Verification and certification report form for CDM programme of activities

(version 02.0)

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION		
Title and UNFCCC reference number of the programme of activities (PoA)	Title of PoA: Sichuan Rural Poor-Household Biogas Development Programme UNFCCC reference number: 2898	
Version number(s) of the PoA-DD(s) to which this report applies	2	
Version number of the verification and certification report	2.1	
Completion date of the verification and certification report	31/12/2017	
Monitoring period number and duration of this morning period	Monitoring period number: 4th Duration of this morning period: 01/01/2015 – 31/12/2015	
Number and version number of the monitoring report to which this report applies	2.1	
Coordinating/managing entity (CME)	Chengdu Oasis Science & Technology Co., Ltd	
Host Parties	Host Parties of the PoA	Is this a host Party to a CPA covered in this report? (yes/no)
	People's Republic of China	Yes
Applied methodologies and standardized baselines	AMS-III.R - Methane recovery in agricultural activities at household/small farm level (version 02) (EB59, Annex 4). AMS-I.I.– Biogas/biomass thermal applications for households/small users (version 04) (EB68, Annex 25);	
Mandatory sectoral scopes linked to the applied methodologies	Scope 1: Energy industries (renewable - / non-renewable sources) Scope 15: Agriculture	
Conditional sectoral scopes linked to the applied methodologies, if applicable	N/A	
Estimated amount of GHG emission reductions or GHG removals for this monitoring period in the included CPAs covered in this report	864,019 tCO_2e	
Certified amount of GHG emission reductions or GHG removals for this monitoring period for the included CPAs	748,503 tCO_2e	

covered in this report	
Name and UNFCCC reference number of the DOE	DOE Name: BUREAU VERITAS (INDIA) PVT LTD UNFCCC reference number of the DOE: E-0009
Name, position and signature of the approver of the verification and certification report	 Rajendra Sharma Global Accreditation Manager

SECTION A. Executive summary

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UPM Umwelt-Projekt-Management GmbH (the client) has commissioned the Bureau Veritas Certification (BVC) to carry out the 4th verification of the PoA "Sichuan Rural Poor-Household Biogas Development Programme" (hereafter referred to as "the PoA") registered by the UNFCCC with reference No. 2898 with regard to the relevant requirements for CDM PoA, the PoA located in Sichuan Province, P.R. China.

There is a post-registration change conducted during the 4th monitoring period after its issuance request process, it is response to information incomplete raised by CDM Executive Board secretary. The PRC[1] has been approved by EB on 11/12/2017, thus this is 2nd submission of the 4th issuance request.

GHG data for the monitoring period and all changes due to the PRC were verified in detailed manner applying the set of requirements, audit practices and principles as required under the Validation and Verification Standard of the UNFCCC.

This report summarizes the findings of the verification of the Project, performed on the basis of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

Objective

The objective of CDM PoA verification is to conduct a thorough, independent assessment of the registered project activities.

In carrying out its verification work, the DOE shall ensure that the project activity complies with the requirements of paragraph 62 of the CDM modalities and procedures. In particular, this assessment shall:

(a) Ensure that the CPAs have been implemented and operated as per the revised CPA-DDs and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;

(b) Ensure that the monitoring report and other supporting documents provided are complete and verifiable and in accordance with applicable CDM requirements;

(c) Ensure that actual monitoring systems and procedures comply with the monitoring systems and procedures described in the updated monitoring plan and the approved methodologies;

(d) Ensure that the data is recorded and stored as per the monitoring methodologies.

Scope of the verification

The verification of this registered CPAs is based on both the previous registered and current revised PoA-DD, previous registered and current revised CPA-DDs, the monitoring report, emission reduction calculation spread sheet, supporting documents made available to the verifier and information collected through performing interviews and during the onsite assessment. Furthermore, publicly available information was considered as far as available and required.

The verification is not meant to provide any consulting service towards the PPs. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions

The verification is carried out on the basis of the following requirements, applicable for this project activity:

(a) Clean Development Mechanism Validation and Verification Standard (version 01.0) /35/;

(b) Clean development mechanism project standard, version 01.0 /36/;

[1] https://cdm.unfccc.int/PRCContainer/DB/prcp617554437/view

(c) Guidelines for completing the monitoring report form, version 02.0 /38/;

(d) Other relevant rules, including the host country legislation /20/,

(e) Clean development mechanism project cycle procedure, version 01.0 /37/;

(f) Monitoring plan as given in the registered or included CPA-DDs (/4/~/8/);

(g) Approved CDM Methodologies " AMSI.I.: Biogas/biomass thermal applications for households/small users (version 04.0)", "AMS-III.R– Methane recovery in agricultural activities at household/small farm level (version 02)" /34/;

(h) Bureau Veritas Certification (BVC) CDM procedures and forms /45/;

(i) all related evidence provided by CME;

(j) Approved revised PoA-DD, revised CPA-DDs (CPA001- CPA087) and the post-registration change validation assessment opinion /49/.

Verification Process

The verification consisted of the following three phases: i) desk review of the project design, the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion.

Brief Summary of PoA And Its Included CPAs

The PoA aims to reduce a large amount of greenhouse gases (GHG) by facilitating the installation of a large number of household biogas digesters. To achieve this target, the PoA generates additional incentives to install digesters to households that are supported by existing subsidy schemes. Target group of the PoA are low-income households located in Sichuan Province, China. The primarily targeted areas are thirteen cities (however, the PoA shall not be limited to these thirteen cities exclusively): Yibin, Neijiang, Suining, Ziyang, Zigong, Luzhou, Leshan, Meishan, Mianyang, Guang'An, Ganzi, Aba and Dazhou, all of which are located in Sichuan.

The 4th monitoring period of this PoA consists of the verification of the 87 CPAs, Sichuan Rural Poor-Household Biogas Development Programme, CPA Nb. SCHHBG-2010-001 to CPA Nb. SCHHBG-2014-087. The verifiers have reviewed the implementation of the monitoring plan (MP) as described in the approved revised PoA-DD, CPA-DDs and the Monitoring Report (version 2.1, dated 23-12-2017). The total number of the households for the 87 CPAs during this monitoring period is 395,435.

PoA title:	Sichuan Rural Poor-Household Biogas Development Programme
UNFCCC ref number:	2898
Registration Date:	11/04/2012
PoA renewal Period:	11/04/2012 – 10/04/2019
PoA Duration	10/12/2010 – 09/12/2038
Monitoring Period:	01/01/2015 – 31/12/2015
Coordinating/managing entity (CME):	Host Party: China -Chengdu Oasis Science & Technology Co., Ltd
Other Parties Involved	United Kingdom of Great Britain and Northern Ireland- UPM Umwelt-Projekt-Management GmbH
Methodologies used	AMSI.I.: Biogas/biomass thermal applications for households/small users (version 04.0) AMS-III.R - Methane recovery in agricultural activities at household/small farm level (version 02)
UNFCCC view page:	http://cdm.unfccc.int/ProgrammeOfActivities/poa_db/5BGM96VOK3ATN4JPR70XSWIQ8CZH2F/view

The detailed geographic coordinates of the 87 CPAs included in this monitoring period is listed as below:

CPA reference number	City(ies)	Longitude	Latitude
2898-0001	Yibin	103° 36' - 105° 20' E	27° 50' - 29° 16' N
2898-0002	Yibin	103° 36' - 105° 20' E	27° 50' - 29° 16' N
2898-0003	Yibin	103° 36' - 105° 20' E	27° 50' - 29° 16' N
2898-0004	Yibin	103° 36' - 105° 20' E	27° 50' - 29° 16' N
2898-0005	Yibin	103° 36' - 105° 20' E	27° 50' - 29° 16' N
2898-0006	Yibin	103° 36' - 105° 20' E	27° 50' - 29° 16' N
2898-0007	Yibin	103° 36' - 105° 20' E	27° 50' - 29° 16' N
2898-0008	Yibin	103° 36' - 105° 20' E	27° 50' - 29° 16' N
2898-0009	Yibin	103° 36' - 105° 20' E	27° 50' - 29° 16' N
2898-0010	Yibin	103° 36' - 105° 20' E	27° 50' - 29° 16' N
2898-0011	Mianyang	103° 45' - 105° 43' E	30° 42' - 33° 03' N
2898-0012	Mianyang	103° 45' - 105° 43' E	30° 42' - 33° 03' N
2898-0013	Mianyang	103° 45' - 105° 43' E	30° 42' - 33° 03' N
2898-0014	Mianyang	103° 45' - 105° 43' E	30° 42' - 33° 03' N
2898-0015	Mianyang	103° 45' - 105° 43' E	30° 42' - 33° 03' N
2898-0016	Mianyang	103° 45' - 105° 43' E	30° 42' - 33° 03' N
2898-0017	Mianyang	103° 45' - 105° 43' E	30° 42' - 33° 03' N
2898-0018	Mianyang	103° 45' - 105° 43' E	30° 42' - 33° 03' N
2898-0019	Mianyang	103° 45' - 105° 43' E	30° 42' - 33° 03' N
2898-0020	Mianyang	103° 45' - 105° 43' E	30° 42' - 33° 03' N
2898-0021	Mianyang	103° 45' - 105° 43' E	30° 42' - 33° 03' N
2898-0022	Mianyang	103° 45' - 105° 43' E	30° 42' - 33° 03' N
2898-0023	Mianyang	103° 45' - 105° 43' E	30° 42' - 33° 03' N
2898-0024	Mianyang	103° 45' - 105° 43' E	30° 42' - 33° 03' N
2898-0025	Mianyang	103° 45' - 105° 43' E	30° 42' - 33° 03' N
2898-0026	Mianyang	103° 45' - 105° 43' E	30° 42' - 33° 03' N
2898-0027	Mianyang	103° 45' - 105° 43' E	30° 42' - 33° 03' N
2898-0028	Guang'an	105° 57' - 107° 18' E	30° 01' - 30° 51' N
2898-0029	Guang'an	105° 57' - 107° 18' E	30° 01' - 30° 51' N
2898-0030	Guang'an	105° 57' - 107° 18' E	30° 01' - 30° 51' N
2898-0031	Guang'an	105° 57' - 107° 18' E	30° 01' - 30° 51' N
2898-0032	Suining	105° 03' - 106° 59' E	30° 10' - 31° 10' N
2898-0033	Suining	105° 03' - 106° 59' E	30° 10' - 31° 10' N
2898-0034	Suining	105° 03' - 106° 59' E	30° 10' - 31° 10' N
2898-0035	Dazhou	106° 40' - 108° 33' E	30° 19' - 32° 20' N
2898-0036	Ziyang	104° 11' - 105° 45' E	29° 41' - 30° 39' N
2898-0037	Ziyang	104° 11' - 105° 45' E	29° 41' - 30° 39' N
2898-0038	Ziyang	104° 11' - 105° 45' E	29° 41' - 30° 39' N
2898-0039	Ziyang	104° 11' - 105° 45' E	29° 41' - 30° 39' N
2898-0040	Ziyang	104° 11' - 105° 45' E	29° 41' - 30° 39' N
2898-0041	Ziyang	104° 11' - 105° 45' E	29° 41' - 30° 39' N
2898-0042	Meishan	102° 51' - 104° 30' E	29° 24' - 30° 22' N
2898-0043	Meishan	102° 51' - 104° 30' E	29° 24' - 30° 22' N
2898-0044	Meishan	102° 51' - 104° 30' E	29° 24' - 30° 22' N

CPA reference number	City(ies)	Longitude	Latitude
2898-0045	Meishan	102° 51' - 104° 30' E	29° 24' - 30° 22' N
2898-0046	Neijiang	104° 16' - 105° 26' E	29° 11' - 30° 02' N
2898-0047	Leshan	102° 54' - 104° 15' E	28° 25' - 29° 56' N
2898-0048	Leshan	102° 54' - 104° 15' E	28° 25' - 29° 56' N
2898-0049	Zigong	104° 02' - 105° 16' E	28° 55' - 29° 38' N
2898-0050	Luzhou	105° 08' - 106° 28' E	27° 39' - 29° 20' N
2898-0051	Luzhou	105° 08' - 106° 28' E	27° 39' - 29° 20' N
2898-0052	Dazhou, Aba	100° 30' - 108° 33' E	30° 19' - 34° 19' N
2898-0053	Guang'an, Dazhou, Leshan	102° 54' - 108° 33' E	28° 25' - 32° 20' N
2898-0054	Luzhou	105° 08' - 106° 28' E	27° 39' - 29° 20' N
2898-0055	Mianyang	103° 45' - 105° 43' E	30° 42' - 33° 03' N
2898-0056	Mianyang	103° 45' - 105° 43' E	30° 42' - 33° 03' N
2898-0057	Mianyang	103° 45' - 105° 43' E	30° 42' - 33° 03' N
2898-0058	Mianyang	103° 45' - 105° 43' E	30° 42' - 33° 03' N
2898-0059	Mianyang	103° 45' - 105° 43' E	30° 42' - 33° 03' N
2898-0060	Mianyang	103° 45' - 105° 43' E	30° 42' - 33° 03' N
2898-0061	Mianyang	103° 45' - 105° 43' E	30° 42' - 33° 03' N
2898-0062	Mianyang	103° 45' - 105° 43' E	30° 42' - 33° 03' N
2898-0063	Suining	105° 03' - 106° 59' E	30° 10' - 31° 10' N
2898-0064	Neijiang	104° 16' - 105° 26' E	29° 11' - 30° 02' N
2898-0065	Leshan	102° 54' - 104° 15' E	28° 25' - 29° 56' N
2898-0066	Yibin	103° 36' - 105° 20' E	27° 50' - 29° 16' N
2898-0067	Guang'an	105° 57' - 107° 18' E	30° 01' - 30° 51' N
2898-0068	Guangan, Dazhou, Meishan, Leshan, Luzhou, Aba and Ganzi	97° 22' - 108° 33' E	27° 39' - 34° 20' N
2898-0069	Mianyang and Meishan	102° 51' - 105° 43' E	29° 24' - 33° 03' N
2898-0070	Mianyang and Neijiang	103° 45' - 105° 43' E	29° 11' - 33° 03' N
2898-0071	Yibin, Suining and Neijiang	103° 36' - 106° 59' E	27° 50' - 31° 10' N
2898-0072	Yibin and Ziyang	103° 36' - 105° 45' E	27° 50' - 30° 39' N
2898-0073	Ziyang and Zigong	104° 11' - 105° 16' E	29° 41' - 29° 38' N
2898-0074	Yibin	103° 36' - 105° 20' E	27° 50' - 29° 16' N
2898-0075	Mianyang	103° 45' - 105° 43' E	30° 42' - 33° 03' N
2898-0076	Dazhou	106° 40' - 108° 33' E	30° 19' - 32° 20' N
2898-0077	Ziyang	104° 11' - 105° 45' E	29° 41' - 30° 39' N
2898-0078	Ziyang	104° 11' - 105° 45' E	29° 41' - 30° 39' N
2898-0079	Meishan	102° 51' - 104° 30' E	29° 24' - 30° 22' N
2898-0080	Neijiang	104° 16' - 105° 26' E	29° 11' - 30° 02' N
2898-0081	Luzhou	105° 08' - 106° 28' E	27° 39' - 29° 20' N
2898-0082	Guang'an, Dazhou, Aba	100° 30' - 108° 33' E	30° 01' - 34° 19' N
2898-0083	Guang'an, Leshan	102° 54' - 107° 18' E	28° 25' - 30° 51' N
2898-0084	Leshan, Luzhou	102° 54' - 106° 28' E	27° 39' - 29° 56' N
2898-0085	Mianyang, Meishan, Luzhou	102° 51' - 106° 28' E	27° 39' - 33° 03' N
2898-0086	Yibin, Mianyang, Suining, Neijiang	103° 36' - 106° 59' E	27° 50' - 33° 03' N
2898-0087	Yibin, Ziyang, Zigong	103° 36' - 105° 45' E	27° 50' - 30° 39' N

Verification Conclusions

The findings from the desk review of the original monitoring documents and the findings from interviews during the follow up visit are described in Appendix 4. The Clarification, Corrective and Forward Action Requests are stated, where applicable, in the following sections and are further documented in the Appendix 4. The verification of the Project resulted in 3 CARs and 4 CLs. The CARs, CLs and FARs were closed based on adequate responses from the Coordinating/managing entity (CME) which meets the applicable requirements. They have been reassessed before their formal acceptance and closure.

SECTION B. Verification team, technical reviewer and approver

B.1. Verification team members

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader	EI	Geng	Yan	Bureau Veritas Certification- China	X	X	X	X
2.	Verifier	EI	Wang	Zhen ning	Bureau Veritas Certification- China	X	X	X	X

B.2. Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Tian	Pin	Bureau Veritas Certification Holding SAS
2.	Technical expert supporting	EI	Wang	Zhi Feng	Bureau Veritas Certification- China
3	Approver	IR	Sharma	Rajendra	Bureau Veritas (India) Pvt Ltd

SECTION C. Application of materiality in conducting the verification

C.1. Consideration of materiality in planning the verification

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	*Sample*	*Medium*	*Sample size is not suitable; or the surveyed households in the PoA level are not random*	*1. Cross-check the procedure to identify the sample size against the sample guideline and standard[/12//41//42/], and confirm the sample size is calculated correctly, and chose 200 in a conservation approach, compared 139 (calculated result of sample size). Furthermore, the relative error of the 200 sample results is lower and the*

				statistical quality is sufficient. *2. Using a central online platform, the CME determines the households to be included in the sampling using a simple random approach and submits the household references to the local data collectors.* *3. DoE conducted a random sample following the sample standard during site-visit period, visited 85 households who are partial sourced from the sample conducted by CME and the others are beyond 200 households survey. Based on the result of acceptance sampling, the monitoring records are deemed acceptable.*
2.	*Data management and Human errors*	*Low*	*Typographic errors in the spreadsheets and Human error is likely to occur if the monitoring personnel are not trained well or inexperienced in data recording procedures while recording.*	*1. Require the CME to assess all the data again and confirm that no further errors are made.* *2. All the monitoring personnel are well trained and required to complete the simulated test and ensure each trainee are qualified to undertaken household survey* *3. The hand-written survey records are checked and the data are randomly compared with data in database for the consistency.* *4. Data quality controlled by CME, there are four steps to ensure the data quality and consistency.*

C.2. Consideration of materiality in conducting the verification

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The errors identified in the project are below the threshold limit of materiality and hence not material. The GHG emission reductions are calculated without material misstatements.

SECTION D. Means of verification

D.1. Desk/document review

>> BVC has conducted desk review of all documents provided by the client and publicly available documents relevant for the verification (including the initially materials for 1st issuance request submission and the additional materials after PRC approval for the 2nd issuance request submission). The assessment of the project documentation provided by the CME is based upon both quantitative and qualitative information on emission reductions. Quantitative information comprises the reported numbers in the monitoring report (MR) Version 2.1, 23/12/2017 /1/ and emission reduction calculation spreadsheet Version 2.1, 23/12/2017 /11/, the sample results conducted by the CME /12//13//14/. Qualitative information comprises information on internal management controls/17//18/, calculation procedures, procedures for transfer of data/19/, frequency of emissions reports, and review and internal audit of calculations.

According to the approved post-change change (PRC ref no: PRC-2898-001), the PoA voluntary changes AMS-I.C. (version 19) to AMS-I.I. (version 04). Although the PoA implemention is not change, the description of the PoA in approved revised PoA-DD and included CPA-DDs is consistent with the on-site inspection by BVC, the parameters are changed according to the new applied methodology (AMS-I.I.). To verify the validity of the data for new parameters, BVC checked the added materials provided by CME after PRC against initially materials for 1st issuance request submission, such as three sample surveys (questionnaires completed in Jun. 2010, Dec.2010 and Apr. 2012), the approved revised PoA-DD and included CPA-DDs against previous versions before PRC, the related Gold Stand reports of PoA (GS1239), combined with the random telephone interview household for double-check. The details can be referred to E.3.4.2 below.

The Monitoring Report Version 1.1 dated 27/06/2016 submitted by the CME was web hosted on the UNFCCC-CDM website on 29/06/2016 and available in the public domain. The Monitoring Report Version 2.1, 23/12/2017 updated according to the post-registration change was also verified by BVC.

In addition to the monitoring documentation provided by the project participants, the DOE reviews:

(a) The registered PoA-DD and the corresponding validation report /3//4//24/;

(b) The registered or included CPA-DDs, including the monitoring plan and the corresponding validation reports and inclusion forms (/5/~/9/);

(c) The revised PoA-DD, revised CPA-DD generic and revised CPA-DD specific (CPA Nb. SCHHBG-2010-001 to CPA Nb. SCHHBG-2014-087) (/10/)

(d) The applied monitoring methodologies/34/;

(e) Validation Reports for CPA inclusion Sichuan Rural Poor-Household Biogas Development Programme, CPA Nb. SCHHBG-2010-001 to CPA Nb. SCHHBG-2014-087 (/25/ ~ /29/)

(f) Previous monitoring reports and verification reports /30//31//32/;

(g) Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board (/35/~/42/);

(h) Any other information and references relevant to the project activity's resulting emission reductions (e.g., IPCC reports etc) (/45/~/48/).

(i) Approved evised PoA-DDs, revised CPA-DDs (CPA001- CPA087) and the post-registration change validation assessment opinion /49/

(j) Additional materials after PRC approval for the 2nd issuance request submission, such as stove test report/51//52/.

D.2. On-site inspection

Duration of on-site inspection: 24/07/2016 to 31/07/2016				
No.	**Activity performed on-site**	**Site location**	**Date**	**Team member**
1.	Management and stakeholders interview	Chengdu city	24/07/2016	WANG Zhenning GENG Yan
2.	Further documents review and low-income households visit	Yibin, Neijiang, Suining, Ziyang, Zigong, Leshan,	25/07/2016-29/07/2016	WANG Zhenning GENG Yan

		Meishan, Mianyang, Guang'An		
3.	Further documents review and low-income households visit	Mianyang city	30/07/2016	WANG Zhenning GENG Yan
4.	Close meeting	Mianyang city	31/07/2016	WANG Zhenning GENG Yan

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	SONG	Yumin	Sichuan Rural Energy Office	24/07/2016	1.General aspects of the PoA and the CPA; 2.Changes since validation; 3.Remaining issues from validation 4.Quality management system;	WANG Zhenning GENG Yan
2.	YANG	Jiong	Sichuan Rural Energy Office	24/07/2016	1.Technical equipment and operation; 2.Involved personnel and responsibilities; 3.Training and practice of the operational personnel; 4.Implementation of the monitoring plan;	WANG Zhenning GENG Yan
3	FU	Yinyin	Chengdu Oasis Science & Technology Co., Ltd	24/07/2016	1.Monitoring data management; 2.Data uncertainty and residual risks; 3.GHG calculation 4.Procedural aspects of the verification;	WANG Zhenning GENG Yan
4	ZHA	Haiying	Ziyang Rural Energy Office	25/07/2016	1.Monitoring data management; 2.Procedural aspects of the verification; 3.Maintenance; 4.Environmental aspects	GENG Yan
5	ZENG	Libo	Meishan Rural Energy Office	25/07/2016	As above	WANG Zhenning
6	WANG	Hui	Leshan Rural Energy Office	26/07/2016	As above	WANG Zhenning
7	CHEN	Yong	Neijiang Rural Energy Office	26/07/2016	As above	GENG Yan
8	ZHU	Lin	Zigong Rural Energy Office	27/07/2016	As above	GENG Yan
9	LAI	Yumin	Yibin Rural Energy Office	27/07/2016	As above	WANG Zhenning
10	FENG	Weidong	Yibin Rural Energy Office	28/07/2016	As above	WANG Zhenning
11	YANG	Guanghua	Suining Rural Energy Office	28/07/2016	As above	GENG Yan
12	HE	Min	Luzhou Rural Energy Office	29/07/2016	As above	WANG Zhenning
13	DU	Maolin	Guang'an Rural Energy Office	29/07/2016	As above	WANG Zhenning GENG Yan
14	CHEN	Chao	Guang'an Rural Energy Office	29/07/2016	As above	WANG Zhenning GENG Yan
15	LIANG	Xiuhua	Mianyang Rural Energy Office	30/07/2016	As above	WANG Zhenning GENG Yan
16	YE	Zhanglian	Mianyang Rural Energy Office	30/07/2016	As above	WANG Zhenning GENG

						Yan
Telephone Interviewee After PRC Approval (dated: 18/12/2017)						
1	LIU	Congwu	Household	18/12/2017	1. The survey conducted in Jun, 2010, especially the coal consumption quantity, further verification to the new parameter $FC_{BL,k,j}$; 2. The survey conducted in 2016, especially the coal consumption quantity, further verification to the new parameter $FC_{m,i}$; 3. The actual situation of the PoA implementation, such as the biogas work, the data collection and so on.	GENG Yan
2	HU	Yishan	Household	18/12/2017		
3	YANG	Moxiu	Household	18/12/2017		
4	ZONG	Ruikang	Household	18/12/2017		
5	LIU	Anfu	Household	18/12/2017		
6	LI	Xuefei	Household	18/12/2017		

D.4. Sampling approach

>>

In this monitoring period (01/01/2015 – 31/12/2015), there are 87 CPAs including 395,435 households in this PoA /22/. As the more suitable methodology is adopted in the PRC, the reasonability of sample approach conducted before PRC is verified by BVC.

All the households are located in Sichuan province, which is a limited area. Simple random sampling approach was selected for this PoA due to relatively homogenous population being studied, given the similar average ambient temperature and similar living habit of residents in Sichuan. Therefore, simple random sampling (SRS) approach was followed by the PP to determine the sample size, and BVC is able to confirm the selection of sampling approach is appropriate as per our local knowledge. Target population is defined as all the households included in the PoA, i.e. 395,435 households in all included CPAs.

Whatever the AMS-I.C. or the AMS-I.I. adopted by the PoA, a single sample was drawn by the PP from the monitoring database in line with the Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities (hereafter can be referred to as the 'sampling guideline'). According to the applied methodologies, confidence/precision of 90/10 is acceptable for sampling. According to the Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities, confidence/precision of 95/10 should be applied when the sampling plan covered a group of CPAs. For this PoA, confidence/precision is 95/10. Therefore, BVC is able to confirm that the selection of confidence/precision is appropriate.

According to the updated methodologies (AMS-I.I. and AMS-III.R.) applied, sampling approach is applied for the monitoring parameters: annual consumption of fossil fuel type *j* coal (physical units, mass/volume) by application m ($FC_{m,j}$); Proportion of $N_{k,0}$ that remain operating at year y (fraction) ($n_{k,y}$);Number of thermal application m remaining in use in year y ($N_{m,y}$); Mean annual operation hours of the digesters (t); Annual average number of animals of type *LT* in year y (numbers). ($N_{LT,y}$); Fraction of manure handled in project animal manure management system *i* (i.e. digestion in the newly installed biogas digester) ($MS\%_{i,y}$); Land application of digestate from biogas digesters to avoid anaerobic digestion (Proper sludge application ratio);

The sample size of the PoA considering the parameters is calculated in a conservative way, and the least number of the sample size is 139 for two different methodology combinations. The CME chose 200 for conservation as the same. Details for identify the sample size can be referred below.

To verify the validity of the data, especially for new parameters, BVC checked the parameters one by one, comparing the data in previous MR before PRC and the inspection findings during the site-visit, via checking adopted methodologies and confirms below:

For parameters $N_{k,o}$, $n_{k,y}$ (formerly N_k), $N_{m,y}$, the PoA involves only coal as fossil fuel and biogas stove as only one programme application, the data for these parameters are related directly to the number of households or remaining operational biogas, whose data are already monitored each year for each monitoring period, no matter the PRC conducting or not.

For parameters $FC_{BL,k,j}$ and $FC_{m,i}$: the data for $FC_{BL,k,j}$ are sourced from the sample survey conducted in Jun, 2010/52/; And the data for $FC_{m,i}$ are sourced from the sample survey conducted each year, which provides all the data for this CDM programme and its combined GS programme. the date of sample survey for 4th monitoring period is May, 2016/13/, the data for $FC_{m,i}$ are already monitored each year for each monitoring period, no matter the PRC conducting or not. BVC checked the survey documents and confirms the consistency.

Sampling Method

The unbiased estimation of total value and mean value are:

$$\bar{y} = \frac{1}{n}\sum_{i=1}^{n} y_i \qquad (D.1)$$

$$p = \frac{a}{nm} \qquad (D.2)$$

The unbiased variation estimators of $V(\bar{y})$ and $V(p)$ with a sufficiently small f are:

$$v(\bar{y}) = \frac{1-f}{n}s^2 = \frac{1-f}{n(n-1)}\sum_{i=1}^{n}(y_i-\bar{y})^2 \approx \frac{1}{n(n-1)}\sum_{i=1}^{n}(y_i-\bar{y})^2 \qquad (D.3)$$

$$v(p) = \frac{1-f}{n-1}p(1-q) \approx \frac{1}{n-1}p(1-q) \qquad (D.4)$$

Relative error of the sample is to be calculated by formula:

$$r = t_{0.0.5}\frac{\sqrt{v(\bar{\bar{y}})}}{\bar{\bar{y}}} \qquad (D.5)$$

Where:

n	*Sample size*
f	*Sampling fraction*
N	*Total size of population*
s	*Standard error*
v	*Variation of Sample*
y_i	*Observation of a sample household*
$\bar{y}$	*Mean value of sample*
p	*Proportion of the sample*
q	*Equals to 1-p*
r	*Relative error. Default is 10%.*
$t_{0.05}$	*1.96*

Sampling Size Calculation

Sample size calculation is based on the formulas below as defined in Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities for the simple random sampling approach adopted.

***Step 1**: Confidence/precision*

The proposed PoA adopts the methodologies AMS I.I and AMS III.R. It is defined in *Standard For Sampling And Surveys For CDM Project Activities And Programme Of Activities, version 4* that a confidence/precision of 95/10 should be used if one survey covers several CPAs. Since this is the highest confidence/precision mentioned in the applied methodologies and standards, these values shall be used for the sample size calculation.

***Step 2**: Initial Sample size*

For mean value, the following formula is to calculate the initial sample size n_0:

$$n_0 = \frac{t^2 S^2}{r^2 \bar{Y}^2} \qquad (D.6)$$

To determine population parameter S^2 and $\bar{Y}^2$, the following options can be taken: (a) taking a small scale pre-survey small scale SRS pre-survey, or (b) reference of similar survey, or (c) double sampling scheme.

Where,

S	*Standard error of sample*
$\bar{Y}$	*Mean value of sample*
r	*Relative error. Default is 10%.*
$t_{0.05}$	*1.96*

For proportion, initial sample size n_0 can be calculated by formula:

$$n_0 = \frac{t^2 Q}{r^2 P} \qquad (D.7)$$

$n_0 \approx 97$, while $t_{0.0.5} = 1.96$, r =10%, P=0.8 and Q =1- P =0.2.

Where,

P	*Proportion of sample*
Q	*Q = 1- P*
r	*Relative error. Default is 10%.*
$t_{0.05}$	*1.96*

***Step 4**: Other considerations of sample size*

Sample size should be corrected according to the size of target population *N* by formula:

$$n_1 = \frac{n_0}{1 + \frac{n_0}{N}} \qquad (D.108)$$

Then, be corrected Respond Rate r_R (initially 90%) by formula:

$$n_2 = \frac{n_1}{r_h} \quad (D.9)$$

In case, the survey covers more than one expected parameters, conservatively, sample size n should not be less than the maximum calculated sample size of those indicators.

$$n \geq max(n_2^1, n_2^2, \ldots, n_2^v) \quad (D.10)$$

Using equations D.9, the sampling sizes for the proportional parameters (sludge application rate and rate of digesters still in operation) are calculated to be 97 as described above.

For the sampling of the number of pigs and the annual digester operation hours, the following parameters are estimated (for the application of equation D.8):

Number of pigs: Mean: 5 pigs; Standard Deviation: 3 pigs

Annual operation hours: 8,400 h; Standard Deviation: 1,200 h

Using these values and equation D.8 the sampling sizes for these two parameters are:

Pigs: 139

Operation hours: 8

As a conservative approach, a sample size of 200 was chosen by the CME, who is bigger than all calculated minimum sampling sizes. A Survey list of the 200 samples was supplied by the CME, which was compiled base on the Table of checked and accepted documents done by the survey staff. In the Survey list, name of user, location, operation status of each biogas digester, operation hour of each biogas digester, and sludge application, average pig number etc. were monitored and recorded.

The verification team checked the adoption of sampling size calculation equations and parameter calculation process of the monitoring parameters that applied with sampling approach. BVC is able to confirm that the sampling approach was consistent with the latest EB requirements. Sampling type was properly selected, the required confidence/precision has been met, and the sampling size was corrected calculated, so that the selected samples were representative of the population.

To make sure the data would be well collected during on-site sampling, survey staffs were well trained before they start the collecting work. A copy of training material and training records were reviewed and verified by the verification team. Photos of the training courses were also supplied and BVC is able to confirm that the survey staffs were well trained before start working. When the survey staffs went to the households, questionnaire papers were supplied to the households and users are required to answer the questions on the questionnaire papers. After the questionnaire papers were filled, both survey staff and the user signed on the questionnaire papers. After all the users filled in such questionnaire papers, survey staff were required to fill a table, on which general information of each household are clearly included. Then the table were checked and confirmed by the SREO. The questionnaire papers and Table of checked and accepted documents were well preserved and supplied to the verification team during on-site verification.

BVC has checked the questionnaire papers filled by the household users, table of checked and accepted documents, survey list of the 200 samples summarized by the CME. BVC is able to confirm that the sampling process is reliable.

To ensure the data used in the calculation are correct, a QA/QC procedure was established by the CME including Supervisor Check, Data Entry, Data Check Algorithms and Analytical Checks.

By basic descriptive statistics, the outliers could be easily figured out. Further statistical analysis can work more characteristics of the data by professional analysis tools.

The monitoring sampling data, both hard and soft copy, are stored carefully by CME within the whole crediting period. Two hardcopies of monitoring questionnaires need to be stored in CME offices in Beijing and Chengdu separately to avoid information missing as emergency procedures. The BVC's verification team is able to confirm that the QA/QC procedure is in place and working properly.

D.5. Clarification requests, corrective action requests and forward action requests raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
General			
Compliance of the monitoring report with the monitoring report form	1	0	0
Remaining forward action requests from validation and/or previous verification	0	1	0
CPA(s) considered for verification and covered in this report	0	0	0
Programme of activities	0	0	0
Compliance of the programme implementation with the registered PoA-DD	1	1	0
Implementation and operation of the management system	0	0	0
Post-registration changes	0	0	0
• Temporary deviations from the registered monitoring plan, applied methodology or applied standardized baseline	0	0	0
• Corrections	0	0	0
• Inclusion of a monitoring plan	0	0	0
• Permanent changes to the registered monitoring plan or permanent deviation of monitoring from the applied methodology, standardized baseline or other applied standards or tools	0	0	0
• Changes to the programme design or project design	0	0	0
• Change of coordinating/managing entity	0	0	0
• Changes specific to afforestation and reforestation activities	0	0	0
Component project activities	0	0	0
Compliance of the CPA implementation with the included CPA design document	0	0	0
Post-registration changes	0	0	0
• Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline	0	0	0
• Corrections	0	0	0
• Changes to the start date of the crediting period of component project activities	0	0	0
• Inclusion of a monitoring plan	0	0	0
• Permanent changes to the registered monitoring plan or permanent deviation of monitoring from the applied methodology, standardized baseline or other applied standards or tools	0	0	0
• Changes to the programme design of project design	0	0	0
• Changes specific to afforestation and reforestation component project activities	0	0	0
Compliance of the registered monitoring plan with the methodology including applicable tool(s) and standardized baseline	0	0	0
Compliance of monitoring activities with the registered monitoring plan	0	0	0
• Data and parameters fixed ex ante or at renewal of	0	0	0

crediting period			
• Data and parameters monitored	1	1	0
• Implementation of sampling plan	1	0	0
Compliance with the calibration frequency requirements for measuring instruments	0	0	0
Assessment of data and calculation of emission reductions or net removals	0	0	0
• Calculation of baseline GHG emissions or baseline net GHG removals by sinks	0	0	0
• Calculation of project GHG emissions or actual net GHG removals by sinks	0	0	0
• Calculation of leakage GHG emissions	0	0	0
• Summary of calculation of GHG emission reductions or net GHG removals by sinks	0	0	0
• Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA	0	0	0
• Remarks on difference from estimated value in included CPA	0	0	0
Assessment of reported sustainable development co-benefits	0	0	0
Global stakeholder consultation	0	0	0
Others (please specify)	0	0	0
Total	4	3	0

SECTION E. Verification findings

E.1. General

E.1.1. Compliance of the monitoring report with the monitoring report form

Means of verification	According to para 337 &338 of VVS version 01.0, BVC verification team crosschecked and compared the MR by employing the valid version of the applicable monitoring report form listed in UNFCCC website. - The MR used the latest valid version of the applicable at UNFCCC website. - The MR is completed and meets all relevant requirements of instructions for filling out the Monitoring Report Form (version 01.0) for CDM programme activity.
Findings	**CL-1:** The continued operation periods of each CPAs should be indicated. *The continued operation periods are indicated in the updated MR sheet according to each CPAs, BVC confirmed the CL is closed.*
Conclusion	As per requirement of VVS Version 01.0, based on the findings above, BVC confirms that the MR version 2.1 was in compliance with relevant valid version of monitoring report form and instructions therein for filling out MR.

E.1.2. Remaining forward action requests from validation and/or previous verifications

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CAR-1：The description of the two parameters" $FC_{BL,y}$" and "$FC_{PE,y}$" in the CPA included are wrongly copied from PoA-DD. The correction is raised to clear up the misunderstanding in the 3rd verification as a FAR.

A post-registration change focuses on the two parameters $FC_{BL,y}$" and "$FC_{PE,y}$" were conducted during this monitoring period and approved on by EB on 11/12/2017. The general of the changes are follows:

Conducting a voluntary change from one of the applied methodologies in the registered PoA "AMS-I.C - Thermal energy for the user with or without electricity (version 19)" to another methodology "AMSI. I.: Biogas/biomass thermal applications for households/small users (version 04.0)".

Previous fixed parameters $FC_{BL,y}$ and $FC_{PE,y}$ have been moved to be monitoring parameters as $FC_{BL,k,j}$ and $FC_{m,j}$ in line with the AMS-I.I.

BVC checked the post-registration change request and approve process details, related materials and confirm the misunderstanding caused by the two parameters" $FC_{BL,y}$" and "$FC_{PE,y}$" is cleared up due to the PRC. The FAR in 3rd verification and the CAR is closed.

E.1.3. CPAs considered for verification and covered in this report

Title and UNFCCC reference number of the CPA included in the PoA as of the end of this monitoring period	Is the CPA considered for this verification? (yes/no)	The date when the CPA was included	Version of the PoA-DD	Confirmation that a request for issuance including the CPA has been published for the previous monitoring period (Y/N)
2898-0001	Yes	11/05/2012	2	Y
2898-0002	Yes	11/04/2013	2	Y
2898-0003	Yes	11/04/2013	2	Y
2898-0004	Yes	11/04/2013	2	Y
2898-0005	Yes	11/04/2013	2	Y
2898-0006	Yes	11/04/2013	2	Y
2898-0007	Yes	11/04/2013	2	Y
2898-0008	Yes	11/04/2013	2	Y
2898-0009	Yes	11/04/2013	2	Y
2898-0010	Yes	11/04/2013	2	Y
2898-0011	Yes	11/04/2013	2	Y
2898-0012	Yes	11/04/2013	2	Y
2898-0013	Yes	11/04/2013	2	Y
2898-0014	Yes	11/04/2013	2	Y
2898-0015	Yes	11/04/2013	2	Y
2898-0016	Yes	11/04/2013	2	Y
2898-0017	Yes	11/04/2013	2	Y
2898-0018	Yes	11/04/2013	2	Y
2898-0019	Yes	11/04/2013	2	Y
2898-0020	Yes	11/04/2013	2	Y
2898-0021	Yes	11/04/2013	2	Y
2898-0022	Yes	11/04/2013	2	Y
2898-0023	Yes	11/04/2013	2	Y
2898-0024	Yes	11/04/2013	2	Y
2898-0025	Yes	11/04/2013	2	Y
2898-0026	Yes	11/04/2013	2	Y
2898-0027	Yes	11/04/2013	2	Y
2898-0028	Yes	11/04/2013	2	Y
2898-0029	Yes	11/04/2013	2	Y
2898-0030	Yes	11/04/2013	2	Y
2898-0031	Yes	11/04/2013	2	Y
2898-0032	Yes	11/04/2013	2	Y
2898-0033	Yes	11/04/2013	2	Y
2898-0034	Yes	11/04/2013	2	Y
2898-0035	Yes	11/04/2013	2	Y
2898-0036	Yes	11/04/2013	2	Y
2898-0037	Yes	11/04/2013	2	Y
2898-0038	Yes	11/04/2013	2	Y
2898-0039	Yes	11/04/2013	2	Y
2898-0040	Yes	11/04/2013	2	Y
2898-0041	Yes	11/04/2013	2	Y

2898-0042	Yes	11/04/2013	2	Y
2898-0043	Yes	11/04/2013	2	Y
2898-0044	Yes	11/04/2013	2	Y
2898-0045	Yes	11/04/2013	2	Y
2898-0046	Yes	11/04/2013	2	Y
2898-0047	Yes	11/04/2013	2	Y
2898-0048	Yes	11/04/2013	2	Y
2898-0049	Yes	11/04/2013	2	Y
2898-0050	Yes	11/04/2013	2	Y
2898-0051	Yes	11/04/2013	2	Y
2898-0052	Yes	11/04/2013	2	Y
2898-0053	Yes	11/04/2013	2	Y
2898-0054	Yes	24/03/2014	2	Y
2898-0055	Yes	24/03/2014	2	Y
2898-0056	Yes	24/03/2014	2	Y
2898-0057	Yes	24/03/2014	2	Y
2898-0058	Yes	24/03/2014	2	Y
2898-0059	Yes	24/03/2014	2	Y
2898-0060	Yes	24/03/2014	2	Y
2898-0061	Yes	24/03/2014	2	Y
2898-0062	Yes	24/03/2014	2	Y
2898-0063	Yes	24/03/2014	2	Y
2898-0064	Yes	24/03/2014	2	Y
2898-0065	Yes	24/03/2014	2	Y
2898-0066	Yes	24/03/2014	2	Y
2898-0067	Yes	24/03/2014	2	Y
2898-0068	Yes	24/03/2014	2	Y
2898-0069	Yes	24/03/2014	2	Y
2898-0070	Yes	24/03/2014	2	Y
2898-0071	Yes	24/03/2014	2	Y
2898-0072	Yes	24/03/2014	2	Y
2898-0073	Yes	24/03/2014	2	Y
2898-0074	Yes	29/01/2015	2	N
2898-0075	Yes	29/01/2015	2	N
2898-0076	Yes	29/01/2015	2	N
2898-0077	Yes	29/01/2015	2	N
2898-0078	Yes	29/01/2015	2	N
2898-0079	Yes	29/01/2015	2	N
2898-0080	Yes	29/01/2015	2	N
2898-0081	Yes	29/01/2015	2	N
2898-0082	Yes	29/01/2015	2	N
2898-0083	Yes	29/01/2015	2	N
2898-0084	Yes	29/01/2015	2	N
2898-0085	Yes	29/01/2015	2	N
2898-0086	Yes	29/01/2015	2	N
2898-0087	Yes	29/01/2015	2	N

E.2. Programme of activities

E.2.1. Compliance of the programme implementation with the registered programme design document

Means of verification	According to VVS version 09.0, BVC conducted an on-site inspection (24/07/2016-31/07/2016) to assess that all physical features (technology, project equipment, and monitoring and metering equipment) of the included CDM CPA in the registered PoA-DD and CPA-DDs are in places and the coordinating/managing

	entity have operated the PoA as per the PoA-DD. BVC found that: The PoA aims to reduce a large amount of greenhouse gases (GHG) by facilitating the installation of a large number of household biogas digesters for the low-income households located in Sichuan province, China. During this monitoring period 01/01/2015 – 31/12/2015, 87 CPAs were included and 395,435 households were equipped with the biogas digesters in Yibin, Neijiang, Suining, Ziyang, Zigong, Luzhou, Leshan, Meishan, Mianyang, Guang'An, Ganzi, Aba and Dazhou, all of which are located in Sichuan. In this monitoring period quantities of the included CPAs and households are not changed. Prior to the project activity, households in the area which are now covered by PoA stored animal manure produced by micro-scale animal husbandries in deep pits for several months before applying it to their farmland. In the meantime, coal was used as source of energy for cooking in daily life. Through the project activity, each household is equipped with a household biogas digester that treats the manure anaerobically and recovers the generated methane as energy supply, which will avoid methane emission and reduce coal consumption. The Sichuan Rural Energy Office (SREO) is the local authority while Chengdu Oasis Science & Technology Co., Ltd. is the coordinating/managing entity (CME), who will take the entire task regarding the monitoring issues. Based on the previous verification and during on-site inspection, BVC's verification team checked the Table of checked and accepted documents and statement on the household number and operation date issued by the SREO and is able to confirm that the local authority is SREO, CME is the Chengdu Oasis Science & Technology Co., Ltd, taking care of all investigation and monitoring data review work. During this monitoring period a new statement on the existing total household number as well as the number included in each CPA were issued by the SREO. In the statement, SREO confirmed that in this monitoring period the number of included CPAs and included households was not changed (same as the previous monitoring period). Moreover, during the previous verification a full list of the households equipped with biogas digesters were verified by DoE, on which name, digester ID, digester location, and construction date were clearly indicated. Table of checked and accepted documents for all constructed biogas digesters were also randomly checked and BVC is able to confirm it is accepted by the local authority. Through checking above mentioned documents BVC is able to confirm that the total number of household equipped with biogas digester is 395,435 and the households included in each CPA are not changed, which is consistent with the monitoring report. The verification team also checked construction time of all the digesters on the Household list that included in each CPA (from CPA Nb. SCHHBG-2010-001 to CPA Nb. SCHHBG-2014-087) and confirmed that the earliest construction date of CPA Nb. SCHHBG-2010-001 is 10/12/2010, which is consistent with the revised CPA-DD. The verification team also checked the Household list of CPA Nb. SCHHBG-2012-002 to CPA Nb. SCHHBG-2013-073 and confirmed that the earliest construction date of biogas digester is no earlier than 28/10/2010. It is consistent with the CPA-DDs of CPA Nb. SCHHBG-2012-002 to CPA Nb. SCHHBG-2013-073. The verification team also checked the Household list of CPA Nb. SCHHBG-2014-074 to CPA Nb. SCHHBG-2014-087 and confirmed that the earliest construction date of biogas digester is no earlier than 29/10/2010. It is consistent with the CPA-DDs of CPA Nb. SCHHBG-2014-074 to CPA Nb. SCHHBG-2014-087. Construction of all CPAs (from CPA Nb. SCHHBG-2010-001 to CPA Nb. SCHHBG-2014-087) finished and starting operation before 04/09/2014. Verification team checked the Household list that included in each CPA and able to confirm the information on construction date given in the MR is correct. During on-site visit, the verification team checked the biogas digesters equipped in each household. Each biogas digester system consists of components such as inlet, inlet pipe, fermentation chamber, gas chamber storage, hydraulic chamber, movable cover and gas tube. Verification team is able to confirm that the systems were equipped in line with the registered PoA-DD and CPA-DD. The digesters were designed according to relevant regulations, checked and accepted by local authority. Therefore, based on this on-site visit and the reviewed project

	documentation, the verification team confirms that the realized technology, the project equipment, included CPA and household number, as well as the CME are consistent with the description in the registered or included CPA-DDs. There is no information (data and variables) provided in the monitoring report that is different from that stated in the registered PoA-DD and CPA-DD. ***As the post-registration change was completed during this monitoring period, BVC pay attention to the changes to programme design and verified if the revised programme design compliance with the programme implementation***, and means of verification are listed as below: 1. The CME conducts a voluntary change from one of the applied methodologies in the registered PoA "AMS-I.C - Thermal energy for the user with or without electricity (version 19)" to another methodology "AMSI.I.: Biogas/biomass thermal applications for households/small users (version 04.0)", it is in line with the CDM Standard for programme of activities (version 0.1.0[/36/]) section 9.3.5 Changes to programme or project design, clause 239 (e)" Voluntary update of the applied methodologies to later valid versions of the same methodologies or voluntary change to other methodologies, provided that all requirements in the updated/changed methodologies are met." 2. The assessment of all requirements in the new adopted methodologies (AMS-I.I.) are met by the PoA is validated by the PRC DOE and approved by EB. The PoA is a renewable energy technology and supplies residential users with biogas for use, which is more applicable to the methodology AMS-I.I. (version 4.0). As AMS-I.I. was issued on 18/02/2011 which is later than the date when the PoA submitted for global stakeholder commenting process 28/10/2010, the PoA chose the available but less applicable methodology AMS-I.C. during registration time. Via checking the previous materials such as validation report, registered PoA-DD, CPA-DDs against the revised verification findings during site visit period, BVC confirms the programme implementation and operation are in compliance with the eligibility criteria and applicability criteria of AMS.I.I.. The PoA implementation is same as before, and there is no change due the PRC.
Findings	**CAR-2:** To avoid the misunderstanding, the construction dates of the CPA074 to CPA087 describe in the same way as the other CPAs. *The constructions dates of the CPA001-CPA073 describe as dd-mm-yyyy and for the CPA074 to CPA087 are mm-dd-yyyy, the updated MR correct the description in the same way. BVC checked the evidences of the constructions dates and confirm they are consistent, thus the CAR is closed.* **CL-2:** The biogas stove test report shall be provided. The biogas stove test reports have been provided to DoE for PRC interview, and checked for the 2nd issuance request raised and confirmed by BVC.
Conclusion	According to para 339 &341 of VVS version 01.0, BVC confirms that the implementation and operation of the revised PoA and included CPAs has been conducted in accordance with the description contained in the revised PoA-DD and CPA-DDs; There is no deviation or the proposed or actual changes in the implementation or operation of the revised PoA and CPA comply with the requirements of the Project standard. All physical features (technology, project equipment, and monitoring and metering equipment) of the included CPAs specified in the included CPA-DDs are in place and that the coordinating/managing entity has operated the registered CDM PoA and included CPAs as per the approved revised PoA-DD and CPA-DDs. The changed methodology AMS.I.I. does no impact on the implementation and operation of the PoA in the revised programme design and more applicable to it.

E.2.2. Implementation and operation of the management system

Means of verification	According to VVS version 09.0, BVC verification team conducted documents review and on-site interview to assess implementation and operation of the management system included CDM CPA in the registered PoA-DD and CPA-DDs are consistent with the PoA-DD and CPA-DDs.

	- To make sure the monitoring procedure working properly, a monitoring structure was established. Two organizations were working on the monitoring work of this PoA. SREO is local authority, Chengdu Oasis Science & Technology Co., Ltd is CME, and in charge of all tasks related to CDM and PoA, including determining the households to be included in the sampling survey using a simple random approach, submits the household references to the local data collectors, and the whole process of data management. - The data collection and management process are operated as below: 1. A central online platform was established and the CME could use the platform to determine the households to be included in the sampling using a simple random approach and submits the household references to the local data collectors. 2. Well trained local officers of SREO visited the households. Data collected was uploaded to the platform after the site visit. Using this platform, data could be transferred back to the CME for the calculation of the emission reduction. 3. Data collected would be then analysed by an automatic database system, and outcome of the sampling survey would be used to calculate the emission reduction of each CPA during a certain monitoring period. Monitoring report could be prepared base on the data acquired. - During on-site inspection, data management system was checked by the verification team. Operation manual of the data management system was supplied to the verification team. Therefore, BVC is able to confirm that the data management system was properly designed and operated, and operation manual was well followed. - Both platforms, the web-interface for the local data collectors as well as the emission reduction calculation software are saved in a backup system regularly. ***According to VVS version 01.0, BVC verified the management system contained in the revised PoA-DD, CPA-DDs and updated monitoring report after PRC approval, and confirms it has no change and same with the on-site inspection above. Furthermore, additional phone interview SREO and local rural householders were conducted on 20/12/2017 by BVC and the results support the consistence.***
Findings	There is no CAR/CL raised in this section.
Conclusion	In conclusion, based on document review, and stakeholder interview, together based on BVC's local and sectoral expertise, BVC confirms that: The implementation and operation of the management system included in the revised PoA-DD and CPA-DDs are consistent with the PoA situation.

E.2.3. Post-registration changes

E.2.3.1. Temporary deviations from the registered monitoring plan, applied methodology or applied standardized baseline

>>
N/A

E.2.3.2. Corrections

>>
Yes.

1. Corrections that have been approved prior to this monitoring period;

A correction was made for CPA Nb. SCHHBG-2012-002 to Nb. SCHHBG-2012-053 during the first verification on the monitoring period (10/05/2012 – 05/06/2013). And the correction as a post-registration change was approved on 03/01/2014.

2. Corrections that have been approved during this monitoring period.

There is no correction during this monitoring period.

E.2.3.3. Inclusion of a monitoring plan

>>
N/A

E.2.3.4. Permanent changes to the registered monitoring plan or permanent deviation of monitoring from the applied methodology, standardized baseline or other applied standards or tools

>>
The PoA voluntary changes AMS-I.C. (version 19) to AMS-I.I. (version 04). Such post-registration change (PRC ref no: PRC-2898-001) has been approved by EB on 11/12/2017.

Based on the post-registration change, Monitoring parameters have been changed:

Fixed parameters $FC_{BL,y}$ and $FC_{PE,y}$ have been moved to be monitoring parameters $FC_{BL,k,j}$ and $FC_{m,j}$ in line with the AMS-I.I. Furthermore, additional monitoring parameters $N_{k,o}$, $n_{k,y}$ (formerly N_k), $N_{m,y}$ & $MS_{\%i,y}$ have been added in line with the new methodology AMS-I.I (version 04).
The details can be found in http://cdm.unfccc.int/PRCContainer/DB/prcp617554437/view

E.2.3.5. Changes to the programme design or project design

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The PoA voluntary changes AMS-I.C. (version 19) to AMS-I.I. (version 04). Such post-registration change (PRC ref no: PRC-2898-001) has been approved by EB on 11/12/2017.

Eligibility criteria for inclusion of CPAs in the PoA is updated to include the applicability conditions of AMS-I.I (instead of applicability conditions of AMS-I.C in the registered PoA DD and CPA DD), the remaining criteria is not affected.
The details can be found in http://cdm.unfccc.int/PRCContainer/DB/prcp617554437/view

E.2.3.6. Change of coordination/managing entity

>>
N/A

E.2.3.7. Changes specific to afforestation and reforestation activities

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N/A

E.3. Component project activities

E.3.1. Compliance of the CPA implementation with the included CPA design document

Means of verification	According to VVS version 09.0, BVC verification team conducted an on-site inspection (24/07/2016-31/07/2016) to assess that all physical features (technology, project equipment, and monitoring and metering equipment) of the included CDM CPA in this monitoring period are in places and the coordinating/managing entity have operated the CPA as per the PoA-DD and CPA-DD. - During on-site visit, the verification team checked the biogas digesters equipped in each household. Each biogas digester system consists of components such as inlet, inlet pipe, fermentation chamber, gas chamber storage, hydraulic chamber, movable cover and gas tube. Verification team is able to confirm that the systems were equipped in line with the registered PoA-DD and CPA-DD. The digesters were designed according to relevant regulations, checked and accepted by local authority. Therefore, based on this on-site visit and the reviewed project documentation, the verification team confirms that the realized technology, the project equipment, included CPA and household number, as well as the CME are consistent with the description in the CPA design document. - During this monitoring period a new statement on the existing total household

	number as well as the number included in each CPA were issued by the SREO. In the statement, SREO confirmed that in this monitoring period the number of included CPAs and included households was not changed (same as the registration and inclusion process). Moreover, during the previous verification a full list of the households equipped with biogas digesters were verified by DoE, on which name, digester ID, digester location, and construction date were clearly indicated. Table of checked and accepted documents for all constructed biogas digesters were also randomly checked and BVC is able to confirm it is accepted by the local authority. Through checking above mentioned documents BVC is able to confirm that the total number of household equipped with biogas digester is 395,435 and the households included in each CPA are not changed, which is consistent with the registered CPA-DDs. - ***As the adopted methodology of the PoA switched from AMS.I.C. to AMS.I.I. according the approved PRC, the information provided in each CPAs should be updated accordingly***. Compared with the inspection during the site-visit period and the data and variable included in the previous MR, the variables are changed as below: 1. Fixed parameters $FC_{BL,y}$ and $FC_{PE,y}$ have been moved to be monitoring parameters $FC_{BL,k,j}$ and $FC_{m,j}$ in line with the AMS-I.I. Furthermore, additional monitoring parameters $N_{k,o}$, $n_{k,y}$ (formerly N_k), $N_{m,y}$ & $MS\%_{i,y}$ have been added in line with the new methodology AMS-I.I (version 04) in section B.4.2 and B.5.1 of the of each CPA DD. 2. BVC checked the data and variables in the updated MR and confirms: - The parameters and most data needed according to AMS-III.R are the same as before. Only the data of $MCF_{,j}$ is updated with latest Statistic Year Book (such as: temperature in each CPA) after the PRC approval[/46/], and the monitoring parameter $MS\%_{i,y}$ *is listed as it has been monitored and used for ER calculation all the monitoring periods.* - The parameters and data needed according to AMS-I.C. are updated in line with AMS-I.I, fixed parameters $FC_{BL,y}$ and $FC_{PE,y}$ are moved to be monitoring parameters $FC_{BL,k,j}$ and $FC_{m,j}$, additional monitoring parameters $N_{k,o}$, $n_{k,y}$ (formerly N_k), $N_{m,y}$ are added. **There is no information (data and variables) provided in the monitoring report that is different from that stated in the revised CPA-DD.**
Findings	There is no CAR/CL raised in this section.
Conclusion	In conclusion, based on document review, and stakeholder interview, together based on BVC's local and sectoral expertise, BVC confirms that: The implementation and operation of the registered CPA has been conducted in accordance with the description contained in the registered PoA-DD and CPA-DDs; There is no deviation or the proposed or actual changes in the implementation or operation of the registered CPA comply with the requirements of the Project standard, though the more applicable methodology was switched from AMS-I.C. to AMS-I.I. the actual CPA implementation is the same with approved revised CPAs and previous monitoring periods.

E.3.2. Post-registration changes

E.3.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline

>>
N/A

E.3.2.2. Corrections

>>

There was a correction raised in the 1st issuance request during this monitoring period, but the correction is changed to a PRC and approved on 11/12/2017, thus there is no correction during this monitoring period.

E.3.2.3. Changes to the start date of the crediting period of component project activities

>>
N/A

E.3.2.4. Inclusion of a monitoring plan

>>
N/A

E.3.2.5. Permanent changes to the registered monitoring plan or permanent deviation of monitoring from the applied methodology, standardized baseline, or other applied standards or tools

>>
As the correction in H.3.2 above is failed and turned into a permanent change, the PoA voluntary changes AMS-I.C. (version 19) to AMS-I.I. (version 04). Such post-registration change (PRC ref no: PRC-2898-001) has been approved by EB on 11/12/2017.

Based on the post-registration change, Monitoring parameters in each CPA have been changed:

Fixed parameters $FC_{BL,y}$ and $FC_{PE,y}$ are moved to be monitoring parameters $FC_{BL,k,j}$ and $FC_{m,j}$ in line with the AMS-I.I. Furthermore, additional monitoring parameters $N_{k,o}$, $n_{k,y}$ (formerly N_k), $N_{m,y}$ & $MS_{\%i,y}$ have been added in line with the new methodology AMS-I.I (version 04).
The details can be found in http://cdm.unfccc.int/PRCContainer/DB/prcp617554437/view

E.3.2.6. Changes to the programme design or project design

>>
This PoA conducted voluntary changes AMS-I.C. (version 19) to AMS-I.I. (version 04). Such post-registration change (PRC ref no: PRC-2898-001) has been approved by EB on 11 Dec 2017.

The applicability conditions of AMS-I.C (version 19) have been updated to be the ones of AMS-I.I. (version 04). AMS-I.I. (version 04) is applicable to the PoA and included CPAs;

Fixed parameters $FC_{BL,y}$ and $FC_{PE,y}$ have been moved to be monitoring parameters $FC_{BL,k,j}$ and $FC_{m,j}$ in line with the AMS-I.I. Furthermore, additional monitoring parameters $N_{k,o}$, $n_{k,y}$ (formerly N_k), $N_{m,y}$ & $MS_{\%i,y}$ have been added in line with the new methodology AMS-I.I (version 04).
Based on above, in each CPA, AMS-III.R (version 19) and AMS-I.I. (version 04) are applied

E.3.2.7. Changes specific to afforestation and reforestation component project activities

>>
N/A

E.3.3. Compliance of the registered monitoring plan with the methodology including applicable tool(s) and standardized baseline

Means of verification	According to VVS version 01.0 para. 342 to 344, BVC verification team conducted verification of compliance of monitoring plan with the monitoring methodology including applicable tool and standardized baseline. As the post-registration change (PRC ref no: PRC-2898-001) has been approved by EB on 11/12/2017, BVC conducted the desk reviews with validation report, previous registered PoA materials (such as PoA-DD, each CPA-DDs, previous verification reports and their related monitoring reports), the revised PoA materials with new methodology (AMS-I.I.). ***To verify the validity of the data, especially the data for new parameters***, BVC checked the parameters one by one, comparing the data in previous MR before PRC and the inspection findings during the site-visit, via checking adopted methodologies and confirms below:

	For parameters $N_{k,o}$, $n_{k,y}$ (formerly N_k), Nm,y, the PoA involves only coal as fossil fuel and biogas stove as only one programme application, the data for these parameters are related directly to the number of households or remaining operational biogas, whose data are already monitored each year for each monitoring period, no matter the PRC conducting or not. For parameters $FC_{BL,k,j}$ and $FC_{m,j}$: the data for $FC_{BL,k,j}$ are sourced from the sample survey conducted in Jun, 2010/52/; And the data for $FC_{m,j}$ are sourced from the sample survey conducted each year, which provides all the data for this CDM programme and its combined GS programme. the date of sample survey for 4th monitoring period is May, 2016/13/. The data for $FC_{m,i}$ are already monitored each year for each monitoring period, no matter the PRC conducting or not. BVC checked the survey documents and confirms the consistency. BVC verification team crosschecked that Board issues which enhance the level of accuracy and completeness of the registered monitoring plan. - During the document review and furthermore during the on-site visit the verification team has reviewed the registered monitoring plan and compared it with the monitoring methodology to verify their compliance. - There is no applicable standardized baseline according to the approved revised PoA-DD and included CPA-DDs.
Findings	There is no CAR/CL raised in this section.
Conclusion	According to Para. 388 of VVS Version 09/35/, Bureau Veritas Certification verification team confirms that: The monitoring plan of the registered or included CPA-DDs/3/~/10/ is in compliance with the approved monitoring methodologies (AMS-I.I and AMS-III.R)/34/ including applicable tool(s). There is no applicable standardized baseline according to the registered PoA-DD and included CPA-DDs.

E.3.4. Compliance of monitoring activities with the registered monitoring plan

E.3.4.1. Data and parameters fixed ex ante or at renewal of crediting period

Means of verification

The documents review and the site visit revealed that a complete set of data for the specified monitoring period is available. The correctness of information provided in the monitoring report has been crosschecked against the approved revised PoA-DD and/or included CPA-DDs.
The following ex-ante parameters have been checked the compliance with the approved revised monitoring plan.

Parameter	Value and Assessment
$VS_{LT,y}$, Daily volatile solid excreted per animal (kg dry matter animal-1 year-1)	The applied value reflects the 2006 IPCC value for the daily solid excreted by Asian swines multiplied with 365 days in a year (=0.3*365 kg dry matter animal-1 year-1). Value is 109.5.
$B_{0,LT}$ Maximum methane producing capacity for manure produced by livestock, of VS excreted. (m^3 CH_4 kg^{-1})	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, and Chapter 10, Table 10A-7 (swine). Value is 0.29.
$GWPCH_4$, Global warming potential for CH4.	21 as stated in the registered PoA and CPA DD and applied in the 1st monitoring period. In this monitoring period global warming potential for CH_4 is changed to 25 according to para. 66 of EB69 meeting report "the Board agreed that the second commitment period global warming potentials (GWPs) shall apply to all calculations of emissions reductions or removals achieved from 1 January 2013"/40/.
D_{CH4}, Conversion factor of m^3CH_4 to kilogram CH_4.	0.67
UF_b, Model correction factor to account for model uncertainties	0.94

Findings

Refer to **CAR-1** above.
As mentioned before, the two parameters" $FC_{BL,y}$" and "$FC_{PE,y}$" was fixed for the

	CPA included as ex-ante parameters. According to the approved PRC notified during this period, these two parameters are changed to monitored parameters, and the other parameters fixed ex ante or at renewal of crediting period keep the same as the 1st issuance submission and verified by BVC once more.
Conclusion	According to VVS Version 01.0/35/ and based on the verification team's local and sectorial knowledge, Bureau Veritas Certification verification team confirms that: 1. The monitoring has been carried out in accordance with the approved revised monitoring plan contained in the approved revised PoA-DD and each CPA-DDs/3/~/10/. 2. All the ex-ante parameters have been correctly mentioned and justified in section E.1 of the MR/1/ and applied in the ER calculation process/11/. The information of data and parameters fixed ex ante provided in the monitoring report/1/ is compliance with the approved revised PoA-DD and the included CPA-DDs/3/~/10/.

E.3.4.2. Data and parameters monitored

Means of verification

According to PS (version 01.0), VVS(version 01.0), sample standard/guideline and applied methodologies included the applied tools, the verification team reviewed the revised MR, approved revised PoA-PDD and included CPA-DDs, crosschecked against the other available data and documents, verified whether monitored parameters in accordance with all relevant applicable requirements in the PS; whether the MR list all data and parameters to be monitored, as required by the applied methodologies (AMS.I.I. and AMS.III.R.) and whether the data and parameters obtained in a reasonable way, whether the sample plan conducted accordingly, the source and the applied value of the monitored parameter is acceptable, whether the equipment used and calibrated according to the approved revised monitoring plan included in the revised PoA-DD and CPA-DDs, whether the parameters monitored explain the operational and management structure, responsibilities and institutional arrangement for data collection/archiving, QA/QC procedures.

The information flow and the values in the monitoring report were verified as follows:

Parameter	Value and Assessment
$FC_{BL,k,j}$, Annual consumption of baseline fossil fuel j (Tonnes of coal)	The value of this parameter is sourced from a representative sample survey of targeted households prior to the installation/commissioning conducted in June, 2010/52/. The mean value of $FC_{BL,k,j}$ is 0.987t. The relative error is 1.51% at the 95% confidence level. The value obtained 0.987t will multiply by 0.89 to account for uncertainties, i.e. 0.987t *0.89. As per paragraph 10(a) AMS I.I (version 04). The value is fixed ex ante in the whole crediting period of each CPA in the CPA-DD.
$FC_{m,j}$, Annual consumption of fossil fuel type j (physical units, mass/volume) by application m (Tonnes of coal)	As there is only coal as fossil fuel involved, the value of j is 1. Data has been collected via monitoring survey of targeted households after the installation/commissioning of the project equipment. The value obtained is multiplied by 1.12 to account for uncertainties. According to monitoring survey, the mean value is 0.025t. The relative error is 6.80% at the 95% confidence level. The value obtained 0.025t will multiply by 1.12 to account for uncertainties, i.e. 0.025t *1.12.
$N_{k,0}$, Number of thermal applications k commissioned.	The total number for the 87 CPAs of this monitoring period is 395,435, including: CPA Nb. SCHHBG-2010-001: 1,000; CPA Nb. SCHHBG-2013-073: 3,350; All other CPAs: 4,601 After the installation of the bio-digesters and biogas stoves, they have been inspected as acceptance testing (commissioning) for proper operation in compliance with specifications. The acceptance check date of each subsystem has been recorded.

	$N_{k,y}$, Proportion of $N_{k,0}$ that remain operating at year y (fraction).	Value: 100 In order to determine the number of systems operating in each CPA, CME have followed sampling approach as described above and randomly selected 200 households for interview. The information obtained from household interviews has been recorded in the form of questionnaire papers. Well trained survey staffs were in charge of collecting and recording the information from the questionnaire papers. The information collected by the survey staffs has been supplied to Chengdu Oasis Science & Technology Co., Ltd. (the CME) and data was transferred to automatic database system to determine the value of this parameter. BVC's verification team was provided with the Survey list of the 200 samples, the questionnaire papers filled by the households, and Table of checked and accepted documents. The verification team has also visited 85 of the households on a random sampling basis and interviewed the users. Based on the result of acceptance sampling, the monitoring records are deemed acceptable by BVC in accordance with the sampling standard.
	$N_{m,y}$, Number of thermal application m remaining in use in year y.	m refers to coal stove as there is only coal stove involved. 2898-0001: 1,000 2898-0073: 3,350 All other CPAs: 4,601 The total number for the 87 CPAs during this monitoring period is 395,435. Sampling monitoring survey with a sampling size determined following the latest guidelines and the applied methodologies. The CME inspects that the coal stoves remaining in use in year y, in compliance with the required maintenance procedures from the manufacturers annually during the crediting period. All 200 sampled households have coal stoves in use. Monitoring has been done through a statistically valid sample of the households where the systems are installed as per the relevant requirements for sampling in the latest standard for sampling and surveys using a 95% confidence interval and a 10% margin of error.
	t, Mean annual operation hours of the digesters.	In order to determine the mean annual operation hours of the digesters CME have followed sampling approach as described above and randomly selected 200 households for interview. Based on the result of acceptance sampling, the monitoring records of parameter t are deemed acceptable by BVC in accordance with the sampling standard.
	T, Mean annual temperature in city k. This parameter determines the emission factors of the existing manure management systems.	According to the approved revised PoA-DD/ and CPA-DDs, latest available official publication should be used. When the monitoring report is published on the UNFCCC website, Sichuan Statistical Yearbook 2015 which provided the annual average temperature for the year 2014 is the latest available source. **But the latest available official pubilication for the 2nd issuance request raised is the Sichuan Statistical Yearbook 2015**, Therefore, Mean annual temperature in the Sichuan Statistical Yearbook 2015 is used instead of Sichuan Statistical Yearbook 2014 in GSP MR. Value is: Bazhong: 17.8 Chengdu: 16.8 Dazhou: 18.4 Deyang: 17.5 Guang'an: 17.8 Guangyuan: 16.6 Kangding: 8.3 Leshan: 18.8 Luzhou: 18.5 Maerkang: 9.2

		Meishan: 18.4 Mianyang: 18.1 Nanchong: 18.9 Neijiang: 18.4 Panzhihua: 21.2 Suining: 18.2 Xichang: 17.9 Yaan: 17.3 Yibin: 19.2 Zigong: 19.1 Ziyang: 18.6
	$MCF_{j,k}$, Methane conversion factors for each manure management system j in climate region k.	The value is the methane conversion factor under different temperature. As the 395,435 households are distributed in 13 different cities, the methane conversion factor is different from each other due to different temperature. The value is available in the IPCC 2006 Guidelines for National Greenhouse Gas Inventories, Volume 4, Chapter 10, Table 10.17, in which, different temperature is corresponding different $MCF_{j,k}$ value. **As the mean annual temperature is updated to latest data of Y2015, this parameters values are updated accordingly.** The values for 13 cities are: Bazhong: 35 Chengdu: 32 Dazhou: 35 Deyang: 35 Guang'an: 35 Guangyuan: 32 Kangding: 17 Leshan: 39 Luzhou: 39 Maerkang: 17 Meishan: 35 Mianyang: 35 Nanchong: 39 Neijiang: 35 Panzhihua: 46 Suining: 35 Xichang: 35 Yaan: 32 Yibin: 39 Zigong: 39 Ziyang: 39
	$N_{LT,y}$, Annual average number of animals of type LT in year y (numbers).	In order to determine the average number of pigs in each household during this monitoring period, CME have followed sampling approach as described above and randomly selected 200 households for interview. The information obtained from household interviews has been recorded in the form of questionnaire papers. Well trained survey staffs were in charge of collecting and recording the information from the questionnaire papers. The information collected by the survey staffs has been supplied to Chengdu Oasis Science & Technology Co., Ltd. (the CME) and data was transferred to automatic database system to determine the value of this parameter. BVC's verification team was provided with the Survey list of the 200 samples, the questionnaire papers filled by the households, and Table of checked and accepted documents. The verification team has also visited 85 of these households on a random sampling basis and interviewed the users. A calculation on the reliability of the sample size was done by the verification team and confirmed that the sample size selected by the CME is reliable and conservative. Based on the result of acceptance sampling, the monitoring records are deemed acceptable by BVC in accordance with the sampling standard. Value is 4.30.

	$MS\%_{i,y}$, Fraction of manure handled in project animal manure management system i (i.e. digestion in the newly installed biogas digester)	The CPA only covers one animal manure management system, i.e. the newly built biogas digester. According to monitoring survey, all the manure generated has been fed into biogas digesters directly. The amount of pig manure fed into the biogas digesters is same to what the pig manure generated.
	Proper sludge application ratio, Land application of digestate from biogas digesters to avoid anaerobic digestion	In order to determine the proper sludge application ratio, CME have followed sampling approach as described above, the information obtained from household interviews has been recorded in the form of questionnaire papers. Well trained survey staffs were in charge of collecting and recording the information from the questionnaire papers. The information collected by the survey staffs has been supplied to Chengdu Oasis Science & Technology Co., Ltd. (the CME) and data was transferred to automatic database system to determine the value of this parameter. BVC's verification team was provided with the Survey list of the 200 samples, the questionnaire papers filled by the households, and Table of checked and accepted documents. The verification team has also visited 85 of these households on a random sampling basis and interviewed the users. A calculation on the reliability of the sample size was done by the verification team and confirmed that the sample size selected by the CME is reliable and conservative. Based on the result of acceptance sampling, the monitoring records are deemed acceptable by BVC in accordance with the sampling standard.
	$EF_{CO2,i,y}$, Emission Factor of raw coal	According to the registered PoA-DD and CPA-DDs, latest available official publication should be used. When the monitoring report is published on the UNFCCC website, latest data available is the official data from Chinese DNA. Therefore, Emission Factor of raw coal of Chinese DNA's Guideline of emission factors of Chinese grids 2015 is applied /47/.
	$NCV_{i,y}$, Net Calorific Value of raw coal	According to the registered PoA-DD and CPA-DDs, latest available official publication should be used. When the monitoring report is published on the UNFCCC website, latest data available is the official data from Chinese DNA. Therefore, Emission Factor of raw coal of Chinese DNA's Guideline of emission factors of Chinese grids 2015 is applied/47/.
Findings	**CAR-3:** The data sources of the parameters $EF_{CO2,i,y}$ and $NCV_{i,y}$ are not updated. *The data values of the two parameters are the same as the year before, and the data sources are updated to the latest Chinese DNA publication. BVC checked the data source link of the two parameters and confirms the CAR is closed.* **CL-3:** There is a new monitoring parameter $MS\%_{i,y}$ added, the change shall be clarified. *As per para 8 of AMS III.R (version 02), project emissions due to physical leakage of biogas digester is estimated using the method indicated in paragraph 13 of AMS-III.D Methane recovery in animal manure management systems. The parameter MS%i,y is used in the calculation of project emissions due to physical leakage of biogas digester as per AMS III.D. The monitoring parameter $MS\%_{i,y}$ is added in line with the monitoring requirements of AMS III.D and applied in the project emissions due to physical leakage of biogas digesters. BVC checked the methodology and confirm the added parameter is needed and reasonable, the CL is closed.* **As there are new parameters added according to the PRC which is conducted after the site visit inspection, all these monitoring parameters are verified as below:** 1. $FC_{BL,k,j,}$ this parameter is fixed ex ante as per paragraph 10(a) AMS I.I (version 04), its value is source from the sample survey conducted in June, 2010 before the PoA commission. BVC checked the survey questionnaires provided CME and crosschecked with purchase receipts submitted by households and	

	confirms the consistency. 2. $FC_{m,l,}$ is soured from the sample survey for the 4th monitoring period conducted in 2016. These data represent in the questionnaires provided to DoE during the site-visit period and checked by BVC already. Furthermore, the data is crosschecked with purchase receipts submitted by households, the difference between $FC_{BL,k,j}$ and $FC_{m,j}$ is cross-checked with biogas generation estimated in a conservative way per the national and data in public or literatures/53/by CME in updated MR. BVC checked the cross-check process and data source, confirm the difference between $FC_{BL,k,j}$ and $FC_{m,j}$ (850.43kg coal equivalent) is less than biogas generation estimated (1058.75kg coal equivalent). The difference of coal consumption is acceptable. 3. $N_{k,0}$, this parameter is strictly related to the household number contained in each CPAs. As the sample survey result for the 4th monitoring period shows 200 interviewed households' biogas stoves are all in operation and the random sample conducted by DoE during the site visit period supports the result. Furthermore, BVC checked the acceptance check date provided by CDM and conclude the value for the parameter. 4. $N_{k,y}$, this parameter is strictly related to the household number contained in each CPAs. As the sample survey result for the 4th monitoring period shows 200 interviewed households' biogas stoves are all in operation and the random sample conducted by DoE during the site visit period supports the result. Thus, the value is reasonable. 5. $N_{m,y}$, there is only one thermal application (coal stove) in the PoA. As the sample survey result for the 4th monitoring period shows 200 interviewed households' biogas stoves are all in operation and the random sample conducted by DoE during the site visit period supports the result. All the household need the coal stove in winter when the biogas is less due to low temperature. Thus, the value is reasonable. No site-visit needed more again. 6. $MS\%_{i,y}$, The CPA only covers one animal manure management system, i.e. the newly built biogas digester. According to monitoring survey, all the manure generated has been fed into biogas digesters directly. BVC checked the survey questionnaires and confirms the consistency, and the random sample conducted by DoE during the site visit period supports the result. No site-visit needed more again.
Conclusion	Therefore, based on the document review and onsite verification, according to VVS Version 01.0 para 345 to 349/35/ and based on the verification team's local and sectorial knowledge, Bureau Veritas Certification verification team confirms that: 1. Although the applied methodology AMS-I.C. is changed to AMS-I.I., the monitoring parameters keep almost the same as the 1st issuance request raised, except the two parameters switched from fixed ante parameters (which is the reason for the methodology change), the two new parameters $n_{k,y}$ and $n_{m,y}$ added according to AMS-I.I.. 2. The monitoring has been carried out in accordance with the approved revised monitoring plan contained in the approved revised PoA-DD and each CPA-DDs/3/~/10/. 3. the data generation of the parameters above is reliable and the procedures applied by the CME are appropriate. The data management of parameters above (data aggregation, data recording and data values) is considered to be appropriate. The QA/QC of the parameters was established according to the registered CPA-DDs and applied methodologies (including tools).

E.3.4.3. Implementation of sampling plan

Means of verification	According to the latest version of VVS when the sample conducted, sample standard/guideline and applied methodologies included the applied tools, a single sample was drawn for all 87 included CPAs for this monitoring period in the PoA level by the CME from the monitoring database in line with the Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities (hereafter can be referred to as the "sampling guideline"). Although the applied methodologies updated, confidence/precision of 90/10 is also acceptable for sampling. **CL-4**: Specify how the sample efforts and surveys conducted in 2016 related to the compliance of the registered sampling plan before PRC is validity to the approved

revised sampling plan after PRC according to changed methodology, especially the data of coal consumption ($FC_{BL,k,j}$ and $FC_{m,j}$).

1. *According to the related sampling guideline and standard, the applied guideline after PRC keeps the same version as PRC before, the revision to applied sample standard (version 07.0, issued EB 94, Annex 2) has no effect to the PoA sample conducted in 2016 according to sample standard (version 05.0, issued EB 86, Annex 3). The sampling approach and procedure, the sampling requirements as per the sampling standard (95% confidence level/ 10% precision error) and the targeted population are same, regardless of before or after PRC. All of these issues are not affected by the sampling standard applied during the survey period or the latest sampling standard.*
2. *For the data source and validity of each parameter. As there is a Gold Standard PoA(GS1239) combined the CDM PoA, the questionnaires for sample survey conducted each year included the all necessary information for the two PoA, such as the coal consumption, operation hours, pig numbers and others, thus the sample survey conducted in 2016 can be used after PRC.*

BVC checked the related sampling guideline and standard[/41//42/], focused on the revisions during the PRC period, the sampling approach and procedure, the sampling requirements as per the sampling guideline and the sample size calculation against the sample survey materials provided by CME and confirm the sampling approach for the determination of data and parameters monitored can be used after the PRC approval and the 4th monitoring period of approved revised PoA. Although the AMS-I.C. is changed to AMS-I.I, the CME has provide a complete and transparent description of the sampling activities as PRC before. Via checking the parameters one by one, comparing the data in previous MR before PRC and the inspection findings during the site-visit (refer to E.3.3), furthermore added telephone interview the households after PRC, BVC confirms the sampling efforts and surveys comply with the validated sampling plan in accordance with applicable verification requirements related to the compliance of monitoring activities with the registered monitoring plan in the VVS. The validity of the two important parameters $FC_{BL,k,j}$ and $F_{Cm,j}$ is accepted.

According to the Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities, confidence/precision of 95/10 should be applied when the sampling plan covered a group of CPAs. For this PoA, confidence/precision is 95/10.

According to the sample plan contained in the MR and approved revised PoA-DD and included CPA-DDs, an initial survey is conducted to estimate the population parameter S^2 and $\bar{Y}$. Based on the population characters, the initial sample size was corrected according to the size of target population and then be corrected Respond Rate r_R (initially 90%). In case, the survey covers more than one expected parameters, conservatively, sample size should not be less than the maximum calculated sample size of those indicators.

Reliability Analysis:

In the monitoring report and relevant parameters were monitored and recorded. Reliability of the sample result was calculated by the CME. For the operation hours (t), calculated precision is 0.58%. For the annual average number of pigs ($N_{LT,y}$), calculated precision is 5.31%. For the annual consumption of fossil fuel type j coal (physical units, mass/volume) by application m ($FC_{m,j}$) the precision is calculated as 6.8%. All of them are below 10% of precision under 95% confidence level. As the percentage of sludge application rate and rate of digesters still in operation ($N_{k,y}$) is 100% during sampling survey, standard error is zero. Therefore, the sample result is reliable.

The verification team reviewed the MR, PoA-PDD and included CPA-DDs, the other available data and documents such as the Survey list of the 200 samples, the questionnaire papers filled by the households, and Table of checked and accepted documents. Crosschecked with the inspection during the on-site period, including 85 random households visit. Verified whether the sample plan is reasonable to conduct and the implementation and results of the sample survey can be accepted.

Acceptance of Sampling

Using own professional judgement, it is assumed that the Acceptable Quality Level (AQL) is 1% and the Unacceptable Quality Level (UQL) is 10% for this PoA. The

maximum error of producer's risk and consumer's risk is assumed at 5%, in compliance with the Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities (hereafter referred to as the "sampling standard"). Based on these assumptions, BVC refers to the sampling standard and sampling guideline and found that sample size should be not less than 61 and acceptance number is 2. During on-site visit, 85 households (total sample size by BVC) were chosen by the verification team randomly to check the correctness of sampling size and data that need to be monitored. This is considered to be a good practice.

Parameter	Number of samples in MR	Number of samples by BVC	Acceptance number	Discrepant records	Acceptable or not
Number of systems operating in each CPA ($N_{k,y}$)	200	85	2	0	Yes
Mean annual operation hours of the digesters (t)	200	85	2	0	Yes
Annual average number of animals of type LT in year y ($N_{LT,y}$)	200	85	2	1	Yes
Proper sludge application ratio	200	85	2	0	Yes

As per the above table, for the parameter "number of systems operating in each CPA (N_k)", "proper sludge application ratio" and "Mean annual operation hours of the digesters (t)", result of CME's is consistent in the samples verified (cross-checked) by BVC. For the parameter "Annual average number of animals of type LT in year y ($N_{LT,y}$)", only 1 minor discrepancies are found as table shown below.

Parameter	Serial No. of Household	Result from CME	Result from BVC
Annual average number of animals of type LT in year y ($N_{LT,y}$)	S101156	5.0	5.17

BVC observed that the number of discrepant records is less than the acceptance number. Therefore, in accordance with the sampling standard, BVC is able to confirm that the sample size and sampling result is acceptable.

As there are new parameters added according to the PRC which is conducted after the site visit inspection, all these monitoring parameters are verified as below:

7. $FC_{BL,k,j,}$ this parameter is fixed ex ante as per paragraph 10(a) AMS I.I (version 04), its value is source from the sample survey conducted in June, 2010 before the PoA commission. BVC checked the survey questionnaires provided CME and purchase receipts submitted by households according to AMS-I.I./34/, and confirms the consistency. Telephone interview to biogas households and no site-visit needed more again.
8. $FC_{m,l,}$ is soured from the sample survey for the 4th monitoring period conducted in 2016. These data represent in the questionnaires provided to DoE during the site-visit period and checked by BVC already. Furthermore, the difference between $FC_{BL,k,j}$ and $FC_{m,j}$ is cross-checked with biogas generation estimated in a conservative way per the national and data in public or literatures/53/. BVC checked the cross-check process and data source, confirm the difference between $FC_{BL,k,j}$ and $FC_{m,j}$ (850.43kg coal equivalent) is less than biogas generation estimated (1058.75kg coal equivalent). The difference of coal consumption is acceptable. Telephone interview to biogas households and no site-visit needed more again.
9. $N_{k,0}$, this parameter is strictly related to the household number contained in each CPAs. As the sample survey result for the 4th monitoring period shows 200 interviewed households' biogas stoves are all in operation and the random sample conducted by DoE during the site visit period supports the result. Furthmore, BVC checked the acceptance check date provided by CDM and conclude the value for the parameter. No site-visit needed more again.
10. $N_{k,y}$, this parameter is strictly related to the household number contained in each CPAs. As the sample survey result for the 4th monitoring period shows 200 interviewed households' biogas stoves are all in operation and the random sample conducted by DoE during the site visit period supports the result. Thus,

	the value is reasonable. No site-visit needed more again. 11. $N_{m,y}$, there is only one thermal application (coal stove) in the PoA. As the sample survey result for the 4th monitoring period shows 200 interviewed households' biogas stoves are all in operation and the random sample conducted by DoE during the site visit period supports the result. All the household need the coal stove in winter when the biogas is less due to low temperature. Thus, the value is reasonable. No site-visit needed more again. 12. $MS\%_{i,y}$, The CPA only covers one animal manure management system, i.e. the newly built biogas digester. According to monitoring survey, all the manure generated has been fed into biogas digesters directly. BVC checked the survey questionnaires and confirms the consistency, and the random sample conducted by DoE during the site visit period supports the result. No site-visit needed more again.
Findings	There is no CAR/CL raised in this section.
Conclusion	According to latest version of Guidelines: Sampling and surveys for CDM project activities and programmes of activities/41/ and Standard: Standard for sampling and surveys for CDM project activities and Programme of Activities/42/, and based on the verification team's local and sectorial knowledge, Bureau Veritas Certification verification team confirms that the sampling approach applied by the CME is in accordance with the registered PoA-DD and the CPA-DDs/3/~/10/ including the. The sample plan is reasonable to conduct and the implementation is well performed and results of the sample survey can be accepted. The implementation of sample plan is in line with the VVS (version 01.0)/35/, sample standard/guideline/41//42/ and applied methodologies/34/ included the applied tools.

E.3.4.4. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	According to para 350 to 356, VVS (version 01.0), The DOE shall determine whether the calibration of the measuring equipment that has an impact on the claimed GHG emission reductions or net anthropogenic GHG removals is conducted by the coordinating/managing entity at a frequency specified in the applied methodologies, the applied standardized baselines and/or the registered monitoring plan. As there is no measuring equipment stated in the approved revised PoA-DD and included CPA-DDs, all the parameters values are applied default values or public data or calculated based on sample survey results, thus this compliance requirement is not applicable of the PoA.
Findings	N/A
Conclusion	N/A

E.3.5. Assessment of data and calculation of emission reductions or net removals

E.3.5.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	According to VVS (version 01.0), a complete set of data for the specified monitoring period is verified. Information provided in the monitoring report has been cross-checked with other sources such as inventories and purchase records. Calculations of baseline GHG emissions have been verified whether carried out in accordance with the formulae and methods described in the approved revised monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Whether the appropriate emission factor, IPCC default values, GWP and other reference values have been correctly applied. The correctness of information provided in the monitoring report has been verified by cross checks with Survey list of the 200 samples, Questionnaire paper that filled by the investigated households, Table of checked and accepted documents for all constructed biogas digesters signed by local authority, Sichuan Statistical Yearbook 2016, IPCC default value, and Chinese DNA's Guideline of emission factors of Chinese grids 2015. There are two parts of the baseline emissions, baseline emissions from an existing animal manure management system and baseline emissions due to the reduction of coal consumption. - The baseline emissions from an existing animal manure management system can be calculated as formula below :

	$$BE_{CH_4,y} = GWP_{CH_4} \cdot D_{CH_4} \cdot UF_b \cdot \sum_{j,LT} MCF_j \cdot B_{0,LT} \cdot N_{LT,y} \cdot VS_{LT,y} \cdot MS\%_{Bl,j}$$ For the specific calculation of baseline emissions of each CPA within this monitoring period, the result of equation above is multiplied with three factors: Time: To account for the length of the monitoring period, the length of the monitoring period in days divided by 365 is applied as a factor. For CPA 2898-0001, CPAs 2898-0002 to 2898-0073, the factor is 365/365 = 1. For CPA 2898-0074 to 2898-0087, the factor is 334/365 = 0.915. Households with proper sludge application: To exclude households without proper sludge application, the baseline emissions are multiplied with the monitoring parameter "Proper Sludge Application". Number of households: Multiplying the baseline emissions per household with the number of households in the CPA leads to the baseline emissions in the entire CPA. - The baseline emissions due to coal replacement can be calculated as formula below $$BE_{CO_2,y} = \sum_k \sum_j N_{k,0} * n_{k,y} * FC_{BL,k,j} * NCV_j * EF_{FF,j}$$
Findings	There is no CAR/CL raised in this section.
Conclusion	According to Para. 357 to 359 of VVS Version 01.0[/35/], the verification checked and recalculated the ER calculation sheet and confirms that: 1. A complete set of data for the specified monitoring period was available and is duly reported. 2. As indicated above, the description with regard to cross-check of reported data is included under respective parameter. 3. Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals were followed. 4. Appropriate emission factors, IPCC default factors and other reference values were correctly applied. 5. Appropriate emission factor[/47/], IPCC default values[/48/], GWPs and other reference values have been correctly applied. 6. The sheet is reproducible and calculation was correctly applied. The confirmed value of baseline emissions is 860,039 tCO_2e.

E.3.5.2. Calculation of project GHG emissions or actual net GHG removals by sinks

Means of verification	According to VVS (version 01.0), a complete set of data for the specified monitoring period is verified. Information provided in the monitoring report has been cross-checked with other sources such as inventories and purchase records. Calculations of baseline GHG emissions have been verified whether carried out in accordance with the formulae and methods described in the approved revised monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Whether the appropriate emission factor, IPCC default values, GWP and other reference values have been correctly applied. The correctness of information provided in the monitoring report has been verified by cross checks with Survey list of the 200 samples, Questionnaire paper that filled by the investigated households, Table of checked and accepted documents for all constructed biogas digesters signed by local authority, Sichuan Statistical Yearbook 2016, IPCC default value, and Chinese DNA's Guideline of emission factors of Chinese grids 2015. - the following equation is applied to calculate the project emissions from physical leakage: $$PE_{CH_4,y} = 0.10 \cdot GWP_{CH_4} \cdot D_{CH_4} \cdot \sum_{i,LT} B_{0,LT} \cdot N_{LT,y} \cdot VS_{LT,y} \cdot MS\%_{i,y}$$ For the specific calculation of project emissions of each CPA within this monitoring period, the result of equation above is multiplied with two factors: Time: To account for the length of the monitoring period, the length of the

	monitoring period in days divided by 365 is applied as a factor. For CPA 2898-0001, CPAs 2898-0002 to 2898-0073, the factor is 365/365 = 1. For CPA 2898-0074 to 2898-0087, the factor is 334/365 = 0.915. Households with proper sludge application: To exclude households without proper sludge application, the project emissions are multiplied with the monitoring parameter "Proper Sludge Application". - For the project emissions from coal consumption are calculated using formula below: $PE_{CO_2,y} = \sum_m \sum_j N_{m,y} * FC_{m,j} * NCV_j * EF_{FF,j}$
Findings	There is no CAR/CL raised in this section.
Conclusion	According to Para. 357 to 359 of VVS Version 01.0[/35/], the verification checked and recalculated the ER calculation sheet and confirms that: 1. A complete set of data for the specified monitoring period was available and is duly reported. 2. As indicated above, the description with regard to cross-check of reported data is included under respective parameter. 3. Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals were followed. 4. Appropriate emission factors, IPCC default factors and other reference values were correctly applied. 5. Appropriate emission factor[/47/], IPCC default values[/48/], GWPs and other reference values have been correctly applied. 6. The sheet is reproducible and calculation was correctly applied. The confirmed value of baseline emissions is 111,536 tCO_2e.

E.3.5.3. Calculation of leakage GHG emissions

Means of verification	Calculations of leakage GHG emissions have been verified whether carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline.
Findings	N/A
Conclusion	According to the approved revised PoA-DD and the CPA-DDs, the leakage emissions of this PoA and its CPAs are considered 0.

E.3.5.4. Summary of calculation of GHG emission reductions or net GHG removals by sinks

Means of verification	According to VVS (version 01.0), a complete set of data for the specified monitoring period is verified. Information provided in the monitoring report has been cross-checked with other sources such as inventories and purchase records. Calculations of baseline GHG emissions have been verified whether carried out in accordance with the formulae and methods described in the approved revised monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Whether the appropriate emission factor, IPCC default values, GWP and other reference values have been correctly applied. The correctness of information provided in the monitoring report has been verified by cross checks with Survey list of the 200 samples, Questionnaire paper that filled by the investigated households, Table of checked and accepted documents for all constructed biogas digesters signed by local authority, Sichuan Statistical Yearbook 2016, IPCC default value, and Chinese DNA's Guideline of emission factors of Chinese grids 2015. There are two parts of the emission reductions, emission reductions from an existing animal manure management system and emission reductions due to the coal replacement. The equations to calculate the emission reductions are listed as follow:

	$ER_{CH4,y} = BE_{CH4,y} - PE_{CH4,y} - Leakage$ $ER_{CO2,y} = BE_{CO2,y} - PE_{CO2,y} - Leakage$ $ER_y = ER_{CH4,y} + ER_{CO2,y}$
Findings	There is no CAR/CL raised in this section.
Conclusion	According to Para. 357 to 359 of VVS Version 01.0[/35/], the verification checked and recalculated the ER calculation sheet and confirms that: 1. A complete set of data for the specified monitoring period was available and is duly reported. 2. As indicated above, the description with regard to cross-check of reported data is included under respective parameter. 3. Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals were followed. 4. Appropriate emission factors, IPCC default factors and other reference values were correctly applied. 5. Appropriate emission factor[/47/], IPCC default values[/48/], GWPs and other reference values have been correctly applied. The sheet is reproducible and calculation was correctly applied. The confirmed value of baseline emissions is 748,503 tCO_2e.

CPA UNFCCC reference number	Baseline GHG emissions or baseline net GHG removals (t CO_2e)	Project GHG emissions or actual net GHG removals (t CO_2e)	Leakage GHG emissions (t CO_2e)	GHG emission reductions or net anthropogenic GHG removals (t CO_2e)		
				Before 01/01/2013	From 01/01/2013	Total amount
2898-0001	2,265	286	0	0	1,979	1,979
2898-0002	10,423	1,316	0	0	9,107	9,107
2898-0003	10,423	1,316	0	0	9,107	9,107
2898-0004	10,423	1,316	0	0	9,107	9,107
2898-0005	10,423	1,316	0	0	9,107	9,107
2898-0006	10,423	1,316	0	0	9,107	9,107
2898-0007	10,423	1,316	0	0	9,107	9,107
2898-0008	10,423	1,316	0	0	9,107	9,107
2898-0009	10,423	1,316	0	0	9,107	9,107
2898-0010	10,423	1,316	0	0	9,107	9,107
2898-0011	10,028	1,316	0	0	8,712	8,712
2898-0012	10,028	1,316	0	0	8,712	8,712
2898-0013	10,028	1,316	0	0	8,712	8,712
2898-0014	10,028	1,316	0	0	8,712	8,712
2898-0015	10,028	1,316	0	0	8,712	8,712
2898-0016	10,028	1,316	0	0	8,712	8,712
2898-0017	10,028	1,316	0	0	8,712	8,712
2898-0018	10,028	1,316	0	0	8,712	8,712
2898-0019	10,028	1,316	0	0	8,712	8,712
2898-0020	10,028	1,316	0	0	8,712	8,712
2898-0021	10,028	1,316	0	0	8,712	8,712
2898-0022	10,028	1,316	0	0	8,712	8,712
2898-0023	10,028	1,316	0	0	8,712	8,712

CPA UNFCCC reference number	Baseline GHG emissions or baseline net GHG removals (t CO_2e)	Project GHG emissions or actual net GHG removals (t CO_2e)	Leakage GHG emissions (t CO_2e)	GHG emission reductions or net anthropogenic GHG removals (t CO_2e)		
				Before 01/01/2013	From 01/01/2013	Total amount
2898-0024	10,028	1,316	0	0	8,712	8,712
2898-0025	10,028	1,316	0	0	8,712	8,712
2898-0026	10,028	1,316	0	0	8,712	8,712
2898-0027	10,028	1,316	0	0	8,712	8,712
2898-0028	10,028	1,316	0	0	8,712	8,712
2898-0029	10,028	1,316	0	0	8,712	8,712
2898-0030	10,028	1,316	0	0	8,712	8,712
2898-0031	10,028	1,316	0	0	8,712	8,712
2898-0032	10,028	1,316	0	0	8,712	8,712
2898-0033	10,028	1,316	0	0	8,712	8,712
2898-0034	10,028	1,316	0	0	8,712	8,712
2898-0035	10,028	1,316	0	0	8,712	8,712
2898-0036	10,423	1,316	0	0	9,107	9,107
2898-0037	10,423	1,316	0	0	9,107	9,107
2898-0038	10,423	1,316	0	0	9,107	9,107
2898-0039	10,423	1,316	0	0	9,107	9,107
2898-0040	10,423	1,316	0	0	9,107	9,107
2898-0041	10,423	1,316	0	0	9,107	9,107
2898-0042	10,028	1,316	0	0	8,712	8,712
2898-0043	10,028	1,316	0	0	8,712	8,712
2898-0044	10,028	1,316	0	0	8,712	8,712
2898-0045	10,028	1,316	0	0	8,712	8,712
2898-0046	10,028	1,316	0	0	8,712	8,712
2898-0047	10,423	1,316	0	0	9,107	9,107
2898-0048	10,423	1,316	0	0	9,107	9,107
2898-0049	10,423	1,316	0	0	9,107	9,107
2898-0050	10,423	1,316	0	0	9,107	9,107
2898-0051	10,423	1,316	0	0	9,107	9,107
2898-0052	8,765	1,316	0	0	7,449	7,449
2898-0053	10,105	1,316	0	0	8,789	8,789
2898-0054	10,423	1,316	0	0	9,107	9,107
2898-0055	10,028	1,316	0	0	8,712	8,712
2898-0056	10,028	1,316	0	0	8,712	8,712
2898-0057	10,028	1,316	0	0	8,712	8,712
2898-0058	10,028	1,316	0	0	8,712	8,712
2898-0059	10,028	1,316	0	0	8,712	8,712

CPA UNFCCC reference number	Baseline GHG emissions or baseline net GHG removals (t CO_2e)	Project GHG emissions or actual net GHG removals (t CO_2e)	Leakage GHG emissions (t CO_2e)	GHG emission reductions or net anthropogenic GHG removals (t CO_2e)		
				Before 01/01/2013	From 01/01/2013	Total amount
2898-0060	10,028	1,316	0	0	8,712	8,712
2898-0061	10,028	1,316	0	0	8,712	8,712
2898-0062	10,028	1,316	0	0	8,712	8,712
2898-0063	10,028	1,316	0	0	8,712	8,712
2898-0064	10,028	1,316	0	0	8,712	8,712
2898-0065	10,423	1,316	0	0	9,107	9,107
2898-0066	10,423	1,316	0	0	9,107	9,107
2898-0067	10,028	1,316	0	0	8,712	8,712
2898-0068	10,076	1,316	0	0	8,760	8,760
2898-0069	10,028	1,316	0	0	8,712	8,712
2898-0070	10,028	1,316	0	0	8,712	8,712
2898-0071	10,042	1,316	0	0	8,726	8,726
2898-0072	10,423	1,316	0	0	9,107	9,107
2898-0073	7,589	958	0	0	6,631	6,631
2898-0074	9,538	1,204	0	0	8,334	8,334
2898-0075	9,176	1,204	0	0	7,972	7,972
2898-0076	9,176	1,204	0	0	7,972	7,972
2898-0077	9,538	1,204	0	0	8,334	8,334
2898-0078	9,538	1,204	0	0	8,334	8,334
2898-0079	9,176	1,204	0	0	7,972	7,972
2898-0080	9,176	1,204	0	0	7,972	7,972
2898-0081	9,538	1,204	0	0	8,334	8,334
2898-0082	8,200	1,204	0	0	6,996	6,996
2898-0083	9,197	1,204	0	0	7,993	7,993
2898-0084	9,538	1,204	0	0	8,334	8,334
2898-0085	9,261	1,204	0	0	8,057	8,057
2898-0086	9,251	1,204	0	0	8,047	8,047
2898-0087	9,538	1,204	0	0	8,334	8,334
Total	860,039	111,536	0	0	748,503	748,503

E.3.5.5. Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA

Means of verification	Compared the monitoring report with the approved revised CPA-DDs and PoA-DD, and found the actual value achieved during this monitoring period is 748,503tCO_2e, which is 13.37% less than values (864,019tCO_2e) estimated according to the registered PoA-DD and CPA-DDs.
Findings	There is no CAR/CL raised in this section.
Conclusion	Although the higher value for GWP_{CH4} is applied in this monitoring period, the actual value is less than the estimated value in approved revised PoA-DD and

	CPA-DDs due the methodology change.

Title and UNFCCC reference number of the CPA	Value estimated in ex ante calculation in the included CPA-DD(s)	Actual values achieved by the CPAs during this monitoring period
2898-0001	2,282[2]	1,979
2898-0002	10,502	9,107
2898-0003	10,502	9,107
2898-0004	10,502	9,107
2898-0005	10,502	9,107
2898-0006	10,502	9,107
2898-0007	10,502	9,107
2898-0008	10,502	9,107
2898-0009	10,502	9,107
2898-0010	10,502	9,107
2898-0011	10,061	8,712
2898-0012	10,061	8,712
2898-0013	10,061	8,712
2898-0014	10,061	8,712
2898-0015	10,061	8,712
2898-0016	10,061	8,712
2898-0017	10,061	8,712
2898-0018	10,061	8,712
2898-0019	10,061	8,712
2898-0020	10,061	8,712
2898-0021	10,061	8,712
2898-0022	10,061	8,712
2898-0023	10,061	8,712
2898-0024	10,061	8,712
2898-0025	10,061	8,712
2898-0026	10,061	8,712
2898-0027	10,061	8,712
2898-0028	10,061	8,712
2898-0029	10,061	8,712
2898-0030	10,061	8,712
2898-0031	10,061	8,712
2898-0032	10,061	8,712
2898-0033	10,061	8,712
2898-0034	10,061	8,712
2898-0035	10,061	8,712
2898-0036	10,502	9,107
2898-0037	10,502	9,107
2898-0038	10,502	9,107
2898-0039	10,502	9,107

[2] For the value estimated ex ante calculation in the included CPA-DDs, it's calculated based on the days in the monitoring period multiplied by the ex-ante ER value in the registered CPA-DDs. Please refer to the ER calculation sheet and the registered CPA-DDs

Title and UNFCCC reference number of the CPA	Value estimated in ex ante calculation in the included CPA-DD(s)	Actual values achieved by the CPAs during this monitoring period
2898-0040	10,502	9,107
2898-0041	10,502	9,107
2898-0042	10,061	8,712
2898-0043	10,061	8,712
2898-0044	10,061	8,712
2898-0045	10,061	8,712
2898-0046	10,061	8,712
2898-0047	10,502	9,107
2898-0048	10,502	9,107
2898-0049	10,502	9,107
2898-0050	10,502	9,107
2898-0051	10,502	9,107
2898-0052	8,654	7,449
2898-0053	10,147	8,789
2898-0054	10,502	9,107
2898-0055	10,061	8,712
2898-0056	10,061	8,712
2898-0057	10,061	8,712
2898-0058	10,061	8,712
2898-0059	10,061	8,712
2898-0060	10,061	8,712
2898-0061	10,061	8,712
2898-0062	10,061	8,712
2898-0063	10,061	8,712
2898-0064	10,061	8,712
2898-0065	10,502	9,107
2898-0066	10,502	9,107
2898-0067	10,061	8,712
2898-0068	10,114	8,760
2898-0069	10,061	8,712
2898-0070	10,061	8,712
2898-0071	10,077	8,726
2898-0072	10,502	9,107
2898-0073	7,646	6,631
2898-0074	9,610	8,334
2898-0075	9,207	7,972
2898-0076	9,207	7,972
2898-0077	9,610	8,334
2898-0078	9,610	8,334
2898-0079	9,207	7,972
2898-0080	9,207	7,972
2898-0081	9,610	8,334
2898-0082	8,119	6,996
2898-0083	9,230	7,993

Title and UNFCCC reference number of the CPA	Value estimated in ex ante calculation in the included CPA-DD(s)	Actual values achieved by the CPAs during this monitoring period
2898-0084	9,610	8,334
2898-0085	9,301	8,057
2898-0086	9,290	8,047
2898-0087	9,610	8,334
Total	**864,019**	**748,503**

E.3.5.6. Remarks on difference from estimated value in included CPA

Means of verification	Compared the monitoring report with the approved revised CPA-DDs and PoA-DD, and found the actual value achieved during this monitoring period is 748,503tCO_2e, which is 13.37% less than values (864,019tCO_2e) estimated according to the registered PoA-DD and CPA-DDs.
Findings	There is no CAR/CL raised in this section.
Conclusion	Although the higher value for GWP_{CH4} is applied in this monitoring period, the actual value is less than the estimated value in approved revised PoA-DD and CPA-DDs due the methodology change.

E.3.6. Assessment of reported sustainable development co-benefits

Means of verification	According to para 360 to 362 of VVS 01.0, BVC checked the approved revised PoA-DD, CPA-DDs and the Sustainable Development Co-benefits Description Report of the PoA, the document separately from the monitoring plan to monitor sustainable development co-benefits of the CDM PoA, including the frequency of reporting of monitoring results. As the PoA is also registered as Gold Standard PoA (GS1239) in the same time, thus the sustainable development co-benefits monitoring report is conducted strictly following the registered GS-PoA monitoring plan.
Findings	There is no CAR/CL raised in this section.
Conclusion	The sustainable development co-benefits monitoring is conducted well according to para 68 of PS-PoA 01.0 .

E.3.7. Global stakeholder consultation

Means of verification	According to para 369 and 370 of VVS 01.0, there is no comments received, thus it is not applicable.
Findings	N/A
Conclusion	N/A

SECTION F. Internal quality control

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The verification report underwent an Internal Technical Review (ITR) before requesting issuance of CERs for the programme activity.

The ITR is an independent process performed to examine thoroughly that the process of verification has been carried out in conformance with the requirements of the verification scheme as well as internal Bureau Veritas Certification procedures.

The Team Leader provides a copy of the verification report to the reviewer, including any necessary verification documentation. The reviewer reviews the submitted documentation for conformance with the verification scheme. This will be a comprehensive review of all documentation generated during the verification process.

When performing an Internal Technical Review, the reviewer ensures that:

- The verification activity has been performed by the team by exercising utmost diligence and complete adherence to the CDM rules and requirements.
- The review encompasses all aspects related to the project which includes project design, baseline, additionality, monitoring plans and emission reduction calculations, internal quality assurance systems of the project participant as well as the programme activity, review of the stakeholder comments and responses, closure of CARs, CLs and FARs during the verification exercise, review of sample documents.

The complete assessment prepared by the verification team is checked. The reviewer may raise Clarification Requests to the verification team and discusses these matters with Team Leader.
After the agreement of the responses on the Clarification Requests from the verification team as well as the PP(s), the finalized verification report is accepted for further processing such as uploading via the UNFCCC interface.

SECTION G. Verification opinion

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Bureau Veritas Certification has performed the 4th verification of the programme of activtiy: Sichuan Rural Poor-Household Biogas Development Programme, with regard to the relevant requirements for Programme of Activities and their Component Project Activities. The PoA reduces GHG emissions due to by facilitating the installation of a large number of household biogas digesters. During the programme activity, each household is equipped with a household biogas digester that will treat the manure anaerobically and recover the generated methane to be used for domestic cooking. After installation of the biogas systems, both sources of emissions will be reduced: No methane is emitted from the existing manure management systems, as the manure will be treated within the biogas digesters and furthermore, all recovered methane will be utilized for cooking to reduce the coal consumption of each household. This verification covers the period 01/01/2015 – 31/12/2015 (including both days).

The verification consisted of the following three phases: i) desk review of the project design, the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion.

Bureau Veritas Certification conducted the verification on the basis of the monitoring methodologies; the monitoring plan included in the PoA-DD and CPA-DDs and the monitoring report of version 2.1, dated 23/12/2017. The verification included:

i. Checking whether the design of the PoA and its CPAs is implemented and installed as planned and described in the approved revised /included design documents;

ii. Checking whether the provisions of the monitoring methodologies and the monitoring plan in the CPA-DDs were consistently and appropriately applied;

iii. The collection of evidence supporting the reported data.

BVC's verification approach draws on an understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. BVC planned and performed the verification by obtaining evidence and other information and explanations that BVC considers necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.
Bureau Veritas Certification can confirm that the GHG emission reductions are calculated without material misstatements. Our opinion relates to the projects' GHG emissions and resulting GHG emission reductions reported and related to the validated and approved revised project baseline, monitoring plan and its associated documents. Based on the evidence and information that are considered necessary to guarantee that GHG emission reductions are appropriately calculated, Bureau Veritas Certification confirms the following certificate statement.

SECTION H. Certification statement

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Bureau Veritas Certification has performed the 4th periodic verification of Sichuan Rural Poor-Household Biogas Development Programme which is located in Sichuan Province, P.R. China, with the Registration No. 2898, and applying the methodologies AMS-I.I. Version 04 and AMS-III.R Version 02. The verification was performed based on the requirements set by the CDM and relevant guidance provided by CMP and the CDM Executive Board.

The verification consisted of the following three phases: i) desk review of the project design, the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion.

The management of Chengdu Oasis Science & Technology Co., Ltd. is responsible for the preparation of the GHG emissions data and the reported GHG emission reductions of the Project on the basis set out within the approved revised project Monitoring Plan contained in the approved revised PoA-DD and CPA-DDs. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission reductions from the Project is the responsibility of the management of the Project.

Bureau Veritas Certification verified the Monitoring Report version 2.1 dated 23/12/2017 for the reporting period as indicated below. Bureau Veritas Certification is able to confirm that the Project is implemented as planned and described in approved revised PoA-DD and CPA-DDs. The sample plan for data monitored completed reliably and appropriately.

Bureau Veritas Certification is able to confirm that the GHG emission reductions are calculated without material misstatements. Our opinion relates to the Project's GHG emissions and resulting GHG emission reductions reported and related to the valid and registered project baseline and approved monitoring plan, and its associated documents. Based on the verified amount of emission reductions stated in the verification report, Bureau Veritas Certification confirms the following statement:

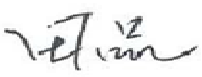
Reporting period: 01/01/2015 – 31/12/2015

Baseline emissions: 860,039 tCO_2 equivalents

Project emissions: 111,536 tCO_2 equivalents

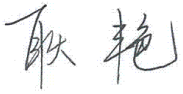
Leakage emissions: 0 tCO_2 equivalents

Emission Reductions: 748,503 tCO_2 equivalents



Mr. Tian Pin
Internal Technical Reviewer

31/12/2017



Ms. Geng Yan
Team Leader

31/12/2017

Appendix 1. Abbreviations

Abbreviations	Full texts
AQL	Acceptable Quality Level
BVC	Bureau Veritas Certification
BE	Baseline Emissions
Board	Executive Board of the clean development mechanism
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM-EB	CDM Executive Board (the board)
CER	Certified Emission Reductions
CH4	Methane
CL	Clarification Request
CME	Coordinating/Managing Entity
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
CMP	Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol
COP	Conference of the Parties
CPA	Component Project Activity
CPA-DD	Component project activity design document
DNA	Designated National Authority
DOE	Designated Operational Entity
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse Gas
GWP	Global Warming Potential
MoC	Modalities of communication
MoV	Means of Verification
MP	Monitoring Plan
MR	Monitoring Report
PE	Project Emission
PoA	Programme of Activities
PoA-DD	PoA Design Document
QA/QC	Quality Assurance / Quality Control
SREO	Sichuan Rural Energy Office
SS	Sectoral Scope
SSC	Small-scale
TA(s)	Technical Area(s)
UNFCCC	United Nations Framework Convention on Climate Change
UQL	Unacceptable Quality Level
VVS	Validation and Verification Standard

Appendix 2. Competence of team members and technical reviewers

Ms. Geng Yan	Bureau Veritas Certification, China	Team Leader, Climate Change Lead Verifier. She holds a Master Degree in Ecology and a bachelor degree in Forestry. She has 2 years of technical experience in CDM in P.R China before joining Bureau Veritas Certification. She obtained the certificate of CDM Lead Verifier and Lead Auditor for EMS ISO 14001. She has successfully completed the course assessment for the ISO 14064:2006. She is qualified for TA1.1, TA5.2, TA14.1, TA15.1

Mr. Wang Zhenning	Bureau Veritas Certification, China	He holds an MSc Degree in Environmental Technology and Bachelor Degree in Environmental Engineering. Before joining BV in 2010, he gained 4 years of technical experiences in waste management as a CDM consultant. He obtained the certificate of CDM Verifier and Lead Auditor for EMS ISO 14001. He is qualified for TA1.2, TA1.2, TA13.1, TA13.2, TA15.1
Mr. Pin Tian	Bureau Veritas Certification, China	Technical Reviewer, Climate Change Lead Verifier, He holds a MEng in Industrial Engineering. Before joining BV in 2009, he gained two years working experience in project management in various industrial sectors. He obtained the certificate of CDM Verifier, Lead Auditor for ISO 14001 and has successfully completed the course assessment for ISO 14064. He is qualified for TA1.1, TA1.2, TA8.1
pMr. Wang Zhifeng	External expert	Technical Specialist. He was engaged in study on forage cultivation and grassland ecology in the Jilin Academy of Agricultural Sciences (JAAS) from 1991 to 2012. He has lead or participated in more than 20 research projects including 12 nation level research projects, and he has received 7 awards for his research achievements, he has bred 2 new forage varieties, and he has published more than 25 specialty papers. He is qualified for TA13.2, TA15.1

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
/1/	Chengdu Oasis Science & Technology Co., Ltd.	Monitoring Report (the 4th monitoring period), including CPA Nb. SCHHBG-2010-001 to CPA Nb. SCHHBG-2014-087of Version 2.1, 23/12/2017, and the previous versions for the 4th monitoring period		CME
/2/	Chengdu Oasis Science & Technology Co., Ltd.	Monitoring Report for GSP of version 1.1, 27/06/2016	http://cdm.unfccc.int/ProgrammeOfActivities/poa_db/5BGM96VOK3ATN4JPR70XSWIQ8CZH2F/view	CME
/3/	Chengdu Oasis Science & Technology Co., Ltd.	Registered PoA-DD: Sichuan Rural Poor-Household Biogas Development Programme version 1.6, dated 03/04/2012	As Above	CME
/4/	Chengdu Oasis Science & Technology Co., Ltd.	Registered CPA-DD Generic: Sichuan Rural Poor- household Biogas Development Programme, CPA Nb. SCHHBG-20XX-XX, version 1.4, dated 03/04/2012	As Above	CME
/5/	Chengdu Oasis Science & Technology Co., Ltd.	Registered CPA-DD specific: Sichuan Rural Poor-Household Biogas Development Programme, CPA Nb. SCHHBG-2010-001, version 1.4, dated 03/04/2012	As Above	CME

No.	Author	Title	References to the document	Provider
/6/	Chengdu Oasis Science & Technology Co., Ltd.	Registered CPA-DD specific: CPA Nb. SCHHBG-2012-002 to CPA Nb. SCHHBG-2012-053, version 1.1, dated 09/04/2013	As Above	CME
/7/	Chengdu Oasis Science & Technology Co., Ltd.	Registered Revised CPA-DD specific (post-registration change): CPA Nb. SCHHBG-2012-002 to CPA Nb. SCHHBG-2012-053, version 1.2, dated 14/07/2013	As Above	CME
/8/	Chengdu Oasis Science & Technology Co., Ltd.	Registered CPA-DD specific: CPA Nb. SCHHBG-2013-054 to CPA Nb. SCHHBG-2013-073, version 1.2, dated 14/03/2014	As Above	CME
/9/	Chengdu Oasis Science & Technology Co., Ltd.	Registered CPA-DD specific: CPA Nb. SCHHBG-2014-074 to CPA Nb. SCHHBG-2014-087, version 1.3, dated 14/01/2015	As Above	CME
/10/	Chengdu Oasis Science & Technology Co., Ltd.	Apporved revised PoA-DD (version 2), revised CPA-DD Generic: Sichuan Rural Poor- household Biogas Development Programme, CPA Nb. SCHHBG-20XX-XX, version 1.5 and every CPA-DD specific: CPA Nb. SCHHBG-2010-001 to CPA Nb. SCHHBG-2014-087	As Above	CME
/11/	Chengdu Oasis Science & Technology Co., Ltd.	Emission Reduction Calculation spreadsheet Version 2.1, 23/12/2017	As Above	CME
/12/	Chengdu Oasis Science & Technology Co., Ltd.	Sample size calculation spreadsheet, version 01, dated 27/06/2016	As Above	CME
/13/	Chengdu Oasis Science & Technology Co., Ltd.	Survey list of the 200 samples, version 1.0, May 2016	As Above	CME
/14/	Chengdu Oasis Science & Technology Co., Ltd.	Questionnaire paper that filled by the investigated households;	As Above	CME
/15/	Chengdu Oasis Science & Technology Co., Ltd.	Table of checked and accepted documents for all constructed biogas digesters	As Above	CME
/16/	Chengdu Oasis Science & Technology Co., Ltd.	Sample of manual check and acceptance records of the included CPAs	As Above	CME
/17/	Chengdu Oasis Science & Technology Co., Ltd.	Training material copy and training records of the survey staff of this PoA	As Above	CME
/18/	Chengdu Oasis Science & Technology Co., Ltd.	CDM GHG Services Manual (incl. procedures and forms)	As Above	CME
/19/	Chengdu Oasis Science & Technology	Operation manual of data management system of the PoA	As Above	CME

No.	Author	Title	References to the document	Provider
	Co., Ltd.			
/20/	Standard	Standard list relevant for household biogas digesters in Sichuan province, e.g.: GB/T 3606-2001: Domestic Biogas Stove; GB/T 4570-2002: Collections of Standard Design Drawings of Household Anaerobic Digesters Etc.…	As Above	CME
/21/	Sichuan Rural Energy Office	Household list that included in each CPA (from CPA Nb. SCHHBG-2010-001 to CPA Nb. SCHHBG-2014-087)		Others
/22/	Sichuan Rural Energy Office	Statement on the number of household equipped with biogas digester in this PoA (from CPA Nb. SCHHBG-2010-001 to CPA Nb.SCHHBG-2014-087)		Others
/23/	Sichuan Rural Energy Office	Statement on the existing number of household equipped with biogas digester and the number of household included in each CPA		Others
/24/	TÜV NORD	Validation Report for CDM PoA Sichuan Rural Poor-Household Biogas Development Programme, version 01, dated 05/04/2012, issued by TÜV NORD	http://cdm.unfccc.int/ProgrammeOfActivities/poa_db/5BGM96VOK3ATN4JPR70XSWIQ8CZH2F/view	Others
/25/	TÜV NORD	Validation Report for CPA inclusion Sichuan Rural Poor-Household Biogas Development Programme, CPA Nb. SCHHBG-2010-001, version 01, dated 2012-04-05, issued by TÜV NORD	As Above	Others
/26/	TÜV NORD	CPA inclusion forms for CPA inclusion CPA Nb. SCHHBG-2012-002 to CPA Nb. SCHHBG-2012-053 dated 11/04/2013, issued by TÜV NORD	As Above	Others
/27/	TÜV NORD	Validation Reports for CPA inclusion Sichuan Rural Poor-Household Biogas Development Programme, CPA Nb. SCHHBG-2012-002 to CPA Nb. SCHHBG-2012-053, version 01, dated 10/04/2013	As Above	Others
/28/	TÜV NORD	Validation Reports for CPA inclusion Sichuan Rural Poor-Household Biogas Development Programme, CPA Nb. SCHHBG-2013-054 to CPA Nb. SCHHBG-2013-073, version 01, dated 20/03/2014	As Above	Others
/29/	TÜV NORD	Validation Reports for CPA inclusion Sichuan Rural Poor-Household Biogas Development Programme, CPA Nb. SCHHBG-2014-074 to CPA Nb. SCHHBG-2014-087, version 01, dated 14/01/2015	As Above	Others
/30/	GLC	Verification Report for the 1st monitoring period version 06 dated 26/08/2013, issued by GLC and 1st monitoring period monitoring report (version 1.4.1)	As Above	Others
/31/	GLC	Verification Report for the 2nd	As Above	Others

No.	Author	Title	References to the document	Provider
		monitoring period, version 05 dated 17/06/2014, issued by GLC and 2nd monitoring period monitoring report (version 2.1)		
/32/	BV	Verification Report for the 3rd monitoring period, version 01.2 dated 01/12/2015, issued by BVC and 3rd monitoring period monitoring report (version 1.2)	As Above	Others
/33/	GLC	Validation Opinion on Post-Registration Changes of Registered CDM PoA: Sichuan Rural Poor-Household Biogas Development Programme version 05, dated 26/08/2013 issued by GLC	As Above	Others
/34/	CDM Executive Board	Approved methodology: AMSI.I.: Biogas/biomass thermal applications for households/small users (version 04.0) (EB68, Annex 25) and AMS-III.R - Methane recovery in agricultural activities at household/small farm level (version 02) (EB59, Annex 4)	https://cdm.unfccc.int/methodologies/DB/3WJ6C7R0JFA62VYA2Z2K6WE1RK1PXI http://cdm.unfccc.int/methodologies/DB/JQHRMGL23TWZ081T6G7G1RZ63GM1BZ	Others
/35/	As above	Standard: CDM validation and verification standard for programmes of activities (version 01.0),01.0	EB93, Annex 8	Others
/36/	As above	Standard: CDM project standard for programmes of activities (version 01.0) dated 03/03/2017	EB93,Annex 7	Others
/37/	As above	Procedure: CDM project cycle procedure for programmes of activities (version 01.0), dated 03/03/2017	EB93,Annex 9	Others
/38/	As above	Monitoring Report Form for CDM programme of activities (F-CDM-MR), Version 02.0 dated 07/06/2017		Others
/39/	As above	Glossary CDM terms, version 9.1		Others
/40/	As above	Application of the global warming potentials to Clean Development Mechanism project activities and programme of activities for the second commitment period of the Kyoto Protocol	Para. 66 of EB69 meeting report	Others
/41/	As above	Guidelines for Sampling and Surveys for CDM Project Actives and Programme of Actives, version 4.0, 16/10/2015	EB 67, Annex 6	Others
/42/	As above	Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities, version 05.0, dated 16/10/2015 Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities, version 07.0, dated 40/20175	EB86, Annex 3 EB94, Annex 2	Others
/43/	CDM Executive Board	Direct Communication Report PoA 2898 dated 20151126		Others
/44/	BVC	On-site picture: pigpens, biogas digesters, living condition of each		Others

No.	Author	Title	References to the document	Provider
		household etc		
/45/	BVC	CDM GHG Services Manual (incl. procedures and forms)		Others
/46/	Sichuan Statistics Bureau	Sichuan Statistical Yearbook 2016	http://www.sc.stats.gov.cn/tjcbw/tjnj/2016/zk/indexch.htm	Others
/47/	Chinese DNA	Chinese DNA's Guideline of emission factors of Chinese grids 2015	http://cdm.ccchina.gov.cn/archiver/cdmcn/UpFile/Files/Default/20160606120704298103.pdf	Others
/48/	IPCC	2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book		Others
/49/	CDM Executive Board	Post-registration change details of the PoA (2898) in EB website, such as the PRC validation report issued by Nord, the revised PoA-DD, revised CPA-DDs (CPA Nb. SCHHBG-2010-001 to CPA Nb. SCHHBG-2014-087) and other process details.	http://cdm.unfccc.int/PRCContainer/DB/prcp617554437/view	
/50/	Chengdu Oasis Science & Technology Co., Ltd.	Monitoring report for sustainable development co-benefits		CME
/51/	Chengdu Oasis Science & Technology Co., Ltd.	Biogas stove test report, dated 14/12/2009	-	CME
/52/	Chengdu Oasis Science & Technology Co., Ltd.	Sample survey materials conducted in Jun, 2010 before the PoA's commissioning.		CME
/53/	Chengdu Oasis Science & Technology Co., Ltd.	Public documents and data for the biogas generated in Sichuan Province, and the double calculation for the acceptances of difference between $FC_{BL,k,j}$ and $FC_{m,j}$ considered biogas generation of the PoA.	http://www.sdny.gov.cn/art/2008/12/31/art_767_155815.html Collection of standard design drawings for household anerobiedigesters (GB / T4750—2002)	Others

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. Remaining FARs from validation and/or previous verification

FAR ID	N/A	**Section no.**		**Date:** DD/MM/YYYY
Description of FAR				
CME response				**Date:** DD/MM/YYYY
Documentation provided by the CME				
DOE assessment				**Date:** DD/MM/YYYY

Table 2. CLs from this verification

CL ID	CL-1	**Section no.**	E.1.1	**Date:** 12/08/2016
Description of CL				
The continued operation periods of each CPAs should be indicated				

CME response	**Date:** 16/08/2016
The continued operation periods of each CPAs are indicated in the updated MR as 20 years.	
Documentation provided by the CME	
Updated MR.	
DOE assessment	**Date:** 08/08/2016
The continued operation periods are indicated in the updated MR according to each CPAs, BVC confirmed the CL is closed.	

CL ID	CL-2	**Section no.**	E.2.1	**Date:** 25/12/2017
Description of CL				
The biogas stove test reports shall be provided.				
CME response				**Date:** 25/12/2017
The biogas stove test reports have been provided to DoE for PRC interview and provided to BVC.				
Documentation provided by the CME				
Biogas stove test reports.				
DOE assessment				**Date:** 26/12/2017
BVC checked the test reports, especially the capacity and test dates and found they are consist with the inspiration during the site-visit period in 2016 and confirmed the CL is closed.				

CL ID	CL-3	**Section no.**	E.1.1	**Date:** 25/12/2017
Description of CL				
There is a new monitoring parameter MS%i,y added, the change shall be clarified.				
CME response				**Date:** 25/12/2017
As per para 8 of AMS III.R (version 02), project emissions due to physical leakage of biogas digester is estimated using the method indicated in paragraph 13 of AMS-III.D Methane recovery in animal manure management systems. The parameter $MS\%_{i,y}$ is used in the calculation of project emissions due to physical leakage of biogas digester as per AMS III.D. The monitoring parameter $MS\%_{i,y}$ is added in line with the monitoring requirements of AMS III.D and applied in the project emissions due to physical leakage of biogas digesters.				
Documentation provided by the CME				
Applied methodology.				
DOE assessment				**Date:** 26/12/2017
BVC checked the methodology and confirm the added parameter is needed and reasonable, the CL is closed.				

CL ID	CL-4	**Section no.**	E.3.4.3	**Date:** 25/12/2017
Description of CL				
Specify how the sample efforts and surveys conducted in 2016 related to the compliance of the registered sampling plan before PRC is validity to the approved revised sampling plan after PRC according to changed methodology. especially the data of coal consumption ($FC_{BL,k,j}$ and $F_{Cm,j}$).				
CME response				**Date:** 25/12/2017
1. According to the related sampling guideline and standard, the applied guideline after PRC keeps the same version as PRC before, the revision to applied sample standard (version 07.0, issued EB 94, Annex 2) has no effect to the PoA sample conducted in 2016 according to sample standard (version 05.0, issued EB 86, Annex 3). The sampling approach and procedure, the sampling requirements as per the sampling standard (95% confidence level/ 10% precision error) and the targeted population are same, regardless of before or after PRC. All of these issues are not affected by the sampling standard applied during the survey period or the latest sampling standard. *2. For the data source and validity of each parameter. As there is a Gold Standard PoA (GS1239) combined the CDM PoA, the questionnaires for sample survey conducted each year included the all necessary information for the two PoA, such as the coal consumption, operation hours, pig numbers and others, thus the sample survey conducted in 2016 can be used after PRC.*				
Documentation provided by the CME				
Applied methodologies and related guidelines and standards (before and after PRC), approved revised PoA-DD and CPA-DDs(before and after PRC), monitoring reports (before and after PRC), sample surveys materials, telephone interviews the households after PRC.				
DOE assessment				**Date:** 26/12/2017

BVC checked the related sampling guideline and standard/41//42/, focused on the revisions during the PRC period, the sampling approach and procedure, the sampling requirements as per the sampling guideline and the sample size calculation against the sample survey materials provided by CME and confirm the sampling approach for the determination of data and parameters monitored can be used after the PRC approval and the 4th monitoring period of approved revised PoA. Although the AMS-I.C. is changed to AMS-I.I, the CME has provide a complete and transparent description of the sampling activities as PRC before. Via checking the parameters one by one, comparing the data in previous MR before PRC and the inspection findings during the site-visit (refer to E.3.3), BVC confirms the sampling efforts and surveys comply with the validated sampling plan in accordance with applicable verification requirements related to the compliance of monitoring activities with the registered monitoring plan in the VVS. The validity of the two important parameters $FC_{BL,k,j}$ and $F_{Cm,j}$ is accepted.

Table 3. CARs from this verification

CAR ID	CAR-1	**Section no.**	E.1.2	**Date:** 08/08/2016
Description of CAR				
The description of the two parameters" $FC_{BL,y}$" and "$FC_{PE,y}$" in the CPA included are wrongly copied from PoA-DD. The correction is raised to clear up the misunderstanding in the 3rd verification as a FAR.				
CME response				**Date:** 25/12/2017
A post-registration change is done for this CAR. The two parameters" $FC_{BL,y}$" and "$FC_{PE,y}$" are switched to monitoring parameters and the applied methodology AMS-I.C. is changed to methodology AMS-I.C. The PRC is approved on 11/12/2017.				
Documentation provided by the CME				
Updated MR, PRC validation report and related approved revised PoA-DD and CPA-DDs.				
DOE assessment				**Date:** 26/12/2017
BVC checked the PRC validation report and *related approved revised PoA-DD and CPA-DDs and confirm the CAR is closed.*				

CAR ID	CAR-2	**Section no.**	E.2.1	**Date:** 08/08/2016
Description of CAR				
The description of the two parameters" $FC_{BL,y}$" and "$FC_{PE,y}$" in the CPA included are wrongly copied from PoA-DD. The correction is raised to clear up the misunderstanding in the 3rd verification as a FAR.				
CME response				**Date:** 12/08/2016
The constructions dates of the CPA001-CPA073 describe as dd-mm-yyyy and for the CPA074 to CPA087 are mm-dd-yyyy, the updated MR correct the description in the same way.				
Documentation provided by the CME				
Updated MR.				
DOE assessment				**Date:** 26/12/2017
BVC checked the evidences of the constructions dates and confirm they are consistent, thus the CAR is closed.				

CAR ID	CAR-3	**Section no.**	E.3.4.2	**Date:** 08/08/2016
Description of CAR				
The data sources of the parameters $EF_{CO2,i,y}$ and $NCV_{i,y}$ are not updated.				
CME response				**Date:** 12/08/2016
The data values of the two parameters are the same as the year before, and the data sources are updated to the latest Chinese DNA publication.				
Documentation provided by the CME				
Updated MR.				
DOE assessment				**Date:** 16/08/2016
BVC checked the data source link of the two parameters and confirms the CAR is closed.				

Table 4. FARs from this verification

FAR ID	N/A	**Section No.**		**Date:** DD/MM/YYYY
Description of FAR				
CME response				**Date:** DD/MM/YYYY
Documentation provided by the CME				
DOE assessment				**Date:** DD/MM/YYYY

Document information

Version	*Date*	*Description*
02.0	29 December 2017	Revision to align with the requirements of the "CDM validation and verification standard for programme of activities" (version 01.0).
01.0	5 June 2015	Initial publication.

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