PoA is to support the building of biogas digester system and biogas recovery system at household/small farm level in Gansu Province, and avoid the methane emitted to atmosphere and fossil fuels utilization for cooking in the baseline scenario, so realize the reduction of greenhouse gases. The approach adopted to achieve this is two aspects:

- 1) Financial support: By offering an additional regular income generated by carbon credits, the PoA will support the households/small farmers in maintenance and repairing the biogas digester system, in

¹ For the sake of conservativeness the emission reductions for electricity substitution will not be accounted in the baseline of the PoA.⁴ That is the size of each unit under 750 kW installed capacity or under 3000 MWh of energy savings per year or 3000 tonnes of emission reductions per year.



order to achieve the stable operation for a long period.

- 2) Technical support: The CME, be cooperated with the Gansu Rural Energy Office and the affiliated local rural energy offices, will provide further technical service during start up and operation of the biogas digester system. By this means the targeted households/small farmers will actually receive long-term benefits.

Expected outcome of the proposed PoA is a large distribution of digesters on the one side and a more reliable operation of the installed systems on the other side. Both effects will contribute to the success of the PoA and increase the achieved emission reductions. Therefore, the PoA clearly facilitates additional and sustainable development and will improve the living conditions of under privileged households/small farmers.

The installed biogas units contribute to the reduction of greenhouse gases in two ways: 1) a manure management system that reduces methane emitted to the atmosphere; 2) the produced biogas replaces conventional fossil fuels for cooking.

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

Social benefits:

- Provide employment opportunities during the Programme operation.
- Avoid epidemic disease spread among people and animal because of innocuous treatment of dung.

Environmental benefits:

- Improve the dung treatment system, and avoid smoke in kitchens, which make the living environment in rural areas improved;
- Reduce GHG and pollutant emissions because of using clean energy, which is in favor of environment protection.

Economic benefits:

- Reduce fuel and fertilizer expenses;
- Change the traditional agriculture mode, and increase farmers' income;

Technological benefits:

- Adopt more advanced anaerobic treatment technique to increase the quantity of recovered biogas;
- Improve the technology of biogas digester maintenance and management, as well as biogas application.



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

This PoA is a scheme developed by Lanzhou Hualong Poultry Breeding Co. (the CME) to promote the building of biogas digester system and biogas recovery system at household/small farm level in Gansu Province. At present, there is no mandatory law to enforce households/small farms to set up biogas digester and biogas recovery system in China. Therefore, this PoA is not implementing any mandatory policy or regulation of China. Households/small farms also participate in this PoA on a voluntary basis.

The Confirmation that proposed PoA is a voluntary action by the CME, which was based on the Board Decision of CME dated 20/07/2011.

The annual average ERs of the 1st real case CPA over the first crediting period is 8,082 tCO₂/year.

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

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The following information shall be included here:

1. Coordinating or managing entity of the PoA as the entity which communicates with the Board.
The CME of the PoA is Lanzhou Hualong Poultry Breeding Co.
2. Project participants being registered in relation to the PoA. Project participants may or may not be involved in one of the CPAs related to the PoA.

Name of Party involved(*) (hose indicate 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)
People's Republic of China (Host Country)	Lanzhou Hualong Poultry Breeding Co.	No
Untied kingdom of great Britain and Northern Ireland	A&T Carbon Asset Co., Limited	No

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

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A.4.1. Location of the programme of activities:

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A.4.1.1. Host Party(ies):

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The People's Republic of China

A.4.1.2. Physical/ Geographical boundary:

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The programme is implemented in Gansu Province, so the entire Gansu Province administrative area delineates the boundary of the Programme. The geographic coordinate is from 92.2167 °E to 108.7667 °E, 32.5167 ° N to 42.9500 ° N. Physical location was labelled in Figure 1:

Gansu Province

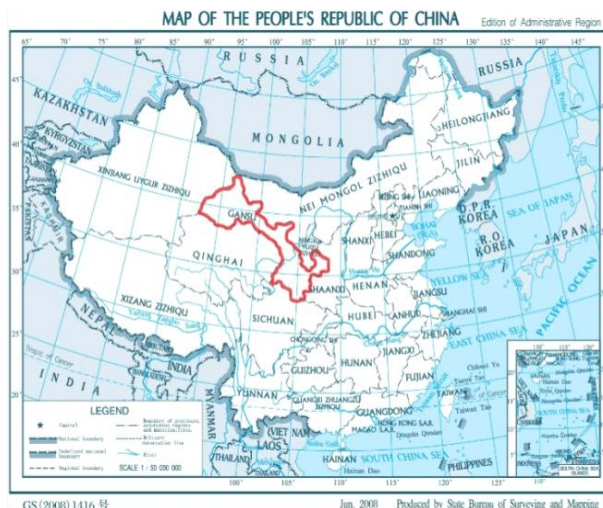


Figure 1. Location of the PoA

A.4.2. Description of a typical small-scale CDM programme activity (CPA):

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A.4.2.1. Technology or measures to be employed by the SSC-CPA:

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All the CPAs under the Programme adopt biogas, a renewable energy resource, avoiding the methane emitted to the atmosphere and displacing fossil fuel for households use, and this technology includes three systems, which are fermentation system, collection system and utilization system.

The technical flow and technical parameter of the three systems are described in details as follows:

1. Fermentation System

Biogas is a mixture that is mainly comprised of methane and carbon dioxide. Biogas is generated by fermentation of cellulose rich organic matter under anaerobic conditions. Only under given conditions the produced gases are rich in methane. Thus, it is necessary to control the fermentation conditions strictly.

There are two phases in the processes. Phase I is the combined hydrolysis and acid formation stages in which the organic wastes are converted mainly into acetate, and phase II is the biogas producing phase in which methane and carbon dioxide are formed. The better the two stages merge with each other, the shorter the digestion process is. Pressure is controlled to ensure dome not to burst, by matching generation to requirement. A valve ensures that no gas flows to the stove when the stove is not lit.

2. Collection system



Collection system includes the process of biogas collection and residue collection.

The biogas collection system is composed of gas tube, pipe connector, switch, pressure meter, and desulfurizer. The chosen methane recovery and combustion system is the time tested model biogas technology which is well-known in China.

The residue collection system is composed of discharging tube and residue absorption-transfer trolley.

3. Utilization system

After the dehydrating and desulfurizing treatment, the biogas will be used for cooking or cooking and lighting. The residue will be stored at the fertilizer-storage room and used for bio-fertilizer. The treated slurry and residue will be applied to land as fertilizer.

Without the PoA, the livestock waste utilized in the PoA would be left to decay anaerobically emitting methane to the atmosphere and the householders would use fossil fuel as fuel for cooking, which is also the baseline scenario.

The equipments involved mainly include the biogas digester, cooking stoves and lightings. The technical description of biogas digesters, cooking stoves and lightings was summarized as follows:

1) Biogas digesters

The design of biogas digesters will be based on national standards established by the Chinese government (Chinese agricultural Industry standard: NY/T 1639-2008). The construction of biogas digesters is certified by technicians accredited by the Ministry of Agriculture.

The proposed PoA is to install appropriate biogas digesters (fixed dome digester or tubular polyethylene digester) instead of conventional manure pits having utilized. Biogas digesters are to be installed following the principle of “one digester with three renovations” including kitchen, toilet and swine pen renovations. The size of biogas digesters depends on households’ population and number of livestock such as swine, cattle and poultry, and typically 8m³, 10m³, 15m³ are dominated.

A typical biogas digesters system consists of function parts such as inlet, gas tube, movable cover, hydraulic chamber, inlet pipe and fermentation chamber. The structure of biogas digester applied in the PoA is shown in Figure 2.

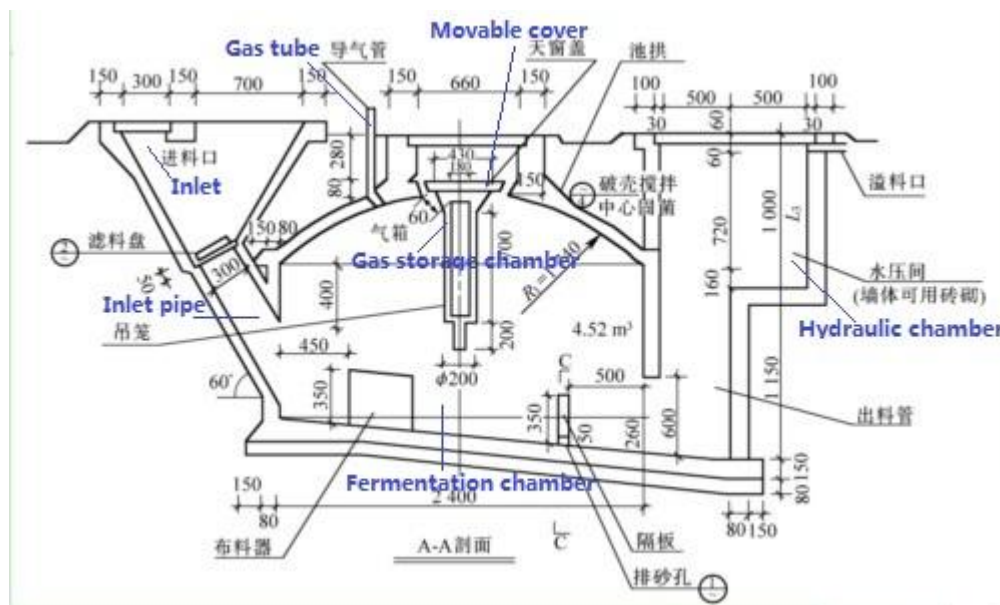


Figure 2. The typical Structure of Biogas Digester

2) Biogas utilization: cooking stoves and lightings.

The biogas generated by the biogas digesters will be fed into cooking stoves or cooking stoves and lightings that can be used for cooking or cooking and lighting.

The design of cooking stoves and lightings will be based on national standards established by the Chinese government.

Equipments	National Standards
Cooking stoves	National Standard of China (GB/T 3606-2001) and its updated version.
Lightings	Agricultural Industry Standard of China (NY/T 344-1998) and its updated version.

All main equipments in the Programme will be domestically produced. The PoA does not require any technology transfer from Annex-I countries to the host country.



**SMALL-SCALE CDM PROGRAMME OF ACTIVITIES DESIGN DOCUMENT FORM
(CDM SSC-PoA-DD) - Version 01**



CDM – Executive Board

page 8

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

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The criteria for inclusion of a CPA in the PoA are as below:

Category	Eligibility criteria for inclusion of a <u>SSC-CPA</u> in the <u>PoA</u>	The documents for the CME to check whether the features of potential CPAs meet the eligibility criteria before inclusion in the PoA
Geographical boundary	1. All the project activities under the CPA should be located in the boundary of the PoA, i.e. within Gansu Province.	--The verification statement on all households/small farms of the real case CPA issued by Gansu Rural Energy Office, including the householder's name and households' address.
To avoid double counting	2. First, the implementers of the project activities under the CPA should confirm in a written statement to the CME that: a) The project activities under the CPA are not and will not be part of another CDM project or programme activity; and b) The implementer of the project activities under the CPA is aware and agrees with the inclusion of the CPA to the proposed PoA. Second, all the project activities under the CPA should be registered and recorded in the database controlled by the CME. The CME should make sure that each project activity (household/small farm) has its unique registration information to avoid to be double counted within the PoA.	--The confirmation by households/small farms; --The database established and controlled by the CME. --The verification statement on all households/small farms of the real case CPA issued by Gansu Rural Energy Office, including the householder's name and household's address.
The specifications of technology/measure	3. Under the CPA, project activities will install biogas digesters and their auxiliary facilities to treat manure and collect biogas which will be used in the cooking stove and the lighting (the lighting is not installed for all CPAs).	--Project approval by the Gansu Development and Reform Commission and the Gansu Rural Energy Office. --Agricultural Industry standard of China for biogas digester(NY/T 1639-2008) --National Standard of China (GB/T 3606-2001) for biogas stove. --Agricultural Industry Standard of China (NY/T 344-1998) for biogas lamp.

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**SMALL-SCALE CDM PROGRAMME OF ACTIVITIES DESIGN DOCUMENT FORM
(CDM SSC-PoA-DD) - Version 01**



CDM – Executive Board

page 9

The start date of the CPA	4. The start date of the CPA, which is the earliest date among equipment purchase date, and construction start date, is later than the PoA GSP start date of 14/09/2011.	--Equipment purchase contract --Construction contract
The applicability and other requirements of applied methodologies	5. For each CPA under the PoA, combination of AMS-III.R and AMS-I.I is applied, other than sole AMS-III.R or AMS-I.I is applied.	-- CPA-DD
	6. In the baseline scenario, animal manure and wastes are stored under anaerobic conditions in pit storage or uncovered anaerobic lagoon. 7. In the baseline scenario, no biogas was recovered or destroyed; all biogas was released into air freely. 8. Prior to the implementation of the CPA, the households use coal (including coal briquette) as main sources of energy for cooking.	-- CDM file card 1 of Household information prior to implementation of the CPA
	9. After the proposed project, all sludge generated by biogas system will be treated under aerobic conditions; 10. After the proposed project, all biogas generated will be utilized.	-- CDM file card 2 of Household information after implementation of the CPA
	11. The total thermal generation capacity shall not exceed 45MW _{th} . 12. The emission reductions from type III component of the CPA is no more than 60 ktCO ₂ e per year. 13. The thermal installed capacity of each unit is no larger than 150 kW _{th} . 14. The emission reductions from methane recovery of each unit are no more than 5 tCO ₂ e per year.	-- Project approval by the Gansu Development and Reform Commission and the Gansu Rural Energy Office. -- households list issued by Gansu Rural Energy Office --Calculation and record in the database by the CME --Name brand of biogas stove or equipment purchasing contract
Target group	15. Under the CPA, project implementers are rural households or small farms. 16. The end users of all CPAs under the proposed PoA are rural households.	--Project approval by the Gansu Development and Reform Commission and the Gansu Rural Energy Office.
Funding from Annex I parties	17. The project activities under the CPAs are not sponsored by any funding from Annex I parties.	--Project approval by the Gansu Development and Reform Commission and the Gansu Rural Energy Office.

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**SMALL-SCALE CDM PROGRAMME OF ACTIVITIES DESIGN DOCUMENT FORM
(CDM SSC-PoA-DD) - Version 01**



CDM – Executive Board

page 10

		-- Statement by CME.
Sampling	18. Each CPA will be monitored and verified. The sampling approach is only used to estimate the value of the monitoring parameter, and the sampling approach will be applied to all the CPAs included in the PoA.	-- Sampling plan included in the CPA, which is completed in accordance with ‘ <i>Standard for sampling and surveys for CDM project activities and programme of activities (version 02.0, EB 65 Annex 2)</i> ’
Other	19. The CPA crediting period does not exceed 31/12/2040 (the PoA end date).	--CPA-DD

Items no need to be checked for inclusion of a CPA in the proposed PoA:

<p>Additionality</p>	<p>According to “Guidelines on the demonstration of additionality of small-scale project activities”(Version 09), 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 size⁴ of each unit is no larger than 5% of the small-scale CDM thresholds⁴ are defined as automatically additional.</p> <p>For each CPA, as per eligibility criteria (16) for inclusion of a SSC-CPA in the PoA described in the Section A.4.2.2, the end users are households as option (c) above. Besides, as per eligibility criteria (11) for inclusion of a SSC-CPA in the PoA described in the Section A.4.2.2, the total installed capacity of each CPA is smaller than the small-scale CDM thresholds for type I component of 45MW_{th}. Also as per eligibility criteria (12) for inclusion of a SSC-CPA in the PoA described in the Section A.4.2.2, the emission reductions from type III components of the CPA is no more than small-scale CDM thresholds for type III component of 60 ktCO₂e/yr. Furthermore, according to eligibility criteria (13) and (14), the thermal installed capacity of each unit is no larger than 150 kW_{th} and the emission reductions from methane recovery of</p>	<p>Detailed is demonstrated for a typical CPA in section E.5.1 and E.5.2.</p>
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⁴ That is the size of each unit under 750 kW installed capacity or under 3000 MWh of energy savings per year or 3000 tonnes of emission reductions per year. This template shall not be altered. It shall be completed without modifying/adding headings or logo, format or font.



**SMALL-SCALE CDM PROGRAMME OF ACTIVITIES DESIGN DOCUMENT FORM
(CDM SSC-PoA-DD) - Version 01**



CDM – Executive Board

page 11

	each unit are no more than 5 tCO ₂ e per year, which are both no larger than 5% of the small-scale CDM thresholds, i.e. 2250 kW _{th} and 3000 tCO ₂ e/yr. Therefore, No further check was needed.	
Debundling check	According to “Guidelines on assessment of de-bundling for SSC project activities” (Ver. 03), if each of the independent subsystems/measures (e.g., biogas digester, solar home system) included in the CPA of a PoA is no larger than 1% of the small-scale thresholds defined by the methodology applied, then that CPA of PoA is exempted from performing de-bundling check i.e., considering as not being a de-bundled component of a large scale activity. According to the Eligibility criteria (13) and (14), the CPA included in the PoA is not a de-bundled component of another CDM programme activity (CPA) or CDM project activity. Therefore, No further check was needed.	According to the Eligibility criteria (13) and (14): -- The thermal installed capacity of each unit is no larger than 150 kW _{th} . -- The emission reductions from methane recovery of each unit are no more than 5 tCO ₂ e per year.
Local stakeholder consultations	As the stakeholder consultation conducted as the PoA level and no further requirements needed, no eligibility criteria was needed.	The stakeholder consultation conducted as the PoA level.
Environmental impact analysis	As the environmental impact analysis conducted as the PoA level and no further requirements needed, no eligibility criteria was needed.	The environmental impact analysis conducted as the PoA level.



A management system is set up by the the CME and therefore ensure the competencies of the CME to check the features of potential CPAs and ensure that each CPA meets all requirements and eligibility criteria before inclusion in the registered PoA. For details on management system, please see Section A.4.4.1.

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):

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The following shall be demonstrated here:

(i) The proposed PoA is a voluntary coordinated action;

This PoA is a scheme developed by Lanzhou Hualong Poultry Breeding Co. (the CME) to promote the building of biogas digester system and biogas recovery system at household/small farm level in Gansu Province. At present, there is no mandatory law to enforce households/small farms to set up biogas digester and biogas recovery system in China. Therefore, this PoA is not implementing any mandatory policy or regulation of China. Households/small farms also participate in this PoA on a voluntary basis.

The Confirmation that proposed PoA is a voluntary action by the CME, which was based on the Board Decision of CME dated 20/07/2011.

(ii) If the PoA is implementing a voluntary coordinated action, it would not be implemented in the absence of the PoA;

According to paragraph 7 of EB 65 annex3, additionality shall be demonstrated by establishing that in the absence of CDM, none of the implemented CPAs would occur which mean that the additionality of the proposed PoA will be demonstrated on the CPA level.

According to “Guidelines on the demonstraton of additionality of small-scale project activities” (Version 09), 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 size¹ of each unit is no larger than 5% of the small-scale CDM thresholds⁵ are defined as automatically additional.

For each CPA, as per eligibility criteria (16) for inclusion of a SSC-CPA in the PoA described in the Section A.4.2.2, the end users are households as option (c) above. Besides, as per eligibility criteria (11) for inclusion of a SSC-CPA in the PoA described in the Section A.4.2.2, the total installed capacity of each CPA is smaller than the small-scale CDM thresholds for type I component of 45MW_{th}. Also as per eligibility criteria (12) for inclusion of a SSC-CPA in the PoA described in the Section A.4.2.2, the emission reductions from type III components of the CPA is no more than small-scale CDM thresholds for type III component of 60 ktCO₂e/yr. Furthermore, according to eligibility criteria (13) and (14), the thermal installed capacity of each unit is no larger than 150 kW_{th} and the emission reductions from methane recovery of each unit are no more than 5 tCO₂e per year, which are both no larger than 5% of the small-scale CDM thresholds, i.e. 2250 kW_{th} and 3000 tCO₂e/yr.

⁵ That is the size of each unit under 750 kW_{electricity} installed capacity or under 3000 MWh of energy savings per year or 3000 tonnes of emission reductions per year.



More detailed is demonstrated for a typical CPA in section E.5.1 and E.5.2.

(iii) If the PoA is implementing a mandatory policy/regulation, this would/is not enforced;

Not applicable.

(iv) If mandatory a policy/regulation is enforced, the PoA will lead to a greater level of enforcement of the existing mandatory policy/regulation.

Not applicable.

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

A.4.4.1. Operational and management plan:

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(i) A record keeping system for each CPA under the PoA;

The CME is in charge of coordinating all project participants of the proposed PoA, collecting necessary data and information from each CPA, and also communicating with DOE and CDM Executive Board.

All the project activities under the CPA are under the control of the CME. A comprehensive database including all activities in each CPA is set up. All the essential activity information mainly including the following variables is required:

- 1) Name and address of the households where biogas systems were installed under the CPA;
- 2) Unique biogas digester registration number which is the unique ID number of the head of the household;
- 3) Date of commissioning;
- 4) The records and information relative to the monitored parameters.

The CME will be responsible for the management of records and data associated with each CPA: The potential activity will be numbered uniquely and registered in the database only if it would pass the eligible criteria checking; The activity status and information will be recorded and updated every one month during the PoA crediting period; The database will be made available to relevant PPs and the DOE; All the paper and electronic documents obtained by the CME will be filed and registered in the library system during the PoA crediting period plus 2 years.

More detailed information regarding responsibilities, what records to keep, storage area of records and how to process performance documentation was elaborated in *the CPA Inclusion Manual* implemented by the CME.

(ii) A system/procedure to avoid double accounting e.g. to avoid the case of including a new CPA that has been already registered either as a CDM project activity or as a CPA of another PoA;

The implementing entity of a CPA is defined as the CME and the actual implementing entities of the project activities under the CPA are households/small farms.



- 1) To avoid the project activities under the CPA are not and will not be part of another CDM project or programme activity

First, in order to avoid double accounting and to ensure that those operating the CPA are aware of and have agreed that their activity is being subscribed to the PoA, the implementing entity of the project activities under the CPA, i.e. households/small farms, shall, in accordance with the eligibility criteria stipulated in section A.4.2.2, confirm with a written statement or enter into a respective contractual arrangement with the CME providing that:

- a) The project activities under the CPA are not and will not be part of another CDM project or programme activity; and
- b) The implementer of the project activities under the CPA is aware and agrees with the inclusion of the CPA to the proposed PoA.

- 2) To avoid the project activities under the CPA are double counted within the PoA.

All the project activities under the CPA should be registered and recorded in the database controlled by the CME. The CME should make sure that each project activity (household/small farms) has its unique registration information to avoid to be double counted within the PoA.

Moreover, as per the NDRC (National Development and Reform Commission, China DNA)'s notification on the requirements of the CDM application of rural household biogas project (Fai Gai Ban Qi Hou [2011] No.2202), Gansu Rural Energy Office is authorized by NDRC to represent all households located in the Gansu province and sign the CDM agreement with CME. So, the written verification about the double counting by the Gansu Rural Energy Office was also provided to DOE for further check.

(iii) the SSC-CPA included in the PoA is not a de-bundled component of another CDM programme activity (CPA) or CDM project activity.

According to "Guidelines on assessment of de-bundling for SSC project activities" (Ver. 03), if each of the independent subsystems/measures (e.g., biogas digester, solar home system) included in the CPA of a PoA is no larger than 1% of the small-scale thresholds defined by the methodology applied, then that CPA of PoA is exempted from performing de-bundling check i.e., considering as not being a de-bundled component of a large scale activity.

Determining the occurrence of debundling for multiple CDM projects involving independent subsystem/measures	Eligibility criteria	Applicability?
1) The total thermal installed capacity of each biogas digester is no larger than 1% of the installed capacity limitation of the methodology AMS-I.I of 45MW _{th} , i.e. 450kW _{th} .	According to the Eligibility criteria (13), The thermal installed capacity of each unit is no larger than 150 kW _{th} .	Y
2) Emission reductions from methane recovery of each unit under a CPA is less than 5	According to the Eligibility criteria (14), The emission	Y



tonnes of CO ₂ e, which is lower than 1% of 60ktCO ₂ e threshold defined by AMS-III.R. i.e. 600tCO ₂ e.	reductions from methane recovery of each unit are no more than 5 tCO ₂ e per year.	
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So according to the *table* above, it is considered that the SSC-CPA included in the PoA is not a de-bundled component of another CDM programme activity (CPA) or CDM project activity.

(iv) The provisions to ensure that those operating the CPA are aware of and have agreed that their activity is being subscribed to the PoA;

According to the eligibility criteria (2) described in Section A.4.2.2, the implementer of the project activities under the CPA is aware of and agrees that their activity is being subscribed to the PoA.

As per the paragraph 17 of EB65 Annex 3, the CME shall have the competencies to check the features of potential CPAs and ensure that each CPA meets all requirements and eligibility criteria before inclusion in the registered PoA. Therefore, the CME have developed and implemented a management system to ensure that each CPA meets all requirements and eligibility criteria listed above before inclusion in the registered PoA.

1. Roles and responsibilities of personnel involved in the process of inclusion of CPAs

In order to implement the inclusion of CPAs effectively and accurately, the CME establish a CDM Operational and Management Office and designate qualified staffs responsible for relevant matters. The structure of the operational and management system is shown in the following Figure 3.

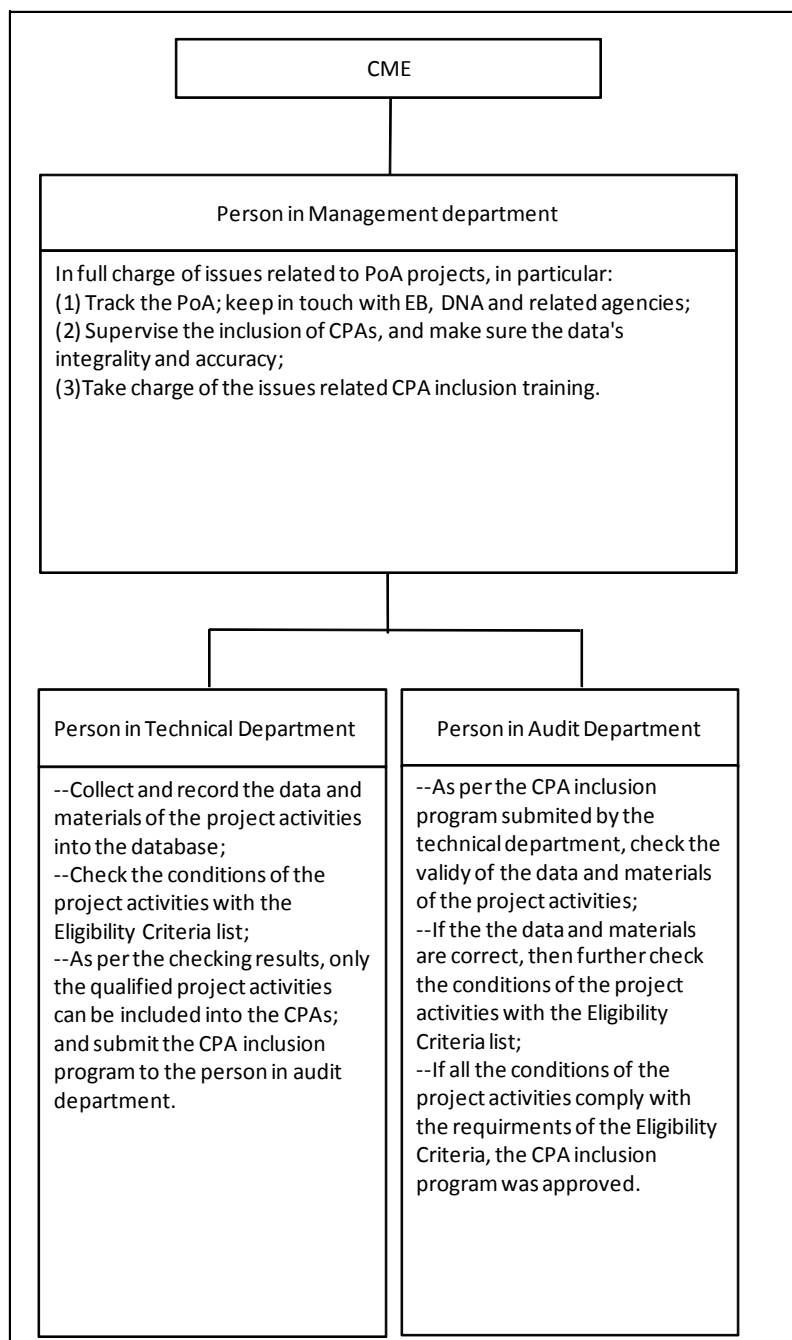


Figure 3. The structure of the operational and managementsystem

2. Records of arrangements for training and capacity development for personnel

The person will be assigned and trained to carry out the CPA inclusion work. The first training will be completed at the time of PoA registration or their start of the first CPA inclusion work. Every person should be trained before his start work. If the person is changed, the training will be re-conducted to the new comers. Furthermore, the training should be conducted in case of the rules changed.



The contents of the staff training mainly included P-CDM knowledge, PoA requirements and CPA inclusion procedure. The training record and competency evaluation is made available to relevant PPs and the DOE.

3. Procedures for technical review of inclusion of CPAs:

As the Figure 3 shown, the technical review of inclusion of CPAs will be conducted by the person in the audit department. In order to effectively implement and manage inclusion of CPAs, the procedures for technical review were divided to the following procedures:

Procedure	Management Responsibilities & Arrangements
Data and Material review	<ul style="list-style-type: none">- Completeness check of the data and materials;- Validity check of the data and materials;- Report the findings and feedback to the technical department.
Eligibility review	<ul style="list-style-type: none">- Implement the inclusion check according to the <i>eligibility criteria</i> in the section A.4.2.2;- Report the findings and feedback to the technical department.
CPA inclusion program review	<ul style="list-style-type: none">- check the CPA inclusion program with the requirements of the registered PoA;- Report the findings and feedback to the technical department.

4. Records and documentation control process for each CPA under the PoA:

The records and documentation related to PCDM for each CPA will be checked and maintained by the CME. All the paper and electronic documents obtained by the CME will be filed and registered in the library system during the PoA crediting period plus 2 years.

5. Measures for continuous improvements of the PoA management system:

The CME will improve the established management system periodically. In the case of a deviation of the process or if a process needs to be updated, any person can also request a revision of the procedure, which will be taken into account by the CME, who is responsible that the procedure is efficiently and up to date.

Also the periodic training, as stated in point 2 above, is a measure of continuous improvements. For the database, the activity status and information will be recorded and updated every one month by the CME during the PoA crediting period.

6. A procedure to avoid double counting

It is stated in the section A.4.4.1 above.



A.4.4.2. Monitoring plan:

>>

- (i) **Description of the proposed statistically sound sampling method/procedure to be used by DOEs for verification of the amount of reductions of anthropogenic emissions by sources or removals by sinks of greenhouse gases achieved by CPAs under the PoA.**

Not applicable as the coordinating/managing entity opts for a verification method that does not use sampling. Every CPA will be monitored and verified.

- (ii) **In case the coordinating/managing entity opts for a verification method that does not use sampling but verifies each CPA (whether in groups or not, with different or identical verification periods) a transparent system is to be defined and described that ensures that no double accounting occurs and that the status of verification can be determined anytime for each CPA;**

1. A transparent database is established which can ensure that no double accounting will occur.

As stated in the section A.4.4.1(i) and (ii), all the project activities under the CPA will be registered and recorded in the database controlled by the CME.

A comprehensive database includes the unique ID number and essential information of activities in each CPA, and also the monitoring data and status. From the database, the monitoring status of each CPA can be clearly identified ensuring that no double accounting will occur.

Moreover, as per the NDRC (National Development and Reform Commission, China DNA)'s notification on the requirements of the CDM application of rural household biogas project (Fai Gai Ban Qi Hou [2011] No.2202), Gansu Rural Energy Office is authorized by NDRC to represent all households located in the Gansu province and sign the CDM agreement with CME. So, the written confirmation about the double counting by the Gansu Rural Energy Office was also provided to DOE for further check.

2. The status of verification can be determined anytime for each CPA

For each CPA, all parameters included in section E.7.1 will be monitored according to the monitoring plan described in section E.7.2. The database is set up by the CME for recording the CPAs included in the PoA. All biogas digesters registered in one CPA will be uniquely defined and recorded, thus each CPA is uniquely identified, and therefore it can be ensured that no double accounting occurs and that the status of verification can be determined anytime for each CPA.

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

>>

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



SECTION B. Duration of the programme of activities (PoA)

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

>>

01/01/2013 or the date of registration of the PoA, whichever is later

B.2. Length of the programme 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 ☒
2. Environmental Analysis is done at SSC-CPA level ☐

According to the document Fa Gai Ban Qi Hou[2011] No. 2202 issued by National Development and Reform Commission and Ministry of Agriculture, the EIA of rural household biogas project should not be conducted and local province environmental bureau should issue the letter of exempting the EIA as the approval of EIA.

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

>>

According to the *Letter on the EIA exemption and approval for the PoA of Biogas Development Programme at household/small farm lever in Gansu Province (Gan Huan Bian Ping Zi Di [2011] No.133)*, issued on 30/09/2011 by Gansu Environment Protection Bureau, EIA is unnecessary for this kind of activities because use of biogas digester can improve the local environment but not bring any negative impact on local 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 programme of activities (PoA);

>>

Based on Section C.2., the PoA is in accordance with the national laws/regulations.



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 ☒
2. Local stakeholder consultation is done at SSC-CPA level ☐

The PoA is set up for developing all the eligible households/small farms level biogas projects in Gansu province as PCDM program; and the corresponding stakeholder consultation campaign is aimed to collect the comments and suggestions of local residents in the Gansu province on the EIA of this kind of project category, the PCDM development and so on.

The PoA implementation is supported by Gansu Rural Energy Office whose routine daily work is the management and supervision of the biogas/ household biogas construction projects in Gansu province. Thus, the local stakeholder comments invitation initiated and cooperated by Gansu Rural Energy Office, its affiliated local rural energy offices and the CME together could be delivered to the resident around the PoA boundary. Therefore, in order to collect the comments on the PCDM development from local residents in whole Gansu province which could be taken in further PoA planning and implementation, the CME choose to launch the local stakeholder consultation at the PoA level.

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

>>

To ensure the sustainability of the PoA, the CME of the PoA carried out a stakeholder consultation process around the Gansu Province during 03/2011 and 04/2011. The whole process is summarized as below:

1. Notification

The bulletin of the stakeholder consultation of the proposed PoA was finished by CME on 01/03/2011, which contained the brief introduction of the PoA, the social impact of these PoA, the introduction of CDM/PCDM, and the contact way for raising comments and getting the questionnaire. The bulletin was published to notify the stakeholder around Gansu Province. The questionnaires were delivered to local residents by Local Rural Energy Office and also can be got by the residents. Therefore, with the supporting of Gansu Rural Energy Office, the bulletin was uploaded to the Gansu Rural Government Website. And the bulletin and matched questionnaires were delivered to Local Rural Energy Office around Gansu Province on 02/03/2011. Each Local Rural Energy Office was asked to put on bulletin, hand out and collect questionnaires.

Moreover, Gansu Rural Energy Office invited delegates of all City and County level Rural Energy Offices to participate the meeting in Lanzhou City on 30/03/2011. The CME and CDM consultation company made a presentation mainly to introduce the PCDM and the working method for stakeholder survey.

2. Questionnaire campaign



During 03/2011 and 04/2011, the workers of Local Rural Energy Office and the CME went to countryside to distribute questionnaires, in the same time, some households got the questionnaires from Local Rural Energy Office by themselves. Totally 90 questionnaires were returned. The following table summarized the basic detail of the respondents from the questionnaires returned.

Basic information	Classification	Number of respondents
Gender	Male	85
	Female	5
Age	≤30	6
	31~45	36
	≥45	48
Occupation	Rural people	76
	workers	6
	officials	7
	student	1
Education	Primary level	68
	Middle level	10
	High level	12

The respondents are representative in terms of gender, age, occupation and education, so their attitude towards the impacts of the PoA can therefore be seen as a comprehensive reflection of the attitudes of the residents possibly affected by the project.

The questions in the questionnaires include:

- 1) The overall attitudes to the PoA;
- 2) Local economic impact of the PoA;
- 3) Local income and life quality impact of the PoA;
- 4) Local new job opportunity impact of the PoA;
- 5) Local ecological impact of the PoA;
- 6) The possible negative impact to the local area;
- 7) Any other comments and suggestions.

D.3. Summary of the comments received:

>>

Based on the returned questionnaires, the comments are summarized as below:

- 1) All respondents are in favor of the PoA, no respondent stated objection;
- 2) 81 respondents (90%) believe the projects under the PoA can bring positive impacts on local economic development; 9 respondents (10%) think the projects under the PoA have no impacts on local economic;
- 3) 85 respondents (94%) believe the projects under the PoA will help to improve income and life quality of local residents; 5 respondents (6%) think the projects under the PoA have no impacts



on income and life quality of local residents;

- 4) 85 respondents (94%) believe the projects under the PoA can provide new job opportunity; 5 respondents (6%) think the projects under the PoA have no impacts on job opportunity;
- 5) 87 respondents (97%) think the projects under the PoA will do not put negative impact on local ecological environment; 3 respondents (3%) think the projects under the PoA have no impacts on local ecological environment;
- 6) No respondent offers any suggestion regarding the negative impacts of the projects under the PoA;
- 7) No other comments or suggestions were received.

The returned questionnaires show that the PoA is supported by local residents and will bring various positive impacts to the local area.

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

>>

The survey shows that the PoA is supported by local residents and will take positive impact on various aspects, and no negative impacts will be caused by the projects under the PoA. Therefore the CME will fully consider the comments and suggestions given by the stakeholders during the implementation and promotion of the PoA, and will keep communication with the public during the process.



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:

>>

The CPAs included in the PoA will apply the following combination of methodologies:

AMS-III.R “Methane recovery in agricultural activities at household/small farm level” (Ver. 03) and

AMS-I.I “Biogas/biomass thermal applications for households/small users” (Ver. 04)

For more information, please refer to:

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

As per AMS-III.R (Ver 03), the CPAs included in the PoA will also refer to the methodologies:

AMS-III.D “Methane recovery in animal manure management systems” (Ver. 18.0)

Those methodologies also refer to:

“Guidelines on the demonstration of additionality of small-scale project activities” (Ver. 09.0)

According to the two methodologies, each of them is approved for use in a PoA.

As per the paragraph 11(a) of “General guidelines to SSC CDM methodologies” version 17, the combination of any one of type III methodologies where activities lead to generation of methane with any one of type I methodologies for utilising the methane generated for generation of renewable, was approved by EB. So the combination of AMS-III.R and AMS-I.I is eligible.

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

>>

Each CPA under the PoA meets the applicability criteria of Methodology AMS-III.R. and AMS-I.I.

The detailed analysis on the applicability criteria of Methodology AMS-III.R is shown as the following table:



**SMALL-SCALE CDM PROGRAMME OF ACTIVITIES DESIGN DOCUMENT FORM
(CDM SSC-PoA-DD) - UNFCCC**

CDM – Executive Board

page 25

AMS-III.R			
No.	Applicability Conditions as per AMS-III.R	Situation of a CPA under the PoA	Applicable?
1	<p>This project category comprises recovery and destruction of methane from manure and wastes from agricultural activities that would be decaying anaerobically emitting methane to the atmosphere in the absence of the project activity. Methane emissions are prevented by:</p> <p>(a) Installing methane recovery and combustion system to an existing source of methane emissions; or</p> <p>(b) Changing the management practice of a biogenic waste or raw material in order to achieve the controlled anaerobic digestion equipped with methane recovery and combustion system.</p>	<p>As per eligibility criteria (6) and (7) for inclusion of a SSC-CPA in the PoA described in the Section A.4.2.2, in absence of the proposed PoA animal manures are stored under anaerobic conditions in pit storage or uncovered anaerobic lagoon, and biogas was released into air.</p> <p>As the eligibility criteria (3) in the Section A.4.2.2 of PoA, each CPA under the PoA is to set up biogas digesters for animal manure treatment. Also, the generated biogas will be recovered and utilized for cooking.</p>	Y
2	<p>The category is limited to measures at individual households or small farms (e.g. installation of a domestic biogas digester). Methane recovery systems that achieve an annual emission reduction of less than or equal to five tonnes of CO₂e per system are included in this category. Systems with annual emission reduction higher than five tonnes of CO₂e are eligible under AMS-III.D “Methane recovery in animal manure management systems”.</p>	<p>As per eligibility criteria (11) for inclusion of a SSC-CPA in the PoA described in the Section A.4.2.2, each CPA under the PoA is to set up biogas digesters by individual households or small farms.</p> <p>As per eligibility criteria (14), ER achieved by each unit is less than 5 tonnes of CO₂e per year.</p>	Y
3	<p>This project category is only applicable in combination with AMS-I.C “Thermal energy production with or without electricity” and/or AMS-I.I “Biogas/biomass thermal applications for households/small users” and/or AMS-I.E “Switch from non-renewable biomass for thermal applications by the user”.</p>	<p>As per eligibility criteria (5), combination of AMS-III.R and AMS-I.I will be applied in each CPA under the PoA.</p>	Y
4	<p>The project activity shall satisfy the following conditions:</p> <p>(a) The sludge must be handled aerobically. In case of soil application of the final sludge the proper conditions and procedures that ensure that there are no methane emissions must be ensured;</p>	<p>As per eligibility criteria (9) and (10) for inclusion of a SSC-CPA in the PoA described in the Section A.4.2.2, sludge from biogas digester will be handled aerobically in each CPA under the PoA. All the methane collected by the recovery system is utilized for cooking or cooking and lighting.</p>	Y

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**SMALL-SCALE CDM PROGRAMME OF ACTIVITIES DESIGN DOCUMENT FORM
(CDM SSC-PoA-DD) - UNFCCC**

CDM – Executive Board

page 26

	(b) Measures shall be used (e.g. combusted or burnt in a biogas burner for cooking needs) to ensure that all the methane collected by the recovery system is destroyed.		
5	Aggregated annual emission reductions of all systems included shall be less than or equal to 60 kt CO ₂ e equivalent.	As per eligibility criteria (12) for inclusion of a SSC-CPA in the PoA described in the Section A.4.2.2, the emission reductions from type III components of the CPA is no more than 60 ktCO ₂ e per year. Therefore, each CPA under PoA can meet this criterion.	Y

Based on the analysis above, AMS-III.R is applicable to all CPAs under the PoA.

The detailed analysis on the applicability criteria of Methodology AMS-I.I is shown as the following table:

AMS-I.I			
No.	Applicability Conditions as per AMS-I.I	Situation of a CPA under the PoA	Applicable?
1	This category comprises activities for generation of renewable thermal energy using renewable biomass or biogas for use in residential, commercial, institutional applications (e.g. for supply to households, small farms or for use in built environment of institutions such as schools). 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 per eligibility criteria (3) for inclusion of a SSC-CPA in the PoA described in the Section A.4.2.2, each CPA under the PoA will utilize the recovered biogas that replaces coal as fuel for thermal generation. As per eligibility criteria (16) for inclusion of a SSC-CPA in the PoA described in the Section A.4.2.2, the end users of all CPAs under the proposed PoA are rural households. As per eligibility criteria (8) for inclusion of a SSC-CPA in the PoA described in the Section A.4.2.2, the households currently use coal (including coal briquette) as main sources of energy for cooking.	Y
2	The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW thermal.	As per eligibility criteria (11) for inclusion of a SSC-CPA in the PoA described in the Section A.4.2.2, the total thermal generation capacity of each CPA under the PoA does not exceed 45MW thermal. Therefore, each CPA under PoA can meet this criterion.	Y



SMALL-SCALE CDM PROGRAMME OF ACTIVITIES DESIGN DOCUMENT FORM
(CDM SSC-PoA-DD) - UNFCCC

CDM – Executive Board

page 27

3	Each unit (e.g. cook stove, heater) shall have a rated capacity equal to or less than 150 kW thermal. 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 eligibility criteria (13) for inclusion of a SSC-CPA in the PoA described in the Section A.4.2.2, the rated capacity of each biogas stove is less than 150kW thermal.	Y
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 biomass⁶ (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 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>	As per eligibility criteria (3), biogas digesters will be installed to treat manure and generate biogas, biomass residues processed are not involved in all CPA under the proposed PoA, therefore this criterion is not relevant.	N/A

According to the analysis above, AMS-I.I is applicable to all CPAs under the PoA.

⁶ Refer to EB 23, annex 18 for the definition of renewable biomass.



According to Para 11 in Annex 23 of EB58, the Board approved the combination of any one of the Type III methodologies where activities lead to generation of methane with any one of the Type I methodologies for utilising the methane generated for generation of renewable energy. These combinations can be applied in PoAs without each PoA specifically requesting the approval of the combination of the Board;

To sum up, combination of AMS-III.R and AMS-I.I is applicable to all the CPAs under the PoA.

E.3. Description of the sources and gases included in the SSC-CPA boundary

>>

As per Methodology AMS-III.R and ASM-I.I, the boundary of the CPA is the physical, geographical site of the methane recovery and combustion systems and the equipment producing thermal energy. For a CPA, the geographic sites of all individual biogas systems included in the CPA define the CPA boundary. A biogas system consists of a biogas digester and a cooking/combustion unit. The table 1 and figure 4 below visualizes the sources and gases included in the SSC-CPA boundary.

Table 1. The emission source and the category of GHG

	Source	Gas	Included?	Justification/Explanation
Baseline	Thermal generation	CO ₂	Included	The major source of emissions in the baseline
		CH ₄	Excluded	Excluded for simplification. This is conservative
		N ₂ O	Excluded	Excluded for simplification. This is conservative
	Treatment of manure and wastes from agricultural activities	CO ₂	Excluded	Excluded for simplification. This is conservative
		CH ₄	Included	The major source of emissions in the baseline
		N ₂ O	Excluded	Excluded for simplification. This is conservative
Project activity	Use of fossil fuels or electricity for the operation of biogas digester	CO ₂	Excluded	Neither fossil fuels nor electricity is consumed for operation of biogas digester. Therefore this source is excluded.
		CH ₄	Excluded	Neither fossil fuels nor electricity is consumed for operation of biogas digester. Therefore this source is excluded.
		N ₂ O	Excluded	Neither fossil fuels nor electricity is consumed for operation of biogas digester. Therefore this source is excluded.
	Fossil fuel consumption for thermal energy	CO ₂	Excluded	The emission reduction from fuel replacement is calculated based on the thermal energy generated using the measured quantity of biogas. According to AMS-I.I, this source is excluded.
		CH ₄	Excluded	The emission reduction from fuel replacement is calculated based on the thermal energy generated using the measured quantity of biogas. According to AMS-I.I, this source is excluded.
		N ₂ O	Excluded	The emission reduction from fuel replacement is calculated based on the thermal energy generated using the measured quantity of biogas. According to AMS-I.I, this source is excluded.



				this source is excluded.
	Physical leakage of biogas digester	CO ₂	Excluded	Excluded for simplification.
		CH ₄	Included	The major emission source.
		N ₂ O	Excluded	Excluded for simplification.

A general schematic view of the boundaries for each biogas unit included in a CPA under the PoA is shown in the figure 4 below.

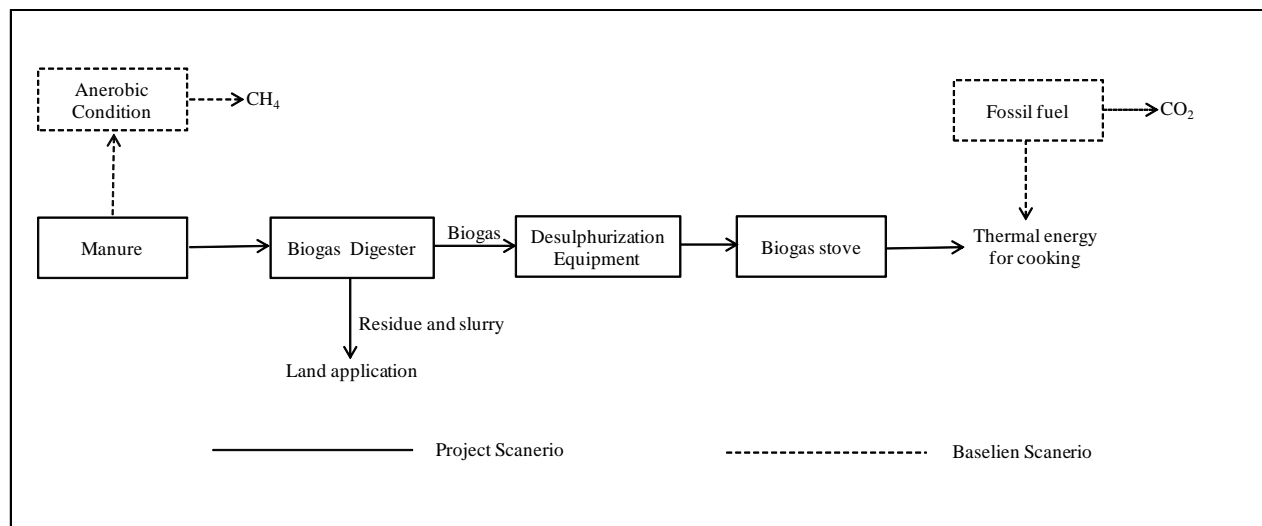


Figure 4. Project boundary

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

>>

The baseline emissions will be determined separately for both type of GHG emissions, each described in the related methodologies AMS-III.R and AMS-I.I.

Baseline of AMS-III.R:

As per AMS-III.R., for animal manure management the baseline scenario is the situation where, in the absence of the project activity, biomass and other organic matter are left to decay anaerobically within the project boundary and methane is emitted to the atmosphere. Baseline emissions (BE_y) are calculated ex ante using the amount of the waste or raw material that would decay anaerobically in the absence of the project activity, with the most recent IPCC tier 2 approach (please refer to the chapter 'Emissions from Livestock and Manure Management' under the volume 'Agriculture, Forestry and other Land use' of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories). Country/regional-specific values shall be used if available. The option in paragraph 9 (a) and relevant formulae shown in paragraph 10 of AMS-III.D "Methane recovery in animal manure management systems" shall be used to calculate baseline emissions.



For the PoA, the baseline for the manure management system is the storage of manure anaerobically in a pit storage or uncovered anaerobic lagoon. This type of manure management is common practice in the rural areas of Gansu Province and the continuation of the present situation. As per eligibility criteria (6) and (7) for inclusion of a SSC-CPA in the PoA described in the Section A.4.2.2, absence of the proposed PoA animal manures are stored under anaerobic conditions in pit storage or uncovered anaerobic lagoon, and biogas was released into air.

Baseline of AMS-I.I:

As per AMS-I.I, the baseline for thermal energy generation is the fuel consumption of the thermal application used or that would have been used in the absence of the project activity times an emission factor for the fossil fuel displaced.

As per eligibility criteria (8) for inclusion of a SSC-CPA in the PoA described in the Section A.4.2.2, in absence of the proposed PoA the households use coal (including coal briquette) as main sources of energy for cooking.

Conclusion

Therefore, the baseline scenario of the PoA is that, the manure and other organic matter are left to decay anaerobically in pit storage or uncovered anaerobic lagoon and the generated methane is emitted to the atmosphere, and the equivalent thermal energy is generated based on coal.

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:

>>

Additionality of a CPA will be demonstrated based on “Guidelines on the Demonstration of Additionality of Small-scale Project Activities” (Ver. 09.0) (hereafter referred to as the *Guideline*).

According to paragraph 2 in the Guideline, documentation of barriers is not required for the positive list of technologies and project activity types that are defined as automatically additional for project sizes up to and including the small-scale CDM thresholds (e.g. installed capacity up to 15 MW). The positive list comprises of:

(a) list of the following grid-connected and off-grid renewable electricity generation technologies that are automatically defined as additional, without further documentation of barriers, consists of the following grid-connected renewable electricity generation technologies of installed capacity up to 15 MW:

- (i) Solar technologies (photovoltaic and solar thermal electricity generation);*
- (ii) Off-shore wind technologies;*
- (iii) Marine technologies (wave, tidal);*
- (iv) Building-integrated wind turbines or household rooftop wind turbines of a size up to 100 kW;*



(b) The following off-grid electricity generation technologies where the individual units do not exceed the thresholds indicated in parentheses with the aggregate project installed capacity not exceeding the 15 MW threshold:

- (i) Micro/pico-hydro (with power plant size up to 100 kW);*
- (ii) Micro/pico-wind turbine (up to 100 kW);*
- (iii) PV-wind hybrid (up to 100 kW);*
- (iv) Geothermal (up to 200 kW);*
- (v) Biomass gasification/biogas (up to 100 kW);*

(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;

(d) Rural electrification project activities using renewable energy sources in countries with rural electrification rates less than 20%; the most recent available data on the electrification rates shall be used to demonstrate compliance with the 20 per cent threshold. In no case shall data be used if older than three years from the date of commencement of validation of the project activity.

For each CPA, as per eligibility criteria (16) for inclusion of a SSC-CPA in the PoA described in the Section A.4.2.2, the end users are households as option (c) above. Besides, as per eligibility criteria (11) for inclusion of a SSC-CPA in the PoA described in the Section A.4.2.2, the total installed capacity of each CPA is smaller than the small-scale CDM thresholds for type I component of 45MW_{th}. Also as per eligibility criteria (12) for inclusion of a SSC-CPA in the PoA described in the Section A.4.2.2, the emission reductions from type III components of the CPA is no more than small-scale CDM thresholds for type III component of 60 ktCO₂e/yr. Furthermore, according to eligibility criteria (13) and (14), the thermal installed capacity of each unit is no larger than 150 kW_{th} and the emission reductions from methane recovery of each unit are no more than 5 tCO₂e per year, which are both no larger than 5% of the small-scale CDM thresholds, i.e. 2250 kW_{th} and 3000 tCO₂e/yr.

Conclusion:

Therefore, according to paragraph 2 in the *Guideline*, each CPA under the PoA is automatically additional.

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

>>

As demonstrated in the section E.5.1, additionality of a CPA is assessed as per “Guidelines on the Demonstration of Additionality of Small-scale Project Activities”. As per eligibility criteria (11), (12), (13), (14) and (16) for inclusion of a SSC-CPA in the PoA described in the Section A.4.2.2, each CPA under the PoA is automatically additional.

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:

>>

AMS-III.R.: “*Methane recovery in agricultural activities at household/small farm level*”, and **AMS-I.I.:** “*Biogas/biomass thermal applications for households/small users*” will be combination applicable for a CPA under the PoA.

AMS-I.I.:

Two options are provided for calculation of emission reductions in AMS-I.I, which are as below:

Option 1: Based on avoided quantity of fossil fuel consumption

Option 2: Based on thermal energy generated

Option 2 is adopted in all CPAs under the PoA.

AMS-III.R.:

According to AMS-III.R., the option in paragraph 9(a) and relevant formulae shown in paragraph 10 of AMS-III.D “*Methane recovery in animal manure management systems*” shall be used to calculate baseline emissions.

According to AMS-III.R., project emissions consist of CO₂ emissions from use of fossil fuels or electricity for the operation of the system and the physical leakages of methane from the recovery system. Neither fossil fuels nor electricity is consumed for operation of biogas digester in the PoA, and therefore the physical leakage of methane from the recovery system is the only emission source.

As per AMS-III.R., project emissions due to physical leakage of biogas digester is estimated using one of the two options using the method indicated in paragraph 13 of AMS-III.D “*Methane recovery in animal manure management systems*”. **Option (a)** is adopted in the PoA.

As per AMS-III.R., the amount of waste or raw materials that would decay anaerobically in the absence of the project activity is determined by survey of a sample group of households/small farms with a 95% confidence interval and 10% margin of error. The survey should determine the baseline animal manure management practices applied. This small-scale methodology is only applicable to the portion of the manure, which would decay anaerobically in the absence of the project activity established by the survey.

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

>>

I. Calculate emission reductions from type III component

1. Calculate baseline emissions from type III component

According to AMS-III.R., the option in paragraph 9(a) and relevant formulae shown in paragraph 10 of AMS-III.D “*Methane recovery in animal manure management systems*” shall be used to calculate baseline emissions. The calculation is as below:

$$BE_{CH4,y} = GWP_{CH4} * D_{CH4} * UF_b * \sum_{j,LT} MCF_j * B_{0,LT} * N_{LT,y} * VS_{LT,y} * MS\%_{BI,j} \quad (I-1)$$



Where:

$BE_{CH_4,y}$	Baseline emissions due to biogas recovery in year y (tCO ₂ e)
GWP_{CH_4}	Global Warming Potential (GWP) of CH ₄ (21)
D_{CH_4}	CH ₄ density (0.00067 t/m ³ at room temperature (20 °C) and 1 atm pressure)
LT	Index for all types of livestock
j	Index for animal manure management system
MCF_j	Annual methane conversion factor (MCF) for the baseline animal manure management system j
$B_{0,LT}$	Maximum methane producing potential of the volatile solid generated for animal type LT (m ³ CH ₄ /kg dm)
$N_{LT,y}$	Annual average number of animals of type LT in year y (numbers)
$VS_{LT,y}$	Volatile solids for livestock LT entering the animal manure management system in year y (on a dry matter weight basis, kg dm/animal/year)
$MS\%_{Bl,j}$	Fraction of manure handled in baseline animal manure management system j
UF_b	Model correction factor to account for model uncertainties (0.94)

Determination of $B_{0,LT}$

According to AMS-III.D, The maximum methane-producing capacity of the manure (B_o) varies by species and diet. Since country specific B_o values are not available, default values from tables 10 A-4 to 10 A-9 of 2006 IPCC Guidelines for National Greenhouse Gas Inventories volume 4 Chapter 10 can be used.

For the proposed PoA, animal were purchased and growing in China, so default Asia values from 2006 IPCC Guidelines was chosen to calculation, it is reasonable.

Determination of $VS_{LT,y}$

Volatile solids (VS) are the organic material in livestock manure and consist of both biodegradable and non-biodegradable fractions. For the calculations the total VS excreted by each animal species is required. The preferred method to obtain VS is to use data from nationally published sources. These values shall be compared with IPCC default values and any significant differences shall be explained. If data from nationally published sources are not available, country-specific VS excretion rates can be estimated from feed intake levels, via the enhanced characterisation method (tier 2) described in section 10.2 in 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4 chapter 10. If country specific VS values are not available IPCC default values from 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4 chapter 10 table 10 A-4 to 10 A-9 can be used provided that the



project participants assess the suitability of those data to the specific situation of the treatment site particularly with reference to feed intake levels;

For the VS value, data from nationally published sources and country specific VS values are not available, so IPCC default values from tables 10 A-4 to 10 A-9 of 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4 chapter 10 are chosen to calculation. For the proposed PoA, animal were purchased and growing in China, so default Asia values was adopted, it is reasonable.

Determination of MCF_j

Methane Conversion Factors (MCF) values are determined for a specific manure management system and represent the degree to which B_o is achieved. Where available country-specific MCF values that reflect the specific management systems used in particular countries or regions shall be used. Alternatively, the IPCC default values provided in table 10.17 of 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4 Chapter 10 can be used. The site annual average temperature is taken from official data at the nearest meteorological station, or from data available from historical on site observations;

For the MCF value, country-specific MCF values are not available, so the IPCC default values provided in table 10.17 of 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4 Chapter 10 was used. The site annual average temperature is taken from official data at the nearest meteorological station, or from data available from historical on site observations.

For simplification, anaerobic lagoon is also considered as pit storage. Therefore, the value of pit storage was used for determination of MCF. This is conservative.

Determination of $N_{LT,y}$

According to AMS-III.D, the annual average number of animals ($N_{LT,y}$) are determined as follows:

$$N_{LT,y} = N_{da,y} * \left(\frac{N_{p,y}}{365} \right) \quad (I-2)$$

Where:

$N_{da,y}$ Number of days animal is alive in the farm in the year y (numbers)

$N_{p,y}$ Number of animals produced annually of type *LT* for the year y (numbers)

2. Calculate project emissions from type III component

According to AMS-III.R., project emissions consist of CO₂ emissions from use of fossil fuels or electricity for the operation of the system and the physical leakages of methane from the recovery system. Neither



fossil fuels nor electricity is consumed for operation of biogas digester in the PoA, and therefore the physical leakage of methane from the recovery system is the only emission source.

As per AMS-III.R., project emissions due to physical leakage of biogas digester is estimated using one of the two options using the method indicated in paragraph 13 of AMS-III.D “Methane recovery in animal manure management systems”. Option (a) is adopted in the PoA, which is as follows:

$$PE_{CH_4,y} = 0.10 * GWP_{CH_4} * D_{CH_4} * \sum_{i,LT} B_{0,LT} * N_{LT,y} * VS_{LT,y} * MS\%_{i,y} \quad (I-3)$$

Where:

$MS\%_{i,y}$ Fraction of manure handled in system i in year y

3. Calculate leakage emissions due to type III component

No methane recovery and combustion equipment is transferred to/from another activity. As per AMS-III.R., leakage is not considered. i.e.

$$LE_{CH_4,y} = 0$$

4. Calculate emission reductions from type III component

$$ER_{CH_4,y} = BE_{CH_4,y} - PE_{CH_4,y} - LE_{CH_4,y} \quad (I-4)$$

Where:

$ER_{CH_4,y}$ Emission reductions from type III component achieved by the project activity for year y (tCO₂e)

$BE_{CH_4,y}$ Baseline emissions from type III component for year y (tCO₂e)

$PE_{CH_4,y}$ Project emissions for year y (tCO₂e)

$LE_{CH_4,y}$ Leakage emissions due to type III component for year y (tCO₂e)

II. Calculate emission reductions from type I component

As per AMS-I.I., the emission reductions from type I component shall be determined using one of the options below.

Option 1: Based on avoided quantity of fossil fuel consumption (applicable only to biogas projects);

Option 2: Based on thermal energy generated.

Option 2 is adopted in the PoA, which is as follows:

$$ER_{Thermal,y} = \sum_k N_{k,0} * n_{k,y} * BS_{k,y} * EF * \eta_{PJ/BL} * NCV_{biomass} - LE_{Thermal,y} \quad (II-1)$$



Where:

- $N_{k,0}$ Number of biogas cook stove commissioned
- $n_{k,y}$ Proportion of $N_{k,0}$ that remain operating in year y (fraction)
- $BS_{k,y}$ The net quantity of biogas consumed by the biogas cook stove in year y (mass or volume units, dry basis)
- EF CO₂ emission factor (tCO₂/GJ)
- $\eta_{PJ/BL}$ Ratio of efficiencies of project equipment and baseline equipment (e.g. cook stove using coal) measured once prior to validation applying the same test procedure (e.g. lab test), as per a national or an international standard. Official data or scientific literature can be used for cross-check purposes
- $NCV_{biomass}$ Net calorific value of the biomass (GJ/unit mass or volume, dry basis). For biogas, use default value: 0.0215 GJ/m³ biogas (assuming NCV of the methane: 0.0359 GJ/m³, default methane content in biogas: 60%)

No energy generating equipment is transferred from outside the boundary to the PoA. Besides, biogas digesters are part of Type III CDM activity. According to AMS-I.I., leakage is neglected. Therefore, the formula above can be simplified as below:

$$ER_{Thermal,y} = \sum_k N_{k,0} * n_{k,y} * BS_{k,y} * EF * \eta_{PJ/BL} * NCV_{biomass} \quad (II-2)$$

$$EF = \sum_j x_j * EF_{FF,j} \quad (II-3)$$

Where:

x_j a fraction representing fuel type j used by the baseline thermal applications displaced by biogas

$EF_{FF,j}$ CO₂ emission factor of coal (tCO₂/GJ)

III. Calculate emission reductions achieved by a CPA

$$ER_y = ER_{CH_4,y} + ER_{Thermal,y} \quad (III-1)$$

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

Data / Parameter:	GWP_{CH_4}
Data unit:	tCO ₂ e /tCH ₄
Description:	Global Warming Potential (GWP) of CH ₄
Source of data used:	<i>2006 IPCC Guidelines for National Greenhouse Gas Inventories</i>
Value applied:	21
Justification of the choice of data or description of measurement methods	Default value



**SMALL-SCALE CDM PROGRAMME OF ACTIVITIES DESIGN DOCUMENT FORM
(CDM SSC-PoA-DD) - Version 01**



CDM – Executive Board

page 37

and procedures actually applied :	
Any comment:	21 for the first period, and Shall be updated according to any future COP/MOP decisions.

Data / Parameter:	D_{CH_4}
Data unit:	t/m ³
Description:	CH ₄ density
Source of data used:	AMS III.D.
Value applied:	0.00067
Justification of the choice of data or description of measurement methods and procedures actually applied :	Recommended by the methodology.
Any comment:	at room temperature (20 °C) and 1atm pressure

Data / Parameter:	UF_b
Data unit:	-
Description:	Model correction factor to account for model uncertainties
Source of data used:	AMS-III.D.
Value applied:	0.94
Justification of the choice of data or description of measurement methods and procedures actually applied :	AMS-III. D is credible data source.
Any comment:	-

Data / Parameter:	MCF_j
Data unit:	%
Description:	Annual methane conversion factor (MCF) for the baseline animal manure management system j
Source of data used:	IPCC default values provided in table 10.17 of 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4 Chapter 10.
Value applied:	Please see individual CPA-DD.
Justification of the choice of data or description of measurement methods and procedures actually applied :	For the MCF value, country-specific MCF values are not available, so the IPCC default values provided in table 10.17 of 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4 Chapter 10 was used. The site annual average temperature is taken from official data at the nearest meteorological station, or from data available from historical on site observations. For simplification, anaerobic lagoon is also considered as pit storage. Therefore, pit storage for determination of MCF. This is conservative.
Any comment:	-



Data / Parameter:	$B_{O,LT}$
Data unit:	$m^3/CH_4/kg\ dm$
Description:	Maximum methane producing potential of the volatile solid generated for animal type “LT”
Source of data used:	Default values from tables 10 A-4 to 10 A-9 of 2006 IPCC Guidelines for National Greenhouse Gas Inventories volume 4 Chapter 10.
Value applied:	Please see individual CPA-DD.
Justification of the choice of data or description of measurement methods and procedures actually applied :	According to AMS-III.D, The maximum methane-producing capacity of the manure (B_o) varies by species and diet. Since country specific B_o values are not available, default values from tables 10 A-4 to 10 A-9 of 2006 IPCC Guidelines for National Greenhouse Gas Inventories volume 4 Chapter 10 can be used. For the proposed PoA, animal were purchased and growing in China, so default Asia values from 2006 IPCC Guidelines was chosen to calculation, it is reasonable.
Any comment:	-

Data / Parameter:	$MS\%_{BL,i}$
Data unit:	%
Description:	Fraction of manure handled in baseline animal manure management system “j”
Source of data used:	The CPA Owner
Value applied:	100% or lower
Justification of the choice of data or description of measurement methods and procedures actually applied :	All manure generated on the households/small farms are handled in baseline animal manure management system.
Any comment:	-

Data / Parameter:	$MS\%_{i,y}$
Data unit:	%
Description:	Fraction of manure handled in system i in year y
Source of data used:	-
Value applied:	100%
Justification of the choice of data or description of measurement methods and procedures actually applied :	In the proposed PoA, the parameter was used to calculate the $PE_{CH_4,y}$, so the value was adopted as 100%, which is conservative.
Any comment:	-

Data / Parameter:	$VS_{LT,y}$
Data unit:	$kg\ dm/animal/day$
Description:	Volatile solids for livestock LT entering the animal manure management system in year y
Source of data used:	Default values from tables 10 A-4 to 10 A-9 of 2006 IPCC Guidelines for



	National Greenhouse Gas Inventories volume 4 Chapter 10.
Value applied:	Please see individual CPA-DD
Justification of the choice of data or description of measurement methods and procedures actually applied :	For the VS value, data from nationally published sources and country specific VS values are not available, so IPCC default values from tables 10 A-4 to 10 A-9 of 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4 chapter 10 are chosen to calculation. For the proposed PoA, animal were purchased and growing in China, so default Asia values was adopted, it is reasonable.
Any comment:	-

Data / Parameter:	$NCV_{biomass}$
Data unit:	GJ/m ³
Description:	Net calorific value of the biogas
Source of data used:	AMS-I.I
Value applied:	0.0215
Justification of the choice of data or description of measurement methods and procedures actually applied :	According to AMS-I.I., for biogas, use default value: 0.0215 GJ/m ³ biogas (assuming NCV of the methane: 0.0359 GJ/m ³ , default methane content in biogas: 60%)
Any comment:	-

Data / Parameter:	$\eta_{PJ/BL}$
Data unit:	-
Description:	Ratio of efficiencies of project equipment and baseline equipment
Source of data used:	lab test
Value applied:	$2.75 (\eta_{biogas\ cooking\ stove} \div \eta_{coal-based\ cooking\ stove} = 55\% \div 20\% = 2.75)$
Justification of the choice of data or description of measurement methods and procedures actually applied :	<p>1. $\eta_{biogas\ cooking\ stove}$:</p> <p>According to National Standard of P.R. China (GB) GB/T 3606-2001, the thermal efficiency of biogas cooking stove can not lower than 55%. Therefore, the thermal efficiency of the biogas cooking stove used in the PoA is adopted as 55%.</p> <p>2. $\eta_{coal-based\ cooking\ stove}$:</p> <p>According to the AMS-I.I, Ratio of efficiencies of project equipment and baseline equipment (e.g. cook stove using coal) measured once prior to validation applying the same test procedure (e.g. lab test), as per a national or an international standard. Official data or scientific literature can be used for cross-check purposes. The thermal efficiency of the coal-fired stove that would have been used in the absence of project activity is adopted as 20%. It was explained in the real case CPA.</p>
Any comment:	-

Data / Parameter:	x_j
Data unit:	-



Description:	a fraction representing fuel type j used by the baseline thermal applications displaced by biogas
Source of data used:	-
Value applied:	Please see individual CPA-DD
Justification of the choice of data or description of measurement methods and procedures actually applied :	-
Any comment:	-

Data / Parameter:	$EF_{FF,j}$
Data unit:	tCO ₂ /GJ
Description:	CO ₂ emission factor of coal (Brown coal briquettes)
Source of data used:	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2 Energy, Chapter 1, table 1.4
Value applied:	0.0873
Justification of the choice of data or description of measurement methods and procedures actually applied :	<p>The value of Brown coal briquettes is used in the proposed PoA, as:</p> <ol style="list-style-type: none">1) The type of coal commonly used in Gansu Province for rural households is Brown coal briquettes.2) The value of Brown coal briquettes is the lowest one among all type of coal stated in the IPCC.3) The lower limit of 95% confidence interval is adopted for more conservative. <p>Thus, the adopted value is reasonable and conservative.</p>
Any comment:	-



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

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

Data / Parameter:	$N_{k,0}$
Data unit:	-
Description:	Number of project activity (biogas digester and biogas cook stove) commissioned
Source of data to be used:	The CME
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Please see individual CPA-DD.
Description of measurement methods and procedures to be applied:	At the time of installation all project activity systems will be inspected and undergo acceptance testing (commissioning) for proper operation in compliance with specifications. The installation date of each system will be recorded. The biogas cook stove will be tested by Local Energy Office workers based on the national standard and procedure. The relevant information will be recorded in the CDM file and database.
QA/QC procedures to be applied:	-
Any comment:	-

Data / Parameter:	$n_{k,y}$
Data unit:	-
Description:	Proportion of $N_{k,0}$ that remain operating at year y (biogas digester and biogas cook stove)
Source of data to be used:	100% is used for ex-ante calculation of emission reductions, the actual value will be sourced from ex-post monitored.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	100%
Description of measurement methods and procedures to be applied:	Emission Reductions can only be applied to systems that are demonstrated to be operational and in compliance with manufacturer required maintenance procedures, at least once every two years (biennial) during the crediting period. After the inspection and acceptance testing at year of installation, the inspections can be done in years 3, 5, 7, etc. and the results of such inspections can be applied to crediting years 3 and 4, 5 and 6, 7 and 8, etc. Ongoing rental/lease payments or a recurring maintenance fee by users can be a substitute to actual site visits. A statistically valid sample of the residences was used to determine the percentage of systems operating, as per the relevant requirements for sampling in



	the Standard for sampling and surveys for CDM project activities and programme of activities. The project proponent chooses to inspect biennially, a 95% confidence interval and 10% margin of error requirement shall be achieved for the sampling parameter.
QA/QC procedures to be applied:	-
Any comment:	Remark: As required by AMS.III.R, recording biennially the number of systems operating using survey methods is needed, which is same with this monitoring parameter. Thus, this monitoring parameter means recording biennially the number of systems (both biogas digester and biogas cooking stove) operated.

Data / Parameter:	$BS_{k,y}$
Data unit:	m^3
Description:	The net quantity of biogas consumed by the biogas cook stove in year y
Source of data to be used:	The CME
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Please see individual CPA-DD
Description of measurement methods and procedures to be applied:	Gas meters are used to monitor accumulated biogas supplied to biogas cook stove. Measurement campaigns will be undertaken at selected sites. Five campaigns per digester type will be carried out in each year of the crediting period. Continuous measurement made for one month at a single digester is considered as a campaign. Monthly average value is annualised taking into account seasonal variation in gas production which is mainly a function of ambient temperature. Digester type was divided as per capacity (6 cubic meter or 8 cubic meter), type (fixed dome or floating dome) and average annual temperature.
QA/QC procedures to be applied:	Gas meters will undergo maintenance/calibration subject to appropriate industry standards.
Any comment:	-

Data / Parameter:	$N_{da,y}$
Data unit:	Number
Description:	Number of days animal is alive in the farm in the year y
Source of data to be used:	Ex-post survey
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Please see individual CPA-DD
Description of	This parameter will be measured by sampling survey with a 95% confidence



measurement methods and procedures to be applied:	interval and 10% margin of error.
QA/QC procedures to be applied:	-
Any comment:	To determine the annual average animal population ($N_{LT,y}$)

Data / Parameter:	$N_{p,y}$
Data unit:	Number
Description:	Number of animals produced annually of type LT for the year y
Source of data to be used:	Ex-post survey
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Please see individual CPA-DD
Description of measurement methods and procedures to be applied:	This parameter will be measured by sampling survey with a 95% confidence interval and 10% margin of error.
QA/QC procedures to be applied:	-
Any comment:	To determine the annual average animal population ($N_{LT,y}$)

Data / Parameter:	Soil application of the final sludge
Data unit:	-
Description:	The proper soil application of the final sludge as fertilizer for vegetable and crops under aerobic condition.
Source of data to be used:	Sampling basis
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Not applicable
Description of measurement methods and procedures to be applied:	This parameter will be measured by sampling survey with a 95% confidence interval and 10% margin of error.
QA/QC procedures to be applied:	-
Any comment:	-

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

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1. Monitoring parameters

First, Each CPA will be monitored and verified.

Second, for project activities under the CPA, the monitoring parameters were shown in the section E.7.1. The CME will conduct the monitoring process as per AMS-III.R and AMS-I.I.

Of which, $BS_{k,y}$ is monitored through Gas meter installed at selected sites as per AMS-I.I at least five campaigns per digester type will be carried out in each year of the crediting period. Continuous measurement made for one month at a single digester is considered as a campaign. Monthly average value is annualised taking into account seasonal variation in gas production which is mainly a function of ambient temperature; Digester type was divided as per capacity (6 cubic meter or 8 cubic meter) and type (fixed dome or floating dome)

The other monitoring parameters will be monitored by sampling survey method.

2. Sampling plan

The objective of the sampling effort is to estimate values of the parameters that were listed and required to be monitored through sampling method. For the proposed PoA, the following parameters are shown as below:

- $n_{k,y}$, Proportion of $N_{k,0}$ that remain operating at year y ; (Recording biennially the number of systems operating using survey methods)
- $N_{LT,y}$, The annual average animal population (this will be determined by $N_{da,y}$ and $N_{p,y}$);
- Soil application of the final sludge;

$N_{LT,y}$ is considered as one parameter in the sampling plan: $N_{LT,y}$ is determined by $N_{da,y}$ multiple $N_{p,y}/365$. Therefore the sampling process and target households for $N_{da,y}$ and $N_{p,y}$ are required to be identical.

Regarding the sampling method, requirements in the “Standard for sampling and surveys for CDM project activities and programme of activities” will be followed. A 95% confidence interval and 10% margin of error requirement will be achieved for the sampling parameter.

Target population

The target population of this sampling plan is the households included in CPAs under the PoA. The households to be sampled will be drawn from the list of individual ID numbers contained in the PoA database.

Sampling method

The CME will draw a single sample for each defined sampling frame. The required number of households to be selected for sampling of each parameter will be determined by the CME according to the level of reliability required for that parameter.

As the population is relatively homogeneous with respect to the object of the sampling effort, simple random sampling method will be adopted within the whole PoA (i.e. covering a group of CPAs) in this



sampling design.

To ensure a random selection, random number generators shall be applied. Each household in the target population is uniquely identifiable by its individual ID number. Each household can thus be allocated a Sample Selection Number in each monitoring period. Applying the random number generators, the households can then be randomly chosen from the defined population up to the required sample size as calculated by the CME.

To determine the parameters, sampling will involve the following approaches:

$n_{k,y}$: visual inspection of biogas digesters and biogas cook stove installed in the sampled households to see if the biogas digester and biogas cook stove is operational and in compliance with manufacturer required maintenance procedures. (Yes/No)

$N_{LT,y}$: interview and visual inspection of the sampled households to determine $N_{da,y}$ and $N_{p,y}$, and then to get the annual average animal population (Mean Value), multiplied by total households.

Soil application of the final sludge: visual inspection of the final sludge from biogas digester to see if it is fully utilized in farmland under aerobic condition. (Yes/No)

Sample size

According to “Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities”, parameter values shall be estimated by sampling in accordance with the requirements in the applied methodology separately and independently for each of the CPAs included in a PoA except when a single sampling plan covering a group of CPAs is undertaken applying 95/10 confidence/precision for the sample size calculation.

This sampling will be conducted at PoA level, and 95/10 confidence/precision will therefore be applied for the sample size calculation.

For the parameters to be monitored using sampling method, two ($n_{k,y}$ and Soil application of the final sludge) are proportions/percentages and the other ($N_{LT,y}$) are mean values. In order to calculate the required sample size estimates for the proportions and the mean values are required. Furthermore, the standard deviation needs to be assumed in case of sampling for a mean value. For the first monitoring period, 1 is applied for value of V for sample size calculation. For the following monitoring periods, the estimates shall be adjusted taken the results of the previous monitoring period(s) into account.

According to “best practices examples focusing on sample size and reliability calculations” (Version 01.0) issued at EB 67 Meeting, for the two proportional parameters ($n_{k,y}$ and Soil application of the final sludge) the following equation is applied:

$$n \geq \frac{z^2 \times N \times V}{(N-1) \times precision^2 + z^2 \times V}$$

Where:

$$V = \frac{p \times (1-p)}{p^2}$$



n	=	Number of elements to be sampled
N	=	Total number of elements in the population
p	=	Proportion
z	=	Constant referring to the level of confidence (e.g. 1.645 for 90 % confidence and 1.96 for 95 % confidence).
<i>precision</i>	=	Required precision (e.g. 10% = 0.1)

For the other parameters ($N_{LT,y}$, to be determined by $N_{da,y}$ and $N_{p,y}$), the following equation is applied:

$$n \geq \frac{z^2 \times N \times V}{(N-1) \times \text{precision}^2 + z^2 \times V}$$

Where:

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

n	=	Number of elements to be sampled
N	=	Total number of elements in the population
mean	=	Average value of the parameter that is expected in the total population
SD	=	Standard deviation of the parameter that is expected in the total population
z	=	Constant referring to the level of confidence (e.g. 1.645 for 90 % confidence and 1.96 for 95 % confidence).
precision	=	Required precision (e.g. 10% = 0.1)

For the first monitoring period, V of each sampling parameter is set at 1 for sample size calculation. Thus, for each sampling parameter, the minimum sample size is as below:

$$n \geq \frac{1.96^2 \times N \times 1}{(N-1) \times 0.1^2 + 1.96^2 \times 1}$$

If result of the sampling cannot achieve the required precision (95/10), additional sample will be taken to achieve the required precision.

Sampling frame

The above mentioned parameters are sampled synchronously.



Parameter	Sampling frames
$n_{k,y}$	All households included in CPAs under the PoA.
$N_{LT,y}$ ($N_{da,y}$ and $N_{p,y}$)	All households included in CPAs under the PoA.
Soil application of the final sludge	All households included in CPAs under the PoA.

Field measurements

The following parameters will be measured as indicated below:

Parameter	Timing (indicative)	Frequency (required by AMS III.R. or AMS-I.I)	Methods to be applied	Comments
$n_{k,y}$	After the inspection and acceptance testing at year of biogas stoves installation, the inspections can be done in years 3, 5, 7, etc.	biennially	Visual inspection of biogas digesters installed in the sampled households to see if the biogas digester is operational and in compliance with manufacturer required maintenance procedures.	Sampling will be applied across all CPAs up to the PoA level.
$N_{LT,y}$ ($N_{da,y}$ and $N_{p,y}$)	First monitoring is likely to occur within 12 months after registration of the PoA	Not specified in AMS-III.R. It will be conducted based on CME's opinion.	Interview and visual inspection of the sampled households to determine $N_{da,y}$ and $N_{p,y}$, and then to get the annual average animal population (Mean Value), multiplied by total households.	Sampling will be applied across all CPAs up to the PoA level.
Soil application of the final sludge	First monitoring is likely to occur within 12 months after registration of the PoA	Not specified in AMS-III.R. It will be conducted based on CME's opinion.	Visual inspection of the final sludge from biogas digester to see if it is fully utilized in farmland under aerobic condition.	Sampling will be applied across all CPAs up to the PoA level.

3. Monitoring Structure

In order to implement the monitoring plan effectively, the specific person in charge of the Programme is designated by CME to make sure the implementation of monitoring plan and keep in touch with EB, DNA and other relevant parties. The monitoring structure is clearly shown in the following figure 5.

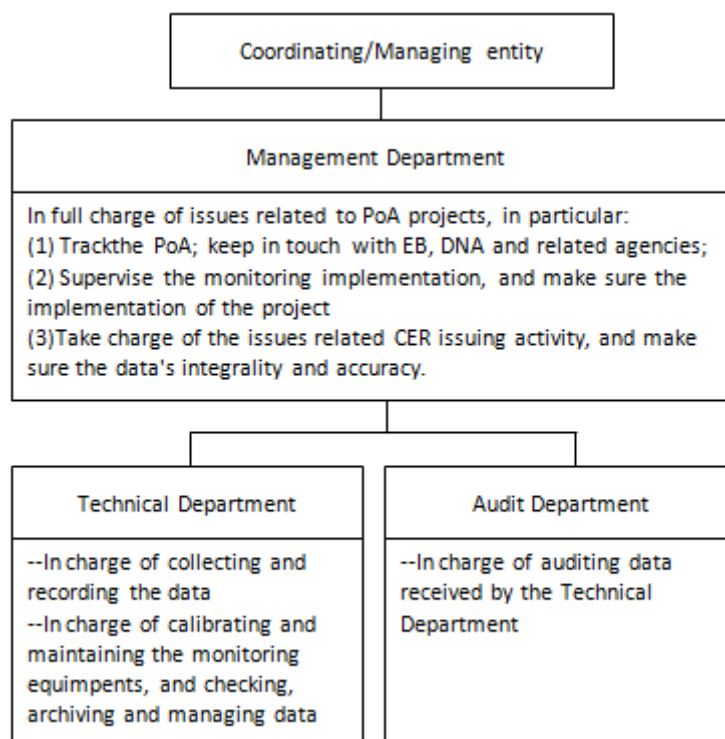


Figure 5. Monitoring Structure

4. Data Collection and Management

All data will be down-top collected as per monitoring structure above. The regular summary should be made and reported to management department by statistician periodic; all the data after internal validation should be saved up to 2 years after the end of the crediting period or the last issuance of CERs, whichever occurs later.

5. QA/QC

The PoA manager shall supervise the implementation of project monitoring plan, and check the monitor report. Once there is any unusual, the manager shall find the solution immediately. During emergency time, CER form the CPA will not be calculated.

All the procedures and/or methods adopted during the monitoring shall comply with the requirements of the applied methodologies and guidelines and/or any other referenced documents. All the data/parameters involved in the monitoring shall satisfy corresponding methods/procedures described in this PoA-DD. In case of any unexpected situation, urgent solution shall be given properly.

Following procedures will be used for Quality assurance / Quality control for sampling.

The potential for non-responses, refusals and related issues will be considered by the CME during sample selection. If the sampling results are insufficient to achieve the target reliability levels, the CME has a number of options to address this (see below).



- By selecting a larger than necessary sample size before commencing monitoring, the CME can help ensure that an adequate number of responses are obtained during sampling.
- The calculation of the sample size will be carried out using estimates for proportions, mean of values and standard deviations as the actual characteristics of the population/sampling frame are unknown. In the event that the sampling results do not fulfill the required level of confidence and precision, the CME can undertake additional samples.
- If the reliability is still not sufficient after additional samples, the sampling may be repeated with an increased sample size.

The data contained in each individual CPA Monitoring Record and collected during field measurements will be transferred to the CME.

6. Verification

The verification of emission reduction is carried out based on CPA principal's requirements. The person in charge of the CPA should provide DOE documents and evident related to monitoring.

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)

>>

The application of the baseline study and monitoring methodology of the project was completed on 30/08/2011 by:

Contact Information of the responsible person	Is organisation a Project Participant <i>Yes/No</i>
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Annex 1

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

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**SMALL-SCALE CDM PROGRAMME OF ACTIVITIES DESIGN DOCUMENT FORM
(CDM SSC-PoA-DD) - Version 01**



CDM – Executive Board

page 51

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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

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



Annex 3

BASELINE INFORMATION

There is no additional baseline information.



Annex 4

MONITORING INFORMATION

There is no additional monitoring information.

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