POA VALIDATION REPORT

Animal Manure Treatment Programme in Henan Province and Shaanxi Province in China

REPORT NO. 2011-9797

REVISION NO. 01

DET NORSKE VERITAS

POA VALIDATION REPORT

Date of first issue: 16 January 2012	Project No.: PRJC-345126-2011-CCS-CHN
Approved by: Edwin Aalders	Organisational unit: DNV KEMA Energy & Sustainability Accredited Climate Change Services
Client: Zhongruihe International New Energy Science and Technology (Beijing) Co. Ltd.	Client ref.: Mr. Rong Qijie

DNV CLIMATE CHANGE SERVICES AS
Veritasveien 1,
1322 HØVIK, Norway
Tel: +47 67 57 99 00
Fax: +47 67 57 99 11
http://www.dnv.com
Org. No: NO 994 774 352 MVA

Title of PoA: Animal Manure Treatment Programme in Henan Province and Shaanxi Province

Host country/ies: China

Methodology: AMS-III.D. Version: 18; AMS-I.C. Version: 19.0;
AMS-I.D. Version: 17.0; AMS-I.F. Version: 02.0

GHG reducing Measure/Technology: Methane recovery in animal manure management systems, thermal energy production with or without electricity, grid connected renewable electricity generation and renewable electricity generation for captive use and mini-grid

ER estimate: 6 325 tCO_2e annually for the first CPA (CPA-0001) and 3 500 000 tCO_2e annually for the PoA over the first 7 year renewable crediting period

Size

☐ Large Scale ☒ Small Scale

Validation Phases:

☒ Desk Review ☒ Follow up interviews

☒ Resolution of outstanding issues

Validation Status

☐ Corrective Actions Requested ☐ Clarifications Requested

☒ Full Approval and submission for registration ☐ Negative validation opinion

In summary, it is DNV's opinion that the Animal Manure Treatment Programme in Henan Province and Shaanxi Province in China, as described in the CDM-SSC-PoA-DD of 6 April 2012 meets all relevant UNFCCC requirements for the CDM and correctly applies the baseline and monitoring methodology AMS-III.D.: "Methane recovery in animal manure management systems" (Ver. 18), AMS-I.C.: "Thermal energy for the user with or without electricity" (Ver. 19.0), AMS-I.D.: "Grid connected renewable electricity generation" (Ver. 17.0) and AMS-I.F.: "Renewable electricity generation for captive use and mini-grid" (Ver. 02.0). DNV thus requests the registration of the programme as a CDM programme of activities.

Report No.:	Date of this revision:	Rev. No.
2011-9797	19 September 2012	01

Report title:
Animal Manure Treatment Programme in Henan Province and Shaanxi Province in China

Work carried out by:
Simon Wong Yon Sing, Huang Wenhu, Liu Qingqiang

Work verified by:
Lai Chee Keong

Key words:
Programme of Activities (PoA)
Clean Development Mechanism (CDM)
Climate Change

☒ No distribution without permission from the Client or responsible organisational unit

☐ Limited distribution

☐ Unrestricted distribution

© 2009 Det Norske Veritas AS
All rights reserved. This publication or parts thereof may not be reproduced or transmitted in any form or by any means, including photocopying or recording, without the prior written consent of Det Norske Veritas AS.

Abbreviations

BM	Build Margin
CAR	Corrective Action Request
CCPG	Central China Power Grid
CDM	Clean Development Mechanism
CME	Coordinating/managing Entity
CPA	CDM programme activity
CDM-CPA-DD	CDM programme activity design document
CDM-POA-DD	CDM programme of activities design document
CER	Certified Emission Reduction
CH_4	Methane
CL	Clarification request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
CM	Combined Margin
CPA	CDM programme activity
DNA	Designated National Authority
DNV	DNV Climate Change Services AS
DVR	Draft Validation Report
EF	CO_2 emission factor from fuel
EIA	Environmental Impact Analysis
FSR	Feasibility Study Report
GHG	Greenhouse gas(es)
GNI	Per Capita Net Income
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
LoA	Letter of approval
MCF	Methane Conversion Factor (capacity of facility to produce methane)
MP	Monitoring Plan
NCV	Net calorific value (energy content) per mass or volume unit of a fuel
NDRC	National Development and Reform of China
NPV	Net Present Value
NWPG	Northwest Power Grid
ODA	Official Development Assistance
OM	Operating Margin
PoA	Programme of activities
PoA-DD	Programme of Activities Design Document
PPP	Purchasing Power Parity
SUZ	Special Underdeveloped Zone
UK	United Kingdom of Great Britain and Northern Ireland
UNFCCC	United Nations Framework Convention on Climate Change
VS	Volatile solid excretion rate per day on a dry-matter basis for a defined livestock population
VVM	Validation and Verification Manual

POA VALIDATION REPORT

Table of Content ***Page***

1 EXECUTIVE SUMMARY – VALIDATION OPINION 1

2 INTRODUCTION 2
2.1 Objective 2
2.2 Scope 2

3 METHODOLOGY 3
3.1 Desk review of the programme design documentation 3
3.2 Follow-up Interviews with Programme Stakeholders 7
3.3 Resolution of outstanding issues 9
3.4 Internal quality control 11
3.5 Validation team 11

4 VALIDATION FINDINGS 12
4.1 Participation requirements 12
4.2 Programme design 12
4.3 Criteria for inclusion of CDM Programme Activities 14
4.4 Operational, management and verification plan 17
4.5 Baseline identification 18
4.6 Project boundary 26
4.7 Additionality 28
4.8 Monitoring plan 32
Only applicable under Scenario III 33
4.9 Environmental impacts 40
4.10 Comments by local stakeholders 40
4.11 Comments by Parties, stakeholders and NGOs 41

Appendix A: Validation Protocol
Appendix B: Protocol for Assessing Compliance of Specific CDM Programme Activities with the Programme of Activities
Appendix C: Curricula vitae of the validation team members

POA VALIDATION REPORT

1 EXECUTIVE SUMMARY – VALIDATION OPINION

DNV Climate Change Services AS (DNV) has performed a validation of the small-scale programme of activity (PoA) titled "Animal Manure Treatment Programme in Henan Province and Shaanxi Province" in China and the PoA specific CDM-SSC-CPA-DD with generic information relevant to all CDM programme activities (CPAs) to be included in this PoA.

The validation was performed on the basis of UNFCCC criteria for programme of activities under the Clean Development Mechanism (CDM) criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfilment of stated criteria.

The host Party is China and the Annex I Party is United Kingdom of Great Britain and Northern Ireland. Both Parties fulfil the participation criteria and have approved the project and authorized the project participants Zhongruihe International New Energy Science and Technology (Beijing) Co. Ltd. and A&T Carbon Asset Co., Limited. The DNA from China has confirmed that the project assists in achieving sustainable development.

The programme correctly applies AMS-III.D.: "Methane recovery in animal manure management systems" (Ver. 18), AMS-I.C.: "Thermal energy for the user with or without electricity" (Ver. 19.0), AMS-I.D.: "Grid connected renewable electricity generation" (Ver. 17.0) and AMS-I.F.: "Renewable electricity generation for captive use and mini-grid" (Ver. 02.0).

The programme will install animal manure treatment systems with recovery of biogas and utilize the generated biogas as fuel for electricity or heat generation in Henan Province and Shaanxi Province. As a result, the programme results in reduction of CH_4 and CO_2 emissions that is real, measurable and gives long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The emission reductions from the first CPA are estimated to be on average 6 325 CO_2e per year and the total emission reductions from the PoA are estimated to be on average 3 500 000 tCO_2e per year over the selected 7 year renewable crediting period.

Adequate training and monitoring procedures have been described in the CDM-SSC-PoA-DD of 6 April 2012.

In summary, it is DNV's opinion that the PoA titled Animal Manure Treatment Programme in Henan Province and Shaanxi Province in China, as described in the CDM-SSC-PoA-DD of 6 April 2012, meets all relevant UNFCCC requirements for a PoA under the CDM and correctly applies the baseline and monitoring methodology AMS-III.D.: "Methane recovery in animal manure management systems" (Ver. 18), AMS-I.C.: "Thermal energy for the user with or without electricity" (Ver. 19.0), AMS-I.D.: "Grid connected renewable electricity generation" (Ver. 17.0) and AMS-I.F.: "Renewable electricity generation for captive use and mini-grid" (Ver. 02.0). DNV thus requests the registration of the PoA titled Animal Manure Treatment Programme in Henan Province and Shaanxi Province as a PoA under the CDM.

Kuala Lumpur and Oslo, 19 September 2012

Simon Wong

Simon Wong
CDM Validator
DNV Kuala Lumpur, Malaysia

Edwin Aalders
Approver,
DNV Climate Change Services AS

2 INTRODUCTION

Zhongruihe International New Energy Science and Technology (Beijing) Co. Ltd. has commissioned DNV Climate Change Services AS (DNV) to perform a validation of the small-scale CDM Programme of Activities (PoA) with the title "Animal Manure Treatment Programme in Henan Province and Shaanxi Province" in China (hereafter called "the PoA"). This report summarises the findings of the validation of the PoA and the PoA specific small-scale CDM programme activities Design Document (CDM-SSC-CPA-DD) with generic information relevant to all CDM programme activities (CPAs) to be included in this PoA. The validation was performed on the basis of UNFCCC criteria for the PoAs under the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, the simplified modalities and procedures for small-scale CDM project activities, the procedures for registration of a programme of activities and the subsequent decisions by the CDM Executive Board.

2.1 Objective

The purpose of a validation is to have an independent third party assess the small-scale PoA design document (CDM-SSC-PoA-DD) and the PoA specific CDM-SSC-CPA-DD with generic information relevant to all CPAs to be included in this PoA. In particular, the eligibility criteria for inclusion and demonstration of additionality of CPAs, the programme's baseline determination, monitoring plan, and the programme's compliance with relevant UNFCCC criteria are validated in order to confirm that the programme design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM PoAs and is seen as necessary to provide assurance to stakeholders of the quality of the programme and its intended generation of certified emission reductions (CERs).

2.2 Scope

The validation scope is defined as an independent and objective review of the CDM-SSC-PoA-DD and the PoA specific CDM-SSC-CPA-DD with generic information relevant to all CPAs to be included in this PoA. The CDM-SSC-PoA-DD and CDM-SSC-CPA-DD were reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, the simplified modalities and procedures for small-scale CDM project activities, the procedures for procedures for registration of a programme of activities as a single CDM project activity and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodologies AMS-III.D. version 18, AMS-I.C. version 19.0, AMS-I.D. version 17.0, and AMS-I.F. version 02.0 /20//21//22//23/.

The validation of the programme has also considered the completed CDM-SSC-CPA-DD for the CPA with the title Animal Manure Treatment Programme in Henan Province and Shaanxi Province-CPA-0001 submitted together with the CDM-SSC-CPA-DD /3/.

The validation is not meant to provide any consulting towards the programme participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

3 METHODOLOGY

The validation consisted of the following three phases:

I a desk review of the CDM-SSC-PoA-DD and the PoA specific CDM-SSC-CPA-DD with generic information relevant to all CPAs to be included in this PoA

II follow-up interviews with programme stakeholders

III the resolution of outstanding issues and the issuance of the final validation report and opinion.

The following sections outline each step in more detail.

3.1 Desk review of the programme design documentation

The following table lists the documentation that was reviewed during the validation:

3.1.1 Documentation provided by the project participants

/1/ A&T Carbon Asset Co., Limited: *CDM-SSC-PoA-DD for PoA titled "Animal Manure Treatment Programme in Henan Province and Shaanxi Province"*, version 01 dated 25 October 2011 and updated version 02 dated 6 April 2012.

/2/ A&T Carbon Asset Co., Limited: *Generic CDM-SSC-CPA-DD for PoA titled "Animal Manure Treatment Programme in Henan Province and Shaanxi Province"*, version 01 dated 25 October 2011 and updated version 02 dated 23 April 2012.

/3/ A&T Carbon Asset Co., Limited: Specific *CDM-SSC-CPA-DD for CPA titled "Animal Manure Treatment Programme in Henan Province and Shaanxi Province--CPA-0001"*, version 01 dated 25 October 2011 and updated version 02 dated 23 April 2012.

/4/ A&T Carbon Asset Co., Limited: *CER calculation spreadsheet*, version 01 dated 7 December 2011 and updated version 02 dated 8 June 2012.

/5/ Henan Kexinyuan Energy Save and Environmental Protection Engineer Designing Co., Ltd.: *Feasibility Study Report (FSR) for Animal Manure Treatment Programme in Henan Province and Shaanxi Province--CPA-0001*, dated November 2010.
Development and Reform Committee of Henan Province & Agricultural Bureau of Henan Province: *FSR approval for Animal Manure Treatment Programme in Henan Province and Shaanxi Province--CPA-0001*, dated 3 June 2011.

/6/ Xinxiang City Hongyuan Environmental Protection Technology Consulting Co., Ltd.: *Environmental Impact Assessment for Animal Manure Treatment Programme in Henan Province and Shaanxi Province--CPA-0001*, dated 26 August 2011.
Environmental Protection Bureau of Xinxiang City: *EIA approval for Animal Manure Treatment Programme in Henan Province and Shaanxi Province--CPA-0001*, dated 26 August 2011.

/7/ Zhongruihe International New Energy Science and Technology (Beijing) Co. Ltd. and A&T Carbon Asset Co., Limited: *CDM development contract for Animal Manure Treatment Programme in Henan Province and Shaanxi Province*, dated 1 August 2011.

/8/ Fengqiu County Zhigang Breeding Farm and Sangda Energy and Environmental Protection Co., Ltd.: *Anaerobic digester construction contract for Animal Manure Treatment Programme in Henan Province and Shaanxi Province--CPA-0001*, dated 28 November 2011.

/9/ A&T Carbon Asset Co., Limited: *140 copies of stakeholder questionnaires for the*

programme, dated from 8 October 2011 to 14 October 2011.

/10/ A&T Carbon Asset Co., Limited: *IRR calculation spreadsheet template for CPAs applying investment analysis for additionality demonstration*, dated 17 January 2012.

/11/ Tengzhou Yifeng Normal Pressure Boiler Factory: *Nameplate of the baseline coal based boiler*, dated 20 June 2009.

/12/ Zhongruihe International New Energy Science and Technology (Beijing) Co. Ltd. and Fengqiu County Zhigang Breeding Farm: *CDM development contract for Animal Manure Treatment Programme in Henan Province and Shaanxi Province--CPA-0001*, dated 29 September 2011.

/13/ Fengqiu County Zhigang Breeding Farm: *Dimensions of two baseline lagoons*, 2012.

/14/ Henan Province Rural Energy and Environment Protection Administration: *Demonstration of surveyed retention time of manure in baseline lagoons for Animal Manure Treatment Programme in Henan Province and Shaanxi Province--CPA-0001*, dated 3 December 2011.

/15/ Fengqiu County Zhigang Breeding Farm: *Biogas supply contract with 320 household*, dated 10 March 2010.

/16/ Fengqiu County Statistics Bureau: *Surveyed per capita net income of Fengqiu County in five equal subgrounds*, dated 19 October 2011.

3.1.2 Letters of approval

/17/ China NDRC (DNA of China): *Letter of Approval from China*, dated June 2012. http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File2896.pdf.

/18/ Environment Agency (DNA of United Kingdom of Great Britain and Northern Ireland): *Letter of Approval* from *United Kingdom of Great Britain and Northern Ireland*, dated 16 August 2012.

The authenticity of LoA from United Kingdom of Great Britain and Northern Ireland is verified by checking email involving delivering information of LoA from DNA of United Kingdom of Great Britain and Northern Ireland dated 17 August 2012.

3.1.3 Methodologies, tools and other guidance by the CDM Executive Board

/19/ CDM Executive Board: *Validation and Verification Manual*, version 1.2 dated 30 July 2010.

/20/ CDM Executive Board: *Baseline and monitoring methodology AMS-III*.D., version 18 dated 29 September 2011.

/21/ CDM Executive Board: *Baseline and monitoring methodology AMS-I.C*, version 19.0 dated 3 June 2011.

/22/ CDM Executive Board: *Baseline and monitoring methodology AMS-I.D*, version 17.0 dated 3 June 2011.

/23/ CDM Executive Board: *Baseline and monitoring methodology AMS-I.F*, version 2.0 dated 3 June 2011.

/24/ CDM Executive Board: *Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities*, version 01.0 dated 25 November 2011.

/25/ CDM Executive Board: *Guidelines regarding the "procedures for registration of a programme of activities as a single CDM project activity and issuance of certified*

emission reductions for a programme of activities", version 01 dated 15 April 2011.

/26/ CDM Executive Board: *General guidelines to SSC CDM methodologies*, version 17 dated 3 June 2011.

/27/ CDM Executive Board: *Procedures for registration of a programme of activities as a single CDM project activity and issuance of certified emission reductions for a programme of activities*, version 04.1 dated 2 August 2010.

/28/ CDM Executive Board: *Attachment A to Appendix B of Appendix B of the simplified modalities and procedures for small-scale CDM project activities*, version 08 dated 22 November 2005.
CDM Executive Board: *Guidelines on the demonstration of additionality of small-scale project activities*, version 09.0 dated 20 July 2012.

/29/ CDM Executive Board: *Guidelines for demonstrating additionality of micro-scale project activities*, version 03 dated 29 September 2011 and version 04.0 dated 20 July 2012.

/30/ CDM Executive Board: *Tool to Calculate the Emission Factor for an Electricity System*, version 02.2.1 dated 29 September 2011.

/31/ CDM Executive Board: *Baseline and monitoring methodology AMS-III.F*, version 10.0 dated 18 February 2011.

/32/ CDM Executive Board: *Tool to determine project emissions from flaring gases containing methane*, version 01 dated 15 December 2006.

/33/ CDM Executive Board: *Tool to determine the remaining lifetime of equipment*, version 1 dated 16 October 2009.

/34/ CDM Executive Board: *Guidelines on the Assessment of Investment Analysis*, version 05.0 dated 15 July 2011.

3.1.4 Documentation used by DNV to validate / cross-check the information provided by the project participants

/35/ IPCC: Guidelines for National Greenhouse Gas Inventories: *Volume 4 of 'Emissions from Livestock and Manure Management", Chapter 10 in the volume on Agriculture, Forestry, and other Land Use'*, 2006.

/36/ China NDRC and National Construction Committee: *Economic Evaluation Code and Parameter for Construction Project (Version 3)*, 2006.

/37/ Compilation Committee of China Electric Power Yearbook: *China Electric Power Yearbook*, year 2005-2010.

/38/ Department of Industry and Transport Statistics, National Bureau of Statistics of P. R. China and China NDRC: *China Energy Statistical Yearbook*, year 2008-2010.

/39/ China NDRC: *Emission factor calculation for each power grid of China (including the Chinese DNA's guidance for the determination of grid boundaries)*, dated 20 October 2011.

/40/ Ministry of Justice of the People's Republic of China: *Environmental Protection Law of the People's Republic of China*, dated 26 December 1989.

/41/ Ministry of Justice of the People's Republic of China: *Law of the People's Republic of China on Evaluation of Environmental Effects*, [2002] No.77 dated 1 September 2003.

/42/ Hudong Website: *Description of Fengqiu County including annual average*

temperature of project site of the first CPA. http://www.hudong.com/wiki/%E6%B2%B3%E5%8D%97%E5%B0%81%E4%B8%98

/43/ The State Council Poverty Alleviation Leading Group Office: *List of counties of national level poverty in Henan Province*, dated 19 March 2012. http://www.cpad.gov.cn/publicfiles/business/htmlfiles/FPB/gggs/201203/175445.html. Henan Provincial Government: *Notice for the determination of county of national level poverty in Henan Province*, dated 8 March 2002.

/44/ China NDRC and Agriculture Department of China: *Notice on improvement of biogas digester in rural areas*, dated 20 November 2008. http://wenku.baidu.com/view/91bedd46b307e87101f696a6.html.

/45/ National Environmental Protection Department of China: *Administrative measures for prevention and control of pollution from animal breeding farms*, dated 8 May 2001. http://www.zhb.gov.cn/gkml/zj/jl/200910/t20091022_171815.htm.

/46/ Shandong Baixin Breeding: *Measures for animal manure treatment in animal breeding farms*, dated 27 February 2010. http://www.360doc.com/content/10/1111/10/4362688_68418706.shtml.

/47/ General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China: *Domestic biogas stove standard, No. GB/T 3060-2001*, dated 12 November 2001.

/48/ President of People's Republic of China: *Law of People's Republic of China on Renewable Energy, promulgated by Decree No. [2005]33 of the president of People's Republic of China*, dated 28 February 2005 and effected 1 January 2006.

/49/ State Council of the People's Republic of China: *Provisional Regulations of the People's Republic of China on City Maintenance and Construction Taxes*, dated 8 February 1985.

/50/ State Council of the People's Republic of China: Provisional Regulations of the People's Republic of China on Education Tax, dated 20 August 2005

/51/ State Council of the People's Republic of China: *Interim Regulation of the People's Republic of China on Value Added Tax*, State Council Decree No.538, issued on 10 November 2008 and effected on 1 January 2009.

/52/ State Council of the People's Republic of China: *Implementation Rules of Enterprise Income Tax Law of People's Republic of China, State Council Decree No.512*, dated 6 December 2007 and effected 1 January 2008.

/53/ Ministry of Finance and National Tax Administration of China: Nitice on modification of Value Added Tax for agricultural products, 1994. http://wenku.baidu.com/view/f6dff865ddccda38366baf07.html.

/54/ Ministry of Finance & State Administration of Taxation: *Notice on modification of value added tax on comprehensive utilization of resources and other products, Caishui [2011] No.115*, 21 November 2011. http://www.grra.com.cn/ArticleView.aspx?ID=65.

/55/ CDM-EB: *"M-DEV0004: Application of AM0005 and AMS-I.D in China"*. http://cdm.unfccc.int/Projects/deviations/87512

The websites in the above references reviewed during the validation were last accessed on 6 April 2012 when the updated CDM-SSC-PoA-DD was received by DNV.

The main changes between the version of the CDM-SSC-PoA-DD published for the 30 days stakeholder commenting period and the final version 02 submitted for registration are:

1. Changes related to the CARs and CLs identified in the DNV's draft validation report;
2. The starting date of crediting period was updated to 1 November 2012 or the date of registration, whichever is later from 1 April 2012 or the date of registration of the PoA, whichever is later;
3. Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities" (Version 01.0) is applied for additionality demonstration, eligibility criteria development and multiple methodologies application.
4. Guidelines for demonstrating additionality of micro-scale project activities version 04.0 or guidelines on the demonstration of additionality of small-scale project activities version 09.0 will be used for additionality demonstration of the CPAs.

3.2 Follow-up Interviews with Programme Stakeholders

From 9 January 2012 to 11 January 2012, Mr. Simon Wong Yon Sing and Mr. Liu Qingqiang from DNV visited the project site of first CPA of Animal Manure Treatment Programme in Henan Province and Shaanxi Province in Fengqiu County, Xinxiang City, Henan Province, China. The representatives of the CME Zhongruihe International New Energy Science and Technology (Beijing) Co. Ltd., participant from Annex 1 Party A&T Carbon Asset Co., Limited, Fengqiu County Zhigang Breeding Farm in the first CPA and the local government were invited to resolve the issues identified during the desk review.

Table below provides the information regarding the issues discussed during the site visit.

	Date	Name	Organization	Topic
/56/	10 January 2012	Mr. Zhang Shujing Mr. Wu Guolin Mr. Zhang Xinmin Mr. Wu Yufang Mr. Li Lei	Henan Provincial Rural Energy and Environmental Bureau	• Development of biogas digesters in Henan Province; • Laws, regulations about biogas digesters in the area; • Policies about biogas digesters in China
/57/	10 January 2012	Mr. Zhou Zuo Mr. Rong Qijie	Zhongruihe International New Energy Science and Technology (Beijing) Co. Ltd.	• Identification of farms • Additionality of the PoA/CPA • Monitoring plan • Baseline emission estimation • Project emission estimation of PoA/CPA

/58/	10 January 2012	Mr. Bai Juchuan Ms. Yu Xiaoxiao	A&T Carbon Asset Co., Limited	• Stakeholders consulting process • Identification of farms • Additionality of the PoA/CPA • Monitoring plan • Baseline emission estimation • Project emission estimation of PoA/CPA • Stakeholders consultation process
/59/	10 January 2012	Mr. Guo Jingjia	Xinxiang City Rural Energy and Environmental Bureau	• Development of biogas digesters in breeding farms in the county; • Laws and regulations about biogas digester construction in the area; • Environmental protection requirements for breeding farms in the county • Farms' environmental compliance • Benefits for the farmers and local area from installation of biogas digesters • Manure management and energy requirement in the pre and post project scenario • Size, location of the farm • Number and weight of pig • Installation fees and contract of the biogas digester • Contract between CME and the farm • Depth of lagoons • Challenges in using the biogas digester • Production of biogas • Farm's environmental compliance
/60/	10 January 2012	Mr. Wu Gongsheng	Fengqiu County Rural Energy and Environmental Bureau	
/61/	10 January 2012	Mr. Wang Guanting	Fengqiu County Environmental Protection Bureau	
/62/	10 January 2012	Mr. Deng Weiguo	Fengqiu County Development and Reform Committee	
/63/	10 January 2012	Mr. Jia Zhigang	Fengqiu County Zhigang Breeding Farm	

3.3 Resolution of outstanding issues

The objective of this phase of the validation was to resolve any outstanding issues which needed to be clarified prior to DNV's positive conclusion on the PoA. In order to ensure transparency a validation protocol was customised for the project. The protocol shows in a transparent manner the criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of four tables. The different columns in these tables are described in the figure below. The completed validation protocol for the programme of activity "Animal Manure Treatment Programme in Henan Province and Shaanxi Province" is enclosed in Appendix A to this report.

Table 2 of the validation protocol documents the findings of the desk review of the project design documentation and follow-up interviews with project stakeholders. Any findings raised in Table 2 are listed in Table 3 of the protocol, and changes to the description of the project design as a result of these findings will be addressed in Table 3. Table 2 thus may not reflect all aspects of the project as described in the final PDD submitted for registration.

A corrective action request (CAR) is raised if one of the following occurs:

(a) The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;

(b) The CDM requirements have not been met;

(c) There is a risk that emission reductions cannot be monitored or calculated.

A clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

A forward action request (FAR) is raised during validation to highlight issues related to project implementation that require review during the first verification of the project activity. FARs shall not relate to the CDM requirements for registration.

Validation Protocol Table 1: Mandatory Requirements for CDM Programme of Activities		
Requirement	***Reference***	***Conclusion***
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is either acceptable based on evidence provided (**OK**), a Corrective Action Request (**CAR**) due to non-compliance with stated requirements or a request for Clarification (**CL**) where further clarifications are needed.*

Validation Protocol Table 2: Requirement Checklist				
Checklist question	***Reference***	***Means of verification (MoV)***	***Assessment by DNV***	***Draft and/or Final Conclusion***
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the CDM-PDD	*Gives reference to documents where the answer to the checklist question or item is found.*	*Means of verification (MoV) are **document review (DR)**, **interview (I)** or any other follow-up actions (e.g., on site visit and telephone or email interviews) and **cross-checking (CC)** with available information relating to projects or technologies similar to the proposed CDM project activity under validation.*	*The discussion on how the conclusion is arrived at and the conclusion on the compliance with the checklist question so far.*	*OK is used if the information and evidence provided is adequate to demonstrate compliance with CDM requirements. A **corrective action request (CAR)** is raised when project participants have made mistakes, the CDM requirements have not been met or there is a risk that emission reductions cannot be monitored or calculated. A **clarification request (CL)** is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met. A **forward action request (FAR)** during validation is raised to highlight issues related to project implementation that require review during the first verification of the project activity.*

Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Corrective action and/ or clarification requests	***Ref. to checklist question in table 2***	***Response by project participants***	***Validation conclusion***
*The **CARs** and/ or **CLs** raised in Table 2 are repeated here.*	*Reference to the checklist question number in Table 2 where the CAR or CL is explained.*	*The responses given by the project participants to address the CARs and/or CLs.*	*The validation team's assessment and final conclusions of the CARs and/or CLs.*

Validation Protocol Table 4: Forward Action Requests		
Forward action request	***Ref. to checklist question in table 2***	***Response by project participants***
The FARs raised in Table 2 are repeated here.	*Reference to the checklist question number in Table 2 where the FAR is explained.*	*Response by project participants on how forward action request will be addressed prior to first verification.*

Figure 1 Validation protocol tables

3.4 Internal quality control

The validation report underwent a technical review performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

3.5 Validation team

				Type of involvement						
Role	***Last Name***	***First Name***	***Country***	Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	TA 13.2 competence	Financial expertise
Team leader (Validator)	Wong	Simon Yon Sing	Malaysia	✓	✓	✓	✓		✓	
Financial expert	Huang	Wenhu	China	✓		✓				✓
Assessor under training	Liu	Qingqiang	China	✓	✓	✓			✓	
Technical reviewer	Lai	Chee Keong	China					✓	✓	

The qualification of each individual validation team member is detailed in Appendix B to this report.

4 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

The final validation findings relate to the programme design as documented and described in the PoA design documentation version 02 dated 6 April 2012.

4.1 Participation requirements

The coordinating/managing entity of the PoA is Zhongruihe International New Energy Science and Technology (Beijing) Co. Ltd.. The project participants are Zhongruihe International New Energy Science and Technology (Beijing) Co. Ltd. of China and A&T Carbon Asset Co., Limited of United Kingdom of Great Britain and Northern Ireland. The host Party (China) and the Annex I Party (United Kingdom of Great Britain and Northern Ireland) meet all relevant participation requirements.

A letter of approval (LoA) /17/ was issued by DNA of China in June 2012, authorizing Zhongruihe International New Energy Science and Technology (Beijing) Co. Ltd. as project participant and confirming that the project assists in achieving sustainable development. The DNA of United Kingdom of Great Britain and Northern Ireland issued the LoA /18/ on 16 August 2012 and authorized A&T Carbon Asset Co., Limited as project participant.

The letters of approval were received from the project participants. Authenticity of letter of approval from China has been verified by checking information from website of China DNA /17/ and authenticity of letter of approval from United Kingdom of Great Britain and Northern Ireland has been verified through checking e-mail involving information of letter of approval from DNA of United Kingdom of Great Britain and Northern Ireland /18/. DNV considers the letters are in accordance with paragraphs 45- 48 of the VVM /19/.

The validation did not reveal any information that indicates that the programme can be seen as a diversion of official development assistance (ODA) funding towards China /1/.

4.2 Programme design

The Programme Animal Manure Treatment Programme in Henan Province and Shaanxi Province is geographically located in Henan Province and Shaanxi Province /1//2//3//5/. The PoA aims to reduce greenhouse gas emissions from livestock manure by converting open anaerobic lagoons to anaerobic digesters with biogas capture and energy generation.

Each CPA under the programme will install anaerobic animal manure treatment systems with recovery of biogas and utilize the generated biogas as fuel for electricity and/or heat generation in Henan Province and Shaanxi Province /1/. The sludge produced in all CPAs will be treated in aerobic manners like soil application that ensures aerobic conditions and avoids methane emissions (eligibility criteria (18) in CDM-SSC-PoA-DD /1/). Also, biogas storage tank will be installed for each CPA to ensure all biogas recovered will be used or flared (flaring system may be involved for part of CPAs). Also, there is no co-generation project in the PoA /1/. Each CPA under the programme will meets eligibility criterions for small-scale project activities (eligibility criteria (23) in CDM-SSC-PoA-DD /1/) and will not be a

debundled component of a large scale project activity (eligibility criteria (2) in CDM-SSC-PoA-DD /1/).

There are three project scenarios for energy generation from recovered biogas in the PoA /1/:

Scenario I: Recovered biogas will be utilized to generate thermal energy supplied to the animal farm based on biogas boiler (the biogas boiler will be newly installed or be retrofitted from coal-fired boiler), and/or used as cooking fuel by the animal farm and/or nearby resident (biogas stove will be introduced), which could satisfy the heat demand of animal farm and/or nearby resident.

Scenario II: Recovered biogas will be utilized to generate electricity by newly installed electricity generator, and electricity generated will be delivered to the power grid and/or consumed for captive use.

Scenario III: One part of recovered biogas will be utilized to generate thermal energy supplied to the animal farm based on biogas boiler (the biogas boiler will be newly installed or be retrofitted from coal-fired boiler), and/or used as cooking fuel by the animal farm and/or nearby resident (biogas stove will be introduced); Another part will be utilized to generate electricity by newly installed electricity generator, and electricity generated will be delivered to the power grid and/or consumed for captive use; which mean that recovered biogas will be utilized for thermal and power generation separately.

According to paragraph 29 (b) of "Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities" /24/, when a principle technology/measure is applied consistently in each CPA using multiple combinations of methodologies, the combinations of methodologies are eligible. This is the case for the programme as a principle technology (Methane recovery in animal manure management systems, AMS-III.D.) is applied in each CPA using multiple combinations of biogas utilization for energy generation ((1) AMS-I.C., (2) AMS-I.F., (3) AMS-I.D., (4) AMS-I.C. and AMS-I.F. and (5) AMS-I.C. and AMS-I.D.) /1/.

The first CPA titled Animal Manure Treatment Programme in Henan Province and Shaanxi Province --CPA-0001 is implemented at Fengqiu County Zhigang Breeding Farm in Xinxiang City, Henan Province and geographical coordinates of the first CPA are 113.3846°E and 35.0458°N /3/. Anaerobic digester with volume of 1 000 m^3 will be installed to replace the two open anaerobic lagoons with depth of 6m /13/. Part of biogas captured will be utilized by the 3.4 MW_{th} boiler retrofitted from coal-fired boiler for thermal generation supplied to the breeding farm, another part of biogas captured will be utilized by 320 households of nearby residents for cooking with biogas stove (capacity is 3.26 kW each) and the remaining biogas will be utilized by 30 kW biogas based generator for electricity generation used in the breeding farm /3//5/. The information of the first CPA has been verified during the site visit.

The programme design has been clearly described in the CDM-SSC-PoA-DD /1/, DNV confirms the completeness and accuracy of the programme description. The management system and training information of the programme are clearly described in the CDM-SSC-PoA-DD /1/.

The programme's geographical area is defined as Henan Province and Shaanxi Province /1/. As the CPAs in Henan Province will purchase or replace electricity from Central China Power Grid and CPAs in Shaanxi Province will purchase or replace electricity from Northwest Power Grid /39/, boundary of the SSC-CPAs under the PoA is defined as the CPA site and all

power plants connected to Central China Power Grid (the CPAs in Henan Province) or Northwest Power Grid (CPAs in Shaanxi Province) /1/.

The expected operational lifetime of the programme is 28 years /1/ and is the maximum length allowed by the "Procedures for registration of a programme of activities as a single CDM project activity and issuance of certified emission reductions for a programme of activities" /27/. A renewable crediting period of 7 years has been chosen for the first CPA titled Animal Manure Treatment Programme in Henan Province and Shaanxi Province -- CPA-0001, starting from 1 November 2012 (The date of inclusion of the CPA into the PoA or the date the CPA put into operation, whichever is later) /3/. The emission reductions of the first CPA are estimated to be on average 6 325tCO_2e per year /1/. Starting date of the CPA titled Animal Manure Treatment Programme in Henan Province and Shaanxi Province -- CPA-0001 is 28 November 2011 /8/, which has been verified to be the earliest financial commitment for the CPA and later than publication of the CDM-SSC-PoA-DD on 24 November 2011.

DNV considers the description of the programme contained in the CDM-SSC-PoA-DD to be complete and accurate. The CDM-SSC-PoA-DD complies with the relevant forms and guidance for completing the CDM-SSC-PoA-DD /25/.

4.3 Criteria for inclusion of CDM Programme Activities

Eligibility criteria for inclusion of a SSC-CPA in the PoA are set for this programme in the CDM-SSC-PoA-DD version 02 dated 6 April 2012 /1/, requiring each CPA that:

Common Criteria:

(1) To demonstrate that the CPA is located in the boundary of the PoA, i.e. within Henan Province or Shaanxi Province;

(2) To demonstrate that the CPA passes the procedure of avoiding double counting described in A.4.4.1 (ii) of CDM-SSC-PoA-DD, which ensures that the SSC-CPA included in the PoA is not a de-bundled component of another CDM programme activity (CPA) or CDM project activity;

(3) To demonstrate that the CPA meets any one of following criteria for assessing additionality:

(a) Meets relevant requirement in "*Guidelines for demonstrating additionality of microscale project activities*" (Ver. 04.0), including:

(i) The geographic location of the project activity is in a special underdeveloped zone of the host country identified by the Government via any one of the following method:

- The proportion of population with income less than USD 2 per day (PPP) in the region is greater than 50% calculated by using the most recent available data in official notifications for development assistance including for planning, management, and investment;

- The GNI per capita in the country is less than USD 3000 and the population of the region is among the poorest 20% in the poverty ranking of the host country as per the applicable national policies and procedures which is calculated by using the most

recent available data in official notifications for development assistance including for planning, management, and investment;

- Based on the recommendation of the designated national authority of the host country, the SUZ in the host country has been approved by EB of the CDM and publised on the UNFCCC website.

(ii) The total installed capacity of the CPA is:

For ***Scenario I***, The total installed capacity of the CPA is no more than $15MW_{th}$;

For ***Scenario II***, The total installed capacity of the CPA is no more than $5MW_e$;

For ***Scenario III***, The total installed capacity of the CPA (for electricity capacity, multiply by 3 to derive thermal units as per the latest version of "General Guidelines to SSC CDM methodologies") is no more than $15MW_{th}$;

(iii) The emission reductions from type III components of the CPA is no more than 20 $ktCO_2e$ per year.

(b) Meets relevant requirement for the positive list of technologies and project activity types that are defined as automatically additional in "*Guidelines for demonstrating additionality of small-scale project activities*", including:

- Project activities solely composed of isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs);
- The emission reductions from type III components of the CPA is no more than 3,000 tCO_2e per year;
- The installed capacity of each unit in the activities included in the CPA is less than 2,250 KW_{th}.

(c) The project IRR (before tax) of the project included in the CPA is lower than the benchmark of 7%;

(4) To demonstrate that the CPA crediting period does not exceed 31/10/2040 (the PoA end date).

(5) To demonstrate that there is no any activity with the same sectoral scope, whose boundary is within 1km of the boundary of the proposed small-scale CPA.

(6) To demonstrate that the start date of the CPA is not prior to 24 November 2011 (Publication date of the PoA), the construction agreement, electricity generator purchasing contract, biogas stove contract and biogas boiler contract involved in the CPA will be used to check the start date).

(7) To demonstrate that each activity included in the CPA must have obtained approval of EIA.

(8) To demonstrate that the CPA has no public funding from Annex I Parties;

(9) To demonstrate that no fossil fuel is used in each activity included in the CPA other than for transportation;

(10) To demonstrate that each activity included in the CPA will introduce newly anaerobic manure treatment systems with biogas recovery replacing uncovered anaerobic lagoons for animal manure treatment.

Criteria Related to Applicability Conditions of AMS-III.D

(11) To demonstrate that all activities under a CPA are to install anaerobic animal manure management systems to achieve methane recovery and destruction by flaring/combustion or gainful use of the recovered methane;

For Scenario I

The recovered methane will be used for thermal energy generation (including supplied to households as life fuel for thermal energy generation and utilized as fuel of boiler for thermal energy generation).

For Scenario II

The recovered methane will be used for electricity generation by newly installed electricity generator.

For Scenario III

One part of the recovered methane will be used to generate thermal energy, another part will be used to generate electricity by newly installed electricity generator.

Biogas storage tank will be also installed in each **Scenario** to achieve that in case of emergency all methane produced from anaerobic digestion can be stored but not emitted to atmosphere, and therefore ensure that all methane produced by the digester is destroyed. Besides, it is also possible that flaring system is installed in some activities.

(12) To demonstrate that the livestock population in the farms included in each CPA under the PoA should be managed under confined conditions;

(13) To demonstrate that the manure or the streams obtained after treatment are not discharged into natural water resources;

(14) To demonstrate that the annual average temperature of baseline site where anaerobic manure treatment facility is located is higher than 5°C;

(15) To demonstrate that in the baseline scenario the retention time of manure waste in the anaerobic treatment system should be greater than one month;

(16) To demonstrate that the baseline scenario for the manure treatment is that the manure waste from the livestock would be treated in anaerobic lagoons with the depth of more than 1m;

(17) To demonstrate that no methane recovery and destruction by flaring, combustion or gainful use takes place in the baseline scenario;

(18) To demonstrate that the residual waste from the animal manure management system must be handled aerobically, e.g. land application;

(19) To demonstrate that only animal manure will be anaerobically treated but no other organic matters are involved in the CPA;

(20) To demonstrate that technical measures will be used to ensure that all biogas produced by the digester is used or flared;

(21) To demonstrate that the storage time of the manure after removal from the animal barns, including transportation, should not exceed 45 days before being fed into the anaerobic digester.

(22) For CPA using option (c) of eligibility criteria (3) for assessing additionality, to demonstrate that emission reductions from type III components of the CPA be less or equal to 60 000 tCO_2/yr.

Criteria Related to Different Combination Application of Methodologies

(23) To demonstrate that the total installed capacity of the CPA is as below:

For ***Scenario I***, according to AMS-I.C., the total installed capacity of the CPA is no more than $45MW_{th}$;

For ***Scenario II***, according to AMS-I.F./AMS-I.D., the total installed capacity of the CPA is no more than $15MW_e$;

For ***Scenario III***, according to AMS-I.C. and AMS-I.F/AMS-I.D. as well as "General Guidelines to SSC CDM methodologies", the total installed capacity of the CPA (for electricity capacity, multiply by 3 to derive thermal units as per the latest version of "General Guidelines to SSC CDM methodologies") is no more than $45MW_{th}$;

(24) According to AMS-I.C./AMS-I.F, in case electricity and/or steam/heat and/or biogas produced by the project activity is delivered to another party, a contract between the supplier and the consumer(s) shall be signed to state that, only the supplier can claim emission reductions from the energy displaced.

DNV considers that eligibility criteria for inclusion of CDM programme activities in the CDM-SSC-PoA-DD to be complete and accurate. The criteria are in accordance with the "Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities" /24/.

4.4 Operational, management and verification plan

The programme involves installation of anaerobic animal manure treatment systems with recovery of biogas and utilization of the generated biogas as fuel for electricity and/or heat generation in Henan Province and Shaanxi Province /1/. Zhongruihe International New Energy Science and Technology (Beijing) Co. Ltd. will coordinate the Small-Scale Programme of Activities (SSC-PoA) and will support the project operators in implementing the CDM Programme Activities (CPAs) in Henan Province and Shaanxi Province while acting as the focal point for all CDM related activities.

In order to avoid double counting of emission reductions, a regular check of PoA database and registered CDM projects will be made to avoid double adding of a CPA or inclusion of a CPA which has been registered as CDM project or included in another PoA, and an undertaking in form of contract agreement would be taken from all the power plant operators which shall cover the following at the minimum /1/.

- The farm is aware and has agreed that their activity is being subscribed to the PoA.
- The activity have neither already been registered as a CDM project, nor as a CPA of another PoA.

DNV has verified the signed contract agreement confirming to both the stated conditions with Fengqiu County Zhigang Breeding Farm, which forms the first CPA /12/. The first CPA constitutes only Fengqiu County Zhigang Breeding Farm located in Henan Province /3/.

Zhongruihe International New Energy Science and Technology (Beijing) Co. Ltd. would in the form of a contract agreement with the individual animal farm operators shall ensure that they have agreed to their specific project activity being subscribed to this PoA.

It has been clearly described that all the data related to the monitoring plan and emission reduction calculations shall be inputted into the database and recorded established by the CME. During the operation, the monitoring plan will be implemented by the CPA project operator, as guided by Zhongruihe International New Energy Science and Technology (Beijing) Co. Ltd.. The Managing entity (Zhongruihe International New Energy Science and Technology (Beijing) Co. Ltd.) will maintain the records for the PoA as a whole in the database. This includes a list of all projects identified through unique activity name, project activity owner name, detailed location and CDM monitoring and verification record that are under review for inclusion in the PoA and approved for inclusion in the PoA and the status of verification. Complete information on the monitoring data will be kept and spot checks done by Zhongruihe International New Energy Science and Technology (Beijing) Co. Ltd. for quality assurance. All the monitored data in electrical and paper documents will be kept during the PoA crediting period and plus 2 years.

The CME has selected for full verification of each CPA (no sampling will be used) /1/ by DOEs for verification of the amount of reductions of anthropogenic emissions. Each CPA under the PoA will be monitored according to the related methodologies and tools and it will be made available for verification. Monitoring reports will be prepared separately for each of the CPAs for the purpose of verification and request for issuance of CERs /1/.

DNV considers that the operational, management and verification plan in the CDM-SSC-PoA-DD to be complete and accurate.

4.5 Baseline identification

The programme applies the simplified baseline methodologies AMS-III.D.: “Methane recovery in animal manure management systems” (Ver. 18) /20/, AMS-I.C.: “Thermal energy for the user with or without electricity” (Ver. 19.0) /21/, AMS-I.D.: “Grid connected renewable electricity generation” (Ver. 17.0) /22/ and AMS-I.F.: “Renewable electricity generation for captive use and mini-grid” (Ver. 02.0) /23/.

The methodology combinations ((1) AMS-III.D. and AMS-I.C., (2) AMS-III.D. and AMS-I.F., (3) AMS-III.D. and AMS-I.D., (4) AMS-III.D., AMS-I.C. and AMS-I.F. and (5) AMS-III.D., AMS-I.C. and AMS-I.D.) are applied for the programme /1/.

As per the Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities /24/ and General guidelines to SSC CDM methodologies /26/, the combinations of ((1) AMS-III.D. and AMS-I.C., (2) AMS-III.D. and AMS-I.F., (3) AMS-III.D. and AMS-I.D., (4) AMS-III.D., AMS-I.C. and AMS-I.F. could be applied without further assessment of cross effects. For CAPs applying combination (5) (AMS-III.D., AMS-I.C. and AMS-I.D.), emission reduction will be from three separate parts (emission reduction from methane recovery (AMS-III.D.), thermal generation (AMS-I.C.) and electricity (AMS-I.D.)) /1/, thus it could be confirmed that emission reductions from each single measure are in in isolated manner and there is no cross

effects that potentially result in over-estimation of emission reductions from the PoA. Therefore, the above methodology combinations are consistent with Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities /24/ and General guidelines to SSC CDM methodologies /26/ and could be used for the programme.

For the methodology AMS-III.D., version 18, the applicability criteria are met as follows /20/:

- *This methodology covers project activities involving the replacement or modification of anaerobic animal manure management systems in livestock farms to achieve methane recovery and destruction by flaring/combustion or gainful use of the recovered methane*.
  The PoA/CPA involves the modification of an existing manure management system from open lagoon treatment to anaerobic digestion (eligibility criteria (11) in the CDM-SSC-PoA-DD version 02 /1/). This was confirmed during the site visit in the 1st CPA at Fengqiu County Zhigang Breeding Farm /63/.
- *The livestock population in the farm is managed under confined conditions*.
  The livestock population in the farms included in each CPA under the PoA is managed under confined conditions (eligibility criteria (12) in the CDM-SSC-PoA-DD version 02 /1/). This was confirmed through the on-site visit in the first CPA of Fengqiu County Zhigang Breeding Farm /63/.
- *Manure or the streams obtained after treatment are not discharged into natural water resources (e.g. river or estuaries), otherwise AMS-III.H-Methane recovery in wastewater treatment shall be applied*.
  CPAs under the PoA will ensure that no manure is discharged into natural water resources (eligibility criteria (13) in the CDM-SSC-PoA-DD version 02 /1/). In the first CPA (Fengqiu County Zhigang Breeding Farm), manure is treated in two anaerobic open lagoons and used in farm land after treatment which was checked and confirmed with project owner on-site /63/.
- *The annual average temperature of baseline site where anaerobic manure treatment facility is located is higher than 5°C*.
  All CPAs under the PoA will be implemented at places with annual average temperature higher than 5°C (eligibility (14) in the CDM-SSC-PoA-DD version 02 /1/). The first CPA is located in Fengqiu County where annual average temperature is 14°C /1//42/.
- *In the baseline scenario the retention time of manure waste in the anaerobic treatment system is greater than one month, and in case of anaerobic lagoons in the baseline, their depths are at least 1 m*.
  All CPAs under the PoA will be implemented in farms which meet both the conditions (eligibility criteria (15) and (16) in the CDM-SSC-PoA-DD version 02 /1/). For the first CPA, there are 2 open lagoons with depth of 6m /13/ and retention time of manure waste in the anaerobic treatment system is 68 days which is more than 1 month /13//14/.
- *No methane recovery and destruction by flaring, combustion or gainful use takes place in the baseline scenario.*
  CPAs under the PoA will be implemented where there is no methane recovery and destruction by flaring, combustion or gainful use takes place in the baseline scenario (eligibility criteria (17) in the CDM-SSC-PoA-DD version 02 /1/). It was confirmed during on-site visit that the farm where the first CPA is implemented does not have methane capture and utilization facilities /1//63/ prior to the programme.

- *The residual waste from the animal manure management system shall be handled aerobically; otherwise the related emissions shall be taken into account as per relevant procedures of AMS-III.AO "Methane recovery through controlled anaerobic digestion". In case of soil application, proper conditions and procedures (not resulting in methane emissions) must be ensured.*
  All CPAs will ensure the final sludge will be handled aerobically (eligibility criteria (18) in the CDM-SSC-PoA-DD version 02 /1/). Proper conditions and procedures for the soil application of the final sludge have been described by the project participant and are deemed reasonable. Furthermore, the proper soil application of final sludge will be monitored during the crediting period.
- *Technical measures shall be used (including a flare for exigencies) to ensure that all biogas produced by the digester is used or flared.*
  Technical measures will be used to ensure that all biogas produced is utilized for electricity generation and/or thermal generation and/or flared (eligibility criteria (20) in the CDM-SSC-PoA-DD version 02 /1/).
- *The storage time of the manure after removal from the animal barns, including transportation, should not exceed 45 days before being fed into the anaerobic digester. If the project proponent can demonstrate that the dry matter content of the manure when removed from the animal barns is larger than 20%, this time constraint will not apply.*
  For CPAs under the PoA, the storage time of the manure after removal from the animal barns, including transportation, should not exceed 45 days before being fed into the anaerobic digester (eligibility criteria (21) in the CDM-SSC-PoA-DD version 02 /1/). In the first CPA, manure is removed from the animal barns into 2 adjusting tanks which have a retention time less than 1 day, which is less than 45 days.
- *Projects that recover methane from landfills shall use AMS-III.G Landfill methane recovery, and projects for wastewater treatment shall use AMS-III.H. Projects for composting of animal manure shall use AMS-III.F Avoidance of methane emissions through composting. Project activities involving co-digestion of animal manure and other organic matters shall use the methodology AMS-III.AO Methane recovery through controlled anaerobic digestion.*
  As per eligibility criteria (11) in the CDM-SSC-PoA-DD version 02, all activities under PoA are to install anaerobic animal manure management systems to achieve methane recovery and destruction by flaring/combustion or gainful use of the recovered methane /1/. So the programme does not involve any of above conditions. Hence, the criterion is not applicable.
- *Different options to utilize the recovered biogas as detailed in paragraph 3 of AMS-III.H are also eligible for use under this methodology. The respective procedures in AMS-III.H shall be followed in this regard.*
  According to the CDM-SSC-PoA-DD and eligibility criteria (11), recovered biogas will be used for heat or electricity generation /1/ which is in accordance with content above in the paragraph and the component of the project activity can use a corresponding methodology under Type I, namely AMS-I.C /21/, AMS-I.D /22/ and AMS-I.F /23/.
- *New facilities (Greenfield projects) and project activities involving capacity additions compared to the baseline scenario are only eligible if they comply with the related and relevant requirements in the General Guidelines to SSC CDM methodologies.*

CPAs under the PoA will comply with the guidelines as per eligibility criteria (10) in the CDM-SSC-PoA-DD /1/. The first CPA is implemented in an existing animal (i.e. swine) farm, which was confirmed by on-site inspection /63/.

- *The requirements concerning demonstration of the remaining lifetime of the replaced equipment shall be met as described in the General Guidelines to SSC CDM methodologies.*
  CPAs under the PoA will comply with the guidelines. As per the eligibility criteria (10) in the CDM-SSC-PoA-DD, each animal manure treatment system included in the CPA will introduce newly anaerobic manure treatment systems with biogas recovery replacing uncovered anaerobic lagoons for animal manure treatment. The first CPA involves installation of anaerobic animal manure management system to replace uncovered anaerobic lagoons, which was verified during the on-site visit.
- *Measures are limited to those that result in aggregate emission reductions of less than or equal to 60 kt CO_2 equivalent annually from all Type III components of the project activity. Emission reductions under this category are estimated ex-ante as the difference between baseline emissions and project emissions.*
  Measures are limited to those that result in aggregate emission reductions of less than or equal to 60 ktCO_2 equivalent annually from all type III components of the project activity (eligibility criteria (22) in the CDM-SSC-PoA-DD /1/). Annual emission reductions from first CPA have been verified to be 6 325 t CO_2e per year and less than 60 kt CO_2e per year.

For the methodology AMS-I.C. version 19.0, the applicability criteria are met as follows /21/ (For scenario I and III):

- *This methodology comprises renewable energy technologies that supply users1 with thermal energy that displaces fossil fuel use. These units include technologies such as solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel.*
  Biogas will be used for thermal energy generation and displace fossil fuel for related CPAs under the PoA (eligibility criteria (11) in the CDM-SSC-PoA-DD version 02 /1/). For the first CPA, biogas will be utilized to displace coal which was confirmed during the on-site visit /63/.
- *Biomass-based cogeneration systems are included in this category. For the purpose of this methodology cogeneration shall mean the simultaneous generation of thermal energy and electrical energy in one process. Project activities that produce heat and power in separate element processes (for example heat from a boiler and electricity from a biogas engine) do not fit under the definition of cogeneration project.*
  Co-generation is not involved in the PoA and this criterion is not applicable.
- *Emission reductions from a biomass cogeneration system can accrue from one of the following activities:*

  (a) Electricity supply to a grid;
  (b) Electricity and/or thermal energy (steam or heat) production for on-site consumption or for consumption by other facilities;
  (c) Combination of (a) and (b).

  Co-generation is not involved in the PoA and this criterion is not applicable.

- *The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW thermal.*
  CPAs under the PoA will unsure that total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW thermal (eligibility criteria (23) in the CDM-SSC-PoA-DD version 02 /1/). The first CPA involves 3.4 MW_{th} boiler retrofitted from coal-fired boiler, 320 biogas stoves (capacity is 3.26 kW each) for households for thermal energy generation and 30 kW biogas based electricity generator and total installed energy generation capacity is less than 45 MW_{th} /3/.
- *For co-fired systems, the total installed thermal energy generation capacity of the project equipment, when using both fossil and renewable fuel, shall not exceed 45 MW thermal.*
  CPAs under the PoA will use biogas for thermal generation /1/ and this criterion is not applicable.
- *The following capacity limits apply for biomass cogeneration units:*
  (a) If the project activity includes emission reductions from both the thermal and electrical energy components, the total installed energy generation capacity thermal and electrical) of the project equipment shall not exceed 45 MW thermal.
  For the purpose of calculating this capacity limit the conversion factor of 1:3 shall be used for converting electrical energy to thermal energy (i.e. for renewable energy project activities, the maximal limit of 15 MW(e) is equivalent to 45 MW thermal output of the equipment or the plant);
  (b) If the emission reductions of the cogeneration project activity are solely on account of thermal energy production (i.e. no emission reductions accrue from the electricity component), the total installed thermal energy production capacity of the project equipment of the cogeneration unit shall not exceed 45 MW thermal;
  (c) If the emission reductions of the cogeneration project activity are solely on account of electrical energy production (i.e. no emission reductions accrue from the thermal energy component), the total installed electrical energy generation capacity of the project equipment of the cogeneration unit shall not exceed 15 MW.
  Co-generation is not involved in the PoA and this criterion is not applicable.
- *The capacity limits specified in the above paragraphs apply to both new facilities and retrofit projects. In the case of project activities that involve the addition of renewable energy units at an existing renewable energy facility, the total capacity of the units added by the project should comply with capacity limits in paragraphs 4 to 6, and should be physically distinct from the existing units.*
  CPAs under the PoA will unsure that total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW_{th} thermal (eligibility criteria (19 and 23) in the CDM-SSC-PoA-DD version 02 /1/).
- *Project activities that seek to retrofit or modify an existing facility for renewable energy generation are included in this category.*

CPAs under the PoA will comply with the guidelines (eligibility criteria (11) in the CDM-SSC-PoA-DD version 02 /1/). The first CPA involves retrofit of an existing coal-fired boiler on-site and is in accordance with the criterion and remaining lifetime of the boiler is 22 years (The boiler was produced on 20 June 2009 /64/, and the default technical lifetime of 25 years is applied according to tool to determine the remaining lifetime of equipment /33/), which is longer than crediting period of the activity /33//11/.

- *New Facilities (Greenfield projects) and project activities involving capacity additions compared to the baseline scenario are only eligible if they comply with the related and relevant requirements in the General Guidelines to SSC CDM methodologies*.
  CPAs under the PoA will comply with the guidelines according to eligibility criteria (11) in the CDM-SSC-PoA-DD version 02 /1/. The first CPA is implemented in an existing swine farm, which was verified during the on-site visit.
- *If solid biomass fuel (e.g. briquette) is used, it shall be demonstrated that it has been produced using solely renewable biomass and all project or leakage emissions associated with its production shall be taken into account in the emissions reduction calculation*.
  In this PoA, biogas will be used for thermal generation and no solid biomass is used /1/. Thus, this criterion is not applicable.
- *Where the project participant is not the producer of the processed solid biomass fuel, the project participant and the producer are bound by a contract that shall enable the project participant to monitor the source of the renewable biomass to account for any emissions associated with solid biomass fuel production. Such a contract shall also ensure that there is no double-counting of emission reductions*.
  In this PoA, biogas will be used for thermal generation and no solid biomass is used. Thus, this criterion is not applicable.
- *If electricity and/or steam/heat produced by the project activity is delivered to a third party i.e. another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into that ensures there is no double-counting of emission reductions.*
  For CPAs under the PoA, contracts will be signed to ensure that only the facility generating energy can claim emission reduction from the energy displaced (eligibility criteria (24) in the CDM-SSC-PoA-DD version 02 /1/). During the site visit for the first CPA, the contract signed between project owner and farmers nearby for biogas supply was provided, which claimed that only the facility generating energy can claim emission reduction from the energy displaced /15/.
- *If the project activity recovers and utilizes biogas for power/heat production and applies this methodology on a stand alone basis i.e. without using a Type III component of a SSC methodology, any incremental emissions occurring due to the implementation of the project activity (e.g. physical leakage of the anaerobic digester, emissions due to inefficiency of the flaring), shall be taken into account either as project or leakage emissions*.
  The programme applies the methodology together with AMS III. D and this criterion is not applicable.
- *Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources6 provided:*
  (a) Charcoal is produced in kilns equipped with methane recovery and destruction facility; or
  (b) If charcoal is produced in kilns not equipped with a methane recovery and destruction facility, methane emissions from the production of charcoal shall be considered. These emissions shall be calculated as per the procedures defined in the approved methodology AMS-III.K.7 Alternatively, conservative emission factor values from peer reviewed literature or from a registered CDM project activity can be used, provided that it can be demonstrated that the parameters from these are comparable e.g. source of biomass,

characteristics of biomass such as moisture, carbon content, type of kiln, operating conditions such as ambient temperature.
This criterion is not applicable.

For the methodologies AMS-I.D. version 17.0 /22/, the applicability criteria are met as follows (For scenario II and III, and not applicable to the first CPA as electricity will be generated for captive use):

- *This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass:1 (a) Supplying electricity to a national or a regional grid; or (b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.*
  For related CPAs under scenario II and III, electricity will be generated with biogas and supplied to Central China Power Grid or Northwest Power Grid /1//39/.
- *This methodology is applicable to project activities that: (a) Install a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant); (b) Involve a capacity addition; (c) Involve a retrofit of (an) existing plant(s); or (d) Involve a replacement of (an) existing plant(s).*
  For related CPAs under scenario II and III, new power plants using biogas will be installed as per eligibility criteria (11) in the CDM-SSC-PoA-DD version 02 /1/.
- *Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology*.
  This criterion is not applicable.
- *If the new unit has both renewable and non-renewable components (e.g. a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.*
  This criterion is not applicable as related CPAs will use biogas for electricity generation and no fossil fuel is used (eligibility criteria (9) in the CDM-SSC-PoA-DD version 02 /1/).
- *Combined heat and power (co-generation) systems are not eligible under this category*.
  Co-generation is not involved in the PoA and this criterion is not applicable.
- *In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units*.
  The recovered methane will be used for electricity generation by newly installed electricity generators /1/ under scenario II and III (eligibility criteria (11) in the CDM-SSC-PoA-DD version 02 /1/). So this criterion is not applicable.
- *In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW.*
  The PoA will be implemented as per the requirement as per eligibility criteria (23) in the CDM-SSC-PoA-DD version 02 /1/.

For the methodology AMS-I.F version 02.0 /23/, the applicability criteria are met as follows (For scenario II and III):

- *This category comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass that supply electricity to user(s). The project activity will displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit i.e., in the absence of the project activity, the users would have been supplied electricity from one or more of the following sources: (a) a national or a regional grid (grid hereafter); (b) Fossil fuel fired captive power plant; (c) a carbon intensive mini-grid.*

  The PoA/CPA is the implementation of a manure management system, producing biogas in an anaerobic digester system, which is then used to generate electricity. Electricity will be used on site and as such displacing electricity from the grid (eligibility criteria (11) in the CDM-SSC-PoA-DD version 02 /1/). It was confirmed on-site that the first CPA will generate electricity with biogas for utilization in the farm and replace electricity from Central China Power Grid /1//39/.

- *For the purpose of this methodology, a mini-grid is defined as small-scale power system with a total capacity not exceeding 15 MW (i.e., the sum of installed capacities of all generators connected to the mini-grid is equal to or less than 15 MW) which is not connected to a national or a regional grid.*

  This criterion is not applicable as electricity from grid will be displaced in related CPAs /1//39/.

- *Project activities or project activity components supplying electricity to a grid shall apply AMS-I.D. Project activities for standalone off-the-grid power systems supplying electricity to households/users included in the boundary are eligible under AMS-I.A.*

  For CPAs consuming electricity generated from the activity on-site, this criterion is applicable /1/.

- *Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology.*

  The PoA/CPA does not fall under this category (hydro) and this criterion is not applicable /1/.

- *For biomass power plants, no other biomass than renewable biomass are to be used in the project plant.*

  The PoA/CPA does not fall under this category (biomass) and this criterion is not applicable /1/.

- *This methodology is applicable for project activities that (a) install a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant); (b) involve a capacity addition (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).*

  CPAs related will be implemented in accordance with the criterion (eligibility criteria (11) in the CDM-SSC-PoA-DD version 02 /1/). It has been confirmed that there is no biogas capture and destruction / utilization system installed at the project site of first CPA /63/.

- *In the case of project activities that involve the capacity addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the unit added by the project should be lower than 15 MW and should be physically distinct from the existing units.*

According to eligibility criteria (11) in the CDM-SSC-PoA-DD version 02 /1/), the recovered methane will be used for electricity generation by newly installed electricity generators /1/. So this criterion is not applicable.

- *In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW.*

  According to eligibility criteria (11) in the CDM-SSC-PoA-DD version 02 /1/), the recovered methane will be used for electricity generation by newly installed electricity generators /1/. So this criterion is not applicable.

- *If the unit added has both renewable and non-renewable components (e.g., a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the unit added co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.*

  Only biogas will be used in related CPA and this criterion is not applicable. It was confirmed that the first CPA involves installation of a 30 kW biogas generator /5//63/.

- *Combined heat and power (co-generation) systems are not eligible under this category.* The PoA/CPA is not a combined heat and power system and hence this criterion is not applicable /1/.

- *In case electricity produced by the project activity is delivered to another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the electricity will have to be entered into specifying that only the facility generating the electricity can claim emission reductions from the electricity displaced.*

  According to eligibility criteria (24) for inclusion of a SSC-CPA into the PoA, the supplier will sign contract with consumers to state that, only the supplier can claim emission reductions from the energy displaced /1/.

Therefore, the methodologies are justified to be included in the programme.

In absence of the PoA, the animal manure will be treated in open anaerobic lagoons without methane recovery as environmental regulations in China only restrict direct discharge of animal manure effluents into the water bodies /44/ and biogas digesters are encouraged to be built in animal breeding farms but not compelled /45/. Equivalent thermal energy will be generated with fossil fuel (Scenario I and III) and equivalent electricity will be generated from Central China Power Grid or Northwest Power Grid (Scenario II and III).

The approved baseline methodologies have been correctly applied to identify baseline scenario that most reasonably represents what would occur in the absence of the PoA /20//21//22//23/.

All the assumption and data used by the project participants are listed in the PoA-SSC-DD /1/ and/or supporting documents. All documentation relevant for establishing the baseline scenario and correctly quoted and interpreted in the PoA-SSC-DD. Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable. Relevant national and/or sectoral policies and circumstances are considered and listed in the PoA-SSC-DD.

4.6 Project boundary

According to the approved simplified baseline methodologies AMS-III.D (version 18), AMS-I.C (version 19.0), AMS-I.D (version 17.0), and AMS-I.F (version 02.0) /20//21//22//23/,

boundary of a CPA involves physical, geographical site of the livestock, animal manure management systems, facilities which recover and flare/combust or use the methane and the power grid (Central China Power Grid including Henan, Hubei, Hunan, Jiangxi, Sichuan and Chongqing provincial power grids or Northwest Power Grid including Shaanxi, Guangxi, Yunan, Guizhou and Hainan provincial power grids) to which the CPA is connected /1//39/.

	GHGs involved	Description
Baseline emissions	CH_4	Emissions due to manure left to decay and released into the atmosphere as per AMS-III.D. (version 18).
	CO_2	Emissions due to electricity generation (for Scenario II or III); Or Emissions due to thermal energy generation (for Scenario I or III)
Project emissions	CH_4	Emissions due to physical leakage of biogas; Or Emissions due to storage of manure before being fed into anaerobic digester; or Emissions from flaring or combustion of the gas stream
	CO_2	Emissions due to on-site electricity generation and incremental transportation distance (only applicable for CPAs involve manure transportation).
		Emissions from on-site electricity use (Considered zero for *ex-ante* estimates of ER)
		Emissions from flaring or combustion of the gas stream (Considered zero for *ex-ante* estimates of the PoA)
Leakage	N/A	No leakage emissions have been accounted for as no energy generating equipment is transferred from another project activity, which is in line with applied methodologies AMS-III.D. version 18, AMS-I.C. version 19.0, AMS-I.D. version 17.0, and AMS-I.F. version 02.0 /20//21//22//23/.

The identified boundary and selected sources and gases are justified for the project activity. The validation of the project activity did not reveal other greenhouse gas emissions occurring within the proposed CDM project activity boundary as a result of the implementation of the proposed project activity which are expected to contribute more than 1% of the overall expected average annual emission reduction, which are not addressed by AMS-III.D. (version 18) /20/, AMS-I.C. version 19.0 /21/, AMS-I.D. version 17.0 /22/ and AMS-I.F. version 02.0 /23/.

4.7 Additionality

4.7.1 Additionality of the programme

The additionality of the programme could be demonstrated considering that there are no mandatory rules for construction and operation of biogas digesters to collect and burn the methane produced by the decay of animal manure in China /44//45/. The environmental regulations established only a restriction to direct discharge animal manure effluents into the water bodies /44/ and biogas digesters are encouraged to be built in animal breeding farms but not compelled in China /45/. The common practice in animal breeding farms in China is to use the anaerobic lagoons in order to decay the manure and subsequent use in farm land /46/, which is in compliance with relevant regulations /44/. During the site visit, it has been confirmed with representatives from local government /56//59//60//61//62/ that anaerobic lagoons for animal manure treatment in animal breeding farms are not restricted by Chinese law and are common practice in the China, while biogas digesters are only encouraged but not compelled.

Although the Chinese government is taking steps to secure environmentally sustainable supplies of energy, there is no regulation or policy to regulate the contribution of fossil fuel powered plants in the national grid /48/. Furthermore, the Central China Power Grid and Northwest Power Grid are dominated by coal-fired power plants /39/. It is deemed likely that coal-fired power plant will continue to dominate the power sector due to the local availability of low-cost coal /37//39/. It is expected that renewable capacity additions will not have significant effects on the mix of the Central China Power Grid or Northwest Power Grid during the first crediting period /37//39/.

Therefore, in the absence of the programme, animal manure will be treated with anaerobic lagoons, electricity will be imported from the Central China Power Grid or Northwest Power Grid (Scenario I and III), depending on the location of the animal farms in the CPAs /39/ and thermal energy will be supplied with fossil fuel (Scenario II and III).

In addition, the implementation of biogas collection and combustion system needs the action of voluntary coordination of Zhongruihe International New Energy Science and Technology (Beijing) Co. Ltd. in order to be implemented, and the likely baseline scenario for animal breeding farmers is to continue to discharge the animal manure into the anaerobic lagoons and importing electricity from the grid, which was confirmed by interview with local government staff /60//61//62/. The PoA is thus implementing a voluntary coordinated action not required by legislation and that would not be implemented in the absence of the PoA /63/.

Thus, DNV is able to confirm that the programme is additional.

4.7.2 Additionality of typical CPA

According to the “Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities, version 01.0” /24/, “Guidelines for demonstrating additionality of microscale project activities” (Ver. 04.0) /29/, or “Guidelines on the demonstration of additionality of small-scale project activities” (Ver, 09.0) /28/ can be applied for demonstration additionality of CPAs under the small-scale programme of activity.

(a) If a CPA meets requirements of micro-scale project activities in “Guidelines for demonstrating additionality of micro-scale project activities” (Ver. 04.0) /29/, then the CPA

could be deemed additional directly. According to the eligibility criteria (3) in the CDM-SSC-PoA-DD /1/, the following requirements shall be met for application of "Guidelines for demonstrating additionality of micro-scale project activities" (Ver. 04.0):

- The geographic location of the project activity is in a special underdeveloped zone of the host country identified by the Government via any one of the following methods:
  - The proportion of population with income less than USD 2 per day (PPP) in the region is greater than 50% calculated by using the most recent available data in official notifications for development assistance including for planning, management, and investment;
  - The GNI per capita in the country is less than USD 3000 and the population of the region is among the poorest 20% in the poverty ranking of the host country as per the applicable national policies and procedures which is calculated by using the most recent available data in official notifications for development assistance including for planning, management, and investment;
  - Based on the recommendation of the designated national authority of the host country, the SUZ in the host country has been approved by EB of the CDM and published on the UNFCCC website.
- The emission reductions from type III components of the CPA are no more than 20 kt CO_2e per year;
- The total installed capacity of the CPA is:

  For Scenario I, The total installed capacity of the CPA is no more than 15MW_{th};

  For Scenario II, The total installed capacity of the CPA is no more than 5MW_e;

  For Scenario III, The total installed capacity of the CPA (for electricity capacity, multiply by 3 to derive thermal units as per the latest version of "General Guidelines to SSC CDM methodologies") is no more than 15MW_{th};

DNV confirms that the above requirements could be applied for additionality demonstration of CPAs that meet requirements of micro-scale project activities in "Guidelines for demonstrating additionality of micro-scale project activities" (Ver. 04.0) /29/.

If a CPA does not meets requirements of micro-scale project activities in "Guidelines for demonstrating additionality of micro-scale project activities" (Ver. 04.0), "Guidelines on the demonstration of additionality of small-scale project activities" (Ver, 09.0) /28/ will be applied to demonstrate additionality of a CPA.

(b) If a CPA is in the list of positive list of technologies and project activity types that are defined as automatically additional in "Guidelines for demonstrating additionality of small-scale project activities" (Ver, 09.0), then the CPA is automatically additional. According to the eligibility criteria (3) in the CDM-SSC-PoA-DD /1/, eligible CPAs shall meet the following requirements to be in the list of positive list of technologies and project activity types that are defined as automatically additional:

- Project activities solely composed of isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs);
- The emission reductions from type III components of the CPA is no more than 3,000 tCO_2e per year;
- The installed capacity of each unit in the activities included in the CPA is less than 2,250 KW_{th}.

DNV confirms that the above requirements included in the CDM-SSC-PoA-DD /1/ are consistent with "Guidelines for demonstrating additionality of small-scale project activities" (Ver, 09.0).

(c) If a CPA is not included in the list of positive list of technologies and project activity types that are defined as automatically additional, the following approach will be used for additionality demonstration.

Choice of approach: According to the "Guidelines on the demonstration of additionality of small-scale project activities" (Ver, 09.0) /28/, investment barrier, technological barrier, barrier due to prevailing practice or other barrier will be used for demonstrating additionality. For this PoA, investment barrier will be used for additionality demonstration and benchmark analysis will be used as the CPAs under the PoA will generate revenue from biogas utilization apart from CER revenue and baseline scenario of CPAs under the PoA is not an investment project /1//3//5/.

Benchmark selection: According to Economic Evaluation Code for Construction of Project (Ver.03), a project-IRR of 7% (before tax) of a project is regarded as a benchmark for investing in livestock industry in China /36/. The benchmark of 7% (before tax) is therefore appropriate for the CPA. DNV was able to confirm that the selected benchmark is suitable and reasonable for the proposed CPA as following:

1. This benchmark was determined by the national administration of this industry in China /36/, and represents a government/official approved benchmark;
2. This benchmark is for project-IRR and before tax and the investment analysis for related CPAs will be for project and before tax also /10/;
3. This Economic Evaluation Code for Construction of Project (Ver.03) /36/ is referred to the risk premiums of livestock projects and is still valid till now.

DNV is able to confirm this benchmark is suitable and reasonable. If the IRR of a CPA is lower than 7% (before tax), the CPA is additional.

The project IRR calculations for subsequent CPAs using investment analysis for additionality demonstration were provided in a spreadsheet template /10/, which has been validated to be appropriate.

Input parameters: Key parameters applied in the financial analysis are assessed as follows.

- Technical lifetime: The technical lifetime of 15 years has been verified to be normal practice and realistic in China.
- City building and maintenance tax rate: The programme applies the city building and maintenance tax rate of 1% of VAT, which is in accordance with the Provisional

Regulations of the People's Republic of China on City Maintenance and Construction Taxes /49/.

- Education added tax: The programme applies an education added tax rate of 3% of VAT, which is in accordance with the Provisional Regulations of the People's Republic of China on Education /50/.
- VAT for equipment (input VAT): The VAT rate of 17% is paid as usual for purchased goods. According to the Interim Regulation of the People's Republic of China on Value Added Tax (State Council Document No. 538) issued on 10 November 2008 and implemented from 1 January 2009 /51/, the equipment VAT can be credited over the operation period against the tariff VAT until the VAT from the equipment VAT is fully recovered.
- VAT on tariff (output VAT): the programme applies VAT rate of 13% on the tariff, which is in line with the Nitice on modification of Value Added Tax for agricultural products issued in 1994 /53/.

  As stipulated in this notice (Cai Shui [2011]115) /54/, VAT refund 100% shall be applicable for electricity, thermal and fuel generation using biogas from animal manure treatment. As each CPA under the programme will install anaerobic animal manure treatment systems with recovery of biogas and utilize the generated biogas as fuel for electricity and/or heat generation in Henan Province and Shaanxi Province /1/, this regulation is thus applicable to the programme and has been taken into consideration in the IRR calculation template.
- Depreciation period: the depreciation period of 15 years is applied for the financial analysis, which is in line with the Implementation Rules of Enterprise Income Tax Law of People's Republic of China /52/.
- Output: Output of the programme (biogas output, power generation and coal saved) will be from the FSR completed by a third party and approved by local government /10/. Thus, the output could be verified to be from third party and provided to the government while applying the project for implementation approval.
- Other parameters: Other parameters applied for the financial analysis (bank loan interest, number of employees, salary and welfare, depreciation rate and assurance rate etc.) will be from the FSR completed by a third party and approved by local government.

Calculation: The IRR calculation spreadsheet for subsequent CPAs using investment analysis for additionality demonstration has been provided and assessed by DNV /10/. In the IRR calculation spreadsheet, the residual value is considered and working capital is returned in the last year of operation and the calculation process in the template is suitable. DNV is able to confirm that the IRR calculation spreadsheet could be used for additionality demonstration of subsequent CPAs using investment analysis for additionality demonstration.

Sensitivity analysis: By checking the provided IRR calculation spreadsheet for subsequent CPAs using investment analysis for additionality demonstration, it could be confirmed that sensitivity analysis will be carried out for parameters contributing more than 20% to revenues or cost to check on the robustness of the financial analysis. -10% to 10% variations will be made to the total investment, annual generation and O&M cost, which has been verified to be appropriate by DNV and could be used for additionality demonstration of subsequent CPAs using investment analysis for additionality demonstration.

The calculations and assumptions used in the calculation in the spreadsheet template were verified by DNV to be correct and in accordance with "Guidelines on the Assessment of Investment Analysis" /34/.

For the first CPA under the PoA titled Animal Manure Treatment Programme in Henan Province and Shaanxi Province--CPA-0001:

- The CPA involves 3.4 MW_{th} biogas boiler retrofitted from coal-fired boiler for thermal generation, 320 biogas stoves with capacity of 3.26 kW each and 30 kW biogas based generator, total installed capacity is 4.53 MW_{th} /3//5/ and is no more than 15 MW_{th};
- The emission reductions from type III components of the CPA is less than 20 $ktCO_2e$ per year /3/ (total emission reductions from the CPA are 6 325 tCO_2e per year /3/);
- The CPA is located in Fengqiu County which is a county of national level poverty in China identified by Chinese government with 60% of the population with income less than 3973.5RMB/yr (about 1.7 USD/day and less than 2 USD/day) /43//16/.

Based on the relevance of the presented arguments, DNV can confirm the CPA titled Animal Manure Treatment Programme in Henan Province and Shaanxi Province--CPA-0001 meets requirements of micro-scale project activities in "Guidelines for demonstrating additionality of micro-scale project activities" (Ver. 04.0) /29/ and it is additional, i.e. its ability to reduce anthropogenic emissions of greenhouse gases by sources below those that would have occurred in the absence of the registered programme activity.

Given above discussion, it is sufficiently demonstrated that the typical CPA of the PoA is not a likely baseline scenario and that emission reductions of a typical CPA thus are additional to what would otherwise have occurred. The additionality of each CAP will be assessed with respect to the compliance of the CPA with the eligibility criteria.

4.7.3 Approach for demonstrating additionality of CPAs

The PoA-DD lists eligibility criteria (3) that shall be used for demonstrating the additionality of each CPA /1/, which has been verified to be in accordance with the "Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities" /24/ and allow for demonstrating additionality of CPAs. The CME will be responsible for inclusion check of CPA and a technical review process will be conducted for inclusion of a CPA according to the eligibility criterions by the designated technical review team and the PoA database will be updated companying inclusion of the new CPA /1/. It could be confirmed that the management system could assure that right additionality criteria and inclusion procedure are used for CPAs.

4.8 Monitoring plan

The programme applies the approved simplified methodologies AMS-III.D.: "Methane recovery in animal manure management systems" (Ver. 18) /20/, AMS-I.C.: "Thermal energy for the user with or without electricity" (Ver. 19.0) /21/, AMS-I.D.: "Grid connected renewable electricity generation" (Ver. 17.0) /22/ and AMS-I.F.: "Renewable electricity generation for captive use and mini-grid" (Ver. 02.0) /23/.

Monitoring of sustainable development indicators is not required by the Chinese DNA. The environmental impacts are considered minor and will be monitored by the local environmental authority during the project lifetime /6/.

For implementation of the monitoring plan, a monitoring team and an auditing team will be established in each CPA. The monitoring team will be in charge of monitoring implementation and data collection in accordance with the monitoring manual and auditing team will take the auditing work about the monitoring and quality assurance and quality control procedure in accordance with the monitoring manual. Also, a person will be designated for all monitoring matters of the CPA, such as management of the monitoring team and auditing team and implementation of the monitoring etc..

A database will be established for recording CPAs in the PoA and each CPA has exclusion information. The PoA manager will be responsible for supervision of implementation of CPAs and collection of data monitored. And the information will be checked by the trchnical review team designated by the CME inputted in the database by the CME.

The programme's monitoring plan has been specified in the CDM-SSC-PoA-DD /1/ and is in compliance with the monitoring methodologies AMS-III.D.: "Methane recovery in animal manure management systems" (Ver. 18) /20/, AMS-I.C.: "Thermal energy for the user with or without electricity" (Ver. 19.0) /21/, AMS-I.D.: "Grid connected renewable electricity generation" (Ver. 17.0) /22/ and AMS-I.F.: "Renewable electricity generation for captive use and mini-grid" (Ver. 02.0) /23/.

It is DNV's opinion that all monitoring parameters are included and the project participants are able to implement the monitoring plan.

4.8.1 Methodological choices and equations to be used for calculation of emission reductions of a CPA

Baseline emissions

Baseline emissions of the PoA include (1) baseline emission due to methane recovery (for three project scenarios), (2) baseline emissions from thermal generation (for scenario I and III) and (3) baseline emissions from electricity generation (for scenario II and III).

Procedures to calculate baseline emissions of an individual CPA have been specified in the PoA. Baseline emissions are calculated as equations below:

$$\begin{cases} BE_y = BE_{CH4,y} + BE_{Thermal,y} & \text{Only applicable under Scenario I} \\ BE_y = BE_{CH4,y} + BE_{Ele,y} & \text{Only applicable under Scenario II} \\ BE_y = BE_{CH4,y} + BE_{Thermal,y} + BE_{Ele,y} & \text{Only applicable under Scenario III} \end{cases}$$

Where:

- $BE_{CH4,y}$ is the baseline emissions due to methane recovery in year *y* (tCO_2e);
- $BE_{Thermal,y}$ is the baseline emissions due to thermal generation in year *y* (tCO_2e);
- $BE_{Ele,y}$ is the baseline emissions due to electricity generation in year *y* (tCO_2e);

Equations used for calculation of baseline emissions of a SSC-CPA are specified as follows.

(1) Baseline emissions due to methane recovery ($BE_{CH4,y}$)

- The approach specified under paragraph 9(a) of AMS-III.D (version 18) /20/ is used for calculation of baseline emission due to methane recovery.
- The maximum methane producing potential of the volatile solid generated (B_o) will be estimated using default values from tables 10 A-4 to 10 A-9 of 2006 IPCC Guidelines for National Greenhouse Gas Inventories volume 4 Chapter 10 /35/, as no country specific value is available.
- Volatile solids will be preferably to be obtained using data from nationally published sources. If data from nationally published sources are not available, country-specific data can be estimated with method in section 10.2 in 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4 chapter 10 /35/. And the default IPCC values will be adjusted using equation (2) AMS-III.D version 18 /20/.
- The annual average number of animals ($N_{LT,y}$) are determined using formula (3) in paragraph 10 (g) of AMS-III.D version 18 /20/.
- As country specific value of methane Conversion Factors (MCF) is not available, IPCC default values provided in table 10.17 of 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4 Chapter 10 will be used /35/.

(2) Baseline emissions from thermal generation ($BE_{Thermal,y}$)

- The approach specified under paragraph 22 of AMS-I.C version 19.0 /21/ is used for calculation of baseline emissions from thermal generation.
- The efficiency of the plant using fossil fuel that would have been used in the absence of the project activity is determined as the default efficiency of 100% /21/.
- The CO_2 emission factor of the fossil fuel is determined using IPCC default emission factors.
- The efficiency of the baseline equipment being replaced by biogas stoves is determined as default efficiency value of 100%.
- Efficiency of the project equipment (biogas stove) is determined as 55% according to the National Standards of China (GB/T 3606-2001) /47/.

(3) Baseline emissions from electricity generation ($BE_{Ele,y}$)

- The baseline emissions from electricity generation is calculated with the quantity of electricity supplied to the grid or displaced from the grid multiplying combined margin CO_2 emission factor for grid connected power generation /22//23/.
- The combined margin CO_2 emission factor for grid connected power generation is calculated with the "Tool to calculate the emission factor for an electricity system" (Ver. 02.2.1) /30/.

It is concluded that procedures to calculate baseline emissions of an individual CPA have been specified in the CDM-SSC-PoA-DD /1/. As per the management system of the PoA specified in the CDM-SSC-PoA-DD /1/, it could be confirmed that responsibilities and authorities for project management monitoring and measurement etc. are in place and the CME has the infrastructure and resources to calculate the baseline emissions.

Project emissions

Procedures to calculate project emissions of an individual CPA have been specified in the CDM-SSC-PoA-DD /1/. Project emissions of the programme consist of 5 parts:

- Physical leakage of biogas in the manure management systems which includes production, collection and transport of biogas to the point of flaring/combustion or gainful use ($PE_{PL,y}$);
- Emissions from flaring or combustion of the gas stream ($PE_{flare,y}$);
- CO_2 emissions from use of fossil fuels or electricity for the operation of all the installed facilities ($PE_{power,y}$);
- CO_2 emissions from incremental transportation distances ($PE_{transp,y}$);
- Emissions from the storage of manure before being fed into the anaerobic digester ($PE_{storage,y}$)

As the CPAs under the PoA do not involve fossil fuel for which an eligibility criteria was set in the CDM-SSC-PoA-DD /1/, the following project emissions are involved in the PoA as per the applied methodologies /20//21//22//23/ and the equations for calculation of project emissions of a SSC-CPA are specified as follows:

- Emissions due to physical leakage of biogas ($PE_{PL,y}$) are estimated as 10% of the maximum methane producing potential of the manure fed into the management systems implemented by the project activity, calculated as per equation (6) of AMS-III.D. version18 /20/.
- Emissions from flaring or combustion of the biogas steam ($PE_{flare,y}$) are calculated using the procedures described in the "Tool to determine project emissions from flaring gases containing methane" /32/. For the calculation, flare efficiency of 0 is applied, which is conservative /1/.
- As CPAs under the PoA do not involve fossil other than for transportation /1/, emission from use of fossil fuel is zero. $PE_{power,y}$ equals to emissions due to use of electricity for operation of the installed facilities which are calculated with the quantity of electricity consumed by the project multiply the combined margin CO_2 emission factor for grid connected power generation calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (Ver. 02.2.1) /22//30/;
- Emissions from incremental transportation ($PE_{transp,y}$) are calculated with equation (6) of AMS-III.F version 10 /31/.
- Emissions due to storage of manure before being fed into the anaerobic digester ($PE_{storage,y}$) are calculated with equation (8) of AMS-III.D version 18 /20/.

It is concluded that procedures to calculate project emissions of an individual CPA have been specified in the PoA and emission reduction calculations are transparently documented by in the CER calculation spreadsheet. As per the management system of the PoA specified in the CDM-SSC-PoA-DD /1/, it could be confirmed that responsibilities and authorities for project management monitoring and measurement etc. are in place and the CME has the infrastructure and resources to calculate the project emissions.

Leakage emissions

As project activities in each CPA will install anaerobic animal manure treatment systems with recovery of biogas and utilize the generated biogas as fuel for energy generation and no energy generating equipment is transferred from another project activity /1/, no leakage emission is involved for this programme, which is in line with applied methodologies AMS-III.D. version 18, AMS-I.C. version 19.0, AMS-I.D. version 17.0, and AMS-I.F. version 02.0 /20//21//22//23/.

Therefore, leakage emissions are zero.

The PoA-DD has correctly identified that no leakage need to be calculated based on the requirements of the applied methodologies /1/.

4.8.2 Parameters determined ex-ante

Data and parameters listed here are determined only once when validation is undertaken. They are not monitored and thus remain fixed at PoA level throughout the crediting period. The list of parameters determined *ex-ante* is as follows:

- Global Warming Potential (GWP) of CH_4 (GWP_{CH4}): 21 as IPCC default value suggested by AMS-III.D version 18 /20/.
- CH_4 Density (D_{CH4}): 0.00067 t/m^3 at room temperature and 1 atm pressure as recommend by the AMS-III.D version 18 /20/ (the value will be adjusted according to the actual monitored biogas pressure (P) and temperature (T) if the monitored biogas volume is not at room temperature and 1 atm pressure).
- Model correction factor to account for model uncertainties (UF_b): 0.94 as per the AMS-III.D version 18 /20/.
- Net electricity generated and delivered to the grid by power plant / unit m in year y (EG_y): values from China Electric Statistical Yearbook 2008 to 2010 /37/.
- Amount of fossil fuel type i consumed in the project electricity system in year y ($FC_{i,y}$): values from China Energy Statistical Yearbook 2008 to 2010 depends on specific fuel /38/.
- The fuel consumption of fuel i in power plant j during year y ($F_{i,j,y}$): values from China Energy Statistical Yearbook 2008 to 2010 depends on specific fuel /38/.
- Net calorific value (energy content) per mass or volume unit of a fuel ($NCV_{i,y)}$: values from China Energy Statistical Yearbook 2010 depends on specific fuel /38/.
- CO_2 emission factor of fossil fuel ($EF_{CO2,i,y}$): IPCC default values depends on specific fuel /35/.
- Methane fraction of biogas: 60% as default value as per the AMS-III.D version 18 /20/.
- Oxidation factor of the fuel i in year y ($OXID_{i,y}$): IPCC default values depends on specific fuel.
- Internal power consumption of power plants: values from China Energy Statistical Yearbook 2008 to 2010 /38/.

- Installed capacities of power plant category ($CAP_{i,j,y}$): values from China Electric Power Yearbook 2008 to 2010.
- Annual methane conversion factor for the project manure storage device l (MCF_l): IPCC default values as per the AMS-III.D version 18 /20/.
- Efficiency of the baseline equipment being replaced by biogas boiler ($\eta_{BL,thermal}$): 100% as default efficiency /21/, this is conservative.
- Efficiency of the baseline equipment being replaced by biogas stove (η_{BL}): 100% as default efficiency /21/, this is conservative.
- Efficiency of the biogas-fired stove (η_{PJ}): 55% according to the National Standards of China (GB/T 3606-2001) /47/.
- Flare efficiency of biogas flaring in year y ($\eta_{flare,h}$): 0% as default efficiency /1/, this is conservative.
- CO_2 emission factor from fuel use due to transportation (EF_{CO2}): 0.001011 t CO_2/km as value from IPCC 1996 /35/.
- Combustion efficiency of biogas utilized for energy generation: 100% as per the AMS-III.D version 18 /20/.
- Degradation rate constant (k): 0.069 as IPCC default value as per AMS-III.D (version 18) /20/.

The following parameters for *ex-ante* calculation will be determined at the inclusion of CPA:

- Annual methane conversion factor (MCF) for the baseline animal waste management system (MCF): IPCC default value as national specific value is not available as per AMS-III.D version 18 /20/.
- Maximum methane producing potential of the volatile solid generated ($B_{o,LT}$): IPCC default value as national specific value is not available as per AMS-III.D version 18 /20/.
- Fraction of manure handled in baseline animal manure management system ($MS\%_{BL,j}$).
- Default average animal weight of a defined population ($W_{default}$): IPCC default values as national specific value is not available as per AMS-III.D version 18 /20/.
- Volatile solid excretion rate per day on a dry-matter basis for a defined livestock population ($VS_{default}$): IPCC default values as national specific value is not available as per AMS-III.D version 18 /20/.
- Combined margin grid emission factor ($EF_{grid,CM,y}$): the combined margin grid emission factor of Northwest Power Grid (NWPG) and Central China Power Grid (CCPG) have been calculated as 50:50 as the weights of the operating margin (OM) and the build margin (BM) in the PoA-DD /1/, which is in line with Tool to Calculate the Emission Factor for an Electricity System, version 02.2.1 /30/.

  Simple OM was chosen and this is justified since the low cost /must run resources constitute less than 50% of total grid generation of Northwest Power Grid and Central China Power Grid /37/. Aggregated generation and fuel consumption data are used due to the fact that more disaggregated data are not available in the Northwest Power

Grid and Central China Power Grid, the total electricity delivered to the Northwest Power Grid and Central China Power Grid has been used which are obtained from the China Electric Power Yearbook from 2008 to 2010 (published annually) /37/. Country specific data for net calorific value of each type of fossil fuel are obtained from the China Energy Statistical Yearbook from 2008 to 2010 /38/ and the emission factors of each type of fossil fuel from IPCC 2006 /35/ are deemed reasonable. The calculated OM of Northwest Power Grid and Central China Power Grid was 1.0001 tCO_2/MWh and 1.0297 tCO_2/MWh separately which have been confirmed by DNV to be same with the values published by NDRC of China for calculation of emission reduction factor for each power grid of China /39/ and were the latest data available at the commencement of validation.

Build margins of Northwest Power Grid and Central China Power Grid were determined *ex-ante*. Because plant specific fuel consumption and electricity generation data are not publicly available in China, the guidance requested by DNV from the CDM EB for a deviation of the baseline methodology of AM0005 /55/ has been applied for calculation of the build margin (BM) emission factor for this project. The calculated BM of Northwest Power Grid and Central China Power Grid was 0.5851 tCO_2/MWh and 0.4191 tCO_2/MWh separately which have been confirmed by DNV to be same with the values published by NDRC of China for calculation of emission reduction factor for each power grid of China /39/.

The resulting combined margin emission factor of Northwest Power Grid and Central China Power Grid is 0.79260 tCO_2e/MWh and 0.72440 tCO_2e/MWh separately /1/. CPAs in Henan Province will apply the combined margin emission factor of 0.72440 tCO_2e/MWh while CPAs in Shaanxi Province will apply the combined margin emission factor of 0.79260 tCO_2e/MWh for the first 7 years renewable crediting period.

4.8.3 Parameters monitored ex-post

The emission reduction calculations are documented in accordance with AMS-III.D.: "Methane recovery in animal manure management systems" (Ver. 18) /20/, AMS-I.C.: "Thermal energy for the user with or without electricity" (Ver. 19.0) /21/, AMS-I.D.: "Grid connected renewable electricity generation" (Ver. 17.0) /22/ and AMS-I.F.: "Renewable electricity generation for captive use and mini-grid" (Ver. 02.0) /23/ and will be calculated *ex-post* for each CPA considering the following parameters:

- Average animal weight of a defined livestock population at the CPA site (W_{site}).
- Number of days in year "y" where the treatment plant was operational (nd_y).
- Number of days animal is alive in the farm in the year *y* ($N_{da,y}$).
- Number of animals produced annually of type p for the year y ($N_{p,y}$).
- Fraction of manure handled in CPA animal manure management system "j" ($MS\%_{PJ,j}$).
- The net quantity of thermal energy supplied by a CPA during the year y ($EG_{PJ,y}$).
- The net quantity of the biogas consumed by households in year *y* ($B_{biomass-1,PJ,y}$).
- The net quantity of the biogas supplied to boilers in year y ($B_{biomass-2,PJ,y}$).
- The net quantity of the biogas supplied to power generator in year y ($B_{biomass-3,PJ,y}$).

- Volumetric flow rate of biogas in dry basis at normal conditions in hour h ($FV_{RG,h}$).
- Quantity of manure transported (Q_y).
- Quantity of product transported ($Q_{y,treatment}$).
- Average truck capacity for manure transportation (CT_y).
- Average truck capacity for product transportation ($CT_{y,treatment}$).
- Average incremental distance for manure transportation (DAF_w).
- Average incremental distance for product transportation ($DAF_{treatment}$).
- Temperature of the biogas at the flow measurement site (T, no separate monitoring is necessary if using flow meters that automatically measure the temperature and pressure of biogas, and expressing biogas volumes in normalized cubic meters).
- Pressure of the biogas at the flow measurement site (P, no separate monitoring is necessary if using flow meters that automatically measure the temperature and pressure of biogas, and expressing biogas volumes in normalized cubic meters).
- Quantity of electricity supplied to and/or displaced from the grid as a result of the implementation of the CDM project activity in year y ($EG_{BL,y}$).
- Quantity of net electricity consumed by a typical SSC-CPA in year y ($EC_{PJ,y}$).
- Fraction of volatile solids (%) handled by storage device l ($MS\%_l$).
- Annual average ambient temperature at weather station nearby project site (T_i).
- Annual average interval between manure collection and delivery for treatment at a given storage device l (AI_l).
- On-site inspection of farms included in CPAs.
- Operation of household biogas stoves.
- Measures for soil application of sludge.

The monitoring plan described in the CDM-PoA-DD will be applied for each CPA and all monitoring parameters are included. As described in the CDM-SSC-PoA-DD /1/, in each CPA a monitoring team will be established for monitoring implementation and data collection and an auditing team will be established for auditing work and QA/QC procedures of the monitoring plan of the CPA while a person will be designated for management of the monitoring and auditing teams and training plan. And PoA manager will be in charge of collecting monitored data from CPAs, supervision of implementation of PoA etc. It could be confirmed that the monitoring plan could be implemented for each CPA. It could be confirmed that the monitoring plan could be implemented as the description in the CDM-SSC-PoA-DD.

4.8.4 Management system and quality assurance for monitoring and reporting

Responsibilities and authorities for project management, monitoring and reporting activities, measurement, training and reporting techniques and QA/QC procedures are defined in PoA-DD /1/. For implementation of the monitoring plan, a monitoring team and an auditing team will be established in each CPA. The monitoring team will be in charge of monitoring implementation and data collection as per the monitoring manual and the auditing team will be charge of auditing work of the monitoring and QA/QC procedures are per the monitoring

manual. Also, a person will be designated for management of the monitoring team and auditing team and training plan for implementation of the monitoring plan in each CPA. The PoA manager will be charge of establishment of monitoring plan and training plan, data collection from CPAs and supervision of implementation of the PoA.

Calibration and testing of monitoring meters will be performed according to state and/or sector standards. Once a meter fails to work properly, it will be replaced by another meter which has been calibrated by professional entity and conservative manner which will cause lower CER will be applied for the period between failure of the meter and replacement of the meter /1/. The procedures for calibration and maintenance, data collection, measures for emergency, quality control and quality assurance and monitoring training have also been defined in the monitoring plan. Data will be kept during the PoA crediting period and plus 2 years.

The monitoring team will implement monitoring plan and collect the data according to the monitoring plan and the monitored data will be checked by the auditing team for quality control in each CPA. All data will be bottom-up collected as per monitoring structure and the regular summary will be made and reported to PoA manager designated by CME periodically. All data will be transmitted to the database managed by CME. Also, the CME will conduct on-site visits to the farms included in the PoA to check their performances.

DNV considers the ability of the project participant to implement the monitoring, the related QA/QC checks adequately.

4.9 Environmental impacts

As stated in the PoA-DD, an environmental Impact Assessment (EIA) will be conducted for each CPA according to Chinese law & regulation and the potential environmental impacts /40//41/. EIA is done in CPA level as per section C.1 in CDM-SSC-PoA-DD and EIA of each CPA shall be carried out and approved by local environmental protection bureau before starting of each CPA (eligibility criteria (7) in the CDM-SSC-PoA-DD /1/).

The EIA of the first CPA was approved by Environmental Protection Bureau of Xinxiang City on 26 August 2011 which is before starting date of the CPA (28 November 2011) and publication date of the CDM-SSC-PoA-DD (24 November 2011) /3//6/. The EIA has not identified any significant environmental impacts /6/.

4.10 Comments by local stakeholders

According to section D.1 of CDM-SSC-PoA-DD /1/, local stakeholder consultation is done at PoA level and a local stakeholder consultation process has been conducted through a stakeholder questionnaire survey to investigate the impacts on the local ecological environment and economy.

A stakeholder survey of residents within boundary of the PoA was carried out on from 8 October 2011 to 14 October 2011 /9/. 140 copies of questionnaire form were distributed and returned /9/. Before stakeholder consultation, a notice was posted in official website of Henan Province and notice was distributed to municipal governments in Shaanxi Province to let stakeholder have more understanding for the programme. Also, questionnaires were randomly distributed to stakeholders with different ages, education level and occupations /9/. Thus, DNV was able to confirm that the 140 questionnaires are reasonable to represent all local stakeholders near the project site.

The survey showed that the project received support from local stakeholders, which has been verified against the questionnaires by DNV /9/.

DNV considers the local stakeholder consultation carried out adequately.

4.11 Comments by Parties, stakeholders and NGOs

The CDM-SSC-PoA-DD dated 25 October 2011, the PoA specific CDM-SSC-CPA-DD with generic information relevant to all CPAs to be included in this PoA and the CDM-SSC-CPA-DD for the CPA with the title Animal Manure Treatment Programme in Henan Province and Shaanxi Province--CPA-0001 was made publicly available on the UNFCCC's website (http://cdm.unfccc.int/ProgrammeOfActivities/Validation/gotoProj?id=OU4SH064A4D3UXRCJX7DFPWDYXIFBE) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 24 November 2011 to 23 December 2011.

No comments were received.

APPENDIX A

CDM VALIDATION PROTOCOL

Table 1 Mandatory Requirements for Clean Development Mechanism (CDM) Programmes of Activities

Requirement	Reference	Conclusion
About Parties		
1. The programme shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3.	Kyoto Protocol Art.12.2	OK
2. The programme shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK
3. The programme shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	~~CAR 2~~ OK
4. The programme shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	~~CAR 2~~ OK
5. In case public funding from Parties included in Annex I is used for the programme, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	~~CAR 1~~ OK
6. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	OK
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	OK
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	OK
9. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	CDM Modalities and Procedures §31b	OK
About Design of Programme		

Requirement	Reference	Conclusion
10. The CDM-POA-DD sets a framework for the implementation of the PoA and defines unambiguously a CPA under the PoA.	PoA Procedures § 2	~~CL 4~~ OK
11. The coordinating/managing entity shall be identified.	PoA Procedures § 2 (a)	OK
12. The boundary for the PoA in terms of a geographical area (e.g., municipality, region within a country, country or several countries) within which all CPAs included in the PoA will be implemented is defined.	PoA Procedures § 2 (b)	OK
13. Eligibility criteria are defined for inclusion of a project activity as a CPA under the PoA, which shall include criteria for demonstration of additionality, and the type and/or extent of information (e.g. criteria, indicators, variables, parameters or measurements) that shall be provided by each CPA in order to ensure its eligibility.	PoA Procedures § 2 (g)	~~CAR 1~~ OK
14. The length of the PoA is not exceeding 28 years.	PoA Procedures § 2 (h)	OK
15. The operational and management arrangements established by the coordinating/managing entity for the implementation of the PoA is decribed, including a description of a record keeping system for each CPA under the PoA, a system/procedure to avoid double accounting e.g. to avoid the case of including a new CPA that has been already registered either as CDM project activity or as a CPA of another PoA, the provisions to ensure that those operating the CPA are aware and have agreed that their activity is being subscribed to the PoA.	PoA Procedures § 2 (i)	~~CAR 1~~ OK
16. The proposed statistically sound sampling method/procedure to be used by DOEs for verification of the amount of emission reductions achieved by CPAs under the PoA is described. In case the coordinating/managing entity opts for a verification method that does not use sampling but verifies each CPA there is a transparent system defined and described that ensures that no double accounting occurs and that the status of verification can be determined anytime for each CPA.	PoA Procedures § 2 (k)	~~CAR 3~~ OK
About small-scale programmes of activities (if applicable)		

Requirement	Reference	Conclusion
17. The CPAs shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakech Accords.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c	OK
About additionality		
18. Additionality of the programme as a whole is demonstrated because in the absence of the CDM (i) the proposed voluntary measure would not be implemented, or (ii) the mandatory policy/regulation would be systematically not enforced and that non-compliance with those requirements is widespread in the country/region, or (iii) that the PoA will lead to a greater level of enforcement of the existing mandatory policy /regulation.	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43 PoA Procedures § 2 (e)	OK
19. Additionality of a typical CPA is demonstrated by using the procedure provided in the baseline and monitoring methodology applied.	PoA Procedures § 2 (f)	OK
About application of baseline and monitoring methodology		
20. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
21. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	CDM Modalities and Procedures §45c,d	OK
22. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	OK
23. The monitoring plan for a typical CPA is developed in accordance with the approved monitoring methodology, and identification of the monitoring provisions and data parameters a CPA has is to apply/monitor	PoA Procedures § 2 (j)	OK
24. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	OK

Requirement	Reference	Conclusion
About forecast emission reductions		
25. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	OK
About environmental impacts		
26. Documentation on the analysis of the environmental impacts of the programme activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the programme participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	☐ Analysis at PoA level ☒ Analysis at CPA level
About stakeholder comments		
27. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	☒ Analysis at PoA level ☐ Analysis at CPA level
28. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available.	CDM Modalities and Procedures §40	OK
Other		
29. The project design document shall be in conformance with the CDM-PoA-DD format.	CDM Modalities and Procedures Appendix B, EB Decision	OK

Table 2 Requirements Checklist

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
A. General Description of the Programme of Activities *The project design is assessed.*					
A.1. Title of the PoA					
A.1.1. Does section A.1 of the PoA-DD include a clearly identifiable project title, version number of the PoA-DD and date of the PoA-DD?	/1/	DR	☒ Clearly identifiable title of the project activity ☒ Version number of the PDD is included ☒ Date of the PDD is included.		OK
A.1.2. Is the PoA-DD is in accordance with the applicable requirements for completing PoA-DDs?	/1/	DR	☒ Yes Compliance of the PoA-DD has been checked before the webhosting.		OK
A.2. Programme Boundaries *Programme Boundaries are the limits and borders defining the GHG emission reduction project.*					
A.2.1. Are the programme's spatial boundaries (geographical) clearly defined?	/1/	DR I	The programmes's spatial boundary includes Henan Province and Shaanxi Province administrative areas.		OK
A.2.2. Are the programme's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1/	DR I	Yes. The programme will reduce methane emission by installing anaerobic manure treatment systems with biogas recovery and reduce CO_2 emission by utilizing the recovered biogas for generation of electricity, heat or both. Further clarification is sought on technologies applied to generate different energy in different CPAs.	~~CL 2~~	OK
A.2.3. Can each CPA under the PoA be clearly identified individually including spatial boundaries (geographical) clearly defined?	/1/ /2/ /3/	DR	Yes. The spatial boundary of each CPA under the PoA will be determined as the location where the biogas digesters are installed. Location of the first CPA titled "CPA-0001" is clearly specified as the Fengqiu County Zhigang Breeding Farm in Xinxiang City, Henan Province		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			in the CDM-SSC-CPA-DD and geographical coordinates of the first CPA are 113.3846°E and 35.0458°N.		
A.2.4. Does the programme establish eligibility criteria for inclusion of a project as a CPA under the PoA?	/1/	DR I	The eligibility criteria for inclusion of a CPA has been established in the PoA. Further clarification is sought on the system/procedures to avoid including CPAs that have already been registered either as CDM project activity or as a CPA of another PoA and to uniquely identify farms located in the CPA.	~~CL 1~~	OK
A.3. Eligibility Criteria *Eligibility criteria to assess eligibility of CPAs to be included to PoA.*					
A.3.1. Are the geographical boundary of the CPA including any time-induced boundary consistent with the geographical boundary set in the PoA?	/1/	DR	A CPA shall be located in the boundary of the programme, within Henan Province or Shaanxi Province. Further clarification is sought on the three project scenarios involved in this PoA, technologies applied and whether there is co-generation project in the PoA.	~~CL 2~~	OK
A.3.2. Are there conditions that avoid double counting of emission reductions like unique identifications of product and end-user locations (e.g. programme logo)?	/1/	DR	Corrective action is sought on the eligibility criteria to avoid double counting of emission reductions.	~~CAR 1~~	OK
A.3.3. Are there specifications of technology/measure including the level and type of service, performance specifications including compliance with testing/certifications?	/1/	DR	As stated in PoA-DD version 01 dated 25 October 2011, all CPAs under the PoA will install anaerobic animal manure management systems to achieve methane recovery and destruction by flaring/combustion or gainful use of the recovered methane, which is not consistent with the three scenarios in section A.2. and description in Section E.6.2.. It is unclear whether	~~CAR 1~~	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			the recovered biogas will be flared/combusted. Corrective action is sought on whether the recovered biogas will be flared. Also, clarification is sought on whether the lagoons will be installed in parallel or in series when there are more anaerobic reactors.	~~CL 3~~	
A.3.4. Are there conditions to check the start date of the CPA through documentary evidence?	/1/	DR	Corrective action is sought on the eligibility criteria to check start date of the CPA through documentary evidence.	~~CAR 1~~	OK
A.3.5. Are there conditions that ensure compliance with applicability and other requirements of single or multiple methodology/ies applied by CPAs?	/1/	DR	There multiple methodologies are applied for the programme. Corrective action is sought on distinct eligibility criteria for each methodology combination applied for this programme.	~~CAR 1~~	OK
A.3.6. Are there conditions that ensure that CPAs meet the requirements pertaining to the demonstration of additionality of the PoA and typical CPA?	/1/	DR	Eligibility criteria for additionality demonstration have been set according to "Guidelines for demonstrating additionality of micro-scale project activities" (Ver. 03) and "Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities".		OK
A.3.7. Are there PoA-specific requirements stipulated by the CMEs including any conditions related to undertaking local stakeholder consultations and environmental impact analysis?	/1/	DR	As stated in PoA-DD version 01 dated 25 October 2011, local stakeholder consultations were undertaken at PoA level while the environmental analysis is undertaken at SSC-CPA level, corrective action is sought on the PoA-specific requirements including any conditions related to undertaking environmental impact analysis.	~~CAR 1~~	OK
A.3.8. Where applicable, are the target group (e.g. domestic/commercial/industrial, rural/urban, grid-	/1/	DR	Not applicable.		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
connected/off-grid) and distribution mechanisms (e.g. direct installation) specified?					
A.3.9. Where applicable, are there conditions related to sampling requirements for a PoA in accordance with the approved guidelines/standard from the Board pertaining to sampling and surveys?	/1/	DR	Not applicable.		OK
A.3.10. Where applicable, are there conditions that ensure that CPA in aggregate meets the small-scale or micro-scale threshold criteria and remain within those thresholds throughout the crediting period of the CPA?	/1/	DR	Yes. The eligibility criteria that emission reductions from type III components of a CPA should be less than or equal to 60,000tCO_2/yr and the total installed thermal capacity of the CPA is less than 45 MW_{th} is developed to meet the small-scale threshold criteria.		OK
A.3.11. Where applicable, are there requirements for the debundling check, in case CPAs belong to small-scale (SSC) or microscale project categories?	/1/	DR	Yes. There are requirements for the debundling check.		OK
A.3.12. Are there conditions to provide an affirmation that funding from Annex I parties, if any, does not result in a diversion of official development assistance?	/1/	DR	Corrective action is sought on the eligibility criteria to confirm whether there is public funding from Annex 1 party of each CPA.	~~CAR 1~~	OK
A.4. Participation Requirements *Referring to Part A, Annex 1 and 2 of the PoA-DD as well as the CDM glossary with respect to the terms Party, Letter of Approval, Authorization and Project Participant.*					
A.4.1. Which Parties and programme participants are participating in the programme?	/1/	DR	The participating parties are China as host Party and United Kingdom of Great Britain and Northern Ireland as Annex 1 Party. The programme participants are Zhongruihe International New Energy Science and		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			Technology (Beijing) Co. Ltd. from China and A&T Carbon Asset Co., Limited from United Kingdom of Great Britain and Northern Ireland.		
A.4.2. Has the coordinating/managing entity of the programme been identified?	/1/	DR	Yes. Zhongruihe International New Energy Science and Technology (Beijing) Co. Ltd. has been identified as the coordinating/managing entity.		OK
A.4.3. Have all involved Parties provided a valid and complete letter of approval and have all private/public programme participants been authorized by an involved Party?	/1/	DR	Letters of approval from China and United Kingdom of Great Britain and Northern Ireland are still pending.	~~CAR 2~~	OK
A.4.4. Do all participating Parties fulfil the participation requirements as follows: - Ratification of the Kyoto Protocol - Voluntary participation - Designated a National Authority?	/1/	DR	Both China and United Kingdom of Great Britain and Northern Ireland fulfil the participation requirements.		OK
A.4.5. Do all participating Parties fulfil the participation requirements as follows:	/1/	DR	Letters of approval from China and United Kingdom of Great Britain and Northern Ireland are still pending.	~~CAR 2~~	OK
	China (host)		UK	Country Y	
a) Party has ratified the Kyoto Protocol	☐ Yes ☐ No		☐ Yes ☐ No	☐ Yes ☐ No	
b) Party has designated a Designated National Authority	☐ Yes ☐ No		☐ Yes ☐ No	☐ Yes ☐ No	
c) The assigned amount has been determined	☐ Yes ☐ No		☐ Yes ☐ No	☐ Yes ☐ No	
A.4.6. Do the letters of approval meet the following requirements?	/1/	DR	Letters of approval from China and United Kingdom of Great Britain and Northern Ireland are still pending.	~~CAR 2~~	OK
	China (host)		UK	Country Y	
a) LoA confirms that Party has ratified the Kyoto Protocol	☐ Yes ☐ No		☐ Yes ☐ No	☐ Yes ☐ No	
b) LoA confirms that participation is voluntary	☐ Yes ☐ No		☐ Yes ☐ No	☐ Yes ☐ No	

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
c) The LoA confirms that the project contributes to the sustainable development of the host country?			☐ Yes ☐ No NA NA		
d) The LoA refers to the precise project activity title in the PDD			☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No		
e) The LoA is unconditional with respect to (a) to (d) above			☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No		
f) The LoA is issued by the respective Party's DNA			☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No		
g) The LoA was received directly by the DNA or the PP			☐ DNA ☐ PP ☐ DNA ☐ PP ☐ DNA ☐ PP		
h) In case of doubt regarding the authenticity of the letter of approval, describe how it was verified that the letter of approval is authentic			Letters of approval from China and United Kingdom of Great Britain and Northern Ireland are still pending.		
A.4.7. Does the programme make provisions for meeting training and maintenance needs?	/1/	DR	Further clarification is sought on the training plan of the programme.	~~CL 4~~	OK
A.5. Contribution to Sustainable Development *The project/programme's contribution to sustainable development is assessed.*		DR			
A.5.1. Has the host Party confirmed that the programme assists it in achieving sustainable development?	/1/	DR	Letter of approval from China is still pending.	~~CAR 2~~	OK
A.5.2. Will the programme create other environmental or social benefits than GHG emission reductions?	/1/	DR	Letter of approval from China is still pending.	~~CAR 2~~	OK
A.6. Small scale programme activity *It is assessed whether the project qualifies as small-scale CDM project activity*					
A.6.1. Do CPAs under the programme qualify as small scale CDM project activities as defined in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM?	/1/	DR	The programme applies simplified baseline methodologies AMS-III.D. version 18, AMS-I.C. version 19.0, AMS-I.D. version 17.0, and AMS-I.F. version 02.0. CPAs under the PoA will be defined to ensure that emission reductions from type III components of the CPA will be less than or equal to 60 000tCO_2/yr and the total installed thermal		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			capacity of the CPA is less than 45 MW_{th} (if electricity generation, Multiply by 3 to derive thermal units as per the latest version of "General Guidelines to SSC CDM methodologies"). Thus, CPAs under the programme will qualify as small scale project activities.		
A.7. Operational, management and monitoring plan for the programme					
A.7.1. Do the operational and management arrangements established by the coordinating entity include a record keeping system for each CPA under the programme?	/1/	DR	The operation and management of each CPA will be led by Zhongruihe International New Energy Science and Technology (Beijing) Co. Ltd. and Zhongruihe International New Energy Science and Technology (Beijing) Co. Ltd. will establish a database for recording the CPAs included in the PoA. Clarification is sought on the following items for management system of the programme: Roles and responsibilities of personnel involved in the process of inclusion of CPAs, including review of their competencies. Arrangements for training and capacity development for personnel. Procedures for technical review of inclusion of CPAs. Records and demonstration control process for each CPA under the PoA. Measures for continuous improvement of the management system.	~~CL 4~~	OK
A.7.2. Do the operational and management arrangements established by the coordinating entity include a system/procedure to avoid including CPAs that have already been registered	/1/	DR	Further clarification is sought on the system/procedures to avoid including CPAs that have already been registered either as CDM project activity or as a CPA of another PoA shall be stated in the PoA-DD.	~~CL 1~~	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
either as CDM project activity or as a CPA of another PoA?					
A.7.3. Do the operational and management arrangements established by the coordinating entity include provisions to ensure that CPA implementers are aware and have agreed that their activity is being subscribed to the PoA?	/1/	DR I	Yes. Before inclusion of the CPA to the PoA, contracts will be signed between Zhongruihe International New Energy Science and Technology (Beijing) Co. Ltd. and owner to ensure that CPA implementers are aware and have agreed that their activity is being subscribed to the PoA.		OK
A.7.4. Does the monitoring plan include a description of a proposed statistically sound sampling method and procedure to be used by designated operational entities for verification of GHG emission reductions by CPAs under the programme? OR If the programme does not use verification method that applies a statistical method for sampling, has a system been defined to avoid double counting of CERs, and is the system transparent?	/1/	DR	It is not clear if the coordinating entity have selected a statistically sound sampling method and procedure to be used by DOEs for verification of GHG emission reductions or choose a verification method that does not use sampling but verifies each CPA in PoA-DD version 01 dated 25 October 2011, the transparent system shall be defined and described to ensure that no double accounting occurs and that the status of verification can be determined anytime for each CPA.	~~CAR 3~~	OK
B. Duration of the Programme of Activities, Crediting Period					
B.1.1. Are the programme starting date and length of the programme clearly defined and evidenced?	/1/	DR	Starting date of the programme is 1 April 2012 or the date of registration of the PoA, which is later. The length of the PoA has been established as 28 years.		OK
B.1.2. Does the PoA design documentation confirm that the length of the PoA does not exceed 28 years?	/1/	DR	Yes. The length of the PoA does not exceed 28 years.		OK
C. Environmental Impacts *Documentation on the analysis of the environmental*			☐ Analysis at PoA level ☒ Analysis at CPA level		

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.			This section must only be completed if the analysis of environmental impacts is at PoA level.		
C.1.1. Has an analysis of the environmental impacts of the programme been sufficiently described?	/1/	DR	Not applicable.		OK
C.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA)?	/40/ /41/	DR	Not applicable.		OK
C.1.3. Will the programme create any adverse environmental effects?	/1/	DR	Not applicable.		OK
C.1.4. Are transboundary environmental impacts considered in the analysis?	/1/	DR	Not applicable.		OK
C.1.5. Have identified environmental impacts been addressed in the programme design?	/1/	DR	Not applicable.		OK
C.1.6. Does the programme comply with environmental legislation in the host country?	/1/	DR	Not applicable.		OK
D. Stakeholder Comments *The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.*			☒ Consultation at PoA level ☐ Consultation at CPA level This section must only be completed if the analysis of environmental impacts is at PoA level.		
D.1.1. Have relevant stakeholders been consulted?	/1/ /9/	DR	The relevant stakeholders have been consulted by distributing questionnaires. 140 copies of questionnaires were distributed and 140 were returned. However, clarification is sought on reasonableness of the 140 questionnaires to represent all local stakeholders in the project boundary.	~~CL 5~~	OK
D.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/ /9/	DR	Questionnaires have been used to invite comments by local stakeholders.		OK
D.1.3. If a stakeholder consultation process is required	/1/	DR	Yes. The stakeholder consultation process is in		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/9/ /41/		accordance with Law of People's Republic of China on Evaluation of Environmental Effects.		
D.1.4. Is a summary of the stakeholder comments received provided?	/1/	DR	Yes. A summary of the stakeholder comments has been provided in section D.3. of PoA-DD version 01 dated 25 October 2011.		OK
D.1.5. Has due account been taken of any stakeholder comments received?	/1/	DR	The survey shows that 100% of the investigated people are supportive to the programme and no negative comments are received.		OK
E. Programme Baseline *The validation of the programme baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.*					
E.1. Baseline Methodology *It is assessed whether the programme applies an appropriate baseline methodology.*					
E.1.1. Does the programme apply an approved methodology and the correct version thereof?	/20/ /21/ /22/ /23/ /26/	DR	The programme applies the simplified baseline methodologies AMS-III.D.: "Methane recovery in animal manure management systems" (Ver. 18), AMS-I.C.: "Thermal energy for the user with or without electricity" (Ver. 19.0), AMS-I.D.: "Grid connected renewable electricity generation" (Ver. 17.0) and AMS-I.F.: "Renewable electricity generation for captive use and mini-grid" (Ver. 02.0). The methodology combinations of AMS-III.D. and AMS-I.C., AMS-III.D. and AMS-I.F., AMS-III.D. and AMS-I.D., AMS-III.D., AMS-I.C. and AMS-I.F. and AMS-III.D., AMS-I.C. and AMS-I.D. are applied for the project.		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			As per the "standard for demonstration of additionality , development of eligibility criteria and application of multiple methodologies for programme of activities" version 01.0 and "General guidelines to SSC CDM methodologies" version 17, the combinations of AMS-III.D. and AMS-I.C., AMS-III.D. and AMS-I.F., AMS-III.D. and AMS-I.D., AMS-III.D., AMS-I.C. and AMS-I.D. and AMS-III.D., AMS-I.C. and AMS-I.F. could be applied without further assessment of cross effects.		
E.1.2. Are the applicability criteria in the baseline methodology all fulfilled?	/1/ /20/ /21/ /22/ /23/	DR	Applicability criteria in the methodology AMS-III.D.: "Methane recovery in animal manure management systems" (Ver. 18) are fulfilled (For all CPAs under the PoA): The livestock population in the farms included in each CPA under the PoA is managed under confined conditions which are confirmed through the on-site visit. Manure or the streams obtained after treatment are not discharged into natural water resources (e.g. river or estuaries), which is confirmed through the on-site visit. As per the eligibility criteria for inclusion of CPA into the PoA, annual average temperature of baseline site where anaerobic manure treatment facility is located is higher than 5° C. In the baseline scenario, the retention time of manure waste in the open anaerobic lagoons is greater than 1 month, and in case of anaerobic lagoons in the baseline, their depths are at least 1 m. No methane recovery and destruction by flaring,	~~CL 6~~	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref	Mo V	Assessment by DNV	Draft Concl.	Final Concl.
			combustion or gainful use takes place in the baseline scenario. It was verified on-site that the existing anaerobic lagoon and farm does not have methane capture and utilization facilities. The final sludge will be handled aerobically. Technical measures will be used to ensure that all biogas produced is utilized for electricity generation or thermal generation. Measures are limited to those that result in aggregate emission reductions of less than or equal to 60 ktCO_2 equivalent annually from all type III components of the project activity. Further justification is sought on the determination of retention time of baseline open lagoons. Applicability criteria in the methodology AMS-I.C.: "Thermal energy for the user with or without electricity" (Ver. 19.0) are fulfilled (Under scenario I and III): Biogas generated will be utilized to provide thermal energy displacing fossil fuel. The total installed capacity of each CPA is less than 45 MW thermal. Contracts will be signed to ensure that only the facility generating energy can claim emission reduction from the energy displaced. Applicability criteria in the methodology AMS-I.D.: "Grid connected renewable electricity generation" (Ver. 17.0) are fulfilled (Under scenario II b and III b):		

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			Comprises renewable energy generation units from renewable biomass (biogas) that displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel generating unit, and For units with new renewable energy components, the eligibility limit of 15 MW for a small scale CDM project activity applies only to the renewable energy component. Applicability criteria in the methodology AMS-I.F.: "Renewable electricity generation for captive use and mini-grid" (Ver. 02.0) are fulfilled (Under scenario II a and III a): Biogas will be used to generate electricity for captive use to displace electricity from the grid. Electricity generated from biogas will be used for captive purpose and not supplied to the grid. Only biogas will be used for electricity generation. All activities in the CPA are Greenfield plants. Total installed capacity of each CPA will not exceed 15 MW.		
E.2. Baseline Scenario Determination *The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.*					
E.2.1. What is the baseline scenario?	/1/ /20/ /21/	DR	For scenario I (AMS-III.D. and AMS-I.C.): animal manure is treated in uncovered anaerobic lagoons without methane recovery and the		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref	Mo V	Assessment by DNV	Draft Concl.	Final Concl.
	/22/ /23/		generated methane is directly emitted to atmosphere, and the equivalent amount of thermal energy is generated based on fossil fuel. For scenario II (AMS-III.D. and AMS-I.F. or AMS-III.D. and AMS-I.D.): animal manure is treated in uncovered anaerobic lagoons without methane recovery and the generated methane is directly emitted to atmosphere, and the equivalent electricity is generated by the grid. For scenario III (AMS-III.D., AMS-I.C. and AMS-I.F. or AMS-III.D., AMS-I.C. and AMS-I.D.): animal manure is treated in uncovered anaerobic lagoons without methane recovery and the generated methane is directly emitted to atmosphere, and the equivalent amount of thermal energy is generated based on fossil fuel, as well as the equivalent electricity is generated by the grid.		
E.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/1/ /20/ /21/ /22/ /23/	DR	The baseline scenario has been directly determined according to the methodology AMS-III.D. version 18, AMS-I.C. version 19.0, AMS-I.D. version 17.0, and AMS-I.F. version 02.0.		OK
E.2.3. Has the baseline scenario been determined according to the methodology?	/1/	DR	Yes. The determination of the baseline scenario is in accordance with the methodology AMS-III.D. version 18, AMS-I.C. version 19.0, AMS-I.D. version 17.0, and AMS-I.F. version 02.0.		OK
E.2.4. Has the baseline scenario been determined using conservative assumptions where possible?	/1/	DR	The baseline scenario has been directly determined according to the methodology AMS-III.D. version 18, AMS-I.C. version 19.0, AMS-I.D. version 17.0, and AMS-I.F. version 02.0.		OK
E.2.5. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies,	/1/	DR	The baseline scenario has been directly determined according to the methodology AMS-		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
macro-economic trends and political aspirations?			III.D. version 18, AMS-I.C. version 19.0, AMS-I.D. version 17.0, and AMS-I.F. version 02.0.		
E.2.6. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/	DR	The baseline scenario has been directly determined according to the methodology AMS-III.D. version 18, AMS-I.C. version 19.0, AMS-I.D. version 17.0, and AMS-I.F. version 02.0. All assumptions and data used for baseline determination by project participants are listed in the PoA-DD version 01 dated 25 October 2011 and the related documents to be submitted for registration.		OK
E.2.7. Have the major risks to the baseline been identified?	/1/	DR	There is no major risk to the identification of the baseline.		OK
E.3. Additionality of the Programme of Activities					
E.3.1. Has it been demonstrated that the programme is a voluntary coordinated action that would not be implemented in the absence of CDM?	/1/ /24/ /27/ /28/	DR	Yes. The installation of biogas digester in existing breeding farms is not required by any law and is a voluntary coordinated action in Henan Province or Shaanxi Province, which was confirmed through follow-up interview with the local government.		OK
E.3.2. If the programme is implementing a mandatory policy/regulation, has it been demonstrated whether the policy/regulation is being enforced? If it is enforced, has it been demonstrated that the programme will lead to a higher level of enforcement?	/1/	DR	Yes. The installation of biogas digester in existing breeding farms is not required by any law and is a voluntary coordinated action in Henan Province or Shaanxi Province, which was confirmed through follow-up interview with the local government.		OK
E.3.3. Are all assumptions stated in a transparent and conservative manner?	/1/	DR	Yes. The installation of biogas digester in existing breeding farms is not required by any law and is a voluntary coordinated action in Henan Province or Shaanxi Province, which was confirmed through follow-up interview with the local government.		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
E.3.4. Is sufficient evidence provided to support the relevance of the arguments made?	/1/	DR	All assumptions are transparently stated.		OK
E.4. Additionality of CPAs					
E.4.1. Is the approach described for demonstrating additionality of a CPA in accordance with the using the procedure provided in the baseline and monitoring methodology applied?	/1/ /24/ /27/ /28/	DR	Yes. The additionality of a CPA shall be demonstrated by applying the "Guidelines for demonstrating additionality of micro-scale project activities" (Ver. 03) and "Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities", which is in accordance with the baseline and monitoring methodologies applied. The approach for demonstrating additionality of a CPA is in accordance with the procedure provided in the baseline and monitoring methodology applied.		OK
E.4.2. Are specific criteria for demonstrating the additionality of a specific CPA included to the PoA?	/1/ /24/ /27/ /28/	DR	The criteria are: (1) Meets relevant requirement in "Guidelines for demonstrating additionality of micro-scale project activities" (Ver. 03), including: The geographic location of the project activity is in a special underdeveloped zone of the host country identified by the Government before 28 May 2010; The total installed capacity of the CPA is no more than 15MW_{th}; The emission reductions from type III components of the CPA are no more than 20 $ktCO_2e$ per year. Or: (2) The project IRR (before tax) of the project included in the CPA is lower than the benchmark of 7%;		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
E.4.3. Is the additionality of a typical CPA demonstrated?	/1/	DR	Yes. Additionality of the first CPA was demonstrated.		OK
E.5. Calculation of GHG Emission Reductions – Project emissions *It is assessed whether the procedure for calculating project emissions is according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
E.5.1. Has the procedure to calculate project emissions of an individual CPA been documented according to the approved methodology and in a complete and transparent manner?	/1/ /20/ /21/ /22/ /23/	DR	The methodology AMS-III.D. version 18 lists project activity emissions to consist of: (a) Physical leakage of biogas in the manure management; (b) Emissions from flaring or combustion of the gas stream; (c) CO_2 emissions from use of fossil fuels or electricity for the operation of all the installed facilities; (d) CO_2 emissions from incremental transportation distances; (e) Emissions from the storage of manure before being fed into the anaerobic digester. (a), (c), (d) and (e) are accounted for in the PoA. As the biogas recovered in CPAs will be utilized for energy generation, (b) is not accounted. However, Whether the recovered biogas will be flared /combusted shall be determined and relative eligibility criteria shall be added. Also, clarification is sought on whether CO_2 emissions from incremental transportation	~~CAR 1~~ ~~CL 7~~	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			distances and emissions from the storage of manure before being fed into the anaerobic digester are involved in project emission calculation of the PoA.		
E.5.2. Have conservative assumptions been used when determining the procedure to be used to calculate the project emissions?	/1/	DR	The conclusion can be reached once CAR 1 and CL 7 are closed.	~~CAR 1 CL 7~~	OK
E.5.3. Are uncertainties in the project emission calculation procedure properly addressed?	/1/	DR	The conclusion can be reached once CAR 1 and CL 7 are closed.	~~CAR 1 CL 7~~	OK
E.6. Calculation of GHG Emission Reductions – Baseline emissions *It is assessed whether the procedure for calculating baseline emissions is according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
E.6.1. Has the procedure to calculate baseline emissions of an individual CPA been documented according to the approved methodology and in a complete and transparent manner?	/1/ /20/ /21/ /22/ /23/	DR	Clarification is sought on measures to determine efficiency of baseline equipment to be replaced and project equipment.	~~CL 8~~	OK
E.6.2. Have conservative assumptions been used when determining the procedure to be used to calculate the baseline emissions?	/1/	DR	The conclusion will be reached when CL 8 is closed.	~~CL 8~~	OK
E.6.3. Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	The conclusion will be reached when CL 8 is closed.	~~CL 8~~	OK
E.7. Calculation of GHG Emission Reductions – Leakage *It is assessed whether the procedure for calculating leakage is according to the methodology and whether the argumentation for the choice of default factors*					

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
and values – where applicable – is justified.					
E.7.1. Has the procedure to calculate leakage emissions of an individual CPA been documented according to the approved methodology and in a complete and transparent manner?	/1/ /20/ /21/ /22/ /23/	DR	No leakage emissions have been accounted for as no energy generating equipment is transferred from another project activity, which is in line with applied methodologies AMS-III.D. version 18, AMS-I.C. version 19.0, AMS-I.D. version 17.0, and AMS-I.F. version 02.0.		OK
E.7.2. Have conservative assumptions been used when determining the procedure to be used to calculate the leakage emissions?	/1/	DR	No leakage calculation is required for this programme.		OK
E.7.3. Are uncertainties in the leakage emission estimates properly addressed?	/1/	DR	No leakage calculation is required for this programme.		OK
E.8. Emission Reductions *The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.*					
E.8.1. Does the PoA-DD provide a clear and correct way of calculating the emission reductions from each CPA?	/1/	DR	In section E.7.2 of the PoA-DD version 01 dated 25 October 2011, emission reduction achieved in year y is the lower one of calculated baseline emissions minus project emissions using the actual monitored data and the emission reduction calculated using formulas in AMS III.D., which is not consistent with calculation in Section E.6.2 (emission reduction is directly calculated with baseline emission minus project emission). Corrective action is requested on the emission reduction calculation method of CPAs.	~~CAR 4~~	OK
E.9. Monitoring Methodology *It is assessed whether the project applies an appropriate monitoring methodology.*					

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
E.9.1. Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/1/ /20/ /21/ /22/ /23/	DR	Clarification is sought on monitoring of the following items: Soil application procedures to ensure final sludge application does not result in methane emissions. Annual average temperature of the project site. Temperature of the biogas at the flow measurement site. Pressure of the biogas at the flow measurement site. On-site inspections for each individual farm included in the programme. Average truck capacity for transportation. Average incremental distance for raw solid waste/manure. Quantity of raw waste/manure treated. Quantity of compost produced. Average distance for compost transportation. The number of days that animals are alive.	~~CL 9~~	OK
E.9.2. Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this programme, whichever occurs later?	/1/	DR	Yes. The monitored data will be kept for two years after the end of the programme.		OK
E.10. Monitoring Plan *It is established whether the monitoring plan provides for reliable and complete emission data over time.*					
E.10.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the programme boundary during the crediting period?	/1/ /20/ /21/ /22/ /23/	DR	The monitoring parameters allow the determination of baseline and project emissions in accordance with the methodology AMS-III.D. version 18, AMS-I.C. version 19.0, AMS-I.D. version 17.0, and AMS-I.F. version 02.0.		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
E.10.2. Are the choices of programme GHG indicators reasonable and conservative?	/1/	DR	Yes, the choice of programme GHG indicators is reasonable.		OK
E.10.3. Is the measurement method clearly stated for each GHG value to be monitored and deemed appropriate?	/1/	DR	The measurement methods for each parameter are stated.		OK
E.10.4. Is the measurement equipment described and deemed appropriate?	/1/	DR	Clarification is sought on installation of monitoring meters and measure to ensure full utilization of supplied biogas to users.	~~CL 10~~	OK
E.10.5. Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/	DR	Procedures to deal with erroneous measurements or emergency situations shall be added.	~~CL 10~~	OK
E.10.6. Is the measurement interval identified and deemed appropriate?	/1/	DR	Measurement interval for each parameter listed under the monitoring plan has been provided.		OK
E.10.7. Is the registration, monitoring, measurement and reporting procedure defined?	/1/	DR	Clarification is sought on the registration, monitoring, measurement and reporting procedure in the monitoring plan.	~~CL 10~~	OK
E.10.8. Are procedures identified for maintenance of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR	Calibration and maintenance information for the monitoring meters shall be provided.	~~CL 10~~	OK
E.10.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR	Further clarification is sought on the record, archive, storage and processing of the monitoring data.	~~CL 10~~	OK
E.11. Monitoring of Sustainable Development Indicators/ Environmental Impacts *It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over time.*					
E.11.1. Is the monitoring of sustainable development indicators/ environmental impacts warranted by	/1/	DR	There is no requirement for monitoring of sustainable development from the approved		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
legislation in the host country			methodologies. There are no national requirements for monitoring of sustainable development indicators in China.		
E.11.2. Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	There is no requirement for monitoring of sustainable development from the approved methodologies. There are no national requirements for monitoring of sustainable development indicators in China.		OK
E.11.3. Are the sustainable development indicators in line with stated national priorities in the Host Country?	/1/	DR	There is no requirement for monitoring of sustainable development from the approved methodologies. There are no national requirements for monitoring of sustainable development indicators in China.		OK
E.12. Management System and Quality Assurance for Monitoring and Reporting *It is checked that programme implementation is properly prepared for and that critical arrangements are addressed.*					
E.12.1. Is the authority and responsibility of overall programme management clearly described?	/1/	DR	Zhongruihe International New Energy Science and Technology (Beijing) Co. Ltd. is responsible for the programme management. Further clarification is sought on the management structure and personnel responsibility of the monitoring.	~~CL 10~~	OK
E.12.2. Are procedures identified for training of monitoring personnel?	/1/	DR	Further clarification is sought on the training plan of the programme.	~~CL 4~~	OK
E.12.3. Are procedures identified for emergency preparedness for cases where emergencies can	/1/	DR	Procedures to deal with emergency situations shall be added.	~~CL 10~~	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
cause unintended emissions?					
E.12.4. Are procedures identified for review of reported results/data?	/1/	DR	Further clarification is sought on the record, archive, storage and processing of the monitoring data.	~~CL 10~~	OK
E.12.5. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR	Corrective actions procedures in order to provide for more accurate future monitoring and reporting shall be described further in the PoA-DD.	~~CL 10~~	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Table 3 Resolution of corrective action requests and clarification requests

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
CAR 1 Corrective action is requested on the following items: • Distinct eligibility criteria of each methodology combination applied for this programme. • The eligibility criteria to avoid double counting of emission reductions and system/procedure to avoid including CPAs that have already been registered either as CDM project activity or as a CPA of another PoA shall be stated in the PoA-DD. • As stated in PoA-DD version 01 dated 25 October 2011, all CPAs under the PoA will install anaerobic animal manure management systems to achieve methane recovery and destruction by flaring/combustion or gainful use of the recovered methane, which is not consistent with the three scenarios in section A.2. and description in Section E.6.2. It is unclear whether the recovered biogas will be flared/combusted. Also, corrective action is sought on eligibility criteria for the following items: • Start date of a CPA. • Environmental impact analysis of a CPA.	B.1.1 B.1.2 B.1.3 B.2.1 B.2.2 B.2.3 B.2.4 B.2.5 B.2.7 B.2.12 A.7.2 E.5.1 E.5.2 E.5.3	➢ Common Criteria, Criteria Related to Applicability Conditions of AMS-III.D, and Criteria Related to Different Combination Application of Methodologies have been respectively listed in the updated PoA-DD. ➢ "The CPA should pass the procedure of avoiding double counting described in A.4.4.1 (ii);" has been added to the eligibility criteria as (2). ➢ The recovered methane will be used for energy generation (including thermal energy generation, electricity generation and both coexsit). Biogas storage tank will be also installed in each Scenario to achieve that in case of emergency all methane produced from anaerobic digestion can be stored but not emitted to atmosphere, and therefore ensure that all methane produced by the digester is used. Besides, it is also possible that flaring system (the flaring system is open flaring or closed flaring based on each owner's opinion. However, for simplification, 0 is used as flaring efficiency of flaring system for ex-post calculation. This is the most conservative way.) is installed in some activities. The content above has been updated in Section A.2 and Section E.6 in the PoA-DD.	OK. The eligibility for inclusion of a CPA into the PoA has been updated in the CDM-SSC-PoA-DD version 02, which has been verified by DNV and is in accordance with "Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities /24/. CAR 1 is closed.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
• Public funding from Annex 1 Parties. • Whether fossil fuel is used for the CPA. • Treatment method of residual waste. • Each CPA is a Greenfield project and not a retrofit or capacity addition project. • Annual average temperature of the CPA is above 5 °C. • In the baseline scenario, treated manure is not discharged to natural water, open anaerobic lagoons in baseline has depth no less than 1m, no methane recovery or flaring in baseline exist. • All recovered biogas are used or flared and related measures. • Technology applied and utilization of biogas for each CPA. • All potential users of biogas and technology to use the biogas.		➢ "The start date of the CPA is not prior to 24/11/2011(GSC date of the PoA) ;" has been added to the eligibility criteria as (6). ➢ "Each activity included in the CPA must have obtained approval of EIA." has been added to the eligibility criteria as (7). ➢ "The CPA has no public funding from Annex 1 Parties;" has been added to the eligibility criteria as (8). ➢ "No fossil fuel is used in each activity included in the CPA other than for transportation;" has been added to the eligibility criteria as (9). ➢ A.4.2.2 (18) has been revised to "The residual waste from the animal manure management system must be handled aerobically, e.g. land application;" ➢ "Each activity included in the CPA will introduce newly anaerobic manure treatment systems with biogas recovery replacing uncovered anaerobic lagoons for animal manure treatment" has been added to the eligibility criteria as (10) ➢ Annual average temperature of above 5 °C has been added in the eligibility criteria (14) in Section A.4.2.2 of the PoA. ➢ the information regarding baseline scenario has been added in the eligibility criteria (13), (15) , (16) and (17) in Section A.4.2.2 of the PoA.	

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		➢ This content has been added in the eligibility criteria (11) in Section A.4.2.2 of the PoA. ➢ The content regarding technology applied and utilization of biogas has been added in the eligibility criteria (11) in Section A.4.2.2 of the PoA ➢ All potential users under each Scenario has been added in Section A.2 of the PoA-DD	
CAR 2 Letters of approval from China and United Kingdom of Great Britain and Northern Ireland are still pending.	A.4.3 A.4.5 A.4.6 A.5.1 A.5.2	LoAs from China and UK have been submitted to DNV.	OK. LoA from China dated June 2012 has been provided and checked by DNV. Authenticity of LoA from China has been verified by checking information from China DNA website /17/. LoA from UK dated 16 August 2012 has been provided and checked by DNV /18/. And authenticity of the LoA from UK has been verified by checking main involving delivering information of the LoA /18/. CAR 2 is closed.
CAR 3 It is not specified whether the coordinating entity will use a statistically sound sampling method and procedure to be used by DOEs for verification of GHG emission reductions or choose a verification method that does not use sampling but verifies each CPA in PoA-DD version 01 dated 25 October 2011, the transparent system shall be defined and described to ensure that no double accounting occurs and that the status of	A.7.4	The CME has opted for verification of each CPA. Each CPA under the PoA will be monitored according to the related methodologies and tools. All relevant parameters included in the monitoring plan will be monitored and recorded for each included CPA respectively (Details please refer to Section E.7.2). The CME will maintain a database for all included CPAs. Based on the operation and	OK. The CME has chosen a verification method that does not use sampling but verifies each CPA in PoA-DD version 02 dated 6 April 2012, which has been verified by DNV. CAR 3 is closed.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
verification can be determined anytime for each CPA.		management plan established by the CME, each CPA is uniquely identified. In this case, it is defined that the system is transparent and therefore ensures that no double accounting occurs.	
CAR 4 In section E.7.2 of the PoA-DD version 01 dated 25 October 2011, emission reduction achieved in year y is the lower one of calculated baseline emissions minus project emissions using the actual monitored data and the emission reduction calculated using formulas in AMS III.D., which is not consistent with calculation method in Section E.6.2. Corrective action is requested on the inconsistency.	B.5.1 E.8.1	The content that emission reduction achieved in year y is the lower one of calculated baseline emissions minus project emissions using the actual monitored data and the emission reduction calculated using formulas in AMS III.D. have been moved from E.7.2 to E.6.2. Besides, two formulas have been added in E.6.2 for ex-post ER calculation.	OK. Calculation process of emission reductions from an individual CPA has been updated and verified by DNV. The updated calculation process in in accordance with the applied methodologies /20//21//22//23/. CAR 4 is closed.
CL 1 Further clarification is sought on the system/procedures to avoid including CPAs that have already been registered either as CDM project activity or as a CPA of another PoA and to uniquely identify farms located in the CPA.	A.2.4	The owner of the project included in the proposed CPA should sign a contract with the CME to confirm that they are aware of, and; have agreed that their activity is being subscribed to the PoA and they have neither already been registered as a CDM project, nor as a CPA of another PoA. The CPA should also be checked inside the PoA database by the CME. In addition, before the activity registered in the database, a regular check is required to avoid double counting.	OK. To avoid including CPAs that have already been registered either as CDM project activity or as a CPA of another PoA, contracts will be signed between the project owner and CME confirming that the project owner are aware of and have agreed that their activity is being subscribed to the PoA and have neither already been registered as a CDM project, nor as a CPA of another PoA. And registered CDM projects will be regularly checked to ensure project activities neither registered as a CDM, nor as a CPA of this or another PoA could be added in the PoA. Each CPA under the PoA will be given a

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
			unique CPA number and title. Relevant information has been added in the CDM-SSC-PoA-DD version 02 and verified by DNV. CL 1 is closed.
CL 2 Further clarification is sought on the three project scenarios involved in this PoA, technologies applied and whether there is co-generation project in the PoA.	A.3.1	Description on three Scenarios has been revised in Section A.2 of PoA-DD. Based on three scenarios described in the PoA, cogeneration is not relevant.	OK. Further information of the three project scenarios under the PoA has been added in the CDM-SSC-PoA-DD version 02 and co-generation is not involved in the PoA for which an eligibility criteria has been set. The updated CDM-SSC-PoA-DD has been verified by DNV. CL 2 is closed.
CL 3 Clarification is sought on whether the lagoons will be installed in parallel or in series when there are more anaerobic reactors.		When there are more anaerobic reactors in an activity under the PoA, more than one adjusting tanks (i.e. lagoons) may be installed. The adjusting tanks in this case will be installed in series to make sure that, the activity can also be operation order when emergency situation in a short time in one biogas digester.	OK. When there are more anaerobic reactors in one CPA, adjusting tanks (i.e. lagoons) will be installed in series, which has been specified in the CDM-SSC-PoA-DD. CL 3 is closed.
CL 4 Clarification is sought on the following items for management system of the programme: ➢ Roles and responsibilities of personnel involved in the process of inclusion of CPAs, including review of their competencies. ➢ Arrangements for training and capacity development for personnel. ➢ Procedures for technical review of inclusion of CPAs.	A.4.7 A.7.1 E.13.2	The related content has been added in Section A.4.4.1 of the PoA-DD.	OK. Detailed information about management system of the programme has been added in the CDM-SSC-PoA-DD version 02 and checked by DNV. The updated management system is in accordance with the "Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities"

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
➢ Records and demonstration control process for each CPA under the PoA. ➢ Procedures to avoid double counting emission reductions of a CPA. ➢ Measures for continuous improvement of the management system			/24/. CL 4 is closed.
CL 5 Clarification is sought on whether the 140 questionnaires are reasonable to represent all local stakeholders in the project boundary.	D.1.1	The CME posted notice (Henan Province post the notice on its official website (http://hnnh.haagri.gov.cn/asp/showdetail.asp?id=97986); Shaanxi Province distributed the notice to the municipal governments) to let the stakeholders to know the PoA before stakeholder consultation. In addition, questionnaires were randomly given out in each city, and most kinds of respondents are involved in questionnaires such as different ages, different occupations and etc. Therefore, this stakeholder consultation is reasonable to represent all local stakeholders in the PoA boundary.	OK. Before stakeholder consultation, notice was posted in official website of Henan Province and notice was distributed to municipal governments in Shaanxi Province to let stakeholder have more understanding for the programme. Also, questionnaires were randomly distributed to stakeholders with different ages, education level and occupations /9/. Thus, DNV was able to confirm that the 140 questionnaires are reasonable to represent all local stakeholders near the project site. CL 5 is closed.
CL 6 Further justification is sought on the determination of retention time of baseline open lagoons.	E.1.2	According to years' experiences of owner of the farm, the farm will generate 10.9m^3 manure waste per day; The total size of both lagoons is 4*25*6+3*8*6=744m^3. Thus, the maximum time for keeping manure in the lagoons could be 744/10.9=68days. (This value is conservative and the actual value will be higher than it.)	OK. According to dimensions of the baseline lagoons /13/, the total volume of the two lagoons is 744 m^3, which was confirmed by project owner during site visit. During interview with project owner of the first CPA /63/, the average daily manure production is 10.9 m^3/day. Thus, the maximum retention time of the baseline open lagoons is 68 days (744/10.9) and longer than 1 month. CL 6 is closed.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
CL 7 Clarification is sought on whether CO_2 emissions from incremental transportation distances and emissions from the storage of manure before being fed into the anaerobic digester are involved in project emission calculation of the PoA and relative eligibility criteria.	E.5.1	Parameters for calculating $PE_{transp,y}$ and $PE_{storage,y}$ has been added to the monitoring plan.	OK. The CO_2 emissions from incremental transportation distances and emissions from the storage of manure before being fed into the anaerobic digester are involved for CPAs in which the material transportation is involved and monitoring information of relevant parameters has been added in the monitoring plan. The above information has been added in CDM-SSC-PoA-DD version 02 /1/ and checked by DNV. CL 7 is closed.
CL 8 Clarification is sought on measures to determine efficiency of baseline equipment to be replaced and project equipment.	E.6.1 E.6.2 E.6.3	As the data described in option (a) or (b) proposed in AMS-I.C. is not available, option (c) default efficiency of 100% is adopted in the PoA. This is conservative. The efficiency of the biogas-fired stoves η_{PJ} is taken to be 55 %. This corresponds to the efficiency requirements of biogas stoves and cookers according to the National Standards of China (GB/T 3606-2001). The biogas-fired products with lower efficiency are not eligible to enter into the market. Products compliance with the National Standards is inspected during manufacturing by the certified authority. This is conservative.	OK. For efficiency of baseline equipment, a conservative value of 100% is adopted. The biogas stoves efficiency of 55% will be adopted, which is in accordance with domestic biogas stove standard in China /47/. Relevant information has been added in the CDM-SSC-PoA-DD version 02, which has been verified by DNV to be appropriate and conservative. CL 8 is closed.
CL 9 Clarification is sought on monitoring of the following items: • Soil application procedures to ensure final	E.9.1	The related monitoring parameters has been added in the PoA-DD.	OK. Monitoring information of these items has been added in the CDM-SSC-PoA-DD version 02 which has been verified by DNV

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
sludge application does not result in methane emissions. • Annual average temperature of the project site. • Temperature of the biogas at the flow measurement site. • Pressure of the biogas at the flow measurement site. • On-site inspections for each individual farm included in the programme. • Average truck capacity for transportation. • Average incremental distance for raw solid waste/manure. • Quantity of raw waste/manure treated. • Quantity of compost produced. • Average distance for compost transportation. • The number of days that animals are alive.			and in is in accordance with the applied methodologies. CL 9 is closed.
CL 10 Clarification is sought on the following items for the monitoring plan: • The management structure and personnel responsibility of the monitoring. • Installation of monitoring meters and measures to ensure full utilization of supplied biogas to users. • Procedures to deal with erroneous measurements or emergency situations. • The registration, monitoring, measurement and reporting procedure in the monitoring plan. • Calibration and maintenance information for	E.10.5 E.10.7 E.10.8 E.10.9 E.13.1 E.13.3 E.13.4 E.13.5 Appendix B B.6.1 B.8.5 B.8.7 B.8.8 B.8.9 B.9.3	➢ The management structure and personnel responsibility has been added in Section E.7.2 of PoA-DD. ➢ Biogas storage tank will be installed in each activity to achieve that in case of emergency all methane produced from anaerobic digestion can be stored but not emitted to atmosphere, and therefore ensure that all methane produced by the digester is used. Besides, it is also possible that flaring system is installed in some activities. In addition, emitting biogas to the atmosphere directly is forbidden in the user manual, which can also ensure full utilization of supplied biogas to users.	OK. Further information for the monitoring plan has been added in CDM-SSC-PoA-DD version 02 which has been checked by DNV and is in accordance with the applied methodologies /20//21//22//23/. CL 10 is closed.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
the monitoring meters. • The record, archive, storage and processing of the monitoring data.	B.9.4 B.9.5	➢ Once erroneous measurements or emergency situations happened, a conservative method that can cause a lower CER value will be used. ➢ The related information has been added in E.7.2 of PoA-DD. ➢ The related information has been added in E.7.2 of PoA-DD. ➢ It has been standardized that all the data will be archived electronically during project plus 2 years.	

Table 4 Forward action requests

Forward action request	Reference to Table 2	Response by project participants
N/A	N/A	N/A

APPENDIX B

PROTOCOL FOR ASSESSING COMPLIANCE OF SPECIFIC CDM PROGRAMME ACTIVITIES WITH THE PROGRAMME OF ACTIVITIES

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
A. General description of CPA					
A.1. Project boundaries					
A.1.1 Are the CPA's spatial boundaries (geographical) clearly defined, allowing the unique identification of the CPA?	/3/				
A.1.2 Are the CPA's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/3/				
A.1.3 Has it been demonstrated that the CPA is within the geographical borders of the PoA?	/3/				
A.1.4 Has it been confirmed that no part of the CPA is registered as a CDM project or included in a registered POA?	/3/				
A.2. Participation requirements					
A.2.1 Which Parties and CPA implementer are participating in the CPA? Are they included in the PoA?	/3/				
A.3. Duration of the CDM programme activity, Crediting Period					
A.3.1 Are the CPA's starting date and operational lifetime clearly defined and evidenced?	/3/				
A.3.2 Has the crediting period been clearly defined and is the start of the crediting period deemed to be reasonable?	/3/				
A.3.3 Has it been confirmed that the length of the CPA crediting period does not exceed the end of PoA?	/3/				
B. Eligibility of CPA and Estimation of Emission Reductions					
B.1. Eligibility criteria for CDM Programme Activities *It is assessed whether the CPA complies with the criteria for*					

CHECKLIST QUESTION		Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
inclusion in the registered programme of activities.						
B.1.1	Has it been sufficiently justified that the CPA complies with eligibility criteria "A CPA should be located in the boundary of the PoA, i.e. within Henan Province or Shaanxi Province"?	/3/				
B.1.2	Has it been sufficiently justified that the CPA complies with eligibility "The CPA passes the procedure of avoiding double counting described in A.4.4.1 (ii) of CDM-SSC-PoA-DD, which ensures that the SSC-CPA included in the PoA is not a de-bundled component of another CDM programme activity (CPA) or CDM project activity"?	/3/				
B.1.3	Has it been sufficiently justified that the CPA complies with eligibility criteria "CPA meets any one of following criteria for assessing additionality: (a) Meets relevant requirement in "Guidelines for demonstrating additionality of microscale project activities" (Ver. 04.0), including: (i) The geographic location of the project activity is in a special underdeveloped zone of the host country identified by the Government via any one of the following methods: • The proportion of population with income less than USD 2 per day (PPP) in the region is greater than 50% calculated by using the most recent available data in official notifications for development assistance including for planning,	/3/	DR			

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
management, and investment; • The GNI per capita in the country is less than USD 3000 and the population of the region is among the poorest 20% in the poverty ranking of the host country as per the applicable national policies and procedures which is calculated by using the most recent available data in official notifications for development assistance including for planning, management, and investment; ▪ Based on the recommendation of the designated national authority of the host country, the SUZ in the host country has been approved by EB of the CDM and publised on the UNFCCC website (ii) The total installed capacity of the CPA is: For **Scenario I**, The total installed capacity of the CPA is no more than $15MW_{th}$; For **Scenario II**, The total installed capacity of the CPA is no more than $5MW_e$; For **Scenario III**, The total installed capacity of the CPA (for electricity capacity, multiply by 3 to derive thermal units as per the latest version of "General Guidelines to SSC CDM methodologies") is no more than $15MW_{th}$; (iii) The emission reductions from type III components of the CPA is no more than 20 $ktCO_2e$ per year. (b) Meets relevant requirement for the positive					

	CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
	list of technologies and project activity types that are defined as automatically additional in "*Guidelines for demonstrating additionality of small-scale project activities*", including: • Project activities solely composed of isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs); • The emission reductions from type III components of the CPA is no more than 3,000 tCO_2e per year; • The installed capacity of each unit in the activities included in the CPA is less than 2,250 KW_{th}. (c) The project IRR (before tax) of the project included in the CPA is lower than the benchmark of 7%"					
B.1.4	Has it been sufficiently justified that the CPA complies with eligibility criteria "the CPA crediting period does not exceed 31/10/2040 (the PoA end date)"?	/3/				
B.1.5	Has it been sufficiently justified that the CPA complies with eligibility criteria "there is no any activity with the same sectoral scope, whose boundary is within 1km of the boundary of the proposed small-scale CPA"?	/3/				
B.1.6	Has it been sufficiently justified that the CPA complies with eligibility criteria "the start date of the CPA is not prior to 24 November 2011	/3/				

CHECKLIST QUESTION		Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
	(Publication date of the PoA and construction agreement, electricity generator purchasing contract, biogas stove contract and biogas boiler contract involved in the CPA will be used to check the start date)”?					
B.1.7	Has it been sufficiently justified that the CPA complies with eligibility criteria “each activity included in the CPA must have obtained approval of EIA”?	/3/				
B.1.8	Has it been sufficiently justified that the CPA complies with eligibility criteria “the CPA has no public funding from Annex I Parties”?	/3/				
B.1.9	Has it been sufficiently justified that the CPA complies with Eligibility criteria “No fossil fuel is used in each activity included in the CPA other than for transportation”?	/3/				
B.1.10	Has it been sufficiently justified that the CPA complies with eligibility criteria “each activity included in the CPA will introduce newly anaerobic manure treatment systems with biogas recovery replacing uncovered anaerobic lagoons for animal manure treatment”?	/3/				
B.1.11	Has it been sufficiently justified that the CPA complies with eligibility criteria “all activities under a CPA are to install anaerobic animal manure management systems to achieve methane recovery and destruction by flaring/combustion or gainful use of the recovered methane; **For Scenario I** The recovered methane will be used for thermal	/3/				

	CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
	energy generation (including supplied to households as life fuel for thermal energy generation and utilized as fuel of boiler for thermal energy generation.). **For Scenario II** The recovered methane will be used for electricity generation by newly installed electricity generator. **For Scenario III** One part of the recovered methane will be used to generate thermal energy, another part will be used to generate electricity by newly installed electricity generator. Biogas storage tank will be also installed in each **Scenario** to achieve that in case of emergency all methane produced from anaerobic digestion can be stored but not emitted to atmosphere, and therefore ensure that all methane produced by the digester is destroyed. Besides, it is also possible that flaring system is installed in some activities”?					
B.1.12	Has it been sufficiently justified that the CPA complies with eligibility criteria “the livestock population in the farms included in each CPA under the PoA should be managed under confined conditions”?	/3/				
B.1.13	Has it been sufficiently justified that the CPA complies with eligibility criteria “manure or the streams obtained after treatment are not discharged into natural water resources”?	/3/				

CHECKLIST QUESTION		Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
B.1.14	Has it been sufficiently justified that the CPA complies with eligibility criteria “the annual average temperature of baseline site where anaerobic manure treatment facility is located is higher than 5°C”?	/3/				
B.1.15	Has it been sufficiently justified that the CPA complies with eligibility criteria “in the baseline scenario the retention time of manure waste in the anaerobic treatment system should be greater than one month”?	/3/				
B.1.16	Has it been sufficiently justified that the CPA complies with eligibility criteria “the baseline scenario for the manure treatment is that the manure waste from the livestock would be treated in anaerobic lagoons with the depth of more than 1m”?	/3/				
B.1.17	Has it been sufficiently justified that the CPA complies with eligibility criteria “no methane recovery and destruction by flaring, combustion or gainful use takes place in the baseline scenario”?	/3/				
B.1.18	Has it been sufficiently justified that the CPA complies with eligibility criteria “the residual waste from the animal manure management system must be handled aerobically, e.g. land application”?	/3/				
B.1.19	Has it been sufficiently justified that the CPA complies with eligibility criteria “only animal manure will be anaerobically treated but no other organic matters are involved in the CPA”?	/3/				

CHECKLIST QUESTION		Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
B.1.20	Has it been sufficiently justified that the CPA complies with eligibility criteria "technical measures will be used to ensure that all biogas produced by the digester is used or flared"?	/3/				
B.1.21	Has it been sufficiently justified that the CPA complies with eligibility criteria "the storage time of the manure after removal from the animal barns, including transportation, should not exceed 45 days before being fed into the anaerobic digester"?	/3/				
B.1.22	Has it been sufficiently justified that the CPA complies with eligibility criteria "For CPA using option (c) of eligibility criteria (3) for assessing additionality, to demonstrate that emission reductions from type III components of the CPA be less or equal to 60 000 tCO_2/yr"?	/3/				
B.1.23	Has it been sufficiently justified that the CPA complies with eligibility criteria "the total installed capacity of the CPA is as below: For **Scenario I**, according to AMS-I.C., the total installed capacity of the CPA is no more than $45MW_{th}$; For **Scenario II**, according to AMS-I.F./AMS-I.D., the total installed capacity of the CPA is no more than $15MW_e$; For **Scenario III**, according to AMS-I.C. and AMS-I.F/AMS-I.D. as well as "General Guidelines to SSC CDM methodologies", the total installed capacity of the CPA (for electricity capacity, multiply by 3 to derive thermal units as	/3/				

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
per the latest version of "General Guidelines to SSC CDM methodologies") is no more than $45MW_{th}$"?					
B.1.24 Has it been sufficiently justified that the CPA complies with eligibility criteria "According to AMS-I.C./AMS-I.F, in case electricity and/or steam/heat and/or biogas produced by the project activity is delivered to another party, a contract between the supplier and the consumer(s) shall be signed to state that, only the supplier can claim emission reductions from the energy displaced"?	/3/				
B.2. Additionality *It is assessed whether the CPA complies with the eligibility criteria for demonstrating additionality of a CPA under the registered programme of activities.*					
B.2.1 Has it been sufficiently justified that the CPA complies with eligibility criteria 3 for additionality?	/3/	DR			
B.3. Calculation of GHG Emission Reductions – Project emissions *It is assessed whether the project emissions are stated according to the methodology and the PoA-DD and whether the argumentation for the choice of default factors and values - where applicable – is justified.*					
B.3.1 Is the calculation of project emissions of the CPA in accordance with the procedure described in the PoA-DD?	/3/	DR			
B.3.2 Are CPA-specific conservative assumptions used when calculating the project emissions?	/3/	DR			
B.3.3 Are CPA-specific uncertainties in the project	/3/	DR			

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
emission estimates properly addressed?					
B.4. Calculation of GHG Emission Reductions – Baseline emissions *It is assessed whether the baseline emissions are stated according to the methodology and the PoA-DD and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
B.4.1 Is the calculation of baseline emissions of the CPA in accordance with the procedure described in the PoA-DD?	/3/	DR			
B.4.2 Are CPA-specific conservative assumptions used when calculating the baseline emissions?	/3/	DR			
B.4.3 Are CPA-specific uncertainties in the baseline emission estimates properly addressed?	/3/	DR			
B.5. Calculation of GHG Emission Reductions – Leakage *It is assessed whether leakage emissions are stated according to the methodology and the PoA-DD and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
B.5.1 Is the calculation of leakage emissions of the CPA in accordance with the procedure described in the PoA-DD?	/3/	DR			
B.5.2 Are CPA-specific conservative assumptions used when calculating the leakage emissions?	/3/	DR			
B.5.3 Are CPA-specific uncertainties in the leakage emission estimates properly addressed?	/3/	DR			
B.6. Emission Reductions *The emission reductions shall be real, measurable and give*					

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
long-term benefits related to the mitigation of climate change.					
B.6.1 Has it been demonstrated that the total emission reductions of the CPA of activities will be real, measurable and give long-term benefits related to the mitigation of climate changeP	/3/	DR			
B.7. Monitoring Methodology *It is assessed whether the CPA applies an appropriate monitoring methodology.*					
B.7.1 Is the monitoring plan for the CPA documented according to the approved methodology, in accordance with the programme of activities and in a complete and transparent manner?	/3/	DR			
B.7.2 Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this programme, whichever occurs later?	/3/	DR			
B.8. Data and Parameters Available at Validation *It is established whether appropriate values were selected for parameters determined ex-ante.*					
B.8.1 Does the applied methodology allow determining the selected values ex-ante?	/3/	DR			
B.8.2 Have adequate assumptions been used for determining the values and are underlying calculations correct?	/3/	DR			
B.8.3 Has sufficient documentary evidence been presented to verify the selected values or to verify the input data used in the calculation of the values of the parameters determined ex-ante.	/3/	DR			
B.9. Ex-Post Monitoring					

CHECKLIST QUESTION		Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
It is established whether the monitoring plan provides for reliable and complete emission data over time.						
B.9.1	Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the CPA boundary during the crediting period?	/3/	DR			
B.9.2	Are the choices of CPA GHG indicators reasonable and conservative?	/3/	DR			
B.9.3	Is the measurement method clearly stated for each GHG value to be monitored and deemed appropriate?	/3/	DR			
B.9.4	Is the measurement equipment described and deemed appropriate?	/3/	DR			
B.9.5	Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/3/	DR			
B.9.6	Is the measurement *interval* identified and deemed appropriate?	/3/	DR			
B.9.7	Is the *registration, monitoring, measurement* and *reporting* procedure defined?	/3/	DR			
B.9.8	Are procedures identified for *maintenance* of monitoring equipment and installations? Are the calibration intervals being observed?	/3/	DR			
B.9.9	Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/3/	DR			
B.10.	**CPA Management Planning**					

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
It is checked that programme implementation is properly prepared for and that critical arrangements are addressed.					
B.10.1 Is the authority and responsibility of overall CPA management clearly described?	/3/	DR			
B.10.2 Are procedures identified for training of monitoring personnel?	/3/	DR			
B.10.3 Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/3/	DR			
B.10.4 Are procedures identified for review of reported results/data?	/3/	DR			
B.10.5 Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/3/	DR			
C. Environmental impacts *It is assessed whether environmental impacts of the CPA have been properly addressed.*					
C.1.1. Has an analysis of the environmental impacts of the CPA been sufficiently described?	/3/	DR			
C.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA)?	/3/	DR			
C.1.3. Will the programme create any adverse environmental effects?	/3/	DR			
C.1.4. Are transboundary environmental impacts considered in the analysis?	/3/	DR			

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
C.1.5. Have identified environmental impacts been addressed in the programme design?	/3/	DR			
C.1.6. Does the programme comply with environmental legislation in the host country?	/3/	DR			
D. Stakeholders' comments *It is assessed whether stakeholders have been properly consulted in the development of the CPA.*					
D.1.1. Have relevant stakeholders been consulted?	/3/	DR			
D.1.2. Have appropriate media been used to invite comments by local stakeholders?	/3/	DR			
D.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/3/	DR			
D.1.4. Is a summary of the stakeholder comments received provided?	/3/	DR			
D.1.5. Has due account been taken of any stakeholder comments received?	/3/	DR			

APPENDIX C

CURRICULA VITAE OF THE VALIDATION TEAM MEMBERS

Mr. Wong Yon Sing holds a Bachelor's Degree in Chemical Engineering with Environmental Engineering, with a year experience in the field of design and operation/maintenance of wastewater treatment as part of working in wastewater design & equipment supply services.
His experience in designing and maintaining the wastewater treatment systems covers the fields of various manufacturing and chemical industries in Malaysia.
He has experience of more than 5 years in validation and verification of numerous CDM projects in DNV, both in Malaysia and abroad. His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in "Energy Generation from Renewable Energy Sources", "Waste Handling and Disposal" and "Animal Waste Management System".

Mr. Huang Wenhu holds a Master Degree in Business Administration (MBA) having an overall experience of around 12 years. Prior to joining DNV, having around 10 years experience in several renowned multinational companies like Kodak, Meggitt, APC etc as a quality engineer, management system specialist, quality team leader, quality manager & management representative and his experience also cover the fields of environmental management. He has also been actively involved in establishing, implementation and audit of management systems such as ISO9001, TS16949, ISO140001 and OHSAS18001 standards in manufacturing industries for more than 8 years. In addition, he has gained knowledge in the field of cost accounting, strategic investment analysis & decision, financial risk and sensitivity analysis, and associated financial knowledge through his MBA course, the financial knowledge gained was also applied for the quality cost analysis while he was working in manufacturing industry as quality management role.

He has experience of around 3.5 years in validation and verification of numerous CDM projects.

His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in "Energy Generation from Renewable Energy Sources".

Mr. Liu Qingqiang holds a Master Degree in Environmental Science, a Bachelor Degree in Environmental Science & Engineering, having an overall experience of around seven years. Prior to joining DNV, he has around two years experience in cleaner production assessment.

He has experience of around 1 year in validation and verification of numerous CDM projects.

His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in "Animal waste management" and "Energy Generation from Renewable Energy Sources".

Mr. Lai Chee Keong holds a Bachelor Degree in Applied Science majoring in Environmental Biology, a Master Degree in Environmental Engineering and a Post Graduate Diploma in Accounting and Finance. He possesses a combined Asian & International experience of more than 18 years in the field of environmental consulting and environmental auditing. His experience also covers the fields of environmental management and environmental impact assessment for various on-shore industries such as petro-chemical plants, general chemical plants, residential developments and industrial park developments.

He has also been actively involved in Management System audits such as ISO 9001, ISO 140001 and OHSAS 18001 standards in various industrial sectors for more than 7 years in DNV.

He has experience of more than 7 years in validation and verification of numerous CDM projects in DNV in Asia including those in South East Asia and China.

His qualification, industrial and investment experience and experience in CDM demonstrate him sufficient sectoral competence in “Energy Generation from Renewable Energy Sources”, “Waste Handling and Disposal” and “Animal Waste Management”.