



# VERIFICATION REPORT

for the CDM Project Activity

## Biogas Utilization Project In Zhejiang Jingxing Paper Joint Stock Co. Ltd.

In

### P.R.China

Report No. 01 997 9105061560

Version 03, 2013-04-01

Designated Operational Entity (DOE)

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**I. Project data:**

<b>Project title:</b>	Biogas Utilization Project In Zhejiang Jingxing Paper Joint Stock Co. Ltd.		<b>Report No.:</b> 01 997 9105061560
<b>Registration No. / Date:</b>	5042/ 28 July 2011		<b>Current revision No.:</b> 03
<b>Monitoring period:</b>	from 28 July 2011 to 31 August 2012		<b>Date of current revision:</b> 2013-04-01
<b>Methodology:</b>	AMS-III.H, Version 15-Methane Recovery in Wastewater Treatment and AMS-I.F, Version 01- Renewable electricity generation for captive use and mini-grid.		<b>Date of first issue:</b> 2012-11-09
<b>Publication of MR:</b>	The monitoring report (Version 1.0, 5 September 2012) was published at UNFCCC website on 11 September 2012.		
<b>Emission reductions:</b>	Estimated:	66,551 tCO <sub>2</sub> e for 401 days It is estimated based on 60,577 tCO <sub>2</sub> e of annual emission reductions as indicated in the registered PDD (Version 2.2, 13 July 2011), and the monitoring period from 28 July 2011 to 31 August 2012, including both days.	Verified: 37,246tCO <sub>2</sub> e of this monitoring period from 28 July 2011 to 31 August 2012, totally 401 days, including both days
<b>GHG reducing measure/technology:</b>	Methane avoidance and displacing fossil-fuel based electricity supply through biogas recovery		

Party	Project participants	Party considered a project participant (Yes/No)	Contract Project Participant
P.R.China(Host)	Zhejiang Jingxing Paper Joint Stock Co. Ltd.	No	<input type="checkbox"/>
Switzerland	Swiss Carbon Assets Ltd.	No	<input checked="" type="checkbox"/>

**II. Verification Team:**

Verification Team			Role									
Full name	Affiliation TÜV Rheinland	Appointed for Sectoral Scopes (Technical Areas)	Team leader	Acting Team Leader	Local Expert	Team Member (Auditor)	Technical Expert	Acting Tech. Expert	Trainee Auditor	Technical Reviewer	Expert to TR	Trainee TR
MA Libo	China	1.1, 1.2, 4.5	X									
TAN Yi	China	1.2,13.1				X						
TIAN Wenting	China	1.2,13.1								X		
Walter TANG	China	1.1, 1.2, 2.1, 2.2, 3.1, 4.3, 4.5, 13.1								X	X	

**Verification Phases Verification Status:**

- Desk Review     
  Follow up interviews     
  Corrective Actions / Clarifications Requested  
 Resolution of outstanding issues     
  Full Approval and Submission for Issuance     
  Rejected

**III. Verification Report:**

<b>Final approval</b>	<b>Released</b>	<b>Distribution</b>
<input checked="" type="checkbox"/>	By: Mr. Henri Phan	<input checked="" type="checkbox"/> No distribution without permission from the Client or responsible organizational unit
<b>Date:</b> 2013-04-03		<input type="checkbox"/> Unrestricted distribution

**Abbreviations**

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM EB	Clean Development Mechanism Executive Board
CDM PCP	Clean Development Mechanism Project Cycle Procedure
CDM PS	Clean Development Mechanism Project Standard
CEF	Carbon Emission Factor
CER(s)	Certified Emission Reduction(s)
CH <sub>4</sub>	Methane
CL	Clarification request
CO <sub>2</sub>	Carbon dioxide
CO <sub>2e</sub>	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
FAR	Forward Action Request
GHG	Greenhouse Gas(es)
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
MR	Monitoring Report
N <sub>2</sub> O	Nitrous oxide
PDD	Project Design Document
PP	Project Participant
TUVR	TUV Rheinland (China) Ltd.
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation And Verification Standard
GWP	Global Warming Potential
ECPG	East China Power Grid

## **Verification opinion — summary**

The Verification Team assigned by the DOE (TÜV Rheinland (China) Ltd.) concludes that the CDM Project Activity “Biogas Utilization Project In Zhejiang Jingxing Paper Joint Stock Co. Ltd.” in P.R.China, as described in the registered PDD (Version 2.2, 13 July 2011), and Monitoring Report (Version 2.2, 30/03/2013), meets all relevant requirements of the UNFCCC for CDM project activities including article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakesh Accords) and the subsequent decisions by the COP/MOP and CDM Executive Board. The verification is conducted in line with the VVS requirements.

### Verification methodology and process

The verification has been performed as described in the VVS Version 03.0 and constitutes the following steps:

- Publication of the MR on the UNFCCC website (starting from 11 September 2012)
- Desk review of the MR and the relevant documents
- On-site assessment (from 26 September 2012 to 27 September 2012)
- Issuance of Verification Report

The project activity was correctly implemented according to selected monitoring methodology(ies) and monitoring plan. The monitoring equipment was installed, calibrated and maintained in a proper manner, while collected monitoring data allowed to verify the amount of achieved GHG emission reductions. The DOE therefore is pleased to issue a positive verification opinion expressed in the attached Certification statement.

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## 1. Introduction

The Swiss Carbon Assets Ltd. has commissioned the DOE TÜV Rheinland (China) Ltd. to perform a verification of the CDM Project Activity “Biogas Utilization Project In Zhejiang Jingxing Paper Joint Stock Co. Ltd.” in P.R.China (hereafter “project activity”). This report summarises the findings of the verification of the project, performed on the basis of paragraph 62 of the CDM modalities and procedures, as well as criteria given to provide for consistent project operations, monitoring and reporting and the subsequent decisions by the CDM Executive Board. Verification is required for all registered CDM project activities intending to confirm their achieved emission reductions and proceed with request for issuance of CERs. This report contains the findings from the verification and a certification statement for the certified emission reductions.

### 1.1 Objective

Verification is the periodic independent review and *ex post* determination of both quantitative and qualitative information by a Designated Operational Entity (DOE) of the monitored reductions in GHG emissions that have occurred as a result of the registered CDM project activity during a defined monitoring period.

Certification is the written assurance by a DOE that, during a specific period in time, a project activity achieved the emission reductions as verified.

The objective of this verification was to verify and certify emission reductions reported for the “Biogas Utilization Project In Zhejiang Jingxing Paper Joint Stock Co. Ltd.” in country “P.R.China” for the period from 28 July 2011 to 31 August 2012.

The purpose of verification is to review the monitoring results and verify that monitoring methodology was implemented according to monitoring plan and monitoring data, used to confirm the reductions in anthropogenic emissions by sources is sufficient, definitive and presented in a concise and transparent manner.

In particular, the monitoring plan, monitoring report and the project’s compliance with relevant UNFCCC and host Party criteria are verified in order to confirm that the project has been implemented in accordance with previously registered design and conservative assumptions, as documented.

### 1.2 Scope

The scope of the verification is:

- To verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan.
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement.
- To verify that reported GHG emission data is sufficiently supported by evidence.

The verification shall ensure that reported emission reductions are complete and accurate in order to be certified.

The verification comprises a review of the monitoring report over the monitoring period from 28 July 2011 to 31 August 2012, based on registered PDD in part of the monitoring parameters and monitoring plan, emission reduction calculation spreadsheet, monitoring methodology/ies

and all related evidence provided by project participants. On-site visit and stakeholders interviews are also performed as part of the verification process.

## 2. Methodology

The verification consists of the following four phases:

- 1) Completeness check and webhost of the monitoring report for public commenting;
- 2) Desk review of the monitoring plan, monitoring report, monitoring methodology, project design document, applicable tools in particular attention to the frequency of measurements, quality of metering equipment including calibration requirements, QA/QC procedures and other relevant documents;
- 3) On-site visit (including follow-up interviews with project stakeholders, when deemed necessary). The on-site assessment includes the following;
  - An assessment of implementation and operation of project activity with respect to registered PDD or approved revised PDD;
  - Review of information flows for generating, aggregating, calculating and reporting the monitoring parameters;
  - Interview with relevant personals to determine whether the operational and data collection procedures are implemented and in accordance with monitoring plan of the registered PDD or approved PDD;
  - Cross check of information and data provided in the monitoring report with plant logbooks, inventories, purchase records or similar data sources;
  - Check of monitoring equipment, calibration frequency and monitoring practice in-line with methodology and the registered PDD or approved PDD;
  - Review of assumptions made in calculating the emission reduction;
  - Implementation of QA/QC procedure in line with the registered PDD or approved PDD and methodology requirement.
- 4) Resolution of outstanding issues and the issuance of the final Verification Report and Certification Statement.

The following sections outline each step in more detail.

### 2.1 Desk review

The following table outlines the documentation reviewed during the verification:

#### ***MR,PDD,VR, Methodologies and Tools, etc.***

- /1/. Monitoring Report of Version 2.2, 30/03/2013 (final version)
- /2/. Monitoring Report for GSP of Version 1.0, 5 September 2012
- /3/. Registered PDD of Version 2.2, 13 July 2011 for the proposed project
- /4/. Validation Report of Version 03, 15 July 2011 for the proposed project
- /5/. CDM Executive Board, Simplified baseline and monitoring methodology AMS-III.H, Version 15, *Methane Recovery in Wastewater Treatment*, EB 55 Annex 34, 30<sup>th</sup> July 2010.
- /6/. CDM Executive Board, Simplified baseline and monitoring methodology AMS-I.F, Version 01 Renewable electricity generation for captive use and mini-grid
- /7/. CDM Executive Board, Tool to calculate the emission factor for an electricity system, Version 02

- /8/. CDM Executive Board, Tool to determine project emissions from flaring gases containing methane version 1, EB28 annex 13, 15<sup>th</sup> December 2006.
- /9/. CDM Executive Board, Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site (version 05), EB55 annex 18, 30 July 2010.
- /10/. CDM Executive Board, Tool to calculate project or leakage CO<sub>2</sub> emissions from fossil fuel combustion (version 02), EB 41 annex 11, 2<sup>nd</sup> August 2008.
- /11/. CDM Executive Board, Clean Development Mechanism Validation and Verification Standard, Version 03.0
- /12/. CDM Executive Board, Clean Development Mechanism Project Standard, Version 02.0
- /13/. CDM Executive Board, Clean Development Mechanism Project Cycle Procedure, Version 03.0
- /14/. CDM Executive Board, Monitoring Report Form (F-CDM-MR), Version 02.0
- /15/. CDM Executive Board, Guidelines for Completing the Monitoring Report Form, Version 02.0
- /16/. CDM Executive Board, Guideline on the Application of Materiality in Verifications, Version 01.0

#### ***Emission Reductions Calculation***

- /17/. Swiss Carbon Assets Ltd., Raw Data and Emission Reduction Calculation Spread Sheet
- /18/. National Development and Reform Commission of P.R.China, Notification on Determining Baseline Emission Factor of Chinese Grids, 20 December 2010
- /19/. Zhejiang Jingxing Paper Joint Stock Co. Ltd., CDM Monitoring Logbook of Biogas Flow, CH<sub>4</sub> Concentration and Electricity Generation, from 28 July 2011 to 31 August 2012
- /20/. Zhejiang Jingxing Paper Joint Stock Co. Ltd., Daily Wastewater Flow and COD Measurement Records from July 2011 to August 2012

#### ***QA/QC Monitoring Training***

- /21/. Technical Administrative Code of DL/T448-2000 Electric Energy Metering
- /22/. Verification Regulation of Electrical Energy Meters with Electronics (Ref. no.: JJG596-1999)
- /23/. Verification Regulation of Electromagnetic Flow Meters (Ref. no.: JJG1033-2007)
- /24/. Wastewater Quality-Determination of the Chemical Oxygen Demand-Dichromate Method (Ref. no.: GB11914-89)
- /25/. Verification Regulation of Turbine Flow Meter (Ref. no.: JJG1037-2008)
- /26/. Verification Regulation of Gas Displacement Meters (Ref. no.: JJG633-2005)
- /27/. Verification Regulation of Alarm Detectors of Combustible Gas (Ref. no.: JJG693-2011)
- /28/. Verification Regulation of Differential Pressure Type Flow Meter (Ref. no.: JJG640-94)
- /29/. Verification Regulation of Electrochemical Oxygen Meter (Ref. no.: JJG365-2008)
- /30/. Jiaying Metrological Verification and Testing Institute, Calibration Report of Wastewater Flow Meter

<b><i>Meter Measuring</i></b>	Accuracy (%)	Serial number	Calibration date	Valid until	Certificate No.

$Q_{ww,1y}$	1.0	85000718000	14/08/2012	13/08/2014	RL-2012080119
$Q_{ww,2y}$	1.0	AD0701015	14/08/2012	13/08/2014	RL-2012080118

/31/. Hangzhou Institute of Calibration and Testing for Quality and Technical Supervision, Verification Certificate of Gas Flow Meter

<b>Meter Measuring</b>	Accuracy (%)	Serial number	Calibration date	Valid until	Certificate No.
$BG_{burnt,y}$	1.5	11095105	15/05/2012	14/05/2014	2712050356001

/32/. Guangzhou Institute of Measuring and Testing Technology, Verification Certificate of CH<sub>4</sub> Gas Analysers

<b>Meter Measuring</b>	Accuracy (%)	Serial number	Calibration date	Valid until	Certificate No.
$W_{CH_4, fuelled,y}$	5.0	741544	17/08/2012	16/08/2013	NH-201216753
$fV_{CH_4, RG, h, 1}$	5.0	776518	24/10/2012	23/10/2013	NH-201222085
$fV_{CH_4, RG, h, 2}$	5.0	741543	17/08/2012	16/08/2013	NH-201216754

/33/. Jiaxing Metrological Verification and Testing Institute, Calibration Report of Gas Flow Meter

<b>Meter Measuring</b>	Accuracy (%)	Serial number	Calibration date	Valid until	Certificate No.
$FV_{RG, h, 1}$	1.5	B3-11M175	16/02/2012	15/02/2015	RL-2012020025
$FV_{RG, h, 2}$	1.5	11095090	16/02/2012	15/02/2014	RL-2012020027

/34/. Jiaxing Metrological Verification and Testing Institute, Verification Certificate of Electricity Meter

<b>Meter Measuring</b>	Accuracy (%)	Serial number	Calibration date	Valid until	Certificate No.
$EG_y$	0.5S	KKK2090204	14/12/2012	13/12/2017	RD-2012120331

/35/. Zhejiang Bureau of Quality and Technical Supervision, Qualification Certificate of Jiaxing Metrological Verification and Testing Institute, Valid from 30/07/2012 to 29/07/2015

/36/. Zhejiang Bureau of Quality and Technical Supervision, Qualification Certificate of Hangzhou Institute of Calibration and Testing for Quality and Technical Supervision, Valid from 24/12/2009 to 23/12/2012

/37/. Guangzhou Bureau of Quality and Technical Supervision, Qualification Certificate of Guangzhou Institute of Measuring and Testing Technology, valid from 05/11/2011 to 05/08/2013

/38/. Zhejiang Jingxing Paper Joint Stock Co. Ltd., Wastewater Measurement Management Regulation (2010 Revision)

- /39/. Zhejiang Jingxing Paper Joint Stock Co. Ltd., Monitoring Manual of Biogas Utilization Project In Zhejiang Jingxing Paper Joint Stock Co. Ltd.
- /40/. South Pole Carbon Asset Management Ltd., CDM Monitoring Training Records, 19 August 2011.
- /41/. Zhejiang Jingxing Paper Joint Stock Co. Ltd., Employee Qualification Certificates

### **Project Implementation**

- /42/. Zhejiang Jingxing Paper Joint Stock Co. Ltd., Construction Contract, signed on 6 January 2009 and construction started on 4 February 2009
- /43/. Zhejiang Jingxing Paper Joint Stock Co. Ltd., Application for Commercial Operation, trial operation started on 23 June 2009 and commercial operation started on 8 October 2009
- /44/. Zhejiang Jingxing Paper Joint Stock Co. Ltd., Sludge Disposal Contract, signed on 06/08/2008 and valid until 06/08/2013

## **2.2 On-site visit and follow-up interviews with project stakeholders**

TÜV Rheinland verification team carried out an on-site visit from 26 September 2012 to 27 September 2012 and performed interviews with the project representatives and stakeholders. Prior to the interview salient points to be discussed were planned. Date of interview, interviewee and points discussed are given in the following table:

**Table 1**

	<b>Date</b>	<b>Name</b>	<b>Organization</b>	<b>Topic</b>
/i/	27 September 2012	- Mr. ZHANG Aiqi/ Deputy Manager of Administration Department	Zhejiang Jingxing Paper Joint Stock Co. Ltd.	Project Implementation Project operation Monitoring devices' calibration Management and Operational procedures Environmental impacts and mitigation measures
/ii/	27 September 2012	- Mr. FANG Jianqi/ Environmental Department Leader	Zhejiang Jingxing Paper Joint Stock Co. Ltd.	Monitoring results reporting Data collection procedure Data QA/QC procedures Emergency procedure
/iii/	27 September 2012	- Ms. ZHANG Peihong/Lab Assistant	Zhejiang Jingxing Paper Joint Stock Co. Ltd.	Wastewater sampling COD measurement
/iv/	27 September 2012	- Mr. YANG Xuan/Head of Implementation	Swiss Carbon Assets Ltd.	Meter installation and calibration Monitoring records analysis ER calculation
/v/	27 September 2012	- Mr. SUN Mingming/Project Manager	Swiss Carbon Assets Ltd.	

Verification Team along with onsite observation, objective evidence collections, data generation and recording analysis also considered the views obtained in these interviews while arriving at verification Opinion.

## 2.3 Resolution of outstanding issues

The objective of this phase of the verification is to resolve any outstanding issues (issues that require further elaboration, research or expansion) which have to be clarified prior to final DOE's conclusions on the project implementation, monitoring practices and achieved emission reductions. In order to ensure transparency a verification protocol is completed for the project activity. The protocol shows in transparent manner criteria (requirements), means of verification and resulting statements on verification actual project activity against identified criteria.

The verification protocol serves the following purposes:

- It organises in a table form, details and clarifies the requirements, which CDM project is expected to meet CDM requirements;
- It ensures a transparent verification process where the DOE will document how a particular requirement has been verified and the result of the verification.
- It ensures that the issues are accurately identified, formulated, discussed and concluded in the validation report.
- It ensures the determination of archiving credible emission reductions from the project activity.

The verification protocol consists of three tables. Table 1 reflects the verification requirements and reference to the materials used to verify the project activity against those requirements, as well as means of verification, reference to Table 2 and preliminary and final opinion of the DOE on every particular requirement. Table 3 reflects the carry forward actions initiated by the verification team if the monitoring and reporting require attention and/or adjustment for the next verification period. The completed verification protocol for this project is enclosed in Appendix A to this report.

Findings during the verification can be interpreted as a non-compliance with CDM criteria or a risk to the compliance. Corrective action requests (CARs) are raised, in case:

- (a) Non-conformities with the monitoring plan or methodology are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;
- (b) Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants;
- (c) Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
- (d) Issues identified in a FAR during validation/previous verification(s) that are not been resolved by the project participant(s) to be verified during current verification.

Requests for clarification (CLs) are 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 verification to highlight issues related to project implementation/monitoring that require review during the subsequent verification of the project activity. FARs shall not relate to the CDM requirements for issuance.

## 2.4 Internal quality control

The final verification report has passed a technical review before being submitted for request for issuance. The technical review was performed by a technical reviewer qualified in accordance with TÜV Rheinland's qualification scheme for CDM validation and verification that meets the criteria of EB guidelines for qualification.

## 2.5 Verification Team

Before the assessment begins, members of the verification team are ensured to cover the technical area(s), sectoral scope(s) and relevant host country experience including local language ability for evaluating the CDM verification activity. The qualification of the team is as per the criterias defined by the EB guidelines for qualification.

Table 2

Verification Team			Type of Involvement							
Full name	Affiliation TÜV Rheinland	Appointed for Sectoral Scopes (Technical Areas)	Supervising the work	Desk review	Site Visit + Interview	Report and protocol Writing	Technical Expert Input	Reporting Support	Trainee Technical Review	Technical Review
MA Libo	China	1.1, 1.2, 4.5	X	X	X	X				
TAN Yi	China	1.2,13.1			X			X		
TIAN Wenting	China	1.2,13.1								X
Walter TANG	China	1.1, 1.2, 2.1, 2.2, 3.1, 4.3, 4.5, 13.1								X

Verification Team along with onsite observation, objective evidence collections, data generation and recording analysis also considered the views obtained in these interviews while arriving at verification Opinion.

## 3. Verification findings

The findings of the verification are described in the following sections. The verification criteria (requirements), the means of verification and the results of verification are documented in detail in the verification protocol in Appendix A.

### 3.1 Project implementation

#### 3.1.1 The implementation of the project activity

The project implementation was verified by means of onsite physical inspection, stakeholders interview and document review, including monitoring report/1//2/, registered PDD/3/ as well as project Validation Report/4/.

The project was registered on 28/07/2011 against the approved methodology AMS-III.H, Version 15 and AMS-I.F, Version 01. Fixed crediting period is chosen for the project from

28/07/2011 to 27/07/2021. The start date of the crediting period is changed from 01/10/2011 to 28/07/2011 which has been approved by EB according to the UNFCCC website. This is the 1<sup>st</sup> verification of the project and the start date of this monitoring period is 28/07/2011, which is the start date of the fixed crediting period. The entire 1<sup>st</sup> monitoring period covers 401 days in total, which is from 28 July 2011 to 31 August 2012.

The Project is to install a biogas-capturing device and a biogas based electricity generation system in the existing wastewater treatment systems at the paper mill of Zhejiang Jingxing Paper Joint Stock Co. Ltd., which is located at Pinghu, Jiaying Municipality, Zhejiang Province, People's Republic of China. The geographic coordinates of (i.e. 120.9501 E, 30.6992 N) indicated in the monitoring report have been confirmed to be realistic through onsite measurement by GPS device.

The verification team confirms by onsite assessment that the proposed project mainly consists of biogas recovery system, biogas purification device, and power generation system. Through onsite assessment, the verification team confirms two production lines with total paper production capacity of 600,000 tons per year are involved in the project activity. The verification team has reviewed the *Daily Wastewater Flow and COD Measurement Records* during this monitoring period and confirmed the production process in this monitoring period produced 6,861,146 m<sup>3</sup> of wastewater, which was sent to an onsite wastewater treatment system. As confirmed by onsite assessment, the generated biogas with a volume of 13,000~15,000m<sup>3</sup> per day is piped to the biogas power plant where 4 units of 500kW biogas engines have been installed. The electricity generated by the proposed project is consumed onsite to support the generation demand of the wastewater treatment plant which would be imported electricity for normal operation from the East China Power Grid (ECPG) in the baseline scenario. During this first monitoring period from 28 July 2011 to 31 August 2012, the project activity reduces 31,793tCO<sub>2</sub>e by capturing the biogas and around 5,453tCO<sub>2</sub>e through displacement of electricity from the grid. The total amount of emission reductions of this monitoring period is 37,246tCO<sub>2</sub>e.

The project is a bilateral CDM project activity/3/. During the monitoring period from 28 July 2011 to 31 August 2012, there was no change on the project participants according to onsite interview with the project owner.

As part of the site visit, the verification team was able to confirm that the project implementation is in accordance with the project description contained in registered PDD, Version 2.2, 13 July 2011/3/ and the registered monitoring plan/3/. The verification took cognizance para.225 of VVS Version 03.0.

Herewith, the Verification Team summarizes *major* changes between webhosted Monitoring Report and final version of Monitoring Report for submission as follows:

**Table 3**

Subject	Webhosted Monitoring Report (MR)	Correction to webhosted MR in the final MR submission for issuance with DOE assessment and reason of acceptance.
MR (participants involved/ project location)	No change.	
Monitoring ( parameters / frequency )	1. The description of the monitoring system in webhosted MR Section C is	1. The description of the monitoring system in MR Section C is revised to be

	<p>not fully consistent with the Section B.7.2 of the registered PDD.</p> <ol style="list-style-type: none"> <li>2. The information of the monitoring equipment is not completely listed in MR Section C;</li> <li>3. The implementation of sampling plan for COD measurement is not described in MR Section D.3;</li> </ol>	<p>consistent with the Section B.7.2 of the registered PDD.</p> <ol style="list-style-type: none"> <li>2. The information of the monitoring equipment is completely listed in MR Section C;</li> <li>3. The implementation of sampling plan for COD measurement is described in MR Section D.3 according to national standard GB11914-89.</li> </ol> <p>Please see details in CAR3, CAR4 and CAR5.</p>
<p>Project implementation/technology, etc.</p>	<ol style="list-style-type: none"> <li>1. The relevant dates of construction starting, commissioning and continued operation periods are not listed in Section A.1 of the MR.</li> <li>2. The description of the installed technology, technical process and equipment are not provided in this MR Section B.1;</li> </ol>	<ol style="list-style-type: none"> <li>1. The relevant dates of construction starting, commissioning and continued operation periods are listed in Section A.1 of the MR.</li> <li>2. The description of the installed technology, technical process and equipment are provided in this MR Section B.1;</li> </ol> <p>Please see details in CAR1 and CAR2.</p>
<p>CER calculations (formula applied/ amount of emission reduction)</p>	<ol style="list-style-type: none"> <li>1. For the calculation of emission reductions in MR Section E, the sample calculation of all formulas are not conducted by using the actual monitoring values during this monitoring period. The relevant spread sheets are not attached to present the calculation process in the MR in line with the Guideline for Completing the Monitoring Report Form Version 02.0;</li> <li>2. The relevant formulas in calculating the emission reductions are not clearly provided in the ER spread sheets in line with the registered PDD.</li> </ol>	<ol style="list-style-type: none"> <li>1. The MR Section E has been revised. The relevant spread sheets are attached to present the calculation process in the MR;</li> <li>2. The relevant formulas in calculating the emission reductions have been provided in the ER spread sheets in line with the registered PDD.</li> </ol> <p>Please see details in CAR6 and CL3.</p>

*Please refer to Appendix A of this report for details of each change between webhosted MR and the final MR for submission. The Verification Team has carried out the verification process based on the Webhosted MR and raised CARs/CLs against the project by issuing the verification protocol.*

*With the updated information and corrections done on final MR, the PP has addressed all the CARs /CLs that were raised by the Verification Team.*

*It is concluded that the Verification Team has reviewed the project in line with the VVS (Version 03.0) and all the evidence, corrections, justifications and updating done on the final MR with respect to CARs /CLs raised are accepted and closed by the Verification Team, issuing the positive verification opinion for project*

registration.

### 3.1.2 The actual operation of the CDM project activity

#### (a) Actual Implementation Status

By means of on-site interviewing with the project owner/i//ii//iii/ and checking the daily operation & maintenance logs/19//20/, the verification team can confirm that the project activity operated well, and no any event which may impact the applicability of the methodology occurred during the monitoring period from 28 July 2011 to 31 August 2012. The timeline of the project's implementation is as follows:

**Table 4**

Milestone of the project activity	Timeline	Assessment by the verification team
Construction start	04/02/2009	It was verified to be consistent with the the <i>Construction Contract/42/</i> .
Starting date of operation: Commission date	23/06/2009	It is verified as the date when the project start commission operation according to the <i>Application for Commercial Operation/43/</i> .
Continued operation	08/10/2009	It is verified as the date when the project start commercial operation according to the <i>Application for Commercial Operation/43/</i> .
Registration of the project activity	28/07/2011	It was verified against the UNFCCC website <a href="http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1311661043.38/view">http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1311661043.38/view</a>
Crediting period: from 28/07/2011 to 27/07/2021		
1 <sup>st</sup> monitoring period	from 28 July 2011 to 31 August 2012	It was verified against the UNFCCC website <a href="http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1311661043.38/view">http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1311661043.38/view</a>

#### (b) Applied Technology

During the on-site assessment, it is confirmed that total 4 units of 500kW biogas generators have been installed at the project site and the model type on the name plates are fully consistent with the Section A.4.3 of the registered PDD and Section B.1 of the final MR/1/. The total installed capacity of the power generation system is 2.0 MW and one unit of 500kW generator is installed for backup use.

**Table 5**

Equipment	Type	Consistent with registered PDD?
Biogas Generators	500GF1 (2 Units)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

	TH500-12/1180 (2 Units)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Sulphur Removal	THIOPAQ	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

**(c) Monitoring Equipment**

The monitoring report provides procedures as well as a list of parameters that need to be monitored in line with the Monitoring Manual/39/ submitted to the verification team and the monitoring plan provided in the registered PDD. All the parameters had been monitored and determined as described in the monitoring plan.

During onsite assessment, the verification team verified all the monitoring equipments were well installed in line with the registered monitoring plan. The calibration records of the monitoring equipments are available for verification and it was verified that the calibration of all the monitoring equipments were delayed. This monitoring period starts from 28 July 2011 while the calibration of the biogas flow meters was conducted on 16 February 2012. As reflected in the emission reduction spread sheets/17/ and monitoring report/1/, a most conservative approach has been applied in line with the para. 238 of VVS Version 03.0. The details are described in Section 3.5.2 of this report.

Through onsite interview, reviewing staff training and qualification records/40//41/, the verification team confirms that the personnel involved in the monitoring tasks were all trained and competent as specified in the monitoring plan.

Through reviewing the operation logbook, data stored on the computer and daily monitoring records, the verification team concluded that the transfer of data was fully creditable, as well as appropriate for and compliant with the monitoring plan. Monitoring data is recorded by the qualified employees on-site using a designed form periodically. Data of power generation, biogas flow and methane fraction are stored in electronic form periodically. Monitoring data is collected and aggregated by the each corresponding team leader on monthly basis and stored properly. The CDM project manager of Zhejiang Jingxing Paper Joint Stock Co. Ltd rechecks and collects the monitoring data from each operation team leaders and sends them to Swiss Carbon Assets Ltd.

**Table 6**

<b>Any Project Design Change been sought and approved by EB for the project?</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	No project design change is identified during this verification.
<b>Any Revision in Monitoring plan is sought and approved by EB for the project?</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	No revision to the monitoring plan is identified during this verification.
<b>Does the monitoring report provide line diagram showing all relevant monitoring equipments?</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The line diagram is provided in Section C of the MR and all the relevant monitoring equipments have been clearly indicated.

In summary, the monitoring period is reasonable and the actual implementation of the project activity is appropriate to its CDM development. The verification took cognizance para.228 of VVS Version 03.0.

### 3.2 Assessment Opinion on Post Registration Change

Not necessary since there is no any post registration change identified through this verification process.

The Verification Team took cognizance Para.247, 248, 249, 250 of VVS Version Version 03.0.

### 3.3 Compliance of the monitoring plan with the monitoring methodology including applicable tool(s)

The Verification Team is able to confirm that the monitoring plan under implementation is in accordance with AMS-III.H, Version 15 and AMS-I.F, Version 01, the approved methodology applied by the registered CDM project activity. The verification took cognizance para.232 of VVS Version 03.0.

### 3.4 Compliance of the actual monitoring with monitoring plan in the PDD

The actual monitoring has been carried out in accordance with the monitoring plan contained in the registered PDD Version 2.2, 13 July 2011 which is confirmed by the Verification Team. The verification took cognizance para.235 of VVS Version 03.0.

Table 7

Determination Requirements	Criteria fulfilled	Determination and reporting by the verification team
Has any MP revision or deviation been sought and approved by EB for the project.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	No MP revision or deviation is identified for this verification.
Is complete set of data for the specified monitoring period available	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The daily monitoring records and operation logbook are complete during this monitoring period.
Has the required information provided in the monitoring report been cross-checked with other sources (ex – plant logbooks, inventories, purchase records, laboratory analysis)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The monitoring data in the emission reduction spread sheets have been cross-checked with the daily plant operation logbook and onsite meter reading records.
Is the calculation of baseline emissions and project activity emissions and leakage in accordance with the formula and methods described in monitoring plan and the applied methodology.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	See details in Section 3.5.2 of this report.
Have all assumptions used for emission calculation been justified	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	See details in Section 3.5.2 of this report.
Have appropriate emission factors, IPCC default values and other reference values been correctly applied	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The baseline grid emission factor of ECPG is 0.7690tCO <sub>2</sub> /MWh, which is calculated in line with the China DNA's guidance/18/.

### 3.4.1 Monitored parameters

#### - Baseline Emissions (BE<sub>y</sub>)

As per the registered PDD, the baseline emissions comprise of baseline emissions from methane avoidance component and electricity displacement component, which are separately verified as follows:

##### (i) Baseline emissions for methane avoidance component

As per Paragraph 17 of AMS-III.H Version 15/5/, baseline emissions are calculated as follows:

$$BE_{methane,y} = \{BE_{power,y} + BE_{ww,treatment,y} + BE_{s,treatment,y} + BE_{ww,discharge,y} + BE_{s,final,y}\}$$

Since the project activity is only involving a biogas capture and utilization system without doing any changes to the existing wastewater treatment and sludge treatment system, only  $BE_{ww,treatment,y}$  needs to be considered as baseline emissions for the project activity, which is calculated as follows

$$BE_{ww,treatment,y} = \sum_i Q_{ww,i,y} * COD_{removed,i,y} * MCF_{ww,treatment,BL,i} * B_{o,ww} * UF_{BL} * GWP_{CH4}$$

Where:

- $Q_{ww,i,y}$  Volume of wastewater treated in baseline wastewater treatment system *i* in year *y* (m<sup>3</sup>)
- $COD_{removed,i,y}$  Chemical oxygen demand removed by baseline treatment system *i* in year *y* (tonnes/m<sup>3</sup>), measured as the difference between inflow COD and the outflow COD in system *i*
- $MCF_{ww,treatment,BL,i}$  Methane correction factor for baseline wastewater treatment systems *i* (MCF value for anaerobic reactor without methane recovery is 0.8 as per table III.H.1)
- $B_{o,ww}$  Methane producing capacity of the wastewater (IPCC value of 0.25 kg CH<sub>4</sub>/kg COD)
- $UF_{BL}$  Model correction factor to account for model uncertainties (0.89)
- $GWP_{CH4}$  Global Warming Potential for methane (value of 21)

As per the registered PDD and the MR,  $Q_{ww,i,y}$  is the sum of  $Q_{ww,1,y}$  and  $Q_{ww,2,y}$ , which are separately monitored by two flow meters installed at the inlet of the two anaerobic digesters. The  $COD_{removed,i,y}$  is the difference of the COD content before and after the anaerobic digesters. The COD measurement is conducted by sampling measurement of the wastewater at the laboratory according to applicable national standard *GB11914/24/*. As indicated in Figure 3 of the MR, the wastewater from sample 1 and 3 are the basis for testing the COD content of the wastewater before digesters. Meanwhile, Sample 2 and 4 are used for testing COD content of wastewater after anaerobic digesters.

**Table 8**

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
1. Data / Parameter: (as in monitoring plan of PDD):	Volume of wastewater treated in plant 1 in the year “y”: $Q_{ww,1,y}$
2. Type of Monitoring equipment	Flow meter
3. Measuring frequency/Time Interval:	Monitored continuously
4. Reporting frequency:	Daily reported

5. Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
6. Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	The accuracy class of the flow meter is verified as 1.0 which is more accurate than 2.5 in the registered PDD.
7. If applicable, has the reported data been cross-checked with other available data?	Not applicable.
8. How were the values in the monitoring report verified?	This is verified by checking daily wastewater flow and COD measurement records of Plant 1.
9. Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the monitoring data is collected and aggregated by the corresponding team leader every month and stored properly. The CDM project manager of Zhejiang Jingxing Paper Joint Stock Co. Ltd rechecks and collects the monitoring data from each operation team leaders and sends them to Swiss Carbon Assets Ltd.
10. In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not applicable.

**Table 9**

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
1. Data / Parameter: (as in monitoring plan of PDD):	Volume of wastewater treated in plant 2 the year “y”: $Q_{ww,2,y}$
2. Type of Monitoring equipment	Flow meter
3. Measuring frequency/Time Interval:	Monitored continuously
4. Reporting frequency:	Daily reported
5. Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
6. Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	The accuracy class of the flow meter is verified as 1.0 which is more accurate than 2.5 in the registered PDD.
7. If applicable, has the reported data been	Not applicable.

cross-checked with other available data?	
8. How were the values in the monitoring report verified?	This is verified by checking daily wastewater flow and COD measurement records of Plant 2.
9. Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the monitoring data is collected and aggregated by the corresponding team leader every month and stored properly. The CDM project manager of Zhejiang Jingxing Paper Joint Stock Co. Ltd rechecks and collects the monitoring data from each operation team leaders and sends them to Swiss Carbon Assets Ltd.
10. In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not applicable.

Table 10

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
1. Data / Parameter: (as in monitoring plan of PDD):	Volume of wastewater treated in the year "y": $Q_{ww,i,y}$
2. Type of Monitoring equipment	Flow meter
3. Measuring frequency/Time Interval:	Monitored continuously
4. Reporting frequency:	Daily reported
5. Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
6. Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	The accuracy class of the flow meter is verified as 1.0 which is more accurate than 2.5 in the registered PDD.
7. If applicable, has the reported data been cross-checked with other available data?	Not applicable.
8. How were the values in the monitoring report verified?	This is the sum of the daily records of two anaerobic digesters both Plant 1 and 2 (i.e. $Q_{ww,i,y} = Q_{ww,1,y} + Q_{ww,2,y}$ ). This is verified by checking daily wastewater flow and COD measurement records at Plant 1 and Plant 2.
9. Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the monitoring data is collected and aggregated by the corresponding team leader every month and stored properly. The CDM project manager of Zhejiang Jingxing Paper Joint Stock Co. Ltd rechecks and collects the monitoring data from each operation team leaders and sends them to Swiss Carbon Assets

	Ltd.
10. In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not applicable.

**Table 11**

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
1. Data / Parameter: (as in monitoring plan of PDD):	Chemical oxygen demand of wastewater before the anaerobic treatment reactor/system with methane capture in plant 1 in the year “y”: $COD_{ww,untreated,1,y}$
2. Type of Monitoring equipment	Titrimetric method in line with GB11914-89
3. Measuring frequency/Time Interval:	Daily monitored
4. Reporting frequency:	Daily reported
5. Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
6. Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	Not applicable.
7. If applicable, has the reported data been cross-checked with other available data?	Not applicable.
8. How were the values in the monitoring report verified?	This is verified by checking daily wastewater flow and COD measurement records of Plant 1.
9. Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the monitoring data is collected and aggregated by the corresponding team leader every month and stored properly. The CDM project manager of Zhejiang Jingxing Paper Joint Stock Co. Ltd rechecks and collects the monitoring data from each operation team leaders and sends them to Swiss Carbon Assets Ltd.
10. In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not applicable.

Table 12

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
1. Data / Parameter: (as in monitoring plan of PDD):	Chemical oxygen demand of wastewater after the anaerobic treatment reactor/system with methane capture in plant 1 in the year “y”: $COD_{ww,treated,1,y}$
2. Type of Monitoring equipment	Titrimetric method in line with GB11914-89
3. Measuring frequency/Time Interval:	Daily monitored
4. Reporting frequency:	Daily reported
5. Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
6. Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	Not applicable.
7. If applicable, has the reported data been cross-checked with other available data?	Not applicable.
8. How were the values in the monitoring report verified?	This is verified by checking daily wastewater flow and COD measurement records of Plant 1.
9. Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the monitoring data is collected and aggregated by the corresponding team leader every month and stored properly. The CDM project manager of Zhejiang Jingxing Paper Joint Stock Co. Ltd rechecks and collects the monitoring data from each operation team leaders and sends them to Swiss Carbon Assets Ltd.
10. In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not applicable.

Table 13

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
1. Data / Parameter: (as in monitoring plan of PDD):	Chemical oxygen demand of wastewater before the anaerobic treatment reactor/system with methane capture in plant 2 in the year “y”: $COD_{ww,untreated,2,y}$
2. Type of Monitoring equipment	Titrimetric method in line with GB11914-89
3. Measuring frequency/Time Interval:	Daily monitored
4. Reporting frequency:	Daily reported
5. Is measuring and reporting frequency in	Yes

accordance with the monitoring plan and monitoring methodology? (Yes / No)	
6. Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	Not applicable.
7. If applicable, has the reported data been cross-checked with other available data?	Not applicable.
8. How were the values in the monitoring report verified?	This is verified by checking daily wastewater flow and COD measurement records of Plant 2.
9. Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the monitoring data is collected and aggregated by the corresponding team leader every month and stored properly. The CDM project manager of Zhejiang Jingxing Paper Joint Stock Co. Ltd rechecks and collects the monitoring data from each operation team leaders and sends them to Swiss Carbon Assets Ltd.
10. In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not applicable.

Table 14

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
1. Data / Parameter: (as in monitoring plan of PDD):	Chemical oxygen demand of wastewater after the anaerobic treatment reactor/system with methane capture in plant 2 in the year “y”: $COD_{ww,treated,2,y}$
2. Type of Monitoring equipment	Titrimetric method in line with GB11914-89
3. Measuring frequency/Time Interval:	Daily monitored
4. Reporting frequency:	Daily reported
5. Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
6. Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	Not applicable.
7. If applicable, has the reported data been cross-checked with other available data?	Not applicable.

8. How were the values in the monitoring report verified?	This is verified by checking daily wastewater flow and COD measurement records of Plant 2.
9. Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the monitoring data is collected and aggregated by the corresponding team leader every month and stored properly. The CDM project manager of Zhejiang Jingxing Paper Joint Stock Co. Ltd rechecks and collects the monitoring data from each operation team leaders and sends them to Swiss Carbon Assets Ltd.
10. In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not applicable.

Table 15

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
1. Data / Parameter: (as in monitoring plan of PDD):	Amount of biogas combusted (fuelled) in the year "y": $BG_{burnt,y}$
2. Type of Monitoring equipment	Flow meter (normalized flow)
3. Measuring frequency/Time Interval:	Measured continuously
4. Reporting frequency:	Monthly reported
5. Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
6. Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	The accuracy class of the normalized flow meter is 1.5 which is more accurate than 2.5 in the registered PDD.
7. If applicable, has the reported data been cross-checked with other available data?	Not applicable.
8. How were the values in the monitoring report verified?	This is verified by checking monitoring logbook of biogas flow, CH <sub>4</sub> concentration and electricity generation.
9. Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the monitoring data is collected and aggregated by the corresponding team leader every month and stored properly. The CDM project manager of Zhejiang Jingxing Paper Joint Stock Co. Ltd rechecks and collects the monitoring data from each operation team leaders and sends them to Swiss Carbon Assets Ltd.
10. In case only partial data are available	Not applicable.

because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	
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Table 16

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
1. Data / Parameter: (as in monitoring plan of PDD):	Methane content in the biogas combusted (fuelled) in year “y”: $W_{CH_4, fuelled, y}$
2. Type of Monitoring equipment	Gas analyzer
3. Measuring frequency/Time Interval:	Measured continuously
4. Reporting frequency:	Hourly reported
5. Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
6. Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	The accuracy class of the gas analyzer is 5.0 which is in line with the applicable national standard <i>Verification Regulation of Alarm Detectors of Combustible Gas (Ref. no.: JJG693-2011)/27/</i> .
7. If applicable, has the reported data been cross-checked with other available data?	Not applicable.
8. How were the values in the monitoring report verified?	This is verified by checking monitoring logbook of biogas flow, CH <sub>4</sub> concentration and electricity generation.
9. Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the monitoring data is collected and aggregated by the corresponding team leader every month and stored properly. The CDM project manager of Zhejiang Jingxing Paper Joint Stock Co. Ltd rechecks and collects the monitoring data from each operation team leaders and sends them to Swiss Carbon Assets Ltd.
10. In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not applicable.

Table 17

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
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1. Data / Parameter: (as in monitoring plan of PDD):	Volumetric flow rate of the residual gas in dry basis at normal conditions in hour $h$ in plant 1: $FV_{RG,h,1}$
2. Type of Monitoring equipment	Flow meter
3. Measuring frequency/Time Interval:	Measured continuously
4. Reporting frequency:	Hourly reported
5. Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
6. Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	The accuracy class of the gas analyzer is 1.5 which is more accurate than 2.5 in the registered PDD.
7. If applicable, has the reported data been cross-checked with other available data?	Not applicable.
8. How were the values in the monitoring report verified?	As verified by onsite assessment, the moisture has been discounted from flow rate after pre-treatment. The monitoring data is verified by checking monitoring logbook of biogas flow, CH <sub>4</sub> concentration and electricity generation.
9. Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the monitoring data is collected and aggregated by the corresponding team leader every month and stored properly. The CDM project manager of Zhejiang Jingxing Paper Joint Stock Co. Ltd rechecks and collects the monitoring data from each operation team leaders and sends them to Swiss Carbon Assets Ltd.
10. In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not applicable.

Table 18

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
1. Data / Parameter: (as in monitoring plan of PDD):	Volumetric fraction of methane in the residual gas on dry basis in hour $h$ in plant 1: $fV_{CH_4,RG,h,1}$
2. Type of Monitoring equipment	Gas analyzer
3. Measuring frequency/Time Interval:	Measured continuously
4. Reporting frequency:	Hourly reported
5. Is measuring and reporting frequency in accordance with the monitoring plan	Yes

and monitoring methodology? (Yes / No)	
6. Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	The accuracy class of the gas analyzer is 5.0 which is in line with the applicable national standard <i>Verification Regulation of Alarm Detectors of Combustible Gas (Ref. no.: JJG693-2011)/27/</i> .
7. If applicable, has the reported data been cross-checked with other available data?	Not applicable.
8. How were the values in the monitoring report verified?	As verified by onsite assessment, the moisture has been discounted from methane fraction after pre-treatment. The monitoring data is verified by checking monitoring logbook of biogas flow, CH <sub>4</sub> concentration and electricity generation.
9. Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the monitoring data is collected and aggregated by the corresponding team leader every month and stored properly. The CDM project manager of Zhejiang Jingxing Paper Joint Stock Co. Ltd rechecks and collects the monitoring data from each operation team leaders and sends them to Swiss Carbon Assets Ltd.
10. In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not applicable.

Table 19

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
1. Data / Parameter: (as in monitoring plan of PDD):	Flare efficiency in plant 1: $\eta_{\text{flare},1}$
2. Type of Monitoring equipment	Online temperature gauge
3. Measuring frequency/Time Interval:	Measured continuously
4. Reporting frequency:	Hourly reported
5. Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
6. Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	The PDD does not specify the accuracy of the temperature gauge, while it is verified during onsite verification that the accuracy of the temperature gauge is 3%.
7. If applicable, has the reported data been	Not applicable.

cross-checked with other available data?	
8. How were the values in the monitoring report verified?	This value is selected as 0% for conservative because the temperature gauge is not calibrated.
9. Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the monitoring data is collected and aggregated by the corresponding team leader every month and stored properly. The CDM project manager of Zhejiang Jingxing Paper Joint Stock Co. Ltd rechecks and collects the monitoring data from each operation team leaders and sends them to Swiss Carbon Assets Ltd.
10. In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not applicable.

Table 20

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
1. Data / Parameter: (as in monitoring plan of PDD):	Volumetric flow rate of the residual gas in dry basis at normal conditions in hour $h$ in plant 2: $FV_{RG,h,2}$
2. Type of Monitoring equipment	Flow meter
3. Measuring frequency/Time Interval:	Measured continuously
4. Reporting frequency:	Hourly reported
5. Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
6. Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	The accuracy class of the gas analyzer is 1.5 which is more accurate than 2.5 in the registered PDD.
7. If applicable, has the reported data been cross-checked with other available data?	Not applicable.
8. How were the values in the monitoring report verified?	As verified by onsite assessment, the moisture has been discounted from flow rate after pre-treatment. The monitoring data is verified by checking monitoring logbook of biogas flow, CH <sub>4</sub> concentration and electricity generation.
9. Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the monitoring data is collected and aggregated by the corresponding team leader every month and stored properly. The CDM project manager of Zhejiang Jingxing Paper Joint Stock Co. Ltd rechecks and collects the monitoring data from each operation team leaders and sends them to Swiss Carbon Assets

	Ltd.
10. In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not applicable.

Table 21

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
1. Data / Parameter: (as in monitoring plan of PDD):	Volumetric fraction of methane in the residual gas on dry basis in hour $h$ in plant 2: $fV_{CH_4, RG, h, 2}$
2. Type of Monitoring equipment	Gas analyzer
3. Measuring frequency/Time Interval:	Measured continuously
4. Reporting frequency:	Hourly reported
5. Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
6. Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	The accuracy class of the gas analyzer is 5.0 which is in line with the applicable national standard <i>Verification Regulation of Alarm Detectors of Combustible Gas (Ref. no.: JJG693-2011)/27/</i> .
7. If applicable, has the reported data been cross-checked with other available data?	Not applicable.
8. How were the values in the monitoring report verified?	As verified by onsite assessment, the moisture has been discounted from methane fraction after pre-treatment. The monitoring data is verified by checking monitoring logbook of biogas flow, CH <sub>4</sub> concentration and electricity generation.
9. Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the monitoring data is collected and aggregated by the corresponding team leader every month and stored properly. The CDM project manager of Zhejiang Jingxing Paper Joint Stock Co. Ltd rechecks and collects the monitoring data from each operation team leaders and sends them to Swiss Carbon Assets Ltd.
10. In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request	Not applicable.

for deviation been approved?	
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**Table 22**

Monitoring Prameter Requirement	Assessment/ Observation by the DOE
1. Data / Parameter: (as in monitoring plan of PDD):	Flare efficiency in plant 2: $\eta_{flare,2}$
2. Type of Monitoring equipment	Online temperature gauge
3. Measuring frequency/Time Interval:	Measured continuously
4. Reporting frequency:	Hourly reported
5. Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
6. Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	The PDD does not specify the accuracy of the temperature gauge, while it is verified during onsite verification that the accuracy of the temperature gauge is 3%.
7. If applicable, has the reported data been cross-checked with other available data?	Not applicable.
8. How were the values in the monitoring report verified?	This value is selected as 0% for conservative because the temperature gauge is not calibrated.
9. Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the monitoring data is collected and aggregated by the corresponding team leader every month and stored properly. The CDM project manager of Zhejiang Jingxing Paper Joint Stock Co. Ltd rechecks and collects the monitoring data from each operation team leaders and sends them to Swiss Carbon Assets Ltd.
10. In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not applicable.

**Table 23**

Monitoring Prameter Requirement	Assessment/ Observation by the DOE
1. Data / Parameter: (as in monitoring plan of PDD):	<i>Final disposal of sludge</i>
2. Type of Monitoring equipment	Not applicable since it is monitored by checking the sludge disposal contract/44/.
3. Measuring frequency/Time Interval:	Not applicable.
4. Reporting frequency:	Annually

5. Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes.
6. Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	Not applicable.
7. If applicable, has the reported data been cross-checked with other available data?	Not applicable.
8. How were the values in the monitoring report verified?	This is verified by checking sludge disposal contract/44/.
9. Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the monitoring data is collected and aggregated by the corresponding team leader every month and stored properly. The CDM project manager of Zhejiang Jingxing Paper Joint Stock Co. Ltd rechecks and collects the monitoring data from each operation team leaders and sends them to Swiss Carbon Assets Ltd.
10. In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not applicable.

(ii) **Baseline emissions for electricity displacement component**

As per AMS-IF version 01 paragraph 14/6/, the baseline emissions for other systems are the product of amount electricity displaced with the electricity produced by the renewable generating unit and an emission factor:

$$BE_y = EG_{BL,y} * EF_{CO2,y}$$

The emission factor of ECPG has been calculated as a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the *Tool to calculate the emission factor for an electricity system version 02*. The OM and BM data is calculated in line with China DNA’s guidelines dated on 20/12/2010. Considering the weighting of the OM and BM for biogas power generation projects (i.e. 0.50 and 0.50 respectively) as per *Tool to calculate the emission factor for an electricity system (version 02)*, the combined margin (CM) in 2010 is calculated as 0.7690 tCO<sub>2</sub>/MWh. As per the registered PDD, the  $EG_{BL,y}$  is measured continuously by a bi-directional electricity meter installed at the project site.

**Table 24**

Monitoring Prameter Requirement	Assessment/ Observation by the DOE
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1. Data / Parameter: (as in monitoring plan of PDD):	Quantity of net electricity displaced as a result of the implementation of the project activity in year y: <i>EG<sub>BLy</sub></i>
2. Type of Monitoring equipment	Electricity meter
3. Measuring frequency/Time Interval:	Measured continuously
4. Reporting frequency:	Monthly reported
5. Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes.
6. Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	The accuracy class of the electricity meter is 0.5S which is more accurate than 1.0 in the registered PDD.
7. If applicable, has the reported data been cross-checked with other available data?	Not applicable.
8. How were the values in the monitoring report verified?	This is verified by checking monitoring logbook of biogas flow, CH <sub>4</sub> concentration and electricity generation/19/.
9. Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the monitoring data is collected and aggregated by the corresponding team leader every month and stored properly. The CDM project manager of Zhejiang Jingxing Paper Joint Stock Co. Ltd rechecks and collects the monitoring data from each operation team leaders and sends them to Swiss Carbon Assets Ltd.
10. In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not applicable.

## - Project Emissions (PE<sub>y</sub>)

### (i) Project emissions for methane avoidance component

As per Paragraph 27 of AMS-III.H Version 15/5/, the project activity emissions due to methane avoidance are calculated as follows :

$$PE_{methane,y} = \langle PE_{power,y} + PE_{ww,treatment,y} + PE_{s,treatment,y} + PE_{ww,discharge,y} + PE_{s,final,y} + PE_{fugitive,y} + PE_{biomass,y} + PE_{flaring,y} \rangle$$

Where:

$PE_{methane,y}$  Project activity emissions due to methane avoidance in the year “y” (tCO<sub>2</sub>e)

$PE_{power,y}$  Emissions from electricity or fuel consumption in the year y (tCO<sub>2</sub>e).

$PE_{ww,treatment,y}$  Methane emissions from wastewater treatment systems affected by the project

	activity, and not equipped with biogas recovery, in year y (tCO <sub>2</sub> e).
$PE_{s,treatment,y}$	Methane emissions from sludge treatment systems affected by the project activity, and not equipped with biogas recovery, in year y (tCO <sub>2</sub> e).
$PE_{ww,discharge,y}$	Methane emissions from degradable organic carbon in treated wastewater in year y (tCO <sub>2</sub> e).
$PE_{s,final,y}$	Methane emissions from anaerobic decay of the final sludge produced in year y (tCO <sub>2</sub> e).
$PE_{fugitive,y}$	Methane emissions from biogas release in capture systems in year y
$PE_{biomass,y}$	Methane emissions from biomass stored under anaerobic conditions.
$PE_{flaring,y}$	Methane emissions due to incomplete flaring in year y as per the “Tool to determine project emissions from flaring gases containing methane”(tCO <sub>2</sub> e)

- 1) As described in registered validation report, wastewater treatment plant remains unchanged regardless of the construction and implementation of the project activity. Therefore, *emissions from fossil-fuel consumptions of existing wastewater treatment system*,  $PE_{ww,treatment,y}$  and  $PE_{ww,discharge,y}$  are not be taken into account.
- 2) Only electricity consumption from the newly intalled facilities (i.e. biogas recovery system, sulphur removal system and power generation system) are taken into account for calculation of  $PE_{power,y}$ .
- 3)  $PE_{s,treatment,y}$  and  $PE_{s,final,y}$  are not considered since the sludge treatment is unaffected by the project activity as sludge is disposed in a controlled landfill, which is the same as in the baseline scenario.
- 4)  $PE_{biomass,y}$  are all not applicable for the project activity as no biomass has been stored under anaerobic conditions .

Based on the above analysis, the project activity emissions due to methane avoidance are calculated for the project activity as follows:

$$PE_{methane,y} = PE_{fugitive,y} + PE_{flaring,y}$$

The methane emissions from biogas release in capture systems (i.e.  $PE_{fugitive,y}$ ) is calculated as per paragraph 28 of AMS-III.H version 15.

$$PE_{fugitive,y} = PE_{fugitive,ww,y} + PE_{fugitive,s,y}$$

Where:

$PE_{fugitive,ww,y}$  Fugitive emissions through capture inefficiencies in the anaerobic wastewater treatment in year “y” (tCO<sub>2</sub>e);

$PE_{fugitive,s,y}$  Fugitive emissions through capture inefficiencies in the anaerobic sludge treatment in the year “y” (tCO<sub>2</sub>e)

$PE_{fugitive,s,y}$  are not considered as the sludge treatment is not affected by the project activity.  $PE_{fugitive,ww,y}$  is calculated as follows:

$$PE_{fugitive,ww,y} = (1 - CFE_{ww}) \cdot MEP_{ww,treatment,y} \cdot GWP_{CH4}$$

Where:

$CFE_{ww}$  Capture efficiency of the biogas recovery equipment in the wastewater treatment systems (a default value of 0.9 shall be used)

$GWP_{CH4}$  Global Warming Potential for methane (value of 21 is used)

$MEP_{ww,treatment,y}$  Methane emission potential of wastewater treatment systems equipped with biogas recovery system in year y (tonnes) which is calculated according to the equation below:

$$MEP_{ww,treatment,y} = Q_{ww,y} * B_{o,ww} * UF_{PJ} * \sum_k COD_{removed,PJ,k,y} \cdot MCF_{ww,treatment,PJ,k}$$

Where:

$Q_{ww,y}$	Volume of wastewater treated in the year $y$ (m)
$B_{o,ww}$	Methane producing capacity of the wastewater (IPCC default value for domestic wastewater of 0.25kg CH <sub>4</sub> /kg COD)
$COD_{removed,PJ,k,y}$	The chemical oxygen demand removed by the treatment system $k$ of the project activity equipped with biogas recovery in the year $y$ (tonnes/m <sup>3</sup> )
$MCF_{ww,treatment,PJ,k,y}$	Methane correction factor for the project wastewater treatment system $k$ equipped with biogas recovery equipment (MCF value for Anaerobic reactor without methane recovery is 0.8 as per table III.H.)
$UF_{PJ}$	Model correction factor to account for model uncertainties

The methane emissions due to incomplete flaring (i.e.  $PE_{flaring,y}$ ) are calculated as per the “*Tool to determine project emissions from flaring gases containing methane*” :

$$PE_{flaring,y} = \sum_{i=1}^{8760} TM_{RG,h} * (1 - \eta_{flare,h}) * \frac{GWP_{CH_4}}{1000}$$

Where:

$PE_{flare,y}$	Project emissions from flaring of the residual gas stream in a year $y$ ; tCO <sub>2e</sub>
$TM_{RG,h}$	Mass flow rate of methane in the residual gas in the hour $h$ ; kg/h
$\eta_{flare,h}$	Flare efficiency in hour $h$ ;

The mass flow rate of methane in the residual gas is calculated as follows:

$$TM_{RG,h} = FV_{RG,h} * fv_{CH_4,RG,h} * \rho_{CH_4,n}$$

Where:

$TM_{RG,h}$	Mass flow rate of methane in the residual gas in the hour $h$ ; kg/h
$FV_{RG,h}$	Volumetric flow rate of the residual gas in dry basis at normal conditions
$fv_{CH_4,RG,h}$	Volumetric fraction of methane in the residual gas on dry basis in hour $h$ ;
$\rho_{CH_4,n}$	Density of methane at normal conditions

## (ii) Project emissions for electricity displacement component

Since the project activity is a renewable biogas power project, the project emissions for electricity displacement component are zero as per AMS-I.F. Version 01/6/.

### - Leakage (L<sub>y</sub>)

#### (i) Leakage for methane avoidance component

As per methodology AMS-III.H/5/, the leakage effect is not relevant to the proposed project activity as no transfer of used technology occurs due to the project activity.

#### (ii) Leakage for electricity displacement component

As per methodologies AMS-I.F/6/ and AMS-I.D, the leakage effects are not relevant to the proposed project as no transfer of the used energy generating equipments occurs due to the project activity.

- Emission Reductions (ER<sub>y</sub>)

(i) Emission reductions for methane avoidance component

Since the project activity belongs to case 1(d) under AMS-III.H version 15 para. 1, the ex post emission reductions are calculated as follows:

$$ER_{y,ex:post} = \min((BE_{methane,y,ex:post} - PE_{methane,y,ex:post} - LE_{methane,y,ex:post}),$$

$$(MD_{methane,y} - PE_{power,y} - PE_{biomass,y} - LE_{methane,y,ex:post}))$$

ER<sub>y,ex post</sub> Emission reductions achieved by methane avoidance

BE<sub>y,ex post</sub> Baseline emissions due to methane avoidance

PE<sub>y,ex post</sub> Project emissions due to methane avoidance

MD<sub>methane,y</sub> Methane captured and destroyed/gainfully due to methane avoidance

$$MD_{methane,y} = BG_{burnt,y} * W_{CH4} * D_{CH4} * FE * GWP_{CH4}$$

Where:

BG<sub>burnt,y</sub> Biogas flared/combusted in year y

W<sub>CH4,y</sub> Methane content<sup>12</sup> in the biogas in the year y (volume fraction)

D<sub>CH4</sub> Density of methane at the temperature and pressure of the biogas in the year y

FE Flare efficiency in year y (fraction)

(ii) Emission reductions for electricity displacement component

Since the project emissions and leakage emissions are both zero as per AMS-I.F. Version 01/6/, the emission reductions due to electricity displacement equals to the baseline emissions, which are calculated as follows:

$$ER_y = BE_y = EG_{BL,y} * EF_{grid,CM,y}$$

Moreover, all the ex-ante parameters are summarized in the tables below:

Table 25

Default values used:	Methane producing capacity of the wastewater: B <sub>o,ww</sub> /0.25 kg CH <sub>4</sub> /kg COD
Source and Verification of the source	IPCC default value selected in line with AMS-III.H Version 15/5/. Registered PDD of Version 2.2, 13 July 2011/3/

Table 26

Default values used:	Global Warming Potential for methane: GWP <sub>CH4</sub> /21
Source and Verification of the source	IPCC default value selected in line with AMS-III.H Version 15/5/. Registered PDD of Version 2.2, 13 July 2011/3/

Table 27

Default values used:	Density of methane at normal conditions: ρ <sub>CH4,n</sub> /0.716kg/Nm <sup>3</sup> (or 0.000716 t/ Nm <sup>3</sup> )
Source and Verification of the source	Default value selected in line with AMS-III.H Version 15/5/. Registered PDD of Version 2.2, 13 July 2011/3/

**Table 28**

Default values used:	Methane correction factor for the wastewater treatment system: $MCF/0.8$
Source and Verification of the source	IPCC default value selected in line with AMS-III.H Version 15/5/ Registered PDD of Version 2.2, 13 July 2011/3/

**Table 29**

Default values used:	Model correction factor to account for model uncertainties: $UF_{BL}/0.89$
Source and Verification of the source	Default value selected in line with AMS-III.H Version 15/5/ Registered PDD of Version 2.2, 13 July 2011/3/

**Table 30**

Default values used:	Model correction factor to account for model uncertainties: $UF_{PJ}/1.12$
Source and Verification of the source	Default value selected in line with AMS-III.H Version 15/5/ Registered PDD of Version 2.2, 13 July 2011/3/

**Table 31**

Default values used:	Capture efficiency of the biogas recovery equipment in the wastewater treatment systems: $CFE_{ww}/0.9$
Source and Verification of the source	Default value selected in line with AMS-III.H Version 15/5/ Registered PDD of Version 2.2, 13 July 2011/3/

**Table 32**

Default values used:	Combined margin CO <sub>2</sub> emission factor of East China Power Grid in year y: $EF_{grid,CM,y}/0.7690tCO_2/MWh$
Source and Verification of the source	Registered PDD of Version 2.2, 13 July 2011/3/ Notification on Determining Baseline Emission Factor of Chinese Grids of 20 December 2010/18/

In summary, the Verification Team confirms that all the ex-ante and ex-post parameters are monitored in accordance to the approved monitoring plan and applied methodology. The verification took cognizance para.236 of VVS Version 03.0.

### 3.4.2 Monitoring responsibility

During the on-site visit, the verification team interviewed with the management representative and on-site operators/i/, and confirmed that the structure of monitoring management team and the responsibilities of team have been defined and followed well in accordance with the registered PDD/3/. Moreover, the Wastewater Measurement Management Regulation and CDM Monitoring Manual/38//39/ were found being documented in place for the monitoring of the project.

The monitoring personnel are well trained/40/ and have got relevant national operation qualifications/41/, which demonstrates that they have sufficient competence to carry out the relevant monitoring tasks.

### **3.4.3 Accuracy of equipment and calibration frequency**

The monitoring equipments have been installed in the project activity according to registered monitoring plan. The table below summarizes relevant specifications of monitoring equipments:

Table 33

<b>Monitoring Equipment:</b>	Flow meter	Flow meter	Flow meter	Gas analyser	Gas analyser	Gas analyser	Flow meter	Flow meter	Temperature gauge*	Temperature gauge*	Electricity meter
<b>Function</b>	Electromagnetic flow meter	Electromagnetic flow meter	Gas turbine flow meter	CH <sub>4</sub> Detector	CH <sub>4</sub> Detector	CH <sub>4</sub> Detector	Gas displacement flow meter	Gas turbine flow meter	Temperature meter	Temperature meter	Bidirectional electricity meter
<b>Ownership:</b>	Project owner	Project owner	Project owner	Project owner	Project owner	Project owner	Project owner	Project owner	Project owner	Project owner	Project owner
<b>Location:</b>	Project site	Project site	Project site	Project site	Project site	Project site	Project site	Project site	Project site	Project site	Project site
<b>Monitored parameter:</b>	$Q_{ww,1,y}$	$Q_{ww,2,y}$	$BG_{burnt,y}$	$W_{CH_4, fuelled,y}$	$fV_{CH_4, RG, h, 1}$	$fV_{CH_4, RG, h, 2}$	$FV_{RG, h, 1}$	$FV_{RG, h, 2}$	$\eta_{flare, 1}$	$\eta_{flare, 2}$	$EG_{BL,y}$
<b>Type:</b>	50W2H-HD0A1AA0AAAA	AE340MG-ZR1-1SJ	TBQZ-250A12	LB-DQZ	LB-DQZ	LB-DQZ	B3-11M175	TBQZ-200A12	Not available	Not available	DSSD19
<b>Serial number:</b>	85000718000	AD0701015	11095105	741544	776518	741543	B3-11M175	11095090	Not available	Not available	KKK2090204
<b>Accuracy:</b>	1.0%	1.0%	1.5%	5.0%	5.0%	5.0%	1.5%	1.5%	3.0%	3.0%	0.5S
<b>Last calibration date</b>	06/2007	06/2007	09/2009	10/2009	10/2009	10/2009	09/2009	06/2009	Not available	Not available	11/02/2009
<b>Validity of last calibration</b>	05/2009	05/2009	08/2011	09/2010	09/2010	09/2010	08/2012	05/2011	Not available	Not available	1
<b>Current calibration date:</b>	14/08/2012	14/08/2012	15/05/2012	17/08/2012	24/10/2012	17/08/2012	16/02/2012	16/02/2012	Not available	Not available	14/12/2012
<b>Expiration date of calibration:</b>	13/08/2014	13/08/2014	14/05/2014	16/08/2013	23/10/2013	16/08/2013	15/02/2015	15/02/2014	Not available	Not available	13/12/2017
<b>Calibration certificate no. and name of the</b>	RL-2012080119 Jiaxing Metrological Verification	RL-2012080118 Jiaxing Metrological Verification	2712050356001 Hangzhou Institute of Calibration	NH-201216753 Guangzhou Institute of Measuring	NH-201222085 Guangzhou Institute of Measuring	NH-201216754 Guangzhou Institute of Measuring	RL-2012020025 Jiaxing Metrological Verification	RL-2012020027 Jiaxing Metrologic	Not available	Not available	RD-2012120331 Jiaxing Metrological Verification

certifier	and Testing Institute	and Testing Institute	and Testing for Quality and Technical Supervision	and Testing Technology	and Testing Technology	and Testing Technology	and Testing Institute	al Verification and Testing Institute			and Testing Institute
<b>Authority of the certifier and validity of certifier</b>	Zhejiang Bureau of Quality and Technical Supervision Valid from 30/07/2012 to 29/07/2015	Zhejiang Bureau of Quality and Technical Supervision Valid from 30/07/2012 to 29/07/2015	Zhejiang Bureau of Quality and Technical Supervision, Valid from 24/12/2009 to 23/12/2012	Guangzhou Bureau of Quality and Technical Supervision, valid from 05/11/2011 to 05/08/2013	Guangzhou Bureau of Quality and Technical Supervision, valid from 05/11/2011 to 05/08/2013	Guangzhou Bureau of Quality and Technical Supervision, valid from 05/11/2011 to 05/08/2013	Zhejiang Bureau of Quality and Technical Supervision Valid from 30/07/2012 to 29/07/2015	Zhejiang Bureau of Quality and Technical Supervision Valid from 30/07/2012 to 29/07/2015	Not available	Not available	Zhejiang Bureau of Quality and Technical Supervision Valid from 30/07/2012 to 29/07/2015
<b>Frequency of calibration:</b>	Two Years	Two Years	Two Years	Annually	Annually	Annually	Three years	Two Years	Not available	Not available	Five Years
<b>Relevant sectoral standard:</b>	JJG1033-2007	JJG1033-2007	JJG1037-2008	JJG693-2011	JJG693-2011	JJG693-2011	JJG633-2005	JJG1037-2008	Not available	Not available	JJG596-1999

\*Note: As discussed in Section 3.4.1 of this report, both of the temperature gauges for measuring the flaring efficiency are not calibrated during this monitoring period. However, the flare efficiency (i.e.,  $\eta_{\text{flare},1}$  and  $\eta_{\text{flare},2}$ ) is conservatively selected as 0% in the emission reduction spreadsheets, which means that all the methane entering the flaring system are taking as project emissions for conservative. The verification team confirms this is conservative since the emission reductions from flaring methane are considered as zero and this has resulted in lower emission reduction in line with para. 238 of VVS Version 03.0.

As indicated in the table above, this monitoring period starts from 28 July 2011 while the current calibration of the biogas flow meters was conducted on 16 February 2012. The calibration of all the monitoring equipments were delayed. The verification team has reviewed the delayed calibration records of all monitoring equipments and it was confirmed that the errors identified in the delayed calibration test are all smaller than the maximum permissible error of the monitoring equipment as indicated in the table below.

Table 34

Monitoring Equipment	Monitored parameter	Accuracy (%)	Error in delayed calibration report	Maximum permissible error	Applied error for conservative approach
Flow meter	$Q_{ww,1y}$	1.0	-0.97%	1%	1%
Flow meter	$Q_{ww,2y}$	1.0	+0.65%	1%	1%
Flow meter	$BG_{burnt,y}$	1.5	0.78%	1.5%	1.5%
Gas analyzer	$W_{CH_4, fuelled,y}$	5.0	2.0%	5.0%	5.0%
Gas analyzer	$fV_{CH_4, RG, h, 1}$	5.0	-2.4%	5.0%	5.0%
Gas analyzer	$fV_{CH_4, RG, h, 2}$	5.0	2.6%	5.0%	5.0%
Flow meter	$FV_{RG, h, 1}$	1.5	0.46%	1.5%	1.5%
Flow meter	$FV_{RG, h, 2}$	1.5	0.4%	1.5%	1.5%
Electricity meter	$EG_y$	0.5S	0.5%	0.5%	0.5%

As reflected in the emission reduction spread sheets/17/ and monitoring report/1/, a most conservative approach has been applied in line with the para. 238 of VVS Version 03.0 as follows:

- 1) For baseline emissions, a lower adjusting factor (i.e., 1-Maximum permissible error) is applied and this will result in lower baseline emissions in conservative manner;
- 2) For project emissions, a higher adjusting factor (i.e., 1+Maximum permissible error) is applied and this will result in higher project emissions in conservative manner;

For the flaring system, it is verified that the temperature gauges are not calibrated. However, the flare efficiency (i.e.,  $\eta_{flare,1}$  and  $\eta_{flare,2}$ ) is conservatively selected as 0% in the emission reduction spreadsheets, which means that all the methane entering the flaring system are taking as project emissions for conservative. The verification team confirms this is conservative since the emission reductions from flaring methane are considered as zero and this has resulted in lower emission reduction in line with para. 238 of VVS Version 03.0.

In line with the para. 239 of the VVS Version 03.0, the verification team confirms the applied conservative approach in the emission reductions spreadsheets has been applied through this entire monitoring period (i.e. without considering the scheduled/actual date of calibration) and resulted in fewer claimed emission reductions. The details are discussed in the Section 3.5 of this report.

In summary, the Verification Team is able to verify that the accuracy the monitoring equipments were set according to the registered monitoring plan and relevant sectoral standard of China. Furthermore, all calibration procedures were carried out according to the monitoring plan. Therefore, accuracy of monitoring equipments is assured. The verification took cognizance para.243 of VVS Version 03.0.

### 3.4.4 Deviation from and/or Revision of the registered monitoring plan

Not applicable since there is no deviation or revision to the registered monitoring plan in this monitoring period.

## 3.5 Assessment of data and calculation of greenhouse gas emission reductions

As stated in the Section 3.3.1, the Verification Team confirms the emission reductions formula applied in the Monitoring Report is correctly referred from monitoring methodology AMS-III.H, Version 15/5/ and AMS-I.F, Version 01/6/.

A complete set data for this monitoring period is available to the Verification Team. The Verification Team has verified the data in the ER spreadsheet/17/ against the raw data records /19//20//44/. The verification team is able to confirm the consistency between the documents. Risk assessment is undertaken by the Verification Team and no material errors, omissions or misstatements were detected. The Verification Team confirms that all reported data are authentic and traceable.

### (i) Emission reductions for methane avoidance component

As stated in Section 3.4.1 of this report, the emission reductions due to methane avoidance are decided with following formula:

$$ER_{methane,y,expost} = \min((BE_{methane,y,expost} - PE_{methane,y,expost} - LE_{methane,y,expost}), (MD_{methane,y} - PE_{power,y} - PE_{biomass,y} - LE_{methane,y,expost}))$$

The calculation and comparison results process has been transparently presented in the emission reduction calculation spreadsheets and the verification team confirms the calculation process are correct and traceable. The monitored emission reductions are separately presented in calendar year 2011 (i.e. from 28/07/2011 to 31/12/2011) and year 2012 (i.e. from 01/01/2012 to 31/08/2012).

a)  $BE_{methane,y,expost} - PE_{methane,y,expost} - LE_{methane,y,expost}$

**Table 35**

**Value of 2011 (from 28/07/2011 to 31/12/2011)**

Parameter	Value	Unit
$BE_{methane,2011,expost}$	12,544	tCO <sub>2</sub> e
$PE_{methane,2011,expost}$	1,655	tCO <sub>2</sub> e
$LE_{methane,2011,expost}$	0	tCO <sub>2</sub> e
$BE_{methane,2011,expost} - PE_{methane,2011,expost} - LE_{methane,2011,expost}$	10,889	tCO <sub>2</sub> e

**Table 36**

**Value of 2012 (from 01/01/2012 to 31/08/2012)**

Parameter	Value	Unit
$BE_{methane,2012,expost}$	24,290	tCO <sub>2</sub> e

$PE_{methane,2012,expost}$	3,386	tCO <sub>2</sub> e
$LE_{methane,2012,expost}$	0	tCO <sub>2</sub> e
$BE_{methane,2012,expost} - PE_{methane,2012,expost} - LE_{methane,2012,expost}$	20,904	tCO <sub>2</sub> e

$$b) MD_{methane,y} - PE_{power,y} - PE_{biomass,y} - LE_{methane,y,expost}$$

Table 37

Value of 2011 (from 28/07/2011 to 31/12/2011)

Parameter	Value	Unit
$MD_{methane,2011}$	17,291	tCO <sub>2</sub> e
$PE_{power,2011}$	0	tCO <sub>2</sub> e
$PE_{biomass,2011}$	0	tCO <sub>2</sub> e
$LE_{methane,2011,expost}$	0	tCO <sub>2</sub> e
$MD_{methane,2011} - PE_{power,2011} - PE_{biomass,2011} - LE_{methane,2011,expost}$	17,291	tCO <sub>2</sub> e

Table 38

Value of 2012 (from 01/01/2012 to 31/08/2012)

Parameter	Value	Unit
$MD_{methane,2012}$	26,861	tCO <sub>2</sub> e
$PE_{power,2012}$	0	tCO <sub>2</sub> e
$PE_{biomass,2012}$	0	tCO <sub>2</sub> e
$LE_{methane,2012,expost}$	0	tCO <sub>2</sub> e
$MD_{methane,2012} - PE_{power,2012} - PE_{biomass,2012} - LE_{methane,2012,expost}$	26,861	tCO <sub>2</sub> e

## c) Comparison results

Table 39

Year	$BE_{methane,y,expost} - PE_{methane,y,expost} - LE_{methane,y,expost}$ (tCO <sub>2</sub> e)	$MD_{methane,y} - PE_{power,y} - PE_{biomass,y} - LE_{methane,y,expost}$ (tCO <sub>2</sub> e)	$ER_{methane,expost}$ (tCO <sub>2</sub> e)
2011	10,889	17,291	10,889
2012	20,904	26,861	20,904

## (ii) Emission reductions for electricity displacement component

As stated in Section 3.4.1 of this report, the emission reductions due to electricity displacement equals to the baseline emissions, which are calculated as follows:

$$ER_y = BE_y = EG_{BL,y} * EF_{grid,CM,y}$$

The monitored results are separately presented in calendar year 2011 and 2012 and the results are summarized in the tables below.

Table 40

Value of 2011 (from 28/07/2011 to 31/12/2011)

Parameter	Value	Unit
$BE_{2011}$	2,221	tCO <sub>2</sub> e
$PE_{2011}$	0	tCO <sub>2</sub> e
$Leakage_{2011}$	0	tCO <sub>2</sub> e
$ER_{2011}$	2,221	tCO <sub>2</sub> e

Table 41

Value of 2012 (from 01/01/2012 to 31/08/2012)

Parameter	Value	Unit
$BE_{2012}$	3,232	tCO <sub>2e</sub>
$PE_{2012}$	0	tCO <sub>2e</sub>
$Leakage_{2012}$	0	tCO <sub>2e</sub>
$ER_{2012}$	3,232	tCO <sub>2e</sub>

## (iii) Total Emission reductions

Table 42

Parameter	Methane recovery component	Electricity component	Total emission reductions
Emission reduction in 2011 (tCO <sub>2e</sub> )	10,889	2,221	13,110
Emission reduction in 2012 (tCO <sub>2e</sub> )	20,904	3,232	24,136
<b>Total of the monitoring period (tCO<sub>2e</sub>)</b>	31,793	5,453	37,246

In conclusion, to the Verification Team's opinion, the monitored data for this monitoring period is complete, the formulas and default values are applied correct and all results are verifiable and transparent. The verification took cognizance para.246 of VVS Version 03.0.

### 3.5.1 Assessment opinion against Guideline on the Application of Materiality in Verifications

Against the Guideline on the Application of Materiality in Verifications, Version 01.0, the verification team further assessed the materiality in verification on the project activity and interpreted as follows:

Table 43

Reference	Requirement	Verification team assessment
<b>Para. 10</b>	<p>The CMP materiality decision prescribes the thresholds for the application of materiality in verifications, by defining that information is material if it might lead, at an aggregated level, to an overestimation of the total emission reductions or removals achieved by a CDM project activity equal to or higher than:</p> <p>(a) 0.5 per cent of the emission reductions or removals for project activities achieving a total emission reduction or removal of equal to or more than 500,000 tons of carbon dioxide equivalent per year;</p> <p>(b) 1 per cent of the emission reductions or removals for project activities achieving a total emission reduction or removal between 300,000 and 500,000 tons of carbon dioxide equivalent per year;</p> <p>(c) 2 per cent of the emission reductions or</p>	<p>As per registered PDD<b>Error! Reference source not found.</b>, the estimated CERs of the project is 60,577 annually and is small-scale hydropower project, thus meets the item (c) of the paragraph 10 in the Materiality guideline/16/. Therefore, the threshold for the application of materiality in this verification is 5 per cent of emission reductions of the project as per guideline/16/.</p>

	<p>removals for large-scale project activities achieving a total emission reduction or removal of 300,000 tons of carbon dioxide equivalent per year or less;</p> <p>(d) 5 per cent of the emission reductions or removals for small-scale project activities other than project activities covered under subparagraph (e) below;</p> <p>(e) 10 per cent of the emission reductions or removals for the type of project activities referred to in decision 3/CMP.6, paragraph 38 (referred to as microscale project activities).</p>	
<p><b>Para. 24</b></p>	<p>The DOE should describe in its certification/certification report the risks, the risk assessment undertaken and how the verification and sampling plans were designed to respond to these risks and ensure that all material errors, omissions or misstatements were detected.</p>	<p>The risk assessment has been undertaken by the verification team by means of onsite physical inspection, stakeholders' interview and document review to all the raw data/17//19//20/ and cross-check data. For details please refer to section 3.4 of this report. Material information including data process, system and related controls has been verified. The COD content before and after the anaerobic digesters is daily monitored through sampled lab test according to the national standard GB11914/24/. Therefore, the data of COD removed will be the difference of these two values. Since there are two anaerobic digesters involved in the project activity, the test has been done separately for the COD content after each reactor. As discussed in Section 3.4.1 of this report, the verification team is able to confirm that all parameters are properly monitored by the relevant equipments (i.e., flow meters, gas analyzers and electricity meters), the accuracy and the calibration of the meters is assured, all the data reported in the ER spread sheet/17/ has been completely verified against the raw data/19//20/, the data management system and QA/QC process is carried out appropriately. Thus no material errors, omissions or misstatements were detected by the verification team during the risk assessment.</p>
<p><b>Para. 25</b></p>	<p>The DOE should also describe whether and how the verification and sampling plans were revised to take into account the need for further audit procedures due to the nature/type of errors, omissions or misstatements detected.</p>	<p>The sampling plan is conducted according to the national standard GB11914/24/ and there is no need to revise the sampling plan.</p>
<p><b>Para. 26</b></p>	<p>The DOE should also document how materiality was applied in determining whether a detected error, omission or</p>	<p>N/A, as verified before, no material errors, omissions or misstatements were detected by the verification team during the risk</p>

	misstatement was material or immaterial either individually or in aggregate.	assessment.
<b>Para. 27</b>	The DOE should state in its certification/certification opinion that the claimed emission reductions or removals are free from material errors, omissions or misstatements, with a reasonable level of assurance.	Refer to Certification Statement of this report.

### 3.5.2 Assessment of actual emission reductions with the estimate emission reductions in PDD

The emission reduction comparison between estimation of the registered PDD and the actual one of this monitoring period is summarized in the table below:

**Table 44**

<b>Estimated Emission Reduction as per Registered/Approved PDD:</b>	<i>66,551 tCO<sub>2</sub>e for 401 days including both days and it is based on 60,577 tCO<sub>2</sub>e of annual emission reductions as indicated in the registered PDD (Version 2.2, 13 July 2011)</i>
<b>Actual Emission Reduction for the Monitoring Period</b>	<i>37,246tCO<sub>2</sub>e of this monitoring period from 28 July 2011 to 31 August 2012, totally 401 days, including both days</i>
<b>Is any increase of CER's occurred?</b>	No

In summary, the Verification Team confirms that actual emission reduction is lower than the estimate of the registered PDD for the current monitoring period. The verification took cognizance of VVS Version 03.0.

### 3.6 Issues remaining from the previous verification period

This is first time of verification of the proposed project. The Verification Team confirms there is no FAR remained in the Validation Report.

## **Appendix A**

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### **CDM Verification Protocol**

**Biogas Utilization Project In Zhejiang Jingxing Paper Joint Stock Co. Ltd.**

**in**

**P.R.China**

**to**

**Report No. 01 997 9105061560**

Table 1: Checklist question	Ref.	MoV <sup>1</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
<b>1. Implementation</b>					
1.1 Have all physical features proposed in the registered PDD been implemented at the project site? para. 227 of VVS Version 03.0	/1/ /2/ /3/	DR I	Yes.		OK
1.2 Has the project activity been operated in accordance with the project scenario described in the registered PDD and relevant guidance? Reference: < <a href="http://cdm.unfccc.int/EB/033/eb33rep.pdf">http://cdm.unfccc.int/EB/033/eb33rep.pdf</a> >, §75 para. 230 of VVS Version 03.0	/1/ /2/ /3/	DR I	CAR4 For monitoring equipment listed in the parameters table in MR Section D.2, the information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity are not provided in line with Guideline for Completing the Monitoring Report Form Version 02.0. CL2 The evidence on project implementation milestone (i.e. construction starting, commissioning starting and continued operation period) is not received.	CAR4 <del>CL2</del>	OK (Refer to Table 2)
1.3 If the project activity is implemented on a number of different locations, has the Monitoring report provided the verifiable starting dates for each site? para. 228 (a) of VVS Version 03.0	/1/ /2/ /3/	DR I	Not applicable since the project only involves one site and this is confirmed during onsite visit.		OK

<sup>1</sup> MoV = Means of Verification, DR = Document Review, I = Interview, www = internet search.

Table 1: Checklist question	Ref.	MoV <sup>1</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
1.4 Is the start date of monitoring period consistent?	/1/ /2/ /3/	DR I www	Yes.		OK
1.5 Is the monitoring report consistently filled with respect to all sections as required by its guideline of filling the monitoring report?	/1/ /2/ /3/ /15/	DR I	<p>CAR1 In accordance with the Guideline for Completing the Monitoring Report Form Version 02.0, the relevant dates of construction starting, commissioning and continued operation periods are not listed in Section A.1 of the MR.</p> <p>CAR2 The MR Section B.1 are not completed in line with Guideline for Completing the Monitoring Report Form Version 02.0. The description of the installed technology, technical process and equipment are not provided in this section.</p> <p>CAR3 The description of the monitoring system in MR Section C is not fully consistent with the Section B.7.2 of the registered PDD.</p> <p>CAR4 For monitoring equipment listed in the parameters table in MR Section D.2, the information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity are not provided in line with Guideline for Completing the Monitoring Report Form Version 02.0.</p> <p>CAR5 The implementation of sampling plan for the</p>	<p><del>CAR1</del> <del>CAR2</del> <del>CAR3</del> <del>CAR4</del> <del>CAR5</del> <del>CAR6</del></p>	OK (Refer to Table 2)

Table 1: Checklist question	Ref.	MoV <sup>1</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
			COD measurement is not described in MR Section D.3 in line with the registered PDD and AMS-III.H. Version 15. CAR6 For the calculation of emission reductions in MR Section E, the sample calculation of all formulas are not conducted by using the actual monitoring values during this monitoring period. The relevant spread sheets are not attached to present the calculation process in the MR in line with the Guideline for Completing the Monitoring Report Form Version 02.0.		
1.6 Does the CER's obtained for the monitoring period within the limit of estimate in the registered PDD? Is the claimed CER's justifiable?	/1/ /2/ /3/	DR I	CL3 The relevant formulas in calculating the emission reductions are not clearly provided in the ER spread sheets in line with the registered PDD.	CL3	OK (Refer to Table 2)
1.7 Is the monitoring system provided in line diagrams showing all relevant monitoring points?	/1/ /2/ /3/	DR I	CAR3 The description of the monitoring system in MR Section C is not fully consistent with the Section B.7.2 of the registered PDD.	CAR3	OK (Refer to Table 2)
<b>2. Monitoring plan and methodology</b>					
2.1 Is the monitoring plan established in accordance with the monitoring methodology? para. 229 of VVS Version 03.0	/1/ /2/ /3/	DR I	Yes.		OK
2.2 In case the implemented monitoring plan defers from the monitoring methodology, has any requests	/1/	DR	Not applicable.		OK

Table 1: Checklist question	Ref.	MoV <sup>1</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
for revision to or deviation from the monitoring methodology been officially communicated to the CDM EB? Reference: < <a href="http://cdm.unfccc.int/EB/033/eb33rep.pdf">http://cdm.unfccc.int/EB/033/eb33rep.pdf</a> >, para. 226 of VVS Version 03.0	/2/ /3/	I			
2.2.1 Have the above changes to the monitoring plan been approved by the CDM EB?	/1/ /2/ /3/	DR I	Not applicable.		OK
<b>3. Monitoring and the monitoring plan</b>					
3.1 Is monitoring established in full compliance with the monitoring plan, contained in the registered PDD (or new monitoring plan approved by the CDM EB)? para. 235 of VVS Version 03.0	/1/ /2/ /3/ /15/	DR I	CAR3 The description of the monitoring system in MR Section C is not fully consistent with the Section B.7.2 of the registered PDD.	CAR3	OK (Refer to Table 2)
3.2 Are all baseline emission parameters monitored and updated in accordance with monitoring plan, monitoring methodology and relevant CDM EB decisions?	/1/ /2/ /3/ /15/	DR I	CAR4 For monitoring equipment listed in the parameters table in MR Section D.2, the information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity are not provided in line with Guideline for Completing the Monitoring Report Form Version 02.0.	CAR4	OK (Refer to Table 2)

Table 1: Checklist question	Ref.	MoV <sup>1</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
3.2.1 Was the monitoring equipment for baseline emission parameters controlled and monitoring results recorded as per approved frequency?	/1/ /2/ /3/ /15/	DR I	<p>CAR4</p> <p>For monitoring equipment listed in the parameters table in MR Section D.2, the information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity are not provided in line with Guideline for Completing the Monitoring Report Form Version 02.0.</p>	<p><del>CAR4</del></p>	<p>OK</p> <p>(Refer to Table 2)</p>
3.2.2 Was the monitoring equipment for baseline emission parameters calibrated in accordance with QA&QC procedures described in the registered monitoring plan?	/1/ /2/ /3/ /15/	DR I	<p>CL1</p> <p>It is to be clarified how the calibration frequency of the flow meters, methane analysers, electricity meters have been ensured to be consistent with the registered PDD in this monitoring period.</p>	<p><del>CL1</del></p>	<p>OK</p> <p>(Refer to Table 2)</p>
3.3 Are all project emission parameters monitored and updated in accordance with monitoring plan, monitoring methodology and relevant CDM EB decisions?	/1/ /2/ /3/ /15/	DR I	<p>CAR4</p> <p>For monitoring equipment listed in the parameters table in MR Section D.2, the information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity are not provided in line with Guideline for Completing the Monitoring Report Form Version 02.0.</p> <p>CL4</p> <p>The evidence on final sludge disposal is not received.</p>	<p><del>CAR4</del></p> <p><del>CL4</del></p>	<p>OK</p> <p>(Refer to Table 2)</p>

Table 1: Checklist question	Ref.	MoV <sup>1</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
3.3.1 Was the monitoring equipment for project emission parameters controlled and monitoring results recorded as per approved frequency?	/1/ /2/ /3/ /15/	DR I	<p>CAR4</p> <p>For monitoring equipment listed in the parameters table in MR Section D.2, the information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity are not provided in line with Guideline for Completing the Monitoring Report Form Version 02.0.</p> <p>CL4</p> <p>The evidence on final sludge disposal is not received.</p>	<p><del>CAR4</del></p> <p><del>CL4</del></p>	<p>OK</p> <p>(Refer to Table 2)</p>
3.3.2 Was the monitoring equipment for project emission parameters calibrated in accordance with QA&QC procedures described in the registered monitoring plan?	/1/ /2/ /3/ /15/	DR I	<p>CL1</p> <p>It is to be clarified how the calibration frequency of the flow meters, methane analysers, electricity meters have been ensured to be consistent with the registered PDD in this monitoring period.</p>	<p><del>CL1</del></p>	<p>OK</p> <p>(Refer to Table 2)</p>
3.4 Are all leakage emission parameters monitored and updated in accordance with monitoring plan, monitoring methodology and relevant CDM EB decisions?	/1/ /2/ /3/ /15/	DR I	<p>No leakage should be considered for the project activity.</p>		<p>OK</p>
3.4.1 Was the monitoring equipment for leakage emission parameters controlled and monitoring results recorded as per approved frequency?	/1/ /2/ /3/ /15/	DR I	<p>No leakage should be considered for the project activity.</p>		<p>OK</p>

Table 1: Checklist question	Ref.	MoV <sup>1</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
3.4.2 Was the monitoring equipment for leakage emission parameters calibrated in accordance with QA&QC procedures described in the registered monitoring plan?	/1/ /2/ /3/ /15/	DR I	No leakage should be considered for the project activity.		OK
3.5 Were all monitoring parameters available and verifiable through the whole monitoring period?	/1/ /2/ /3/ /15/	DR I	CAR4 For monitoring equipment listed in the parameters table in MR Section D.2, the information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity are not provided in line with Guideline for Completing the Monitoring Report Form Version 02.0.	CAR4	OK (Refer to Table 2)
3.5.1 In case, only partial monitoring data is available and PP(s) provide estimations or assumptions for the rest of data, was it possible to verify those estimations and assumptions?	/1/ /2/ /3/ /15/	DR I	CAR4 For monitoring equipment listed in the parameters table in MR Section D.2, the information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity are not provided in line with Guideline for Completing the Monitoring Report Form Version 02.0.	CAR4	OK (Refer to Table 2)
3.6 Was management and operation system established and operated in accordance with the monitoring plan?	/1/ /2/ /3/ /15/	DR I	CAR3 The description of the monitoring system in MR Section C is not fully consistent with the Section B.7.2 of the registered PDD.	CAR3	OK (Refer to Table 2)

Table 1: Checklist question	Ref.	MoV <sup>1</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
3.7 Was is it possible to verify that involved management and operation personal is fully aware of the responsibilities and perform all operations according to the registered monitoring plan and internally developed manuals?	/1/ /2/ /3/ /15/	DR I	CAR3 The description of the monitoring system in MR Section C is not fully consistent with the Section B.7.2 of the registered PDD.	<del>CAR3</del>	OK (Refer to Table 2)
3.8 Does the monitoring system provide organizational structure, role and responsibilities, emergency procedures?	/1/ /2/ /3/ /15/	DR I	CAR3 The description of the monitoring system in MR Section C is not fully consistent with the Section B.7.2 of the registered PDD.	<del>CAR3</del>	OK (Refer to Table 2)
3.9 Does any uncertainties identified and addressed?	/1/ /2/ /3/ /15/	DR I	Not applicable.		OK
<b>4. Parameters</b>					
4.1 <b>Monitored parameter</b> Title: $Q_{ww,I,y}$ Indication: Volume of wastewater treated in plant 1 in the year “y” Units: m <sup>3</sup> Estimated value ( <i>ex-ante</i> ): 970,360 Measured value ( <i>ex-post</i> ): 1,507,791	/1/ /2/ /3/ /15/ /17/	DR I	CAR4 For monitoring equipment listed in the parameters table in MR Section D.2, the information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity are not provided in line with Guideline for Completing the Monitoring Report Form Version 02.0.	<del>CAR4</del>	OK (Refer to Table 2)

Table 1: Checklist question	Ref.	MoV <sup>1</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
<p>4.2 <b>Monitored parameter</b>            Title: <math>Q_{ww,2,y}</math>            Indication: Volume of wastewater treated in plant 2 in the year “y”            Units: m<sup>3</sup>            Estimated value (<i>ex-ante</i>): 4,043,280            Measured value (<i>ex-post</i>): 5,353,355</p>	<p>/1/ /2/ /3/ /15/ /17/</p>	<p>DR I</p>	<p>CAR4 For monitoring equipment listed in the parameters table in MR Section D.2, the information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity are not provided in line with Guideline for Completing the Monitoring Report Form Version 02.0.</p>	<p>CAR4</p>	<p>OK (Refer to Table 2)</p>
<p>4.3 <b>Monitored parameter</b>            Title: <math>Q_{ww,i,y}</math>            Indication: Volume of wastewater treated in the year “y”            Units: m<sup>3</sup>            Estimated value (<i>ex-ante</i>): 5,013,640            Measured value (<i>ex-post</i>): 6,861,146</p>	<p>/1/ /2/ /3/ /15/ /17/</p>	<p>DR I</p>	<p>CAR4 For monitoring equipment listed in the parameters table in MR Section D.2, the information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity are not provided in line with Guideline for Completing the Monitoring Report Form Version 02.0.</p>	<p>CAR4</p>	<p>OK (Refer to Table 2)</p>
<p>4.4 <b>Monitored parameter</b>            Title: <math>COD_{ww,untreated,1,y}</math>            Indication: Chemical oxygen demand of wastewater before the anaerobic treatment reactor/system with methane capture in plant 1 in the year “y”            Units: mg/l            Estimated value (<i>ex-ante</i>): 4,055            Measured value (<i>ex-post</i>): 2,876</p>	<p>/1/ /2/ /3/ /15/ /17/</p>	<p>DR I</p>	<p>CAR4 For monitoring equipment listed in the parameters table in MR Section D.2, the information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity are not provided in line with Guideline for Completing the Monitoring Report Form Version 02.0.</p>	<p>CAR4</p>	<p>OK (Refer to Table 2)</p>

Table 1: Checklist question	Ref.	MoV <sup>1</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
<p>4.5 <b>Monitored parameter</b>            Title: <math>COD_{ww,treated,1,y}</math>            Indication: Chemical oxygen demand of wastewater after the anaerobic treatment reactor/system with methane capture in plant 1 in the year “y”            Units: mg/l            Estimated value (<i>ex-ante</i>): 900            Measured value (<i>ex-post</i>): 1,330</p>	<p>/1/ /2/ /3/ /15/ /17/</p>	<p>DR I</p>	<p>CAR4            For monitoring equipment listed in the parameters table in MR Section D.2, the information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity are not provided in line with Guideline for Completing the Monitoring Report Form Version 02.0.</p>	<p>CAR4</p>	<p>OK            (Refer to Table 2)</p>
<p>4.6 <b>Monitored parameter</b>            Title: <math>COD_{ww,untreated,2,y}</math>            Indication: Chemical oxygen demand of wastewater before the anaerobic treatment reactor/system with methane capture in plant 2 in the year “y”            Units: mg/l            Estimated value (<i>ex-ante</i>): 4,036            Measured value (<i>ex-post</i>): 2,732</p>	<p>/1/ /2/ /3/ /15/ /17/</p>	<p>DR I</p>	<p>CAR4            For monitoring equipment listed in the parameters table in MR Section D.2, the information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity are not provided in line with Guideline for Completing the Monitoring Report Form Version 02.0.</p>	<p>CAR4</p>	<p>OK            (Refer to Table 2)</p>
<p>4.7 <b>Monitored parameter</b>            Title: <math>COD_{ww,treated,2,y}</math>            Indication: Chemical oxygen demand of wastewater after the anaerobic treatment reactor/system with methane capture in plant 2 in the year “y”            Units: mg/l            Estimated value (<i>ex-ante</i>): 920            Measured value (<i>ex-post</i>): 1,345</p>	<p>/1/ /2/ /3/ /15/ /17/</p>	<p>DR I</p>	<p>CAR4            For monitoring equipment listed in the parameters table in MR Section D.2, the information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity are not provided in line with Guideline for Completing the Monitoring Report Form Version 02.0.</p>	<p>CAR4</p>	<p>OK            (Refer to Table 2)</p>

Table 1: Checklist question	Ref.	MoV <sup>1</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
<p>4.8 <b>Monitored parameter</b></p> <p>Title: <math>BG_{burnt,y}</math></p> <p>Indication: Amount of biogas combusted (fuelled and flared) in the year “y”</p> <p>Units: Nm<sup>3</sup></p> <p>Estimated value (<i>ex-ante</i>): 5,100,000</p> <p>Measured value (<i>ex-post</i>): 3,309,426</p>	<p>/1/</p> <p>/2/</p> <p>/3/</p> <p>/15/</p> <p>/17/</p>	<p>DR</p> <p>I</p>	<p>CAR4</p> <p>For monitoring equipment listed in the parameters table in MR Section D.2, the information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity are not provided in line with Guideline for Completing the Monitoring Report Form Version 02.0.</p>	<p>CAR4</p>	<p>OK</p> <p>(Refer to Table 2)</p>
<p>4.9 <b>Monitored parameter</b></p> <p>Title: <math>W_{CH_4,fuelled,y}</math></p> <p>Indication: Methane content in the biogas combusted (fuelled) in year “y”</p> <p>Units: % volume</p> <p>Estimated value (<i>ex-ante</i>): 65%~75%</p> <p>Measured value (<i>ex-post</i>): 60%~95%</p>	<p>/1/</p> <p>/2/</p> <p>/3/</p> <p>/15/</p> <p>/17/</p>	<p>DR</p> <p>I</p>	<p>CAR4</p> <p>For monitoring equipment listed in the parameters table in MR Section D.2, the information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity are not provided in line with Guideline for Completing the Monitoring Report Form Version 02.0.</p>	<p>CAR4</p>	<p>OK</p> <p>(Refer to Table 2)</p>
<p>4.10 <b>Monitored parameter</b></p> <p>Title: <math>FV_{RG,h,1}</math></p> <p>Indication: Volumetric flow rate of the residual gas in dry basis at normal conditions in hour <math>h</math> in plant 1</p> <p>Units: Nm<sup>3</sup>/h</p> <p>Estimated value (<i>ex-ante</i>): 0</p> <p>Measured value (<i>ex-post</i>): 0</p>	<p>/1/</p> <p>/2/</p> <p>/3/</p> <p>/15/</p> <p>/17/</p>	<p>DR</p> <p>I</p>	<p>CAR4</p> <p>For monitoring equipment listed in the parameters table in MR Section D.2, the information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity are not provided in line with Guideline for Completing the Monitoring Report Form Version 02.0.</p>	<p>CAR4</p>	<p>OK</p> <p>(Refer to Table 2)</p>

Table 1: Checklist question	Ref.	MoV <sup>1</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
<p>4.11 <b>Monitored parameter</b>            Title: <math>f_{VCH_4, RG, h, 1}</math>            Indication: Volumetric fraction of methane in the residual gas on dry basis in hour <math>h</math> in plant 1            Units: % volume            Estimated value (<i>ex-ante</i>): 65%~75%            Measured value (<i>ex-post</i>): 0</p>	<p>/1/ /2/ /3/ /15/ /17/</p>	<p>DR I</p>	<p>CAR4 For monitoring equipment listed in the parameters table in MR Section D.2, the information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity are not provided in line with Guideline for Completing the Monitoring Report Form Version 02.0.</p>	<p>CAR4</p>	<p>OK (Refer to Table 2)</p>
<p>4.12 <b>Monitored parameter</b>            Title: <math>\eta_{flare, 1}</math>            Indication: flare efficiency in plant 1            Units: %            Estimated value (<i>ex-ante</i>): 50%            Measured value (<i>ex-post</i>): 0</p>	<p>/1/ /2/ /3/ /15/ /17/</p>	<p>DR I</p>	<p>CAR4 For monitoring equipment listed in the parameters table in MR Section D.2, the information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity are not provided in line with Guideline for Completing the Monitoring Report Form Version 02.0.</p>	<p>CAR4</p>	<p>OK (Refer to Table 2)</p>
<p>4.13 <b>Monitored parameter</b>            Title: <math>FV_{RG, h, 2}</math>            Indication: Volumetric flow rate of the residual gas in dry basis at normal conditions in hour <math>h</math> in plant 2            Units: Nm<sup>3</sup>/h            Estimated value (<i>ex-ante</i>): 0            Measured value (<i>ex-post</i>): 30,725</p>	<p>/1/ /2/ /3/ /15/ /17/</p>	<p>DR I</p>	<p>CAR4 For monitoring equipment listed in the parameters table in MR Section D.2, the information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity are not provided in line with Guideline for Completing the Monitoring Report Form Version 02.0.</p>	<p>CAR4</p>	<p>OK (Refer to Table 2)</p>

Table 1: Checklist question	Ref.	MoV <sup>1</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
<p>4.14 <b>Monitored parameter</b></p> <p>Title: <math>f_{VCH_4, RG, h, 2}</math></p> <p>Indication: Volumetric fraction of methane in the residual gas on dry basis in hour <math>h</math> in plant 2</p> <p>Units: % volume</p> <p>Estimated value (<i>ex-ante</i>): 65%~75%</p> <p>Measured value (<i>ex-post</i>): 60%~76%</p>	<p>/1/</p> <p>/2/</p> <p>/3/</p> <p>/15/</p> <p>/17/</p>	<p>DR</p> <p>I</p>	<p>CAR4</p> <p>For monitoring equipment listed in the parameters table in MR Section D.2, the information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity are not provided in line with Guideline for Completing the Monitoring Report Form Version 02.0.</p>	<p>CAR4</p>	<p>OK</p> <p>(Refer to Table 2)</p>
<p>4.15 <b>Monitored parameter</b></p> <p>Title: <math>\eta_{flare, 2}</math></p> <p>Indication: flare efficiency in plant 2</p> <p>Units: %</p> <p>Estimated value (<i>ex-ante</i>): 50%</p> <p>Measured value (<i>ex-post</i>): 0% for conservative</p>	<p>/1/</p> <p>/2/</p> <p>/3/</p> <p>/15/</p> <p>/17/</p>	<p>DR</p> <p>I</p>	<p>CAR4</p> <p>For monitoring equipment listed in the parameters table in MR Section D.2, the information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity are not provided in line with Guideline for Completing the Monitoring Report Form Version 02.0.</p>	<p>CAR4</p>	<p>OK</p> <p>(Refer to Table 2)</p>
<p>4.16 <b>Monitored parameter</b></p> <p>Title: <i>Final disposal of sludge</i></p> <p>Indication: For the proposed project, the final sludge is being transported outside of the project site to a controlled landfill.</p> <p>Units: N/A</p> <p>Estimated value (<i>ex-ante</i>): Controlled landfill</p> <p>Measured value (<i>ex-post</i>): Controlled landfill</p>	<p>/1/</p> <p>/2/</p> <p>/3/</p> <p>/15/</p> <p>/17/</p>	<p>DR</p> <p>I</p>	<p>CL4</p> <p>The evidence on final sludge disposal is not received.</p>	<p><del>CL4</del></p>	<p>OK</p> <p>(Refer to Table 2)</p>

Table 1: Checklist question	Ref.	MoV <sup>1</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
<p>4.17 <b>Monitored parameter</b>  Title: <i>EG<sub>BLy</sub></i>  Indication: Quantity of net electricity displaced as a result of the implementation of the project activity in year y  Units: MWh  Estimated value (<i>ex-ante</i>): 10,914  Measured value (<i>ex-post</i>): 7,092</p>	<p>/1/ /2/ /3/ /15/ /17/</p>	<p>DR I</p>	<p>CAR4  For monitoring equipment listed in the parameters table in MR Section D.2, the information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity are not provided in line with Guideline for Completing the Monitoring Report Form Version 02.0.</p>	<p>CAR4</p>	<p>OK  (Refer to Table 2)</p>
<p>4.18 <b>Default parameter</b>  Title: <i>B<sub>o,ww</sub></i>  Indication: Methane producing capacity of the wastewater  Units: kg CH<sub>4</sub>/kg COD  Default/Used value: 0.25</p>	<p>/1/ /2/ /3/ /15/ /17/</p>	<p>DR I</p>	<p>This is IPCC default value selected in line with AMS-III.H Version 15.</p>		<p>OK</p>
<p>4.19 <b>Default parameter</b>  Title: <i>GWP<sub>CH4</sub></i>  Indication: Global Warming Potential for methane  Units: N/A  Default/Used value: 21</p>	<p>/1/ /2/ /3/ /15/ /17/</p>	<p>DR I</p>	<p>This is IPCC default value selected in line with AMS-III.H Version 15.</p>		<p>OK</p>
<p>4.20 <b>Default parameter</b>  Title: <i>MCF</i>  Indication: Methane correction factor for the wastewater treatment system  Units: N/A  Default/Used value: 0.8</p>	<p>/1/ /2/ /3/ /15/ /17/</p>	<p>DR I</p>	<p>This is IPCC default value selected in line with AMS-III.H Version 15.</p>		<p>OK</p>

Table 1: Checklist question	Ref.	MoV <sup>1</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
4.21 <b>Default parameter</b> Title: $\rho_{CH_4,n}$ Indication: Density of methane at normal conditions Units: kg/Nm <sup>3</sup> Default/Used value:0.716 (or 0.000716 t/ Nm <sup>3</sup> )	/1/ /2/ /3/ /15/ /17/	DR I	This is default value selected in line with Tool to determine project emissions from flaring gases containing methane version 1 which is recommended by AMS-III.H Version 15.		OK
4.22 <b>Default parameter</b> Title: $UF_{BL}$ Indication: Model correction factor to account for model uncertainties Units: N/A Default/Used value:0.89	/1/ /2/ /3/ /15/ /17/	DR I	This is default value selected in line with AMS-III.H Version 15.		OK
4.23 <b>Default parameter</b> Title: $UF_{PJ}$ Indication: Model correction factor to account for model uncertainties Units: N/A Default/Used value:1.12	/1/ /2/ /3/ /15/ /17/	DR I	This is default value selected in line with AMS-III.H Version 15.		OK
4.24 <b>Default parameter</b> Title: $CFE_{ww}$ Indication: Capture efficiency of the biogas recovery equipment in the wastewater treatment systems Units: N/A Default/Used value:0.9	/1/ /2/ /3/ /15/ /17/	DR I	This is default value selected in line with AMS-III.H Version 15.		OK

Table 1: Checklist question	Ref.	MoV <sup>1</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
4.25 <b>Default parameter</b> Title: $EF_{grid,CM,y}$ Indication: Combined margin CO <sub>2</sub> emission factor of East China Power Grid in year y Units: tCO <sub>2</sub> /MWh Default/Used value: 0.7690	/1/ /2/ /3/ /15/ /17/	DR I	This is default value selected in line with Notification on Determining Baseline Emission Factor of Chinese Grids of 20 December 2010.		OK
<b>5. Calculations</b>					
5.1 Have all the calculations related to the baseline emissions been carried according to the formulae and methods described in the registered PDD and applied methodology? para. 244, 225 of VVS Version 03.0	/1/ /2/ /3/ /15/ /17/	DR I	CL3 The relevant formulas in calculating the emission reductions are not clearly provided in the ER spread sheets in line with the registered PDD.	<del>CL3</del>	OK (Refer to Table 2)
5.2 Have all the calculations related to the project emissions been carried according to the formulae and methods described in the registered PDD and applied methodology? para. 244, 225 of VVS Version 03.0	/1/ /2/ /3/ /15/ /17/	DR I	CL3 The relevant formulas in calculating the emission reductions are not clearly provided in the ER spread sheets in line with the registered PDD.	<del>CL3</del>	OK (Refer to Table 2)
5.3 Have all the calculations related to the leakage emissions been carried according to the formulae and methods described in the registered PDD and applied methodology? para. 244, 225 of VVS Version 03.0	/1/ /2/ /3/ /15/ /17/	DR I	As per AMS.III.H leakage effects do not have to be considered since the used technology equipment is not being transferred from or to another activity. The proposed project activity does not involve upgrading and bottling of biogas and no leakage will happen from this part either.		OK

Table 2: List of Requests for Corrective Action (CAR) and Clarification (CL)			
Observation	Reference (Table 1)	Summary of project owner response	Verification team conclusion
<p><b>CAR1</b> In accordance with the Guideline for Completing the Monitoring Report Form Version 02.0, the relevant dates of construction starting, commissioning and continued operation periods are not listed in Section A.1 of the MR.</p>	1.5	Section A.1 of the MR has been revised, and relevant dates of the project implementation have been added.	<p>OK. The relevant dates of construction starting, commissioning and continued operation period have been listed in the revised MR. The CAR is therefore closed.</p>
<p><b>CAR2</b> The MR Section B.1 are not completed in line with Guideline for Completing the Monitoring Report Form Version 02.0. The description of the installed technology, technical process and equipment are not provided in this section.</p>	1.5	The MR Section B.1 has been revised, and the description of the installed technology, technical process and equipment are added accordingly.	<p>OK. The description of the installed technology, technical process and equipment has been provided in MR Section B.1 in line with the registered PDD. The CAR is therefore closed.</p>
<p><b>CAR3</b> The description of the monitoring system in MR Section C is not fully consistent with the Section B.7.2 of the registered PDD.</p>	1.5 1.7 3.1 3.6~3.8	Revisions has been made to Section C of MR. Monitoring system is fully in consistent with Section B.7 of the registered PDD.	<p>OK. The description of the monitoring system in MR Section C has been revised to be consistent with the Section B.7.2 of the registered PDD. The CAR is therefore closed.</p>
<p><b>CAR4</b> For monitoring equipment listed in the parameters table in MR Section D.2, the information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity are not provided in line with Guideline for Completing the Monitoring Report Form Version 02.0.</p>	1.2 1.5 3.2 3.3 4.1~4.15	Revisions have been done to MR Section D.2, required information has been added as per Guideline for Completing the Monitoring Report Form Version 02.0.	<p>OK. The information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity for each equipment has been provided in MR Section D.2. The information has been verified to be effective as described in Section 3.4.3 of this report. The CAR is therefore closed.</p>
<p><b>CAR5</b> The implementation of sampling plan for the COD</p>	1.5	MR Section D.3 has been revised, the descriptions of the implementation of the	<p>OK. The implementation of the sampling plan has</p>

<p>measurement is not described in MR Section D.3 in line with the registered PDD and AMS-III.H. Version 15.</p>		<p>sampling plan has been added, and please refer to it accordingly.</p>	<p>been described in the revised MR. The wastewater sampling and COD measurement has been conducted as per GB11914-89. The CAR is therefore closed.</p>
<p><b>CAR6</b> For the calculation of emission reductions in MR Section E, the sample calculation of all formulas are not conducted by using the actual monitoring values during this monitoring period. The relevant spread sheets are not attached to present the calculation process in the MR in line with the Guideline for Completing the Monitoring Report Form Version 02.0.</p>	<p>1.5</p>	<p>MR Section E has been revised, the sample calculation of all formulas have been attached, relevant spread sheets showing the details of the calculations have been attached accordingly. Please refer to MR Section E accordingly.</p>	<p>OK. The sample calculation of all formulas has been inserted in the MR. The relevant data have been verified to be consistent with the emission reduction calculation spread sheets. The CAR is therefore closed.</p>
<p><b>CL1</b> It is to be clarified how the calibration frequency of the flow meters, methane analysers, electricity meters have been ensured to be consistent with the registered PDD in this monitoring period.</p>	<p>3.2.2 3.3.2</p>	<p>The calibrations of flow meters (wastewater flow meters and gas flow meters) and gas analyzers are delayed, however, as per paragraph 4.a in EB52 report Annex 60, the delayed calibration report shows that the error is smaller than the maximum permissible errors (5% for gas analyser, 1.5% for gas flow meters, 1% for wastewater flow meters), therefore the maximum permissible errors are applied conservatively for the calculations of emission reductions.</p> <p>As to monitoring data of flaring part, it is not applied for the calculations of MD (methane destroyed) for conservativeness, however, the project emissions from incomplete flaring are fully considered for calculations of emission reductions. This is in line with the AMS.III.H version 15 and registered PDD.</p>	<p>OK. The verification team has reviewed all the calibration reports of the monitoring equipments and it is confirmed that the calibration of all the monitoring equipments were delayed. Further, it was verified that the errors identified in the delayed calibration test are all smaller than the maximum permissible error of the monitoring equipment. As reflected in the emission reduction spread sheets/17/ and monitoring report/1/, a most conservative approach has been applied in line with the para. 238 of VVS Version 03.0 as follows: 1) For baseline emissions, a lower adjusting factor (i.e., 1-Maximum permissible error) is applied and this will result in lower baseline emissions in conservative manner; 2) For project emissions, a higher adjusting factor (i.e., 1+Maximum permissible error) is applied and this will result in</p>

			<p>higher project emissions in conservative manner;</p> <p>In line with the para. 239 of the VVS Version 03.0, the verification team confirms the applied conservative approach in the emission reductions spreadsheets has been applied through this entire monitoring period (i.e. without considering the scheduled/actual date of calibration) and resulted in fewer claimed emission reductions.</p> <p>The CL is therefore closed.</p>
<p>CL2</p> <p>The evidence on project implementation milestone (i.e. construction starting, commissioning starting and continued operation period) is not received.</p>	1.2	<p>The “Construction Contract” and “The approval of continued operation” have been provided as evidences.</p>	<p>OK.</p> <p>The relevant dates of construction starting, commissioning starting and continued operation have been added in the MR.</p> <p>The CL is therefore closed.</p>
<p>CL3</p> <p>The relevant formulas in calculating the emission reductions are not clearly provided in the ER spread sheets in line with the registered PDD.</p>	1.6 5.1 5.2	<p>The formulas of calculating emission reductions have been added in the spread sheet, and it is in line with the registered PDD. Please refer to revised spread sheet accordingly.</p>	<p>OK.</p> <p>The relevant formulas for emission reductions calculation have been added in the spread sheets and this is verified to be consistent with the MR and registered PDD.</p> <p>The CL is therefore closed.</p>
<p>CL4</p> <p>The evidence on final sludge disposal is not received.</p>	3.3 3.3.1	<p>The valid sludge contract has been provided to DOE showing that the sludge disposal remains unchanged compared with the register PDD and baseline scenario.</p>	<p>OK.</p> <p>The sludge disposal contract has been received and it was verified that the sludge is centralized landfilled. The project activity has no impact on the sludge disposal.</p> <p>The CL is therefore closed.</p>

Table 3: List of forward action requests (FARs)			
Observation	Reference	Summary of project participants' response	Verification team conclusion
N/A			

## **Appendix B**

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### Certification Statement

to the Verification Report 01 997 9105061560

## Certification Statement

TUV Rheinland (China) Ltd., the DOE, has performed the verification of the registered CDM project activity “UNFCCC Registration № 5042”, “Biogas Utilization Project In Zhejiang Jingxing Paper Joint Stock Co. Ltd.” in P.R.China. The project activity is designed to generate emission reductions by Methane avoidance and displacing fossil-fuel based electricity supply through biogas recovery.

The project participants are responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project. It is DOE’s responsibility to express an independent verification statement on the reported GHG emission reductions from the project. The DOE does not express any opinion on the selected baseline scenario or on the validated and registered PDD. The verification is carried out in-line with the VVS requirements.

The verification was performed to identify the compliance of the project activity with implementation and monitoring requirements, and to verify the actual amount of achieved emission reductions, through obtaining evidence and information on-site that included i) checking whether the provisions of the monitoring methodology and the monitoring plan were consistently and appropriately applied and ii) the collection of evidence supporting the reported data and iii) emission reductions that are claimed is free from material errors, omissions or misstatements.

The verification is based on:

- PDD of Version 2.2, 13 July 2011, registered with the CDM Executive Board on 28 July 2011;
- Monitoring Report of Version 2.2, 30/03/2013;
- Approved monitoring methodology AMS-III.H, Version 15 “Methane Recovery in Wastewater Treatment” and AMS-I.F, Version 01 “Renewable electricity generation for captive use and mini-grid”;
- Approved Validation Report of Version 03, 15 July 2011;

This statement covers verification period of 401 days days from 28 July 2011 to 31 August 2012.

The DOE has raised 6 corrective action requests and 4 clarification requests, all of which have been successfully resolved by PPs.

The DOE considers necessary to give reasonable assurance that reported GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology and the revised approved monitoring plan contained in the registered PDD are fairly stated.

The DOE, hereby certifies that the project activity, achieved emission reductions by sources of GHG equal to 37,246tCO<sub>2</sub>e and all monitoring requirements have been fulfilled.

The DOE states that the claimed emission reductions are free from material errors, omissions and misstatements with a reasonable level of assurance.

2013-04-03

Date



Mr. Henri Phan  
DOE Manager  
TUV Rheinland (China) Ltd.

2013-04-02

Date



Walter TANG  
Technical Reviewer  
TUV Rheinland (China) Ltd.

2013-04-01

Date



MA Libo  
Team Leader  
TUV Rheinland (China) Ltd.

## **Appendix C**

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### Certificates of Competence