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# CDM VERIFICATION REPORT

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SHENYANG LAOHUCHONG MUNICIPAL SOLID  
WASTE MANAGEMENT Co., LTD.

SHENYANG LAOHUCHONG LFG POWER  
GENERATION PROJECT IN CHINA

UNFCCC REF NO: 1906

MONITORING PERIOD: 01 AUGUST 2014 TO 30 JUNE  
2015 (BOTH DAYS INCLUDED)

REPORT No: C-2-C-01-L-0420-VE

REVISION No: 3



# VERIFICATION REPORT - vvs9.0

Date of first issue:		Project No:	
07 August 2015		C-2-C-01-L-0420	
Project Title:			
Shenyang Laohuchong LFG Power Generation Project			
Approved By and Date:		Organizational unit:	
Bilal Anwar 05 September 2015		Perry Johnson Registrars Carbon Emissions Services, Inc	
Client Name:		Client Reference:	
Asja Renewables (shenyang) Co., Ltd		Diao Xianlan	
Publication of Monitoring Report for Global Stakeholders Consultation:			
Publication Date:		13 July 2014	
First MR Version and Date:		version 01 dated 15 July 2015	
Final MR Version and Date:		version 03 dated 31 August 2015	
Summary:			
Methodology(ies) used:	‘Consolidated baseline methodology for landfill gas project activities’		
Version number and date:	ACM0001 version 06; ACM0002 version 6		
Sectoral Scope:	01		
Scale of the Project activity:	<input checked="" type="checkbox"/> Large Scale <input type="checkbox"/> Small Scale		
Verification Status:			
<p>PJRCES Inc has performed the verification of the emission reductions reported for the Shenyang Laohuchong LFG Power Generation Project in China for the 4<sup>th</sup> monitoring period from 01 August 2014 to 30 June 2015 (both dates are included). The main purpose of the project is to utilize the captured landfill gas to generate electricity. The proposed project has been registered at UNFCCC with registration no. 1906 on 25 December 2008.</p> <p>In summary, it is PJRCES, Inc's opinion that the Shenyang Laohuchong LFG Power Generation Project in China is implemented as planned and described in the validated and registered project design document, Version 03, dated 16 June 2008. The monitoring system is in place and emission reductions are calculated without material misstatements. PJRCES, Inc.'s, opinion relates to project's GHG emissions and the resulting GHG emissions reported and related to the valid and registered project baseline, monitoring and associated documents. Based on the information provided by PP and evaluated by verification team, PJRCES, Inc confirms the following:</p> <p>Baseline Emissions (tCO<sub>2</sub>e) : 156,119          Project Emissions (tCO<sub>2</sub>e) : 378          Leakage Emissions (tCO<sub>2</sub>e) : 0          Emission Reductions (tCO<sub>2</sub>e) : 155,741</p> <p> <input type="checkbox"/> Corrective Actions &amp; Clarifications Requested  <input checked="" type="checkbox"/> Recommendation to CDM EB with a request for registration  <input type="checkbox"/> Not recommended for registration as a Negative Validation Opinion is issued.          (The validation report shall be sent to the CDM Executive Board)       </p>			
Verification Team:		Documentation Distribution:	
Team Leader	Zhang Xiaojun Johnsen	<input checked="" type="checkbox"/> No distribution without permission from the Client or responsible organizational unit <input type="checkbox"/> Limited distribution <input type="checkbox"/> Unrestricted distribution	
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Sector Expert (TA-1.1)	Wu Jianmin		
Independent Technical Review:			
Technical Reviewer:		Trainee Technical Reviewer:	
Date: 27 August 2015		Date: NA	
Name: Anjana Sharma		Name: NA	
Report No.:	Rev. No.	Date:	
C-2-C-01-L-0420-Ve	1	07 August 2015	
	2	27 August 2015	
	3	05 September 2015	



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## ABBREVIATIONS

BAU	Business as usual
BM	Building Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CL	Clarification request
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Carbon dioxide equivalent
CM	Combined Margin
DNA	Designated National Authority
ETNs	Electricity Transaction Notes
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
EB	Executive Board
EIA	Environmental Impact Assessment
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of Approval
MP	Monitoring Plan
NEPG	Northeast Electric Power Grid
NGO	Non-governmental Organisation
ODA	Official Development Assistance
OM	Operational Margin
PCP	Project Cycle Procedure
PDD	Project Design Document
PJRCS	Perry Johnson Registrars Carbon Emissions Services, Inc
PS	Project Standard
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard

## MAIN DOCUMENTS REFERRED IN THIS REPORT

Methodology (name / version)	ACM0001 version 06
Scope	01
Technical Area	1.1
Registered PDD	Version 03, dated 16 June 2008
Published Monitoring Report	version 01 dated 15 July 2015
Final Monitoring Report	version 03 dated 31 August 2015
Project documentation link	<a href="https://cdm.unfccc.int/Projects/DB/DNV-CUK1214898000.95/view">https://cdm.unfccc.int/Projects/DB/DNV-CUK1214898000.95/view</a>



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## 1. INTRODUCTION

### 1.1. OBJECTIVE

Asja Ambiente Italia S.p.A [Hereafter, referred as PP] commissioned PJRCES Inc. to perform to verify the emission reductions for the CDM project titled, Shenyang Laohuchong LFG Power Generation Project [hereafter referred as “the project”] in China. The period under verification is 01 August 2014 to 30 June 2015.

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

The objective of CDM verification is to conduct a thorough, independent assessment of the registered project activities. In carrying out its verification work, the DOE shall ensure that the project activity complies with the requirements of paragraph 62 of the CDM modalities and procedures. In particular, this assessment shall:

- Ensure that the project activity has been implemented and operated as per the registered CDM-PDD or any approved revised CDM-PDD, and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- Ensure that the monitoring report and other supporting documents provided are complete in accordance with latest applicable version of the completeness checklist for requests for issuance of CERs, verifiable, and in accordance with applicable CDM requirements;
- Ensure that actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan or any revised approved monitoring plan, and the approved methodology including applicable tool(s);
- Evaluate the data recorded and stored as per the monitoring methodology including applicable tool(s).

### 1.2. SCOPE

The verification scope is defined as an independent and objective review and ex-post determination of the monitored GHG emission reductions. The verification is based on the validated and registered project design document, the monitoring report, emission reduction calculation spreadsheet, and supporting documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

Based on the recommendations of the Validation and Verification Standard version 9.0 (hereafter called VVSv9.0), the verification team has employed a risk-based approach in the verification, focusing on the identification of significant risks for project implementation and the generation of emission reductions. Where, no specific means of verification is specified; the verification team has applied the standard auditing techniques as described in §373 of the VVSv9.0.

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

### 1.3. GHG PROJECT DESCRIPTION

The project activity is to utilize the captured landfill gas for power generation, with total design installation of 3MW (6x0.5MW LFG power generators) and two flares of 2,000Nm<sup>3</sup>/h.



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Project Title	:	Shenyang Laohuchong LFG Power Generation Project
Unique Reference No.	:	1906
Registration Date	:	25 December 2008
Crediting period	:	25 December 2008 to 24 December 2018 (Fixed crediting period)
Monitoring Period	:	01 August 2014 to 30 June 2015 (4 <sup>th</sup> Monitoring)
Project Participant	:	Shenyang Laohuchong Municipal Solid Waste Management Co., Ltd. from China; Asja Ambiente Italia S.p.A. from Italy ICF- International Clean Fund LLC from Switzerland
Methodology Used	:	"Consolidated baseline methodology for landfill gas project activities" ACM0001 version 06 and ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 6
Location	:	Tashan Farm, Chenxiang Town, Su Jiatun District, Shenyang, Liaoning Province, China
Geographical coordinates	:	123° 34'E and 41°33'N

## Post Registration Changes:

Through the document review and the onsite visit, the assessment team confirms that the project was implemented strictly according to the registered monitoring plan and applied methodology. There are no post registration changes to this project activity.

## 1.4. VERIFICATION TEAM

The verification of the project activity has been carried out by qualified personnel in-line with the selection criteria of verification team under procedures defined by PJRCES, Inc. The verification report has undergone a technical review before requesting issuance of CERs for the CDM project activity. The technical review was performed by an independent technical reviewer.

ROLE OF THE VERIFICATION/ASSESSMENT TEAM								
ASSESSMENT TEAM	ROLE	COMPETENCY			TASK PERFORMED			
		METH EXPERT	TECHNICAL AREA	HOST COUNTRY EXP.	DESK REVIEW	SITE VISIT	REPORT PREPARATION	INDEPENDENT TECH. REVIEW
Zhang Xiaojun Johnsen	TL TE (13.1)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Wu Jianmin	TE (1.1)		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Anjana Sharma	ITR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	NA			<input checked="" type="checkbox"/>
Anjana Sharma	TE (ITR)		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	NA			<input checked="" type="checkbox"/>

### Note:

1. TL – Team Leader V – Verifier, VT – Verifier trainee, LV – Lead Verifier, TE – Technical Expert, ITR – Independent Technical Reviewer
2. DR – Desk review of MR and documents, SV – Site Visit, RP – Final Report Preparation.

## 2. METHODOLOGY

The overall verification, from Contract Review to Verification Report and Verification Opinion, was conducted using internal procedures implemented by PJRCES Inc. In order to ensure transparency, a



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“verification protocol: requirement checklist” (Table1), additional verification requirements checklist in line with VVS9.0., “Draft CL/CAR or FAR” (Table2) under Appendix I and the Reporting section has been customized, which covers all the provisions and requirements of VVS9.0 of the Clean Development Mechanism, issued by CDM Executive Board at its 82 meeting (EB82, Annex14).

The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from verifying the identified criteria. The verification protocol serves the following purposes:

- It organizes, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent verification process where the verifier will document how a particular requirement has been verified and the result of the verification.

The complete verification protocol is enclosed in Appendix A to this report.

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 revised 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 inline with methodology and the registered PDD or approved revised PDD;
  - Review of assumptions made in calculating the emission reduction;
  - Implementation of QA/QC procedure in line with the registered PDD or approved revised PDD and methodology requirement.
- 4) Resolution of outstanding issues and the issuance of the final Verification Report and Certification Statement.

## 2.1. REVIEW OF DOCUMENTS

The assessment of the project documentation provided by the project participant is based upon both quantitative and qualitative information on emission reductions. Quantitative information comprises the reported numbers in the monitoring report (MR) version 03 dated 31 August 2015 /2/ and emission reduction calculation spreadsheet /14/. Qualitative information comprises information on internal management controls, calculation procedures, and procedures for transfer of data, frequency of emissions reports, and review and internal audit of calculations.

In-line with Procedures for making the monitoring report available to the public in accordance with §62 of the modalities and procedures for the CDM, monitoring report, version 01 dated 15 July 2015 /2/ was made publicly available at UNFCCC CDM website.

In addition to the monitoring documentation provided by PP, the verification team reviewed:

- *Monitoring report for Shenyang Laohuchong LFG Power Generation Project for the period 01 August 2014 to 30 June 2015, prepared by Asja Renewables (shenyang) Co., Ltd /2/;*





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- *Emission reduction calculations for the verification period under consideration*, provided in the form of spread sheets submitted by Asja Renewables (shenyang) Co., Ltd /14/;
- *Registered Project Design Document (PDD) Version 03*, dated 16 June 2008 /3/, the monitoring plan as described in the registered PDD /3/, by Asja Ambiente Italia A.p.A.;
- *The final validation report*, Report No. 2008-9050, Version 01, dated 30 June 2008 /4/, prepared by DNV;
- *The applied monitoring methodology ACM0001 version 06 /5/ and ACM0002 version 6 /6/.*
- *Clean Development Mechanism Validation and Verification Standard*, Version 9.0 issued by the CDM Executive Board /9/.
- Additional background documents related to the project performance /15/ ~/49/, and relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board.

A complete list of documents reviewed by the verification team is listed in section 5 of present report under **References 5**.

Key changes in the final version of the version 03 dated 31 August 2015 /2/ as compared to that version 01 dated 15 July 2015 /2/ webhosted in UNFCCC CDM website is summarized in the table given below:

S. No.	SUBJECT	WEBHOSTED MONITORING REPORT (MR)	FINAL MR SUBMISSION FOR ISSUANCE
1	Global warming potential of methane	$GWP_{CH_4}$ is 21 $tCO_2/t CH_4$ .	$GWP_{CH_4}$ is 25 $tCO_2/t CH_4$ from year 2013 as per EB's guidance for conservative consideration.

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 (VVSv9.0) 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.

## 2.2. SITE VISIT & FOLLOW UP INTERVIEWS

Between 5 August 2015 to 6 August 2015, qualified verification team from PJRCES, Inc performed physical site inspection and interviews, upon Shenyang Laohuchong LFG Power Generation Project located at Tashan Farm, Chenxiang Town, Su Jiatun District, Shenyang, Liaoning Province, China, with project stakeholders to confirm selected information and to resolve issues identified during the document review.

SL. No	DATE	NAME	ORGANIZATION	TOPIC
/1/	6 August 2015	Li Wei Pan Libo	Shenyang Laohuchong Municipal Solid Waste Management Co., Ltd.	<ul style="list-style-type: none"> <li>- Power supplied to and imported from the grid;</li> <li>- Landfill gas measurement;</li> <li>- Meter accuracy and calibration;</li> <li>- Monitoring report;</li> <li>- Calculation of the carbon emission reductions;</li> </ul>
	6 August 2015	Diao Xianlan	Asja Renewables (shenyang) Co., Ltd	<ul style="list-style-type: none"> <li>- Data collection, aggregation and uncertainty;</li> <li>- Calibration of the meters;</li> <li>- QA/QC of the data;</li> <li>- CDM monitoring manual;</li> <li>- CDM training plan.</li> </ul>



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## 2.3. RESOLUTION OF CARs, CLs & FARs

The objective of this phase of the verification is to resolve issues related to the monitoring, implementation and operations of the registered project activity that could impair the capacity of the registered project activity to achieve emission reductions or influence the monitoring and reporting of emission reductions prior to PJRCES Inc.'s positive conclusion on the GHG emission reduction calculation.

Findings established during the verification can either be seen as a non-fulfilment of criteria ensuring the proper implementation of a project or where a risk to deliver high quality emission reductions is identified.

A **Corrective Action Request (CAR)** is raised, if one of the following situations occurs:

- Non-compliance 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;
- Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants;
- Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions;
- Issues identified in a FAR during validation to be verified during verification or previous verification(s) have not been resolved by the project participants.

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

A **Forward Action Request (FAR)** is raised, for actions if the monitoring and reporting require attention and/or adjustment for the next verification period.

To guarantee the transparency of the verification process, the concerns raised are documented in more detail in the verification protocol in **Appendix A**.

## 2.4. INTERNAL QUALITY CONTROL

Following the completion of the assessment process and a recommendation by the verification team, all documentation will be forwarded to an Independent Technical Reviewer. The task of the Independent Technical Reviewer is to check that all procedures have been followed and all conclusions are justified. The Independent Technical Reviewer may either accept or reject the recommendation made by the verification team. Findings can be raised at this stage and PP must address the same within agreed timeline.

## 3. VERIFICATION CONCLUSIONS

In the following sections, the conclusions of the verification activity have been stated. The findings of the desk review of the original monitoring documents and the findings from interviews during the follow up visit are described in the Verification Protocol in Appendix A.

The Clarification, Corrective and Forward Action Requests are stated, where applicable, in the following sections and are further documented in the Verification Protocol in Appendix A. The verification of the Project resulted in 1 CAR; 0 CL and 0 FAR.

The CARs/ CLs/ FARs were closed based on the adequate responses from PP, which met the applicable requirements. They have been reassessed before their formal acceptance and closure.



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## 3.1. REMAINING ISSUES FROM VALIDATION OR PREVIOUS VERIFICATION(S) [§409]

The present verification is conducted for the 4<sup>th</sup> periodic monitoring period 01 August 2014 to 30 June 2015 (both days included). Verification team reviewed the validation report /4/ and 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> verification report /13/ and identified no Forward Action Requests that has to be addressed during the current monitoring period.

**Opinion:** Based on the above discussion and document reviewed, verification team is of the opinion that the no FAR in validation/previous verification report has to be addressed as per §354 of VVS9.0.

## 3.2. COMPLIANCE WITH THE PROJECT IMPLEMENTATION WITH THE REGISTERED PROJECT DESIGN DOCUMENT [§383]

**Implementation & operation status:** Based on the physical site inspection carried out from 5 August 2015 to 6 August 2015, verification team was able to confirm that the commercial operation for 1#, 2# and 3# power generators started on 04/03/2008, which has been confirmed from the operation logs /36/. The project has been implemented and operated as per the registered PDD /3/. More information of implementation and actual operation timeline of the project is as listed in Table 1.

Table 1 Actual operation timeline

MILESTONE	DATE	VERIFICATION TEAM'S OPINION
Operation starting of flare	18/10/2007	The flare operation start date of 18/10/2007 can be confirmed in the registered PDD /3/, the validation report /4/ and the previous 3 verification and monitoring reports /12/. Besides, it has been verified by checking the flare installation acceptance report /37/.
Operation starting of 1#, 2# and 3# power generators	04/03/2008	The operation start date of 04/03/2008 for 1#, 2# and 3# can be verified by checking the operation logs /36/.
Operation starting of 4# and 5# power generators	27/03/2012	The operation start date of 27/03/2012 can be verified by checking the operation logs /36/.

### Generation system

The project activity is to utilize the captured landfill gas for power generation, supplying to grid, with total design installation of 3MW (6x0.5MW LFG power generators) and two flares of 2,000Nm<sup>3</sup>/h.

During on-site inspection, PJRCES confirms that only five LFG power generators and one flare have been installed and put into operation, each of them has been installed in line with the registered PDD /3/ and the validation report /4/ of the project. As confirmed by Mr. PAN Libo /1/, the last one power generating unit and last one flare will be installed as soon as the biogas flow will be high and stable enough to guarantee suitable working conditions, which is deemed reasonable based on the expertise of verification team.

By means of on-site inspection of equipment name plates, current operating units involved in the project activity are confirmed to have been installed as same as proposed in the registered PDD /3/, as shown in the Table 2. And also their technical specification is verified to be consistent with that described in the registered PDD /3/.

Table 2 Installation of equipment

PROJECT EQUIPMENT	IMPLEMENTATION IN ACCORDANCE WITH PDD	ASSESSMENT APPROACH
<b>Gas generating Set</b> Unit rated capacity: 500kW	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	On-site inspection



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Type:500GF-N		
<b>Flare</b>	<input checked="" type="checkbox"/> Yes	On-site inspection
Type: TOR-30-A1	<input type="checkbox"/> No	

By means of on-site interviewing with Mr. PAN Libo /1/ (i.e. the project manager of the project) and checking the daily operation & maintenance logs /42/, the verification team can confirm that the project activity operated well, and no event which may impact the applicability of the methodology occurred during the monitoring period from 01 August 2014 to 30 June 2015.

## Power System

As clearly indicated in the electric line diagram of the project /21/ and the power purchase agreement /40/, the electricity generated by the project is delivered to the NEPG (Xiaobu substation), which is consistent with the registered PDD /3/.

Hence, verification team was able to confirm that the power systems implemented and described in the MR; as observed during the physical site inspection is in-line with the registered PDD.

## Meter System

One sealed electric meter for monitoring the electricity exported to the grid, and two sealed electric meters for monitoring the electricity imported from the grid, are envisaged, which can be confirmed based on the site inspection from 5 August 2015 to 6 August 2015 and interview /1/. The power purchase agreements /40/ covering the whole monitoring period are checked, and can demonstrate that the electricity generated by the project activity is delivered to the NEPG. And the electric line diagram showing three meters /21/ is confirmed to be accurately indicated in the monitoring report /2/.

Regarding the monitoring of landfill gas captured (i.e.  $LFG_{total,y}$ ), landfill gas flared (i.e.  $LFG_{flare,y}$ ) and landfill gas combusted in the power plant (i.e.  $LFG_{electricity,y}$ ), three flow meters have been installed separately with function that automatically measures temperature and pressure of gas and directly expresses LFG volumes in normalized cubic meters. All those are confirmed to be in compliance with the registered PDD /3/. Further, the installed flow meters are checked to be consistent with those reported in the previous 3 monitoring and verification reports /12/.

Besides, one gas analyser with type of XGF-4043 has been equipped to continuously measure the methane fraction in the landfill gas, and the exhaust gas temperature has been continuously measured by N-type thermocouple with type of WRMK-331, both of which are checked to be consistent with those reported in the previous 3 monitoring and verification reports /12/.

**Opinion:** On the basis of above discussion and in-line with the requirement of §383 of VVS9.0, verification team was able to confirm that:

- the implementation of the project is consistent with the registered PDD;
- the project is operated as per the registered PDD by PP;
- information provided in the MR is in accordance with that stated in the registered PDD.

### 3.3. COMPLIANCE OF MONITORING PLAN WITH THE MONITORING METHODOLOGY INCLUDING APPLICABLE TOOL(S) AND THE STANDARDISED BASELINE [§386]

The project activity applied monitoring methodology ACM0001 version 06 “*Consolidated baseline methodology for landfill gas project activities*” and ACM0002 “*Consolidated baseline methodology for grid-connected electricity generation from renewable sources*”, Version 6; and reflected the emission sources included in the project boundary to be consistent with the registered PDD /3/ and the validation report /4/, after through assessment on the whole project operation process.

**Opinion:** From the discussion above, verification team was able to confirm that the monitoring plan is in accordance with the approved monitoring methodology ACM0001 version 06 /5/ and ACM0002 and applicable tools. This is in line with the requirement of §352 of VVS9.0.



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## 3.4. COMPLIANCE OF MONITORING ACTIVITIES WITH THE REGISTERED MONITORING PLAN [§390-§391]

The monitoring activities for the CDM project activity has been carried out as per the monitoring plan described in the registered CDM PDD Version 03, dated 16 June 2008 /3/. All parameters are monitored and reported in-line with the registered monitoring plan, shown in Table 3.

Table 3

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	N/A
Is complete set of data for the specified monitoring period available	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The monitoring data records covering the monitoring period from 01 August 2014 to 30 June 2015 /15/ has been provided to the verification team, and can be confirmed to be complete form the verification.
Has the required information provided in the monitoring report been crosschecked with other sources	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Yes, the electricity monitoring data records /15/ have been cross-checked with the electricity transaction notes /19/. Regarding the monitoring of landfill gas captured (i.e. $LFG_{total,y}$ ), landfill gas flared (i.e. $LFG_{flare,y}$ ) and landfill gas combusted in the power plant (i.e. $LFG_{electricity,y}$ ) have been internally checked with each other.
Is the calculation of baseline emissions and project activity emissions and leakage in accordance with the formulae and methods described in monitoring plan and the applied methodology?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	It is confirmed by the verification team that the calculation of baseline emissions and project activity emissions and leakage, as reflected in the monitoring report /1/ and emission reductions calculation spreadsheet /14/, is in accordance with the formulae and methods described in monitoring plan of the registered PDD /3/ and the applied methodology <i>ACM0001 version 06 /5/</i> .
Have all assumptions used for emission calculation been justified	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	For the emission reductions calculation, the adopted ex-ante emission factor of 1.05176 tCO <sub>2</sub> e/MWh, and $\rho_{CH_4,n,h}$ of 0.0007168 tCH <sub>4</sub> /m <sup>3</sup> CH <sub>4</sub> are confirmed to be in compliance with monitoring plan of the registered PDD /3/. GWP <sub>CH<sub>4</sub></sub> of 25 is as per EB's guidance for conservative consideration.
Have appropriate emission factors, IPCC default values and other reference values been correctly applied	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	As clearly reflected in the monitoring report /2/ and the emission reductions calculation spreadsheet /14/, the ex-ante reference values are correctly applied in the emission reductions calculation.

### 3.4.1 MONITORING PARAMETERS

In line with the registered PDD /3/, the ex-post monitored parameter for the emission reductions calculation is confirmed as listed in the Table 4-Table 15.

Table 4

MONITORING REQUIREMENT	PARAMETER	ASSESSMENT/OBSERVATION BY DOE
Data / Parameter: (as in	$LFG_{total,y}$	Total amount of landfill gas captured



# VERIFICATION REPORT - vvs9.0

monitoring plan of PDD):				
Type of Monitoring equipment	Item	Type	Accuracy Level	Serial No.
	Flow meter	Annubar485	±0.9%	01726699
Measuring frequency/Time Interval:	Continuously measured			
Reporting frequency:	Recorded every 5 minutes			
Monitored value:	15,524,848 Nm <sup>3</sup>			
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency of continuously measurement and recording every 5 minutes is fully in accordance with the registered PDD /3/ and the monitoring methodology <i>ACM0001 version 06 /5/</i> .			
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?	No, the accuracy of the proposed flow meter not stated in the PDD /3/. However, based on the on-site inspection, the gas flow meter has the accuracy level of ±2%, and the adopted accuracy level is confirmed to be in compliance with the national standard of "Regulation on the installation and management of energy measurement devices for energy using entities (GB/17167-2006)" /47/.			
If applicable, has the reported data been cross-checked with other available data?	N/A			
How were the values in the monitoring report verified?	The values presented in the monitoring report /2/ and the emission reductions calculation spreadsheet /14/ have been verified against the original electronic data automatically stored in the Factory DataStorage (FDS) via PLC /16/, and all of them are accurately reported.			
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 well-organized CDM monitoring manual has been documented in place for the project /41/. In addition, during the on-site assessment, the CDM training records /43/ and operational qualifications of staff /44/ were checked valid to demonstrate the data management competence of CDM monitoring team.			
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?	N/A			

Table 5

MONITORING REQUIREMENT	PARAMETER	ASSESSMENT/OBSERVATION BY DOE
Data / Parameter: (as in monitoring plan of PDD):	LFG <sub>flare,y</sub>	Amount of landfill gas flared





# VERIFICATION REPORT - vvs9.0

Type of Monitoring equipment	Item	Type	Accuracy Level	Serial No.	Period used
	Flow meter	Annubar485	±2%	01746509	01/08/2014-05/09/2014
	Flow meter	Annubar485	±2%	01746511	05/09/2014-30/06/2015
	The replacement of meter (01746509) with meter (01746511) is on date of 05/09/2014.				
Measuring frequency/Time Interval:	Continuously measured				
Reporting frequency:	Recorded every 5 minutes, and aggregated hourly, daily, monthly and yearly				
Monitored value:	5,805,508 Nm <sup>3</sup>				
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency of continuously measurement and recording every 5 minutes is fully in accordance with the registered PDD /3/ and the monitoring methodology ACM0001 version 06 /5/.				
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?	No, the accuracy of the proposed flow meter is not stated in the PDD /3/. However, based on the on-site inspection, the gas flow meter has the accuracy level of ±2%, and the adopted accuracy level is confirmed to be in compliance with the national standard of "Regulation on the installation and management of energy measurement devices for energy using entities (GB/17167-2006)" /47/.				
If applicable, has the reported data been cross-checked with other available data?	N/A				
How were the values in the monitoring report verified?	The values presented in the monitoring report /2/ and the emission reductions calculation spreadsheet /14/ have been verified against the original electronic data automatically stored in the Factory DataStorage (FDS) via PLC /16/, and all of them are accurately reported.				
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 well-organized CDM monitoring manual /41/ has been documented in place for the project. In addition, during the on-site assessment, the CDM training records /43/ and operational qualifications of staff /44/ were checked valid to demonstrate the data management competence of CDM monitoring team.				
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?	N/A				

Table 6

MONITORING	PARAMETER	ASSESSMENT/OBSERVATION BY DOE
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# VERIFICATION REPORT - vvs9.0

REQUIREMENT				
Data / Parameter: (as in monitoring plan of PDD):	LFG <sub>electricity,y</sub> / Amount of landfill gas combusted in power plant			
Type of Monitoring equipment	Item	Type	Accuracy Level	Serial No.
	Flow meter	Annubar285	±2%	01746510
Measuring frequency/Time Interval:	Continuously measured			
Reporting frequency:	Recorded every 5 minutes, and aggregated hourly, daily, monthly and yearly			
Monitored value:	9,756,850 Nm <sup>3</sup>			
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency of continuously measurement and recording every 5 minutes is fully in accordance with the registered PDD /3/ and the monitoring methodology <i>ACM0001 version 06/5/</i> .			
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?	No, the accuracy of the proposed flow meter is not stated in the PDD /3/. However, based on the on-site inspection, the gas flow meter has the accuracy level of ±2%, and the adopted accuracy level is confirmed to be in compliance with the national standard of "Regulation on the installation and management of energy measurement devices for energy using entities (GB/17167-2006)" /47/.			
If applicable, has the reported data been cross-checked with other available data?	N/A			
How were the values in the monitoring report verified?	The values presented in the monitoring report /2/ and the emission reductions calculation spreadsheet /14/ have been verified against the original electronic data automatically stored in the Factory DataStorage (FDS) via PLC /16/, and all of them are accurately reported.			
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 well-organized CDM monitoring manual /41/ has been documented in place for the project. In addition, during the on-site assessment, the CDM training records /43/ and operational qualifications of staff /44/ were checked valid to demonstrate the data management competence of CDM monitoring team.			
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?	N/A			

Table 7

MONITORING REQUIREMENT	PARAMETER	ASSESSMENT/OBSERVATION BY DOE
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# VERIFICATION REPORT - vvs9.0

Data / Parameter: (as in monitoring plan of PDD):	EL <sub>LFG</sub> / Net amount of electricity generated using landfill gas			
Type of Monitoring equipment	Item	Type	Accuracy Level	Serial No.
	Electric meter	DSSD331-3	0.5s	8007472
Measuring frequency/Time Interval:	Continuously measured			
Reporting frequency:	Monthly recorded			
Monitored value:	14,305.200 MWh			
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency of continuously measurement and monthly recording is fully in accordance with the registered PDD /3/ and the monitoring methodology <i>ACM0001 version 06/5/</i> .			
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?	No, the accuracy of the proposed electric meter is not stated in the PDD /3/. However, based on the on-site inspection, the electric meter has the accuracy level of 0.5s, and the adopted accuracy level is confirmed to be in compliance with the national standard of "Technical administrative code of electric energy metering (DL/T448-2000)" /48/.			
If applicable, has the reported data been cross-checked with other available data?	Yes, the reported data has been cross checked with the official electricity transaction notes from grid company /19/.			
How were the values in the monitoring report verified?	The values presented in the monitoring report /2/ and the emission reductions calculation spreadsheet /14/ have been verified against the official electricity transaction notes from grid company /19/, and conservative value has been taken for the calculation of emission reductions as reflected in the ER calculation spreadsheet /14/.			
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 well-organized CDM monitoring manual /41/ has been documented in place for the project. In addition, during the on-site assessment, the CDM training records /43/ and operational qualifications of staff /44/ were checked valid to demonstrate the data management competence of CDM monitoring team.			
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?	N/A			

Table 8

MONITORING REQUIREMENT	PARAMETER	ASSESSMENT/OBSERVATION BY DOE
Data / Parameter: (as in monitoring plan of PDD):	EL <sub>PR</sub>	Total amount of electricity required to meet the project requirement



# VERIFICATION REPORT - vvsv9.0

Type of Monitoring equipment	Item	Type	Accuracy Level	Serial No.
	<i>Electric Meter A</i>	DTZ188	0.5s	010112300001515158
	<i>Electric Meter B</i>	DTS51	1	0103200019480
Measuring frequency/Time Interval:	Continuously measured			
Reporting frequency:	Monthly recorded			
Monitored value:	358.934MWh (i.e. Electricity meter A: 358.934MWh, Electricity meter B: 0MWh, thus EL <sub>PR</sub> is 358.934MWh in total during the monitoring period)			
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency of continuously measurement and monthly recording is fully in accordance with the registered PDD /3/ and the monitoring methodology ACM0001 version 06/5/.			
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?	No, the accuracy of the proposed electric meter is not stated in the PDD /3/. Based on the on-site inspection, the electric meter A (SN: 010112300001515158) has the accuracy of 0.5s. While the electric meter B has its accuracy of 1. By reviewing against relevant regulatory requirement, these adopted accuracy levels are all confirmed to be in compliance with the national standard of "Technical administrative code of electric energy metering (DL/T448-2000)"/48/.			
If applicable, has the reported data been cross-checked with other available data?	Yes, the reported data has been cross checked with the official electricity transaction notes from grid company /19/.			
How were the values in the monitoring report verified?	The values presented in the monitoring report /2/ and the emission reductions calculation spreadsheet /14/ have been verified against the official electricity transaction notes from grid company /19/, and conservative value has been taken for the calculation of emission reductions as reflected in the ER calculation spreadsheet /14/.			
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 well-organized CDM monitoring manual /41/ has been documented in place for the project. In addition, during the on-site assessment, the CDM training records /43/ and operational qualifications of staff /44/ were checked valid to demonstrate the data management competence of CDM monitoring team.			
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?	Yes. For the EL <sub>PR</sub> data of both first month and last month, considering the power company didn't record the electric meter reading on the fixed date of each month, thus PP used longer period (from 17/07/2014 to 15/07/2015) of the monitoring data as the electricity consumption for 01 August 2014 to 30 June 2015, which are considered most conservative assumption for the emission reductions calculation.			

Table 9



# VERIFICATION REPORT - vvs9.0

MONITORING REQUIREMENT	PARAMETER	ASSESSMENT/OBSERVATION BY DOE			
Data / Parameter: (as in monitoring plan of PDD):		w <sub>CH<sub>4</sub>,y</sub> / Methane fraction in the landfill gas			
Type of Monitoring equipment		Item	Type	Accuracy Level	Serial No.
		Gas analyzer	XGF-4043	≤2%	0708404
Measuring frequency/Time Interval:		Continuously measured			
Reporting frequency:		Recorded every 5 minutes			
Monitored value:		Refer to the ER calculation spreadsheets for specific values /14/.			
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)		Yes. The frequency of continuously measurement and recording every 5 minutes is fully in accordance with the registered PDD /3/ and the monitoring methodology <i>ACM0001 version 06/5/</i> .			
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?		No, the accuracy of the proposed gas analyzer is not stated in the PDD /3/. However, based on the on-site inspection, the gas analyzer has the accuracy level of ≤2% and the adopted accuracy level is confirmed to be in compliance with the national standard of "Verification Regulation of Catalysis Combustion Type Methane Measuring Device (JJG678-2007)" /33/.			
If applicable, has the reported data been cross-checked with other available data?		N/A			
How were the values in the monitoring report verified?		The values presented in the monitoring report /2/ and the emission reductions calculation spreadsheet /14/ have been verified against the original electronic data automatically stored in the Factory DataStorage (FDS) via PLC /16/, and all of them are accurately reported.			
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 well-organized CDM monitoring manual /41/ has been documented in place for the project. In addition, during the on-site assessment, the CDM training records /43/ and operational qualifications of staff /44/ were checked valid to demonstrate the data management competence of CDM monitoring team.			
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?		N/A			

Table 10

MONITORING REQUIREMENT	PARAMETER	ASSESSMENT/OBSERVATION BY DOE			
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# VERIFICATION REPORT - vvs9.0

Data / Parameter: (as in monitoring plan of PDD):	T <sub>flare</sub> / Temperature in the exhaust gas of the enclosed flare			
Type of Monitoring equipment	Item	Type	Accuracy Level	Serial No.
	N-type thermocouple	WRMK-331	±2.5°C	/
Measuring frequency/Time Interval:	Continuously measured			
Reporting frequency:	Recorded every 5 minutes			
Monitored value:	Pls. refer to the ER calculation spreadsheets for specific values/14/.			
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency of continuously measurement and recording every 5 minutes is fully in accordance with the registered PDD /3/ and the monitoring methodology <i>ACM0001 version 06/5/</i> .			
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?	No, the accuracy of the proposed thermocouple is not stated in the PDD /3/. However, based on the on-site inspection, the thermocouple has the accuracy level of ±2.5°C and the adopted accuracy level is confirmed to be in compliance with the national standard of "Verification Regulation of Working Base Metal Thermocouple (JJG351-1996)" /34/.			
If applicable, has the reported data been cross-checked with other available data?	N/A			
How were the values in the monitoring report verified?	The values presented in the monitoring report /2/ and the emission reductions calculation spreadsheet /14/ have been verified against the original electronic data automatically stored in the Factory DataStorage (FDS) via PLC /16/, and all of them are accurately reported.			
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 well-organized CDM monitoring manual /41/ has been documented in place for the project. In addition, during the on-site assessment, the CDM training records /43/ and operational qualifications of staff /44/ were checked valid to demonstrate the data management competence of CDM monitoring team.			
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?	N/A			

Table 11

MONITORING REQUIREMENT	PARAMETER	ASSESSMENT/OBSERVATION BY DOE
Data / Parameter: (as in		EPH / Engine working hours of power plant



# VERIFICATION REPORT - vvs9.0

monitoring plan of PDD):				
Type of Monitoring equipment	Item	Type	Accuracy Level	Serial No.
	Programmable Logic Controller (PLC)	Siemens S7-300	<10s per day	/
Measuring frequency/Time Interval:	Continuously measured			
Reporting frequency:	Recorded every 5 minutes			
Monitored value:	7,905h			
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency of continuously measurement and recording every 5 minutes is fully in accordance with the registered PDD /3/ and the monitoring methodology <i>ACM0001 version 06/5/</i> .			
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?	No, the accuracy of the proposed PLC is not stated in the PDD /3/. However, based on the on-site inspection, the PLC has the accuracy level of <10s. Based on its expertise of verification team, the adopted accuracy level represents good monitoring practices.			
If applicable, has the reported data been cross-checked with other available data?	N/A			
How were the values in the monitoring report verified?	The values presented in the monitoring report /2/ and the emission reductions calculation spreadsheet /14/ have been verified against the original electronic data automatically stored in the Factory DataStorage (FDS) via PLC /16/, and all of them are accurately reported.			
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 well-organized CDM monitoring manual /41/ has been documented in place for the project. In addition, during the on-site assessment, the CDM training records /43/ and operational qualifications of staff /44/ were checked valid to demonstrate the data management competence of CDM monitoring team.			
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?	N/A			

Table 12

MONITORING REQUIREMENT	PARAMETER	ASSESSMENT/OBSERVATION BY DOE
Data / Parameter: (as in monitoring plan of PDD):		FWH / Flare working hours





# VERIFICATION REPORT - vvs9.0

Type of Monitoring equipment	Item	Type	Accuracy Level	Serial No.
	Programmable Logic Controller (PLC)	Siemens S7-300	<10s per day	/
Measuring frequency/Time Interval:	Continuously measured			
Reporting frequency:	Recorded every 5 minutes			
Monitored value:	7,643h			
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency of continuously measurement and recording every 5 minutes is fully in accordance with the registered PDD /3/ and the monitoring methodology <i>ACM0001 version 06/5/</i> .			
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?	No, the accuracy of the proposed PLC is not stated in the PDD /3/. However, based on the on-site inspection, the PLC has the accuracy level of <10s. Based on it's expertise of verification team, the adopted accuracy level represents good monitoring practices.			
If applicable, has the reported data been cross-checked with other available data?	N/A			
How were the values in the monitoring report verified?	The values presented in the monitoring report /2/ and the emission reductions calculation spreadsheet /14/ have been verified against the original electronic data automatically stored in the Factory DataStorage (FDS) via PLC /16/, and all of them are accurately reported.			
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 well-organized CDM monitoring manual /41/ has been documented in place for the project. In addition, during the on-site assessment, the CDM training records /43/ and operational qualifications of the staff /44/ were checked valid to demonstrate the data management competence of CDM monitoring team.			
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?	N/A			

Table 13

MONITORING REQUIREMENT	PARAMETER	ASSESSMENT/OBSERVATION BY DOE
Data / Parameter: (as in monitoring plan of PDD):	PE <sub>flare</sub>	Project emissions from flaring of the residual gas stream in year y
Type of Monitoring		Not applicable. As per the applied methodology <i>ACM0001 version</i>



# VERIFICATION REPORT - vvs9.0

equipment	06 /5/, it is calculated following the procedures described in the <Tool to determine project emissions from flaring gases containing methane> /8/, i.e. $PE_{flare,y} = \sum TM_{RG,h} * (1 - \eta_{flare,h}) * GWP_{CH4} / 1000$
Measuring frequency/Time Interval:	N/A
Reporting frequency:	N/A
Monitored value:	5,485.78tCO <sub>2</sub> , detailed as reflected in the ER calculation spreadsheet /14/.
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	N/A
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?	N/A
If applicable, has the reported data been cross-checked with other available data?	N/A
How were the values in the monitoring report verified?	The values presented in the monitoring report /2/ and the emission reductions calculation spreadsheet /14/ have been verified against the original electronic data automatically stored in the Factory DataStorage (FDS) via PLC /16/, and all of them are accurately reported.
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 well-organized CDM monitoring manual /41/ has been documented in place for the project. In addition, during the on-site assessment, the CDM training records /43/ and operational qualifications of staff /44/ were checked valid to demonstrate the data management competence of CDM monitoring team.
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?	N/A

Table 14

MONITORING REQUIREMENT	PARAMETER	ASSESSMENT/OBSERVATION BY DOE
Data / Parameter: (as in monitoring plan of PDD):	$fv_{CH4, RG, h}$	Volumetric fraction of methane in the residual gas on dry basis in hour h





# VERIFICATION REPORT - vvs9.0

Type of Monitoring equipment	Item	Type	Accuracy Level	Serial No.
	Gas analyzer	XGF-4043	≤2%	0708404
Measuring frequency/Time Interval:	Continuously measured			
Reporting frequency:	Recorded every 5 minutes			
Monitored value:	Pls. refer to the ER calculation spreadsheets for specific values /14/.			
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency of continuously measurement and recording every 5 minutes is fully in accordance with the registered PDD /3/ and the monitoring methodology <i>ACM0001 version 06/5/</i> .			
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?	No, the accuracy of the proposed gas analyzer is not stated in the PDD /3/. However, based on the on-site inspection, the gas analyzer has the accuracy level of ≤2% and the adopted accuracy level is confirmed to be in compliance with the national standard of "Verification Regulation of Catalysis Combustion Type Methane Measuring Device (JJG678-2007)" /33/.			
If applicable, has the reported data been cross-checked with other available data?	N/A			
How were the values in the monitoring report verified?	The values presented in the monitoring report /2/ and the emission reductions calculation spreadsheet /14/ have been verified against the original electronic data automatically stored in the Factory DataStorage (FDS) via PLC /16/, and all of them are accurately reported.			
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 well-organized CDM monitoring manual /41/ has been documented in place for the project. In addition, during the on-site assessment, the CDM training records /43/ and operational qualifications of staff /44/ were checked valid to demonstrate the data management competence of CDM monitoring team.			
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?	N/A			

Table 15

MONITORING REQUIREMENT	PARAMETER	ASSESSMENT/OBSERVATION BY DOE
Data / Parameter: (as in monitoring plan of PDD):		FV <sub>RG,h</sub> / Volumetric flow rate of the residual gas in dry basis at normal conditions in the hour h



# VERIFICATION REPORT - vvsv9.0

Type of Monitoring equipment	Item	Type	Accuracy Level	Serial No.	Period
	Flow meter	Annubar 285	±2%	01746509	01/08/2014-05/09/2014
	Flow meter	Annubar 285	±2%	01746511	05/09/2014-30/06/2015
Measuring frequency/Time Interval:	Continuously measured				
Reporting frequency:	Recorded every 5 minutes, and aggregated hourly, daily, monthly and yearly				
Monitored value:	Variable				
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency of continuously measurement and recording every 5 minutes is fully in accordance with the registered PDD /3/ and the monitoring methodology <i>ACM0001 version 06/5/</i> .				
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?	No, the accuracy of the proposed flow meter is not stated in the PDD /3/. However, based on the on-site inspection, the gas flow meter has the accuracy level of ±2%, and the adopted accuracy level is confirmed to be in compliance with the national standard of "Regulation on the installation and management of energy measurement devices for energy using entities (GB/17167-2006)" /47/.				
If applicable, has the reported data been cross-checked with other available data?	N/A				
How were the values in the monitoring report verified?	The values presented in the monitoring report /2/ and the emission reductions calculation spreadsheet /14/ have been verified against the original electronic data automatically stored in the Factory DataStorage (FDS) via PLC /16/, and all of them are accurately reported.				
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 well-organized CDM monitoring manual /41/ has been documented in place for the project. In addition, during the on-site assessment, the CDM training records /43/ and operational qualifications of staff /44/ were checked valid to demonstrate the data management competence of CDM monitoring team.				
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?	N/A				

## 3.4.2 MONITORING RESPONSIBILITY



# VERIFICATION REPORT - vvs9.0

During the on-site visit, the verification team interviewed with the management representative and on-site operators /1/, 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/. And also one well organized CDM monitoring manual /41/ was found being documented in place for the monitoring of the project.

The monitoring personnel are well trained /43/ and have got relevant national operation qualifications /44/, 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 equipment has been installed in the project activity according to the monitoring plan in the registered PDD /3/.

The tables below summarize relevant specifications of monitoring equipments:

**Table 16**

<b>Monitoring Equipment:</b>	<b>Electricity meter</b>		
<b>Ownership:</b>	Electric power company		
<b>Location:</b>	The high voltage side of the project activity	The low voltage side of the project activity	
<b>Monitored parameter:</b>	EL <sub>LFG</sub>	EL <sub>PR</sub>	
<b>Serial number:</b>	8007472	<i>Electricity meter A</i> 010112300001515158	<i>Electricity meter B</i> 0103200019480
<b>Accuracy:</b>	0.5s	0.5s	1
<b>Frequency of calibration:</b>	5 years	5 years	5 years
<b>Calibration date:</b>	10/10/2013	17/07/2013	26/12/2013
<b>Validity of calibration:</b>	10/10/2013-09/10/2018	17/07/2013-16/07/2018	26/12/2013-25/12/2018
<b>Calibration certificate no.</b>	DC1310SY201	DC1312SY202	DC1312SY203
<b>Name of the certifier</b>	Northeast Electric Power Research Institute Co., Ltd. /27/		
<b>Relevant sectoral standard:</b>	Verification Regulation of Electrical Energy Meters with Electronics (JJG596-1999) /30/		
<b>Authority of the certifier and validity of certifier</b>	Certificate for Metrological Authorization to Northeast Electric Power Research Institute Co., Ltd., issued by General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China, (Guo) Fa Ji (2012)01038, dated 01/12/2012 and valid to 30/11/2017 /27/		

**Table 17**

<b>Monitoring Equipment:</b>	<b>Gas flow meter</b>					
<b>Ownership:</b>	The project owner					
<b>Location:</b>	Entrance of the main pipeline to the power plant		Entrance of the pipeline to the flare		Entrance of the main pipeline to all gas engines	
<b>Monitored parameter:</b>	LFG <sub>total,y</sub>		LFG <sub>flare,y</sub>		LFG <sub>electricity,y</sub>	
<b>Serial number:</b>	01726699		01746509	01746511	01746510	
<b>Accuracy:</b>	±0.9%		±2%	±2%	±2%	
<b>Frequency of calibration:</b>	Yearly		Yearly	Yearly	Yearly	
<b>Calibration date:</b>	09/09/2013	05/09/2014	09/09/2013	02/09/2014	09/09/2013	05/09/2014
<b>Validity of calibration:</b>	09/09/2013-08/09/2014	05/09/2014-04/09/2015	09/09/2013-08/09/2014	02/09/2014-01/09/2015	09/09/2013-08/09/2014	05/09/2014-04/09/2015



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<b>Name of the certifier</b>	Liaoning Provincial Institute of Measurement /29/
<b>Relevant sectoral standard:</b>	Verification Regulation of Differential Pressure Type Flowmeter (JJG640-1994) /32/
<b>Authority of the certifier and validity of certifier</b>	Laboratory accreditation certificate for Liaoning Provincial Institute of Measurement issued by China National Accreditation Service for Conformity Assessment, No. CNAS L0954, dated 06/06/2012 and valid to 05/06/2015

Table 18

<b>Monitoring Equipment:</b>	<b>Gas Analyzer</b>	
<b>Ownership:</b>	The project owner	
<b>Location:</b>	the main pipeline to the power plant	
<b>Monitored parameter:</b>	$w_{CH_4,y}$ and $f_{vCH_4,y}$	
<b>Serial number:</b>	0708404	
<b>Accuracy:</b>	$\leq 2\%$	
<b>Frequency of calibration:</b>	Yearly	
<b>Calibration date:</b>	31/08/2013	30/08/2014
<b>Validity of calibration:</b>	31/08/2013- 30/08/2014	30/08/2014-29/08/2015
<b>Calibration certificate no.</b>	Liao Ji 13051223986	
<b>Name of the certifier</b>	Liaoning Provincial Institute of Measurement /29/	
<b>Relevant sectoral standard:</b>	Verification Regulation of Catalysis Combustion Type Methane Measuring Device (JJG678-2007) /36/	
<b>Authority of the certifier and validity of certifier</b>	Laboratory accreditation certificate for Liaoning Provincial Institute of Measurement issued by China National Accreditation Service for Conformity Assessment, No. CNAS L0954, dated 06/06/2012 and valid to 05/06/2015	

<b>Monitoring Equipment:</b>	<b>N-type thermocouple</b>	
<b>Ownership:</b>	The project owner	
<b>Location:</b>	At the flare	
<b>Monitored parameter:</b>	$T_{flare}$	
<b>Serial number:</b>	/	
<b>Accuracy:</b>	$\pm 2.5^{\circ}C$	
<b>Frequency of calibration:</b>	Yearly replaced with same new one	
<b>Replacement date</b>	8/02/2014	29/12/2014
<b>Validity of replacement</b>	18/02/2014- 17/02/2015	29/12/2014- 28/12/2015
<b>Relevant sectoral standard:</b>	Verification Regulation of Working Base Metal Thermocouple (JJG351-1996) /34/	
<b>Others</b>	For the monitoring of temperature in exhaust gas of enclosed flare, in order to ensure the measurement accuracy of N-type thermocouple, the project owner conservatively adopted the procedures to replace yearly with same new thermocouple, which is verified to be fully in compliance with the registered PDD /3/.	

In summary, the verification team is able to verify that the accuracy of the monitoring equipments were set according to relevant sectoral standard /30/ /31/ /32/ /33/ /34/.

Furthermore, all calibration procedures were carried out according to the monitoring plan in the registered PDD /3/, and the calibration validity of all monitoring equipments is confirmed to effectively cover the monitoring period from 01 August 2014 to 30 June 2015. Therefore, accuracy of monitoring equipments is assured. The verification took cognizance para.384 of VVS Version 9.0.



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## 3.4.4 DEVIATION FROM AND/OR REVISION OF THE REGISTERED MONITORING PLAN

Not applicable.

**Opinion:** On the basis of above discussion and in-line with the requirement of §379 – §383 of VVSV9.0; verification team confirms that:

- The monitoring activities for the project activity have been carried out in accordance with the monitoring plan contained in the registered CDM PDD.
- All monitoring parameters required by the monitoring plan have been sufficiently monitored and correctly listed;
- Information flow (from data generation, aggregation, to recording, calculation and reporting) for each parameter has been verified and found to be appropriate.

## 3.5. ASSESSMENT OF DATA AND CALCULATION OF EMISSION REDUCTIONS [§401]

According to the applied methodology ACM0001 version 06 /5/, no leakage effects need to be accounted under this methodology. Thus, the emission reductions during the monitoring period are determined as follows:

$$ER_y = BE_y - PE_y$$

Where:

$ER_y$  = Emission reductions in year  $y$  (tCO<sub>2</sub>e/yr)

$BE_y$  = Baseline emissions in year  $y$  (tCO<sub>2</sub>e/yr)

$PE_y$  = Project emissions in year  $y$  (tCO<sub>2</sub>/yr)

### 3.5.1. COMPLETENESS OF MONITORING DATA

A complete set of data records for the monitoring parameter as stated in the monitoring report /2/ from 01 August 2014 to 30 June 2015 are available for verification /15/ /16/ /17/ /18/.

Table 19 Amount of methane that would have been destroyed/combusted by the project (tCH<sub>4</sub>)

LFG <sub>total,y</sub> , Nm <sup>3</sup>	LFG <sub>flare,y</sub> , Nm <sup>3</sup>	LF <sub>Gelectricity,y</sub> , Nm <sup>3</sup>
15,524,848	5,805,508	9,756,850

To be conservative, the minimum of LFG<sub>total,y</sub> and sum of (LFG<sub>flare,y</sub> + LFG<sub>electricity,y</sub>) was used for gross ER from CH<sub>4</sub> destruction.

Table 20 Electricity supplied to the grid by the project

Start Date	End Date	Records data on the electricity exported to the grid [kWh]	Electricity transaction notes [kWh]	Min(records data, ETNs)
01/08/2014	01/09/2014	1,312,200	1,310,000	1,310,000
01/09/2014	01/10/2014	1,292,320	1,290,000	1,290,000
01/10/2014	01/11/2014	1,360,720	1,360,000	1,360,000
01/11/2014	01/12/2014	1,257,760	1,260,000	1,257,760
01/12/2014	01/01/2015	1,124,880	1,130,000	1,124,880
01/01/2015	01/02/2015	1,267,000	1,270,000	1,267,000



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01/02/2015	01/03/2015	1,255,560	1,260,000	1,255,560
01/03/2015	01/04/2015	1,543,320	1,540,000	1,540,000
01/04/2015	01/05/2015	1,373,960	1,370,000	1,370,000
01/05/2015	01/06/2015	1,232,840	1,230,000	1,230,000
01/06/2015	01/07/2015	1,304,960	1,300,000	1,300,000
Total		14,305.200 MWh		

Table 21 *Electricity imported from the grid by the project*

Start Date	End Date	Electricity meter A		
		Records data on the electricity imported from the grid [kWh]	Electricity transaction notes [kWh]	Max(records data, ETNs) [kWh]
17/07/2014	13/08/2014	36,700	37,268	37,268
13/08/2014	15/09/2014	25,400	25,906	25,906
15/09/2014	15/10/2014	27,900	28,410	28,410
15/10/2014	15/11/2014	29,900	30,417	30,417
15/11/2014	15/12/2014	22,600	23,082	23,082
15/12/2014	12/01/2015	17,800	18,265	18,265
12/01/2015	08/02/2015	24,100	24,585	24,585
08/02/2015	15/03/2015	23,300	23,782	23,782
15/03/2015	16/04/2015	34,400	34,395	34,400
16/04/2015	20/04/2015	300	305	305
20/04/2015	15/05/2015	30,300	30,817	30,817
15/05/2015	15/06/2015	41,681	42,283	42,283
15/06/2015	15/07/2015	38,825	39,414	39,414
Subtotal		358.934 MWh		

The verification team checked the electricity exported to the grid ( $EL_{LFG}$ ) and the electricity imported from the grid ( $EL_{PR}$ ) with ETNs from the grid company /19/, and confirmed that all of reported data are appropriate and conservative, i.e. the smaller value between the data records and the ETNs is taken as  $EL_{LFG}$  each month, while the bigger value between the data records and the ETNs is taken as  $EL_{PR}$  each month.

Especially for the  $EL_{PR}$  monitoring of both first month and last month, considering the power company didn't record the electric meter reading on the fixed date of each month, thus PP directly took the monitoring data from 17/07/2014 to 13/08/2014 as the electricity consumption for period of 01/08/2014 to 13/08/2014; the monitoring data from 15/06/2015 to 15/07/2015 as the electricity consumption from 15/06/2015 to 01/07/2015 respectively, both of which are considered most conservative assumption for the emission reductions calculation.

The verification team checked all monitoring parameters data relevant to how to determine methane destroyed by the project activities /16/, and considered that they are accurately applied for the calculation of emission reductions in line with the applied methodology "Consolidated baseline methodology for landfill gas project activities" /5/.





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**Opinion:** In-line with §392 (a) of VVSv9.0; for all the parameters mentioned above, verification team has thoroughly checked all the data for the monitoring period under verification. During the course of verification, it has been observed that the complete set of data is available and monitored in accordance with the registered Monitoring Plan.

## 3.5.2. DATA FLOW

The readings for flow rate, methane fraction of the LFG (normalized by the temperature, pressure) and electricity imports and exports have been continually measured, hourly and/or daily recorded, and aggregated monthly on monthly basis /14/ /15/ /16/ /17/ /18/. Paired values of the methane fraction of the landfill gas and LFG flow which are averaged for the same time interval have been used in the calculation of emission reductions /16/ /17/.

The electricity exported to and imported from the Grid was measured by electricity meters, continually measured, hourly and/or daily recorded, and aggregated monthly on monthly basis /15/.

As per the monitoring plan and internal procedures, all the monitoring data collected are archived electronically basis /14/ /15/ /16/ /17/ /18/.

**Opinion:** In-line with §392(b) of VVSv9.0; verification team confirms that:

- Data used for the determination of the emission reductions are available and monitored in accordance with the monitoring plan contained in the registered PDD /3/.
- Information and data provided in the monitoring report have been cross-checked with various sources mentioned in the table above and found the same to be consistent with the data presented in the monitoring report.

## 3.5.3. CALCULATION OF EMISSION REDUCTIONS [§280 (C)]

Verification team, in accordance with the applied methodology ACM0001 version 06 /5/ and where applicable, the standardised baseline, undertook the evaluation of calculations applied in order to calculate the emission reductions during the current monitoring period.

$$ER_y = (MD_{project,y} - MD_{reg,y}) * GWP_{CH_4} + EL_{LFG} * CEF_{elec,BL,y} - EL_{PR,y} * CEF_{elec,BL,y} + ET_{LFG,y} * CEF_{ther,BL,y} - ET_{PR,y} * CEF_{ther,PR,y}$$

For this project, there are no thermal energy produced and no fossil fuel consumption, verified on-site and by interviews with PP. Thus,  $ET_{LFG,y}=0$  and  $ET_{PR,y}=0$

Where:

$ER_y$  = Emissions reduction in tCO<sub>2</sub>e

$MD_{project,y}$  = The amount of methane that would have been destroyed/combusted during the year, in tonnes of methane (tCH<sub>4</sub>) in project scenario

$MD_{reg,y}$  = The amount of methane that would have been destroyed/combusted during the year in the absence of the project due to regulatory and/or contractual requirement, in tonnes of methane (tCH<sub>4</sub>)

$GWP_{CH_4}$  = Global Warming Potential value for methane is 25 tCO<sub>2</sub>e/tCH<sub>4</sub> as per EB's latest guidance.

$EL_{LFG}$  = Net quantity of electricity produced using LFG, which in the absence of the project activity would have been produced by power plants connected to the grid during year y, in megawatt hours (MWh)

$CEF_{elec,BL,y}$  = CO<sub>2</sub> emissions intensity of the baseline source of electricity displaced, in tCO<sub>2</sub>e/MWh

$EL_{PR,y}$  = Amount of electricity imported from the grid, in megawatt hours (MWh)

### a) Calculation of $MD_{reg,y}$

$$MD_{BL,y} = MD_{project,y} * AF$$





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As per *ACM0001 version 06*, this parameter is required for any changes to the adjustment factor (AF) or directly  $MD_{BL,y}$  at renewal of the crediting period. Relevant regulations for LFG project activities shall be updated at renewal of each credit period.

The project was registered on 25 December 2008. As per the registered PDD, there is no contractual requirement, and the local and national mandatory regulations are not enforced to be implemented for destruction of certain amounts of methane from landfills. AF will be monitored during the whole crediting period and shall be updated at the renewal of each crediting period. For the selected monitoring period from 01 August 2014 to 30 June 2015, verification team is able to confirm that no changes happened to the Chinese regulatory requirements relating to landfill gas which has impacts on parameters monitored during this crediting period. Therefore, AF remains zero. Thus,  $MD_{BL,y} = 0$ .

## b) Calculation of $MD_{project,y}$

$$MD_{project,y} = MD_{electricity,y} + MD_{flared,y}$$

$$MD_{electricity,y} = LFG_{electricity,y} * \omega_{CH_4,y} * D_{CH_4}$$

Where:

$MD_{electricity,y}$  = Quantity of methane destroyed by generation of electricity (tCH<sub>4</sub>)

$LFG_{electricity,y}$  = Quantity of LFG fed into electricity generator (m<sup>3</sup>)

$\omega_{CH_4,y}$  = Average methane fraction of the LFG as measured during year y and expressed as a fraction (in m<sup>3</sup>CH<sub>4</sub>/m<sup>3</sup>LFG)

$D_{CH_4}$  = Methane density expressed in tonnes of methane per cubic meter of methane (tCH<sub>4</sub>/m<sup>3</sup>CH<sub>4</sub>)

$$MD_{flared,y} = (LFG_{flare,y} * \omega_{CH_4,y} * D_{CH_4}) - (PE_{flare,y} / GWP_{CH_4})$$

Where:

$MD_{flared,y}$  = Quantity of methane destroyed by flaring (tCH<sub>4</sub>)

$LFG_{flare,y}$  = Quantity of LFG fed to the flare(s) during year y measured in cubic meters (m<sup>3</sup>)

$PE_{flare,y}$  = Project emissions from flaring of the residual gas stream in year y (tCO<sub>2</sub>e) determined following the procedure described in the *Tool to determine project emissions from flaring gases containing Methane* /8/.

$$PE_{flare,y} = \sum TM_{RG,h} * (1 - \eta_{flare,h}) * GWP_{CH_4} / 1000$$

Where:

$TM_{RG,h}$  = Mass flow rate of methane in the exhaust gas of the flare on dry basis at normal

$\eta_{flare,h}$  = Flare efficiency in hour

$GWP_{CH_4}$  = Global Warming Potential of methane valid for the 2<sup>nd</sup> commitment period, 25 tCO<sub>2</sub>e/tCH<sub>4</sub>

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

Where:

$FV_{RG,h}$  = Volumetric flow rate of the residual gas on dry basis at normal conditions in the hour h, m<sup>3</sup>/h

$fV_{CH_4,RG,h}$  = Volumetric fraction of methane in the residual gas on dry basis in hour h

$\rho_{CH_4,n}$  = Density of methane at normal conditions (0.716), kg/m<sup>3</sup>



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As demonstrated in the section 3.5 of the report, in the monitoring activities, the monitoring records of parameters  $LFG_{flare,y}$  and  $\omega_{CH_4}$  can be used as the monitoring data of  $FV_{RG,h}$  and  $fV_{CH_4,RG,h}$  respectively for the calculation of  $PE_{flare,y}$ , as the monitoring requirements of latter 2 parameters can be met with the monitoring procedures of former 2 parameters.

Verification team is able to confirm that the formulas and emission factors used are consistent with the registered PDD and the applied methodologies. In the above formulas, to be conservative, the minimum of  $LFG_{total,y}$  and sum of  $(LFG_{flare,y} + LFG_{electricity,y})$  was used for emission reductions from  $CH_4$  destruction.  $LFG_{total,y}$ ,  $LFG_{flare,y}$ ,  $LFG_{electricity,y}$  and  $\omega_{CH_4,y}$  have been aggregated and reported. The value of  $D_{CH_4}$  ( $\rho_{CH_4,n}$ ) is at normal conditions is  $0.0007168 \text{ tCH}_4/\text{m}^3\text{CH}_4$  according to tool to determine project emissions from flaring gases containing methane /8/.

## c) $EL_{LFG}$

As per the registered PDD /3/, electricity generated by the project is supplied to the NEPG.

The electricity exports to the grid during the monitoring period from 01 August 2014 to 30 June 2015 was derived from the continuous monitoring data of main meter M1 installed at the project site, which has been verified against the power purchase agreement /40/. The emission reductions calculation spreadsheet /14/ has been provided by the project participant and the amount of electricity exported to the grid has been cross-checked against and the Electricity Transaction Notes (ETNs) issued by the grid company /19/.

According to the registered PDD /3/, the baseline emission factor of the project ( $CEF_{elec,BL,y}$ ) is fixed *ex-ante* as  $1.05176 \text{ tCO}_2\text{e/MWh}$  for the first crediting period.

The emissions from electricity consumption ( $PE_{EC,y} = EL_{PR,y} * CEF_{elec,BL,y} (1 + TDL_y)$ ) will be calculated following the latest version of "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" /7/.

$$PE_{EC,y} = EL_{PR} * CEF_{elec,BL,y} * (1 + TDL_y)$$

Where:

$PE_y$  = Project emissions from consumption of electricity by the project activity during the year  $y$  ( $\text{tCO}_2\text{e/yr}$ );

$EL_{PR}$  = Onsite consumption of electricity provided by the NEPG and attributable to the project activity during the year  $y$  if any (MWh);

$TDL_y$  = Average technical transmission and distribution losses in the NEPG in year  $y$  for the voltage level at which electricity is obtained from the grid at the project site. Default value is 0%.

$CEF_{elec,BL,y}$  =  $\text{CO}_2$  emissions intensity of the baseline source of electricity displaced, in  $\text{tCO}_2\text{e/MWh}$ ;

The electricity imports from the grid during the monitoring period from 01 August 2014 to 30 June 2015 was derived from the continuous monitoring data of main meter M1 installed at the project site, which has been verified against the power purchase agreement /40/. The emission reductions calculation spreadsheet /14/ has been provided by the project participant and the amount of electricity imported from the NEPG by the project has been cross-checked against the electricity purchase receipts issued by the grid company /19/. The quantity of electricity imported to the project is calculated as  $358.934 \text{ MWh}$ .

Therefore, the project emissions in the selected monitoring period are as follows:



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$$PE_{EC,y} = EL_{PR} * CEF_{elec,BL,y} * (1 + TDL_y)$$

$$= 358.934 * 1.05176 * (1 + 0\%) = 378 \text{ tCO}_2\text{e}$$

## Emission reduction

According to the applied methodology *ACM0001 version 06*, emission reductions are:

$$BE_y = (MD_{project,y} - MD_{BL,y}) * GWP_{CH4} + EL_{LFG} * CEF_{elec,BL,y} - EL_{PR,y} * CEF_{elec,BL,y}$$

$$= 141,074 + 14,305.200 * 1.05176 - 378 = 155,741 \text{ tCO}_2\text{e}$$

PJRCES confirms that the calculation method of the emission reductions in the monitoring report and ER calculation spreadsheet /14/ is in compliance with the registered PDD /3/ and *ACM0001 version 06*.

$$ER_{y, \text{upto } 31/12/2012} = 0 \text{ tCO}_2\text{e}$$

$$ER_{y, \text{from } 01/01/2013} = 155,741 \text{ tCO}_2\text{e}$$

BASILINE EMISSIONS (tCO <sub>2</sub> e)	PROJECT EMISSIONS (tCO <sub>2</sub> e)	LEAKAGE EMISSIONS (tCO <sub>2</sub> e)	EMISSION REDUCTIONS (tCO <sub>2</sub> e)
156,119	378	0	155,741

Total Year-Wise emission reductions:

Period	Emission Reductions (tCO <sub>2</sub> e)
Up to 31 December 2012	0
From 1 January 2013 onwards	155,741

**Opinion:** Verification team, in-line with §392(c) and §392(d) of VVS9.0; confirms that formulae, assumptions and default emission factors used in the emission reduction calculation are reasonable and are in line with the approved monitoring methodology and where applicable, the standardised baseline and the monitoring plan and therefore, leads to the conservative estimation of emission reductions.

### 3.5.4. COMPARISON BETWEEN ESTIMATE AND ACTUAL EMISSION REDUCTION

According to the “project standard” /10/, the MR contains the comparison of the actual emission reduction claimed in the monitoring period with the annual estimate in the registered PDD /3/.

Estimated Emission Reduction as per Registered/Approved PDD:	The estimation of emission reduction for the monitoring period from 01 August 2014 to 30 June 2015 (153 days) is correctly calculated as 136,480 tCO <sub>2</sub> e (=142,354 tCO <sub>2</sub> e /365days*153 days+154,891 tCO <sub>2</sub> e /365days*181) as per the estimation made in the registered PDD /3/.
Actual Emission Reduction for the Monitoring Period	The actual emission reduction has been verified as 155,741 tCO <sub>2</sub> e for the same period.
Is any increase of CER' s	The actual emission reduction is bigger than average estimated ER (136,480 tCO <sub>2</sub> e) of this period. This is due



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occurred?	to the adoption of 25 for $GWP_{CH_4}$ of methane, when 21 $GWP_{CH_4}$ was used /20/, the emission reduction is 133,169 tCO <sub>2</sub> e, lower than that of estimated.
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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 VVSv9.0.

## 3.6. POST REGISTRATION CHANGES

### 3.6.1. TEMPORARY DEVIATION FROM REGISTERED MONITORING PLAN AND/OR MONITORING METHODOLOGY AND/OR STANDARDISED BASELINE [§286 – §291]

There were no temporary deviations from the project activity as described in registered PDD /3/

### 3.6.2. CORRECTIONS [§292]

There were no permanent changes from the registered monitoring plan and applied methodology in this monitoring period.

### 3.6.3. CHANGES IN THE START DATE OF CREDITING PERIOD [§295]

There were no changes in the start date of crediting period.

**Opinion:** In-line with §410, VVSv9.0; verification team was able to confirm that:

- change in the start date of the crediting period is in accordance with section 12.8 of CDM Project Standard /10/;
- Proposed changes results in conservative estimation of the baseline.

## 3.7. APPLICATION OF MATERIALITY IN VERIFICATION

In order to detect errors, omissions or misstatements in emission reductions or removals being claimed by project participants in the monitoring report, the materiality have been applied by PJRCES in verification based on VVS v9.0.

- (a) The project is a large-scale CDM project activity achieving total emission reductions of <300,000 tons of CO<sub>2</sub>e per year; as such, a 2 per cent materiality thresholds is applied.
- (b) In planning the verification, PJRCES is able to understand the environment in which the project activity operates, the sources of project emissions within the project boundary and the leakage, the monitoring activities, the equipment used to monitor or measure activity data, the origin and application of data used to calculate or measure the emissions, data flow, the internal quality control system, and the overall organization with respect to monitoring and reporting.
- (c) In conducting the verification, the risk assessment has been conducted by the verification team during the on-site physical inspection. Based on the site visit, verification team is able to confirm that the quality controls on the data management have been effectively performed /41/ /43/ /44/. The use of spreadsheets /14/ shows the adequate controls related to data updates, version tracking, traceability and security. In order to make sure the accuracy of monitoring data, the calibration of the meters has been conducted by the accredited third-party organizations in accordance with the relevant calibration standards.
- (d) During the course of the verification, no errors related to the materiality threshold of 2 per cent have been identified in the data set.



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PJRCES confirms that the claimed emission reductions are free from material errors, omissions or misstatements, with a reasonable level of assurance, and proceeds with the verification as defined in the verification plan.

## 3.8. MANAGEMENT SYSTEM AND QUALITY ASSURANCE

Based on the site visit, the management system for the project operations is in place. The management of the project activity has implemented a quality management system to monitor the performance and ability of the project to deliver the emission reductions. Monitoring Manual /41/ is established with detailed responsibility allocated. In the manual, the organization structure with the responsibilities, personnel competencies, monitoring procedure and monitoring management have been properly identified and put in place. By interviewing with some staff, site visit and records check, it can be confirmed that the monitoring management system is implemented following the Monitoring Manual /41/.

As per paraphrase 380 (b)-iv of VVS version 9.0, PJRCES confirms that the responsibilities and authorities in the management and operational system for monitoring and reporting are in accordance with the responsibilities and authorities stated in the monitoring plan in registered PDD /3/.

## 3.9. DEFAULT/FIXED VALUES

The ex-ante parameters are summarized in the below Table:

**Table 22**

PARAMETER	ASSESSMENT
Default values used:	1.05176 tCO <sub>2</sub> e/MWh for CEF <sub>elec,y</sub>
Source and Verification of the source	The default value used for CEF <sub>elec,y</sub> can be verified correct by checking following sources, - registered PDD (Version 03, dated 16 June 2008) /3/;

**Table 23**

PARAMETER	ASSESSMENT
Default values used:	25 tCO <sub>2</sub> /tCH <sub>4</sub> for GWP <sub>CH<sub>4</sub></sub>
Source and Verification of the source	This is sourced from UNFCCC from year 2013 as per EB's guidance for conservative consideration.

**Table 24**

PARAMETER	ASSESSMENT
Default values used:	0.0007168tCH <sub>4</sub> /m <sup>3</sup> CH <sub>4</sub> for ρ <sub>CH<sub>4</sub>,n,h</sub>
Source and Verification of the source	The default value used for ρ <sub>CH<sub>4</sub>,n,h</sub> can be verified correct by checking following sources, - registered PDD (Version 03, dated 16 June 2008) /3/; - Tool to determine project emissions from flaring gases containing methane /8/.

**Table 25**

PARAMETER	ASSESSMENT
Default values used:	No impact on parameters monitored during the current crediting period for "Law and regulations about waste management systems in China"
Source and Verification of the source	The default value can be verified correct by checking following sources, - registered PDD (Version 03, dated 16 June 2008) /3/; - GB16889-1997 and GB16889-2008 /39/.



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According to the description in section B.6.3 of registered PDD /3/, the emission factor of the project is determined ex-ante and fixed at 1.05176 tCO<sub>2</sub>e/MWh for the first crediting period, which was applied consistently in this monitoring period.

$\rho_{\text{CH}_4, \text{n,h}}$  of 0.0007168 tCH<sub>4</sub>/m<sup>3</sup>CH<sub>4</sub> are confirmed to be in compliance with monitoring plan of the registered PDD /3/.



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## 4. VERIFICATION OPINION

PJRCES has performed the verification of the emission reductions that have been reported for the “Shenyang Laohuchong LFG Power Generation Project” in “China” during the period from 01 August 2014 to 30 June 2015. The project is registered CDM project with UNFCCC Registration Reference No. 1906 on 25 December 2008.

The project participants are responsible for the collection of data and reporting the GHG emission reductions on the basis set out within the project’s monitoring plan in the registered PDD and the applied methodology “Consolidated baseline methodology for landfill gas project activities” ACM0001 version 06.

PJRCES’s verification approach basically included the desk review of the project design (as stated in the registered CDM PDD), site verification of reported emission and resolution of outstanding issues and issuance of final verification report. PJRCES also requested for the evidences, relevant information and explanations that were considered necessary to give a reasonable assurance for the reported emission reductions during the period from 01 August 2014 to 30 June 2015.

In PJRCES’s opinion, the GHG emission reductions for the “Shenyang Laohuchong LFG Power Generation Project in “China” are fairly stated in the monitoring report, version 03 dated 31 August 2015. The GHG emission reductions were calculated correctly on the basis of the baseline and monitoring methodology “Consolidated baseline methodology for landfill gas project activities” ACM0001 version 06 and ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”, Version 6, and monitoring plan as included in the registered PDD.

Based on the information provided and verified, PJRCES is able to certify the following statement:

Report Period: From 01 August 2014 to 30 June 2015

Verified GHG emission reductions or removals in the above reporting period:

Emission Reductions	tCO <sub>2</sub> e
Baseline Emissions	156,119
Project Emissions	378
Leakage	0
<b>Net GHG emission reductions or removals</b>	<b>155,741</b>

Total Year-Wise emission reductions:

Period	Emission Reductions (tCO <sub>2</sub> e)
Before 31 December 2012	0
01 January 2013 - upward	155,741
01 August 2014 to 30 June 2015	155,741

Zhang Xiao Jun  
Johnsen.

Lead Verifier

PJRCES  
China

Final Approver

PJRCES  
USA





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## 5. REFERENCES

**Type 1:** Documents that are related directly to the emission reductions verified during verification period under consideration:

No.	Type of document.
/2/	Asja Renewables (shenyang) Co., Ltd: Monitoring Report for Shenyang Laohuchong LFG Power Generation Project, Monitoring Period: 01 August 2014 to 30 June 2015, version 01 dated 15 July 2015 and final version 03 dated 31 August 2015.
/3/	Asja Ambiente Italia A.p.A.: <i>Registered Project Design Document (PDD) for the Shenyang Laohuchong LFG Power Generation Project</i> , Version 03, dated 16 June 2008.
/4/	DNV: <i>CDM Validation report for the Shenyang Laohuchong LFG Power Generation Project</i> , Report No. 2008-9050, Version 01, dated 30 June 2008.
/5/	CDM Executive Board: " <i>Consolidated baseline methodology for landfill gas project activities</i> ", ACM0001 version 06.
/6/	ACM0002 " <i>Consolidated baseline methodology for grid-connected electricity generation from renewable sources</i> ", Version 6, EB 24, Annex 7, dated 12/05/2006
/7/	"Tool to calculate baseline, project and/or leakage emissions from electricity consumption"
/8/	Tool to determine project emissions from flaring gases containing methane
/9/	CDM Executive Board: <i>Clean Development Mechanism Validation and Verification Standard</i> , Version 9.0, 20 February 2015 <a href="https://cdm.unfccc.int/filestorage/e/x/t/extfile-20150225165216290-accr_stan02.pdf/accr_stan02.pdf?t=U258bm5sZzZvfDAemtFM1VNEYw67jhUNPldf">https://cdm.unfccc.int/filestorage/e/x/t/extfile-20150225165216290-accr_stan02.pdf/accr_stan02.pdf?t=U258bm5sZzZvfDAemtFM1VNEYw67jhUNPldf</a>
/10/	CDM Executive Board: Project Standard version 09.0 CDM-EB65-A05-STAN 20 February 2015 <a href="http://cdm.unfccc.int/filestorage/e/x/t/extfile-20150225165200470-reg_stan01.pdf/reg_stan01.pdf?t=Nm18bm5sZHNhfDBeBudn0QNzNG5AeSg4rspj">http://cdm.unfccc.int/filestorage/e/x/t/extfile-20150225165200470-reg_stan01.pdf/reg_stan01.pdf?t=Nm18bm5sZHNhfDBeBudn0QNzNG5AeSg4rspj</a>
/11/	CDM Executive Board: Instructions for filling out the monitoring report form (Version 05.1) <a href="http://cdm.unfccc.int/Reference/index.html">http://cdm.unfccc.int/Reference/index.html</a>
/12/	Verification and monitoring reports for previous 3 monitoring periods via <a href="http://cdm.unfccc.int/Projects/DB/DNV-CUK1214898000.95/view">http://cdm.unfccc.int/Projects/DB/DNV-CUK1214898000.95/view</a>
/13/	TUV Rheinland (China) Ltd. 1 <sup>st</sup> , 2 <sup>nd</sup> and 3 <sup>rd</sup> verification reports <a href="http://cdm.unfccc.int/Projects/DB/DNV-CUK1214898000.95/view">http://cdm.unfccc.int/Projects/DB/DNV-CUK1214898000.95/view</a>
/14/	Asja Renewables (shenyang) Co., Ltd: <i>Emission reduction calculation spreadsheet for the Shenyang Laohuchong LFG Power Generation Project during the monitoring period from 01 August 2014 to 30 June 2015</i> , 4 August 2014.
/15/	Shenyang Laohuchong Municipal Solid Waste Management Co., Ltd. Electricity monitoring data records covering the monitoring period, from 01 August 2014 to 30 June 2015.
/16/	Landfill gas flow monitoring data records covering the monitoring period from 01 August 2014 to 30 June 2015.
/17/	Monitoring data records on the methane fraction in the landfill gas covering the monitoring period from 01 August 2014 to 30 June 2015.
/18/	Monitoring data records on the gas engine working hours, flare working hours and temperature of flare exhaust gas covering the monitoring period from 01 August 2014 to 30 June 2015.
/19/	Liaoning Power Grid Corporation: Electricity transaction notes covering the monitoring period from 01 August 2014 to 30 June 2015.
/20/	2006 IPCC Guidelines for National Greenhouse Gas Inventories
/21/	Electric line diagram of Shenyang Laohuchong LFG Power Generation Project



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/22/	Calibration certificate of electric meters issued by covering the monitoring period from 01 August 2014 to 30 June 2015, details as following, <table><tr><th>Serial No.</th><th>Accuracy Level</th><th>Certificate No.</th><th>Validity</th><th>Calibration Entity</th></tr><tr><td>8007472</td><td>0.5s</td><td>DC1310S Y201</td><td>10/10/2013-09/10/2018</td><td rowspan="3">Northeast Electric Power Research Institute Co., Ltd.</td></tr><tr><td>010112300001515158</td><td>0.5s</td><td>DC1312S Y202</td><td>17/07/2013-16/07/2018</td></tr><tr><td>0103200019480</td><td>1</td><td>DC1312S Y203</td><td>26/12/2013-25/12/2018</td></tr></table>	Serial No.	Accuracy Level	Certificate No.	Validity	Calibration Entity	8007472	0.5s	DC1310S Y201	10/10/2013-09/10/2018	Northeast Electric Power Research Institute Co., Ltd.	010112300001515158	0.5s	DC1312S Y202	17/07/2013-16/07/2018	0103200019480	1	DC1312S Y203	26/12/2013-25/12/2018
Serial No.	Accuracy Level	Certificate No.	Validity	Calibration Entity															
8007472	0.5s	DC1310S Y201	10/10/2013-09/10/2018	Northeast Electric Power Research Institute Co., Ltd.															
010112300001515158	0.5s	DC1312S Y202	17/07/2013-16/07/2018																
0103200019480	1	DC1312S Y203	26/12/2013-25/12/2018																
/23/	Calibration certificate of gas flow meters issued by Liaoning Provincial Institute of Measurement covering the monitoring period from 01 August 2014 to 30 June 2015, details as following, <table><tr><th>Serial No.</th><th>Accuracy Level</th><th>Validity</th></tr><tr><td rowspan="2">01726699</td><td rowspan="2">±0.9%</td><td>09/09/2013- 08/09/2014</td></tr><tr><td>05/09/2014-04/09/2015</td></tr><tr><td>01746509</td><td>±2%</td><td>09/09/2013- 08/09/2014</td></tr><tr><td>01746511</td><td>±2%</td><td>02/09/2014- 01/09/2015</td></tr><tr><td rowspan="2">01746510</td><td rowspan="2">±2%</td><td>09/09/2013- 08/09/2014</td></tr><tr><td>05/09/2014-04/09/2015</td></tr></table>	Serial No.	Accuracy Level	Validity	01726699	±0.9%	09/09/2013- 08/09/2014	05/09/2014-04/09/2015	01746509	±2%	09/09/2013- 08/09/2014	01746511	±2%	02/09/2014- 01/09/2015	01746510	±2%	09/09/2013- 08/09/2014	05/09/2014-04/09/2015	
Serial No.	Accuracy Level	Validity																	
01726699	±0.9%	09/09/2013- 08/09/2014																	
		05/09/2014-04/09/2015																	
01746509	±2%	09/09/2013- 08/09/2014																	
01746511	±2%	02/09/2014- 01/09/2015																	
01746510	±2%	09/09/2013- 08/09/2014																	
		05/09/2014-04/09/2015																	
/24/	Calibration certificate of gas analyzer issued by Liaoning Provincial Institute of Measurement covering the monitoring period from 01 August 2014 to 30 June 2015, details as following, <table><tr><th>Serial No.</th><th>Accuracy Level</th><th>Validity</th></tr><tr><td>0708404</td><td>≤2%</td><td>31/08/2013- 30/08/2014</td></tr></table>	Serial No.	Accuracy Level	Validity	0708404	≤2%	31/08/2013- 30/08/2014												
Serial No.	Accuracy Level	Validity																	
0708404	≤2%	31/08/2013- 30/08/2014																	
/25/	Certificates of new thermocouples covering the monitoring period from 01 August 2014 to 30 June 2015, details as following, <table><tr><th>Type</th><th>Quality check date</th><th>Replacement date</th><th>Validity</th></tr><tr><td>WRMK-331</td><td>January 2014</td><td>18/02/2014</td><td>18/02/2014-17/02/2015</td></tr></table>	Type	Quality check date	Replacement date	Validity	WRMK-331	January 2014	18/02/2014	18/02/2014-17/02/2015										
Type	Quality check date	Replacement date	Validity																
WRMK-331	January 2014	18/02/2014	18/02/2014-17/02/2015																
/26/	China National Accreditation Service for Conformity Assessment: Certificate of Metrological Authorization to The Metrological Verification Institution for the Power Metrology Institute of Shenyang Power Supply Company No. CNAS L1064, dated 04/01/2007 and valid to 03/01/2010.																		
/27/	General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China, Certificate of Metrological Authorization to Northeast Electric Power Research Institute Co., Ltd., (Guo) Fa Ji (2012)01038, dated 01/12/2012 and valid to 30/11/2017.																		
/28/	Certificate of Metrological Authorization to Su Jiatun Agro electricity Bureau Calibration and Testing Center issued by Administration of Quality Supervision, Inspection and Quarantine of Shenyang, (Shen) Fa Ji (2007) 011, dated 11/01/2007 and valid to 10/01/2010																		
/29/	Laboratory accreditation certificate for Liaoning Provincial Institute of Measurement issued by China National Accreditation Service for Conformity Assessment, No. CNAS L0954, dated 06/06/2012 and valid to 05/06/2015																		
/30/	Verification Regulation of Electrical Meters for Measuring Alternating-current Electrical Energy (JJG596-1999) issued by General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China, valid from 15/03/2000																		
/31/	Verification Regulation of Electrical Meters for Measuring Alternating-current Electrical Energy (JJG596-2012) issued by General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China, valid from 08/04/2013																		



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/32/	Verification Regulation of Differential Pressure Type Flowmeter (JJG640-1994) issued by General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China, valid from 01/12/1994
/33/	Verification Regulation of Catalysis Combustion Type Methane Measuring Device (JJG678-2007) issued by General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China, valid from 21/02/2008
/34/	Verification Regulation of Working Base Metal Thermocouple (JJG351-1996) issued by China National Technical Supervision Bureau, valid from 01/03/1997
/35/	Statement on the operation start date of #1, #2 and #3 power generating sets for Shenyang Laohuchong LFG Power Generation Project issued by Shenyang Sujiatun Power Supply Branch of Liaoning Electric Power Co., Ltd., dated 25/06/2010
/36/	Operation log indicating the operation of #4 and #5 power generating sets, dated 27/03/2012
/37/	Flare installation acceptance report, dated 20/10/2007
/38/	Business license of Shenyang Laohuchong LFG Power Generation Project issued by Shenyang Administrator for Industry & Commerce, Registration No.2101001108016(1-1), dated 23/06/2005
/39/	Standard for pollution control on the landfill site of municipal solid waste, GB16889-1997 Standard for pollution control on the landfill site of municipal solid waste, GB16889-2008
/40/	Power purchase agreement for Shenyang Laohuchong LFG Power Generation Project with validity from 26/03/2012 to 25/03/2022, dated 26/03/2012 Power purchase agreement for Shenyang Laohuchong LFG Power Generation Project with validity from 10/01/2008 to 09/01/2013, dated 10/01/2008
/41/	Management Manual of Shenyang Laohuchong LFG Power Generation Project, dated in Oct. 2007
/42/	Shenyang Laohuchong Municipal Solid Waste Management Co., Ltd.: <i>Daily operation and maintenance logs for generators and generators</i> from 01 August 2014 to 30 June 2015.
/43/	Shenyang Laohuchong Municipal Solid Waste Management Co., Ltd.: <i>CDM monitoring training plan and records</i> dated July 2012.
/44/	Operational qualifications of staff
/45/	F-CDM-MOC: Annex 2 to add ICF- International Clean Fund LLC as project participant, dated 13/07/2011
/46/	Annex I Country Approval: Switzerland, Federal Department of the Environment, Transport, Energy and Communications DETEC, Ref. H115-0624, dated 26/05/2011
/47/	Regulation on the installation and management of energy measurement devices for energy using entities (GB/17167-2006)
/48/	Technical administrative code of electric energy metering (DL/T448-2000) issued by National Economy Trade Committee of China, valid from 01/01/2001
/49/	Shenyang Laohuchong Municipal Solid Waste Management Co., Ltd.: <i>Notice on organization structure establishment for CDM monitoring</i>
/50/	PJRCES and Shenyang Laohuchong Municipal Solid Waste Management Co., Ltd.: verification contract, of 17 June 2015



# VERIFICATION CHECKLIST - VVSv9.0

## APPENDIX A – VERIFICATION CHECKLIST

TABLE: 1 – VERIFICATION REQUIREMENTS CHECKLIST IN-LINE WITH VVSv9.0

VERIFICATION REQUIREMENT CHECKLIST	REF. §§	VERIFICATION TEAM COMMENTS		CONCLUSION	
		COMMENTS	EVIDENCE	DRAFT	FINAL
<b>A. General Verification Approach</b>					
A.1. Has PP signed a contractual agreement with PJRCES? If yes, Please mention the date of signing of contract.	PS§261; PCP§208 VVS§346 Decision 3/CMP.1 - §62 of	PJRCES has contractual Agreement with PP. The signing date of contract is on 17 June 2015 /50/.	PJRCES Proposal and Contract with PP /50/	OK	OK
A.2. Confirm verification function by means of review of sectoral scope(s) of the project activity.	PS§261	PJRCES was accredited for the verification function and Sectoral scope 1, 13, in line with the Shenyang Laohuchong LFG Power Generation Project.	PJRCES's accreditation	OK	OK
A.3. Has the monitoring report been made publically available by PJRCES?	VVS§347; PCP§209; PCP§211; Decision 3/CMP.1 - §§62 & 27(h)	MR version 01 dated 15 July 2015 has been made publically available on the UNFCCC web on 16 July 2015. <a href="http://cdm.unfccc.int/Issuance/MonitoringReports">http://cdm.unfccc.int/Issuance/MonitoringReports</a>	UNFCCC web	OK	OK
A.4. Is CDM project under verification a large scale project activity? If yes, confirm the following:	VVS§347	Shenyang Laohuchong LFG Power Generation Project is a large-scale project.	PDD /3/ MR /2/	OK	OK
a. Has PJRCES performed the validation of the large-scale CDM project activity?	VVS§347	PJRCES did not perform validation of the CDM project activity under verification. DOE performing the validation of the CDM project activity under verification is DNV	Validation report /4/		



# VERIFICATION CHECKLIST - VVSv9.0

VERIFICATION REQUIREMENT CHECKLIST	REF. §§	VERIFICATION TEAM COMMENTS		CONCLUSION	
	VVS	COMMENTS	EVIDENCE	DRAFT	FINAL
b. Has PJRCES been granted a prior approval from CDM EB to perform verification of large-scale CDM project activity?	VVS§347	N/A		OK	OK
<b>B. Project Details</b>					
B.1. Specify registration date of the CDM project under verification with CDM EB	VVS§353(a)	Registration date of the project is on 25 December 2008.	UNFCCC web	OK	OK
B.2. Specify title of the registered CDM project activity along with its date and version	VVS§353(a)	Shenyang Laohuchong LFG Power Generation Project Version 03, dated 16 June 2008 was registered on 25 December 2008.	PDD /3/ MR /2/	OK	OK
B.3. Has project applied for any revision in Monitoring Plan?	VVS§353(a)	By checking the project information available under UNFCCC CDM website; it was confirm that the project was not applied for any revision in MP.	UNFCCC web	OK	OK
B.4. Specify version number and date of the final validation report	VVS§353(b)	DNV is the DOE who performed the validation of the project and the CDM validation report is Report No. 2008-9050, Version 01, dated 30 June 2008.	Validation report /4/	OK	OK
B.5. Specify version number and date of previous verification report, if any.	VVS§353(c)	This is the 4th verification of the project activity.	PDD /3/ MR /2/	OK	OK
B.6. Specify monitoring methodology applied by the CDM project activity	VVS§353(d)	<i>"Consolidated baseline methodology for landfill gas project activities"; ACM0001 version 06</i>	PDD /3/ MR /2/	OK	OK
B.7. Does Monitoring report prepared by PP follows the most recent Monitoring Report form available at UNFCCC CDM website?	VVS§353(e) PS§258 PS§260	The most recent MR template available at UNFCCC CDM website is version 05.1. and the Monitoring Report has been prepared using the recent available MR template in UNFCCC CDM website It was confirmed that "Guidelines for completing the monitoring report form (CDM-MR)" has been followed.	UNFCCC MR	OK	OK
B.8. Does registered CDM project	VVS§353(e)	By checking project information in section B.6.2 and section B.7.1 of		OK	OK



# VERIFICATION CHECKLIST - VVSv9.0

VERIFICATION REQUIREMENT CHECKLIST	REF. §§	VERIFICATION TEAM COMMENTS		CONCLUSION	
		COMMENTS	EVIDENCE	DRAFT	FINAL
activity refer to any other information and references relevant to project activity's emission reductions? (e.g. IPCC reports, data on electricity generation in the national grid or laboratory analysis and national regulations)	)	registered CDM PDD. It was confirmed that the CDM project activity does not refer to IPCC reports, data on electricity generation in the national grid or laboratory analysis and national regulations.			
B.9. Has PP addressed any FARs, if any, identified during validation or previous verification(s)?	VVS§354	There is no FAR identified during the validation or previous verification(s) by checking previous reports (validation and/or verification) and their subsequent versions if any.	PDD /3/ Validation report /4/	OK	OK
<b>C. Compliance of the project implementation with the registered project design document (Section 9.4.1 of VVSv9.0)</b>					
C.1. Has the implementation and operation of the project activity been conducted in accordance with the description contained in registered PDD and/or any approved revised PDD?	VVS§383(a) ) VVS§386	Through the on-site inspection, all physical features of the project activity as proposed in the registered CDM PDD have been verified to be in place.  The electricity generated from the project is supplied to the Northeast Electric Power Grid (NEPG).  The project activity has an installed capacity of 3 MW, consisting of 6x0.5MW LFG power generators. The model of gas generators is 500GF-N. During on-site inspection, PJRCES confirms that only five LFG power generators and one flare have been installed and put into operation, each of them has been installed in line with the registered PDD /3/ and the validation report /4/ of the project. The electricity generated by the gas generators is delivered to the NEPG through a	Site visit PDD /3/ MR /2/	OK	OK





# VERIFICATION CHECKLIST - VVSv9.0

VERIFICATION REQUIREMENT CHECKLIST	REF. §§	VERIFICATION TEAM COMMENTS		CONCLUSION	
		COMMENTS	EVIDENCE	DRAFT	FINAL
		220 kV substation of the grid company (Xiaobu Substation), which has been verified to be in line with the registered PDD.			
C.2. Is there any deviation or proposed or actual changes in the implementation or operation of the project activity?	VVS§383(b)	Verification team can confirm that there is no deviation observed. And there is no deviation/ changes proposed by PP in implementation or operation of the project activity by referring section B.2.1 of MR.	PDD /3/ MR /2/	OK	OK
C.3. Is/are deviation(s) or the proposed or actual changes in the implementation or operation of project activity, if any, comply with requirements of Project Standard?	VVS§383(b)	N/A	PDD /3/ MR /2/	OK	OK
C.4. Was an on-site visit conducted? If not, justify the rationale of the decision.	VVS§384 PCP§184	The on-site visit was carried out from 5 August 2015 to 6 August 2015. This was carried out 21 days after the web-hosting of MR at UNFCCC CDM website as per CDM Project Cycle Procedure. The geo-coordinates are checked to be same with that mentioned in the registered /3/. The project activity is a grid-connected gas power generation plant, located at Tashan Farm, Chenxiang Town, Su Jiatun District, Shenyang, Liaoning Province, China. The location is same as that mentioned in the registered PDD.	PDD /3/ MR /2/ Site visit	OK	OK
C.5. Are all physical features of the project activity in the registered PDD in place?	VVS§384	On the basis of physical site inspection, PJRCES was able to confirm that the major features of gas generators is 500GF-N) mentioned in the registered PDD have been implemented.	PDD /3/ MR /2/ Site visit	OK	OK
C.6. Have the project participants operated the project activity as per the registered PDD or any approved revised PDD? Assess and confirm following	VVS§385(a)	From MR, it was confirmed that the above mentioned information is accurately described in section B.1 and as per the registered CDM PDD. The project commissioned on 04/03/2008 for 1#, 2# and 3# can be	Logs and statement	OK	OK



# VERIFICATION CHECKLIST - VVSv9.0

VERIFICATION REQUIREMENT CHECKLIST	REF. §§	VERIFICATION TEAM COMMENTS		CONCLUSION	
		COMMENTS	EVIDENCE	DRAFT	FINAL
a. Starting date of operation b. Phased implementation c. Delayed implementation		verified by checking the operation logs /36/.			
C.7. Is there any increase in the estimates of the emission reductions in the current monitoring period as compared to that stated in the registered PDD?	VVS§385(c)	The number of days (or hours) of operation is 334 from 01 August 2014 to 30 June 2015 The estimates of ER in registered PDD during the current monitoring period is 136,480 tCO <sub>2</sub> e, higher than actually achieved emission reduction (155,741 tCO <sub>2</sub> e), as mentioned in section E.5/ E.6 of MR.	ER sheet /14/ PDD /3/ MR /2/	OK	OK
C.8. In case the estimated emission reduction in the current monitoring period is more than that estimated in the registered PDD, please clarify the reason behind such difference.	VVS§385(c)	There is not any increase in the actual ER, when compared with the registered PDD.	ER sheet /14/ PDD /3/ MR /2/	OK	OK
<b>D. Compliance of the monitoring plan with the monitoring methodology including applicable tool(s) and the standardized baseline. (Section 9.4.2 of VVSv9.0)</b>					
D.1. Is the monitoring plan of the project activity in accordance with the applied methodology and, where applicable, the applied standardized baseline?	VVS§386	The proposed project activity in the registered CDM PDD applied the "Consolidated baseline methodology for landfill gas project activities" ACM0001 version 06 It was checked that all parameters as required by monitoring methodology or standardized baseline are included in the registered PDD. The parameters, as mentioned in the methodology are: LFG <sub>total,y</sub> / Total amount of landfill gas captured; LFG <sub>flare,y</sub> / Amount of landfill gas flared;	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK



# VERIFICATION CHECKLIST - VVSv9.0

VERIFICATION REQUIREMENT CHECKLIST	REF. §§	VERIFICATION TEAM COMMENTS		CONCLUSION	
	VVS	COMMENTS	EVIDENCE	DRAFT	FINAL
		$LFG_{electricity,y}$ / Amount of landfill gas combusted in power plant; $EL_{LFG}$ / Net amount of electricity generated using landfill gas; $EL_{PR}$ / Total amount of electricity required to meet the project requirement; $w_{CH_4,y}$ / Methane fraction in the landfill gas; $T_{flare}$ / Temperature in the exhaust gas of the enclosed flare; $EW_H$ / Engine working hours of power plant; $FW_H$ / Flare working hours; $PE_{flare}$ / Project emissions from flaring of the residual gas stream in year y; $fv_{CH_4,RG,h}$ / Volumetric fraction of methane in the residual gas on dry basis in hour h; $FV_{RG,h}$ / Volumetric flow rate of the residual gas in dry basis at normal conditions in the hour h. In section B.7.1 of registered CDM PDD, those parameters are monitored. Thus PJRCES confirms that the monitoring plan as described in the registered PDD is in accordance with approved monitoring methodology <i>ACM0001 version 06</i> applied for the CDM project activity.			
D.2. Is the monitoring plan of the project activity in accordance with the applicable tools?	VVS§386	N/A	<i>ACM0001 version 06 /5/ PDD /3/</i>	OK	OK
D.3. Keeping compliance of monitoring in mind, determine whether the project implementation is in accordance with the provisions of the registered	VVS§387	It was checked and confirmed that the compliance of monitoring is in compliance with registered PDD and monitoring methodology.	<i>ACM0001 version 06 /5/ PDD /3/</i>	OK	OK



# VERIFICATION CHECKLIST - VVSv9.0

VERIFICATION REQUIREMENT CHECKLIST	REF. §§	VERIFICATION TEAM COMMENTS		CONCLUSION	
		COMMENTS	EVIDENCE	DRAFT	FINAL
PDD and/or an approved revised PDD.					
D.4. During the validation, is/are there any additional monitoring parameters identified, that has not been specified in the applied methodology or, where applicable, standardized baseline (specifically in case of SSC project activities)	VVS§387	There are no additional monitoring parameters identified, that has not been specified in the applied methodology for the project activity.	ACM0001 version 06 /5/ PDD /3/	OK	OK
<b>E. Compliance of monitoring activities with the registered monitoring plan (Section 9.4.3 of VVSv9.0)</b>					
E.1. Determine whether monitoring of parameters related to GHG emissions reductions in the project activity has been implemented in accordance with the monitoring plan contained in the registered PDD or any accepted revised monitoring plan.	VVS§389 VVS§390(a) ) Decision 3/CMP.1, Annex, §56	By referring to section D.2 of MR with the registered CDM PDD. It was confirmed the list of parameters included in the MR are identical with those in registered PDD.	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
E.2. Determine whether all parameters stated in the monitoring plan and relevant Board decisions have been monitored and updated as applicable, including:	VVS§390(b) ) VVS§390(d) ) VVS§390(e) )	All parameters stated in the monitoring plan are monitored. It is not clearly shown how the sum of the quantities fed to the flare(s), to the power plant(s) were compared with the total quantity of methane generated, to reach conservative values of MD <sub>project,y</sub> .	ACM0001 version 06 /5/ PDD /3/ MR /2/	CL-4 OK	



# VERIFICATION CHECKLIST - VVSv9.0

VERIFICATION REQUIREMENT CHECKLIST	REF. §§	VERIFICATION TEAM COMMENTS					CONCLUSION																											
	VVS	COMMENTS			EVIDENCE		DRAFT	FINAL																										
a. Project emission parameters?	VVS§390(b) – (i) VVS§390(d) VVS§390(e)	Yes.			ACM0001 version 06 /5/ PDD /3/ MR /2/		OK	OK																										
Add data/ parameter		EL <sub>PR</sub> / Total amount of electricity required to meet the project requirement; w <sub>CH4,y</sub> / Methane fraction in the landfill gas; PE <sub>flare</sub> / Project emissions from flaring of the residual gas stream in year y.			ACM0001 version 06 /5/ PDD /3/ MR /2/		OK	OK																										
b. Baseline emission parameters?	VVS§390(b) – (ii) VVS§390(d) VVS§390(e)	LFG <sub>total,y</sub> / Total amount of landfill gas captured; LFG <sub>flare,y</sub> / Amount of landfill gas flared; LFG <sub>electricity,y</sub> / Amount of landfill gas combusted in power plant; EL <sub>LFG</sub> / Net amount of electricity generated using landfill gas.			ACM0001 version 06 /5/ PDD /3/ MR /2/																													
Add data/ parameter		The <i>ex-post</i> monitoring parameters have been shown in the table below: <table><tr><th colspan="2">MONITORING PARAMETER REQUIREMENT</th><th colspan="5">ASSESSMENT/OBSERVATION BY DOE</th></tr><tr><td colspan="2">Data / Parameter: (as in monitoring plan of PDD):</td><td colspan="5">LFG<sub>total,y</sub> / Total amount of landfill gas captured</td></tr><tr><td rowspan="2">Type of Monitoring equipment</td><td>Item</td><td>Type</td><td>Accuracy Level</td><td colspan="2">Serial No.</td><td rowspan="2"></td></tr><tr><td>Flow meter</td><td>Annubar485</td><td>±0.9%</td><td colspan="2">01726699</td></tr></table>			MONITORING PARAMETER REQUIREMENT		ASSESSMENT/OBSERVATION BY DOE					Data / Parameter: (as in monitoring plan of PDD):		LFG <sub>total,y</sub> / Total amount of landfill gas captured					Type of Monitoring equipment	Item	Type	Accuracy Level	Serial No.			Flow meter	Annubar485	±0.9%	01726699		ACM0001 version 06 /5/ PDD /3/ MR /2/			OK
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# VERIFICATION CHECKLIST - VVSv9.0

VERIFICATION REQUIREMENT CHECKLIST	REF. §§	VERIFICATION TEAM COMMENTS						CONCLUSION		
	VVS	COMMENTS						EVIDENCE	DRAFT	FINAL
			Electric meter	DSSD331-3	0.5s	8007472				
		<b>MONITORING PARAMETER REQUIREMENT</b>		<b>ASSESSMENT/OBSERVATION BY DOE</b>						
		Data / Parameter: (as in monitoring plan of PDD):		EL <sub>PR</sub> / Total amount of electricity required to meet the project requirement						
		Type of Monitoring equipment		Item	Type	Accuracy Level	Serial No.			
				Electric Meter A	DTZ188	0.5s	010112300001515158			
				Electric Meter B	DTS51	1	0103200019480			
		<b>MONITORING PARAMETER REQUIREMENT</b>		<b>ASSESSMENT/OBSERVATION BY DOE</b>						
		Data / Parameter: (as in monitoring plan of PDD):		w <sub>CH<sub>4</sub>,y</sub> / Methane fraction in the landfill gas						
		Type of Monitoring equipment		Item	Type	Accuracy Level	Serial No.			
				Gas analyzer	XGF-4043	≤2%	0708404			
		<b>MONITORING PARAMETER REQUIREMENT</b>		<b>ASSESSMENT/OBSERVATION BY DOE</b>						
		Data / Parameter: (as in monitoring plan of PDD):		T <sub>flare</sub> / Temperature in the exhaust gas of the enclosed flare						
		Type of Monitoring		Item	Type	Accuracy	Serial			



# VERIFICATION CHECKLIST - VVSv9.0

VERIFICATION REQUIREMENT CHECKLIST	REF. §§	VERIFICATION TEAM COMMENTS					CONCLUSION		
	VVS	COMMENTS					EVIDENCE	DRAFT	FINAL
		equipment	N-type thermocouple	WRMK-331	Level ±2.5°C	No. /			
		<b>MONITORING PARAMETER REQUIREMENT</b>		<b>ASSESSMENT/OBSERVATION BY DOE</b>					
		Data / Parameter: (as in monitoring plan of PDD):		EWH / Engine working hours of power plant					
		Type of Monitoring equipment		Item	Type	Accuracy Level	Serial No.		
				Programmable Logic Controller (PLC)	Siemens S7-300	<10s per day	/		
		<b>MONITORING PARAMETER REQUIREMENT</b>		<b>ASSESSMENT/OBSERVATION BY DOE</b>					
		Data / Parameter: (as in monitoring plan of PDD):		FWH / Flare working hours					
		Type of Monitoring equipment		Item	Type	Accuracy Level	Serial No.		
				Programmable Logic Controller (PLC)	Siemens S7-300	<10s per day	/		
		<b>MONITORING PARAMETER REQUIREMENT</b>		<b>ASSESSMENT/OBSERVATION BY DOE</b>					
		Data / Parameter: (as in monitoring plan of PDD):		f <sub>VCH<sub>4</sub>,RG,h</sub> / Volumetric fraction of methane in the residual gas on dry basis in hour h					
		Type of Monitoring equipment		Item	Type	Accuracy Level	Serial No.		
				Gas	XGF-	≤2%	0708404		



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VERIFICATION REQUIREMENT CHECKLIST	REF. §§	VERIFICATION TEAM COMMENTS						CONCLUSION		
	VVS	COMMENTS						EVIDENCE	DRAFT	FINAL
			analyzer	4043						
		PJRCES confirms that each of the parameters monitored is in line with registered monitoring plan and monitoring methodology <i>ACM0001 version 06</i> . The responsibilities and authorities for monitoring and reporting have been verified to be in accordance with the responsibilities and authorities stated in the monitoring plan.								
c. Leakage parameters?	VVS§390(b) – (iii) VVS§390(d) VVS§390(e)	No leakage emissions are considered as per the methodology. Hence, no parameter is considered to be monitored for the leakage emission calculations.						<i>ACM0001 version 06</i> /5/ PDD /3/ MR /2/		
Add data/ parameter		No leakage emissions are considered as per the methodology. Hence, no parameter is considered to be monitored for the leakage emission calculations.						<i>ACM0001 version 06</i> /5/ PDD /3/ MR /2/	OK	OK
E.3. Management and operational system: Confirm following:	VVS§390(b)	By referring section C of MR and section B.7.3 and Appendix 5 of CDM PDD (new format)/ section B.7.1, B.7.2 and Annex 4 of CDM PDD (old format).						<i>ACM0001 version 06</i> /5/ PDD /3/ MR /2/	OK	OK
a. Is/are monitoring system described adequately?	PS§246	The management of the project activity has implemented a quality management system to monitor the performance and ability of the project to deliver the emission reductions. Monitoring Manual is established with detailed responsibility allocated. In the manual, the organization structure with the responsibilities, personnel competencies, monitoring procedure and monitoring management have been properly identified and put in place.						Monitoring Manual /41/	OK	OK



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VERIFICATION REQUIREMENT CHECKLIST	REF. §§	VERIFICATION TEAM COMMENTS			CONCLUSION									
	VVS	COMMENTS	EVIDENCE	DRAFT	FINAL									
b. Is/are line diagrams provided showing all relevant monitoring points?	PS§246	Yes.		OK	OK									
c. Is/are data collection procedure (information flow including data generation, aggregation, recording, calculations and reporting) described adequately and implemented?	PS§250	The data collection procedure (information flow including data generation, aggregation, recording, calculations and reporting) mentioned in MR are complete when comparing with registered CDM PDD, specifically with QA/ QC procedure mentioned in registered CDM PDD.	Monitoring Manual	OK	OK									
d. Are organizational structure, roles and responsibilities for monitoring and reporting in accordance with the responsibilities and authorities stated in the monitoring plan?	PS§246 VVS§390(b) – (iv)	The organizational structure, roles and responsibilities of personnel involved in monitoring are well detailed.	Monitoring Manual /41/ Notice on organization structure /49/	OK	OK									
e. Is/are emergency procedures adequately described?	PS§250 VVS§390(b) – (iv)	The emergency procedures were followed in case of any emergency during the monitoring period and relevant records were reviewed during physical site inspection for checking compliance.	Daily operation and maintenance record	OK	OK									
E.4. Is/are equipment(s) used for monitoring in accordance with section 6 below and is controlled and calibrated in accordance with the monitoring plan, the applied	VVS§390(c)	<div>The relevant information on the calibration has been shown in the table below:<table><tr><td>Monitoring Equipment:</td><td colspan="2">Electricity meter</td></tr><tr><td>Ownership:</td><td colspan="2">Electric power company</td></tr><tr><td>Location:</td><td>The high</td><td>The low voltage side of the project activity</td></tr></table></div>	Monitoring Equipment:	Electricity meter		Ownership:	Electric power company		Location:	The high	The low voltage side of the project activity	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
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<b>Calibration date:</b>	31/08/2013			30/08/2014																																																													
<b>Validity of calibration:</b>	31/08/2013- 30/08/2014			30/08/2014- 29/08/2015																																																													
		<table border="1"> <tr> <td><b>Monitoring Equipment:</b></td> <td colspan="5"><b>N-type thermocouple</b></td> </tr> <tr> <td><b>Ownership:</b></td> <td colspan="5">The project owner</td> </tr> <tr> <td><b>Location:</b></td> <td colspan="5">At the flare</td> </tr> <tr> <td><b>Monitored parameter:</b></td> <td colspan="5">T<sub>flare</sub></td> </tr> <tr> <td><b>Serial number:</b></td> <td colspan="5">/</td> </tr> <tr> <td><b>Accuracy:</b></td> <td colspan="5">±2.5°C</td> </tr> <tr> <td><b>Frequency of calibration:</b></td> <td colspan="5">Yearly replaced with same new one</td> </tr> <tr> <td><b>Replacement date</b></td> <td colspan="2">8/02/2014</td> <td colspan="3">29/12/2014</td> </tr> <tr> <td><b>Validity of replacement</b></td> <td colspan="2">18/02/2014- 17/02/2015</td> <td colspan="3">29/12/2014- 28/12/2015</td> </tr> <tr> <td><b>Relevant sectoral</b></td> <td colspan="5">Verification Regulation of Working Base Metal</td> </tr> </table>	<b>Monitoring Equipment:</b>	<b>N-type thermocouple</b>					<b>Ownership:</b>	The project owner					<b>Location:</b>	At the flare					<b>Monitored parameter:</b>	T <sub>flare</sub>					<b>Serial number:</b>	/					<b>Accuracy:</b>	±2.5°C					<b>Frequency of calibration:</b>	Yearly replaced with same new one					<b>Replacement date</b>	8/02/2014		29/12/2014			<b>Validity of replacement</b>	18/02/2014- 17/02/2015		29/12/2014- 28/12/2015			<b>Relevant sectoral</b>	Verification Regulation of Working Base Metal							
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# VERIFICATION CHECKLIST - VVSv9.0

VERIFICATION REQUIREMENT CHECKLIST	REF. §§	VERIFICATION TEAM COMMENTS			CONCLUSION	
	VVS	COMMENTS		EVIDENCE	DRAFT	FINAL
		standard:	Thermocouple (JJG351-1996) /34/			
<b>F. Compliance with calibration frequency requirements for measuring instruments (Section 9.4.4 of VVSv9.0)</b>						
F.1. Is calibration of those measuring equipments that have an impact on the claimed emission reductions conducted by the project participants at a frequency specified in the applied monitoring methodology and/or the monitoring plan?	VVS§394	In the monitoring plan, the required calibration frequency for all that equipment are in compliance with regulation/standards, PJRCES confirms that the calibration for those equipment was carried out as per regulations.		ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
Add equipment		N/A				
F.2. During verification of a certain monitoring period, has calibration been delayed and has calibration has been implemented after the monitoring period in consideration (i.e. the results of delayed calibration are available)?	VVS§395	No delayed calibration on the basis of calibration frequency mentioned in registered CDM PDD and that followed by PP.		ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
F.3. If yes, is the following conservative approach adopted in the calculation of emission reductions?	VVS§395	N/A		ACM0001 version 06 /5/ PDD /3/	OK	OK



# VERIFICATION CHECKLIST - VVSv9.0

VERIFICATION REQUIREMENT CHECKLIST	REF. §§	VERIFICATION TEAM COMMENTS		CONCLUSION	
		COMMENTS	EVIDENCE	DRAFT	FINAL
	VVS		MR /2/		
a. Applying the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration, if the results of the delayed calibration do not show any errors in the measuring equipment, or if the error is within permissible limit of error; or	VVS§395(a)	N/A	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
b. Applying the error identified in the delayed calibration test, if the error is beyond the maximum permissible error of the measuring equipment.	VVS§395(b)	N/A	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
F.4. Has the error has been applied:	VVS§396				
a. In a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed emission	VVS§396(a)	N/A	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK



# VERIFICATION CHECKLIST - VVSv9.0

VERIFICATION REQUIREMENT CHECKLIST	REF. §§	VERIFICATION TEAM COMMENTS		CONCLUSION	
		COMMENTS	EVIDENCE	DRAFT	FINAL
reductions?					
b. Applying the error identified in the delayed calibration test, if the error is beyond the maximum permissible error of the measuring equipment.	VVS§396(b)	N/A	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
F.5. In cases where the results of the delayed calibration are not available, or the calibration has not been conducted at the time of verification, prior to finalizing verification, were the project participants requested to conduct the required calibration have the project participants calculated the emission reductions conservatively using the approach mentioned in item iii above?	VVS§397	N/A	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
F.6. Is it possible for the project participants to conduct the calibration at a frequency specified by either the applied methodology, guidance provided by the Board, and/or the registered monitoring plan?	VVS§398	Yes.	ACM0001 version 06 /5/ PDD /3/ MR /2/		



# VERIFICATION CHECKLIST - VVSv9.0

VERIFICATION REQUIREMENT CHECKLIST	REF. §§	VERIFICATION TEAM COMMENTS		CONCLUSION	
		COMMENTS	EVIDENCE	DRAFT	FINAL
F.7. If no, were the requirements for post registration changes, in section of 9.5 of the VVS, followed?	VVS§398	N/A	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
F.8. Do the monitoring methodologies or the monitoring plan specify any requirements for calibration frequency for measuring equipments?	VVS§399	No.	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
F.9. If no, are the equipments calibrated either in accordance with the specifications of the local/national standards, or as per the manufacturer's specification?	VVS§399	In the monitoring plan, the required calibration frequency for all that equipment are in compliance with regulation/standards, PJRCES confirms that the calibration for those equipment was carried out as per regulations.	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
F.10. If neither local/national standards nor the manufacturer's specification are available, were international standards used?	VVS§399	N/A	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
<b>G. Assessment of data and calculation of emission reductions (Section 9.4.5 of VVSv9.0)</b>	VVS§401	→ Verification team shall assess the data and calculations of GHG emission reductions achieved by/resulting from the project activity by the application of the selected methodology and, where applicable, the selected standardized baseline.			
G.1. Is a complete set of data for the specified monitoring period is available?	VVS§402(a)	Yes. A complete set of data is available for the monitoring parameters.  Monitoring meters have been calibrated and maintained periodically	ACM0001 version 06 /5/ PDD /3/	OK	OK



# VERIFICATION CHECKLIST - VVSv9.0

VERIFICATION REQUIREMENT CHECKLIST	REF. §§	VERIFICATION TEAM COMMENTS		CONCLUSION	
	VVS	COMMENTS	EVIDENCE	DRAFT	FINAL
		to ensure the accuracy of measurement. All data has been archived electronically and kept at least for two years after the end of the crediting period or the last issuance of CERs, whichever occurs later.	MR /2/		
G.2. Is information provided in the monitoring report been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis?	VVS§402(b)	All the data of electricity exports and electricity imports have been cross verified against the monthly electricity amount confirmation note for export /19// and for import /16/, and monthly reading records of electricity exports and imports. In addition, the calibration reports for the monitoring meters have been provided to guarantee the accuracy of the readings.	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
G.3. Have calculations of baseline emissions, and project activity emissions and leakage, as appropriate, been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology?	VVS§402(c)	<p>in accordance with the applied methodology ACM0001 version 06 /5/ and where applicable, the standardised baseline, undertook the evaluation of calculations applied in order to calculate the emission reductions during the current monitoring period.</p> $BE_y = (MD_{project,y} - MD_{BL,y}) * GWP_{CH4} + EL_{LFG} * CEF_{elec,BL,y}$ $MD_{BL,y} = MD_{project,y} * AF$ $MD_{project,y} = MD_{flared,y} + MD_{electricity,y}$ $MD_{electricity,y} = LFG_{electricity,y} * \omega_{CH4,y} * D_{CH4}$ $MD_{flared,y} = (LFG_{flare,y} * \omega_{CH4,y} * D_{CH4}) - (PE_{flare,y} / GWP_{CH4})$ $PE_{flare,y} = \sum TM_{RG,h} * (1 - \eta_{flare,h}) * GWP_{CH4} / 1000$ $TM_{RG,h} = FV_{RG,h} * fV_{CH4,RG,h} * \rho_{CH4,n}$ <p>In registered PDD, there are no separate calculations of PEs due to imported electricity. Kindly re-check and revise the entire ER calculation discussion to make it consistent with the registered PDD.</p>	ACM0001 version 06 /5/ PDD /3/ MR /2/	<del>OK</del> 4 OK	OK
G.4. Have any assumptions used in emission calculations been justified?	VVS§402(d)	N/A		OK	OK
G.5. Have appropriate emission factors, IPCC default values	VVS§402(e)	The emission factor ( $EF_{grid\ CM,y}$ ) for NEPG was <i>ex-ante</i> fixed as 1.05176 tCO <sub>2</sub> e/MWh for the first crediting period, which has been	ACM0001 version 06	OK <del>OK</del>	OK



# VERIFICATION CHECKLIST - VVSv9.0

VERIFICATION REQUIREMENT CHECKLIST	REF. §§	VERIFICATION TEAM COMMENTS		CONCLUSION	
	VVS	COMMENTS	EVIDENCE	DRAFT	FINAL
and other reference values been correctly applied?	)	verified to be in line with the registered PDD. Global warming potential of methane, $GWP_{CH_4}$ should be 25 tCO <sub>2</sub> /t CH <sub>4</sub> from year 2013 as per EB's guidance for conservative consideration, instead of being 21 tCO <sub>2</sub> /t CH <sub>4</sub> in the registered PDD.	/5/ PDD /3/ MR /2/	2	
G.6. For a registered CDM project activity using an approved standardized baseline that standardizes baseline emissions, Determine whether the standardized value(s) of the parameter(s) was(were) applied using the correct version of the applied standardized baseline in accordance with the Project standard based on following	VVS§402(f) PS§251	N/A	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
G.7. For a registered CDM project activity using an approved standardized baseline that standardizes baseline emissions and the selected type of crediting period is renewable, Determine whether the standardized value(s) of the parameter(s) was(were) applied using the correct version of the applied standardized baseline in accordance with the Project	VVS§402(f) PS§252	N/A	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK





# VERIFICATION CHECKLIST - VVSv9.0

VERIFICATION REQUIREMENT CHECKLIST	REF. §§	VERIFICATION TEAM COMMENTS		CONCLUSION	
	VVS	COMMENTS	EVIDENCE	DRAFT	FINAL
standard based on following					
<b>H. Post-Registration Changes (Section 9.5 of VVSv9.0)</b>		This section to be filled only in case PJRCES, Inc has been appointed as DOE for assessing Post-registration changes.			
<b>H.1. Temporary deviations from the registered monitoring plan and/or monitoring methodology (Section 9.5.1 of VVSv9.0)</b>					
a. Confirm whether PJRCES Inc. contracted by PP to validate post-registration changes, is accredited to the validation function for the specific CDM sectoral scope.	VVS§404 PS§269	N/A	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
b. Clarify Do changes require prior approval by the Board in accordance with Appendix 1 of CDM Project Standard?	VVS§330	N/A	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
c. Confirm the following:					
i. Is there any change regarding the modalities or information in the MoC statement or its Annexes after a request for registration has been	PS§268	N/A	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK



# VERIFICATION CHECKLIST - VVSv9.0

VERIFICATION REQUIREMENT CHECKLIST	REF. §§	VERIFICATION TEAM COMMENTS		CONCLUSION	
		COMMENTS	EVIDENCE	DRAFT	FINAL
submitted?					
ii. Has PP revised the MoC statement in accordance with the Project Cycle procedure?	PS§268	N/A	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
d. Has, PP identified and documented any actual or proposed changes to the operation, implementation and/or monitoring the registered CDM project activity taking into account the types of changes described in appendix 1 of CDM Project Standard?	VVS§406 PS§267	N/A	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
e. Do the changes proposed in the registered monitoring plan identified as changes which does not require prior approval from the Board in accordance with Appendix 1 of CDM Project Standard?	VVS§405 VVS§406 PS§267	N/A	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
f. If project participants are temporarily unable to monitor the registered	PS§272	N/A	ACM0001 version 06 /5/	OK	OK



# VERIFICATION CHECKLIST - VVSv9.0

VERIFICATION REQUIREMENT CHECKLIST	REF. §§	VERIFICATION TEAM COMMENTS		CONCLUSION	
		COMMENTS	EVIDENCE	DRAFT	FINAL
CDM project activity in accordance with the registered monitoring plan or the applied methodology, confirm following			PDD /3/ MR /2/		
i. Has PP described the nature, extent and duration of the non-conforming monitoring?	PS§272	N/A	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
ii. Cases where PP has not monitored or is unable to produce the evidence related to baseline emissions parameter(s) – determine whether prior approval from Board is required?	PS Appendix 1	N/A	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
iii. Cases where PP has not monitored or is unable to produce the evidence related to project emissions parameter(s) – determine whether prior approval from Board is required?	PS Appendix 1	N/A	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
iv. Has PP proposed alternative monitoring	PS§268	N/A	ACM0001 version 06	OK	OK



# VERIFICATION CHECKLIST - VVSv9.0

VERIFICATION REQUIREMENT CHECKLIST	REF. §§	VERIFICATION TEAM COMMENTS		CONCLUSION	
		COMMENTS	EVIDENCE	DRAFT	FINAL
of the project activity in the monitoring report?			/5/ PDD /3/ MR /2/		
v. Has PP informed the DOE contracted for performing verification of the monitoring period during which they were unable to monitor the registered CDM project activity in accordance with the registered monitoring plan or the applied methodology.	VVS§383(b) ) PS§273 (a)	N/A	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
vi. Did PP request any DOE at any time prior to the commencement of verification of a monitoring period to assess the proposed alternative monitoring of the project activity.	VVS§383(b) ) PS§273(b)	N/A	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
vii. Determine whether deviation is likely to lead to a reduction in the accuracy of the calculation of emission reductions?	VVS§411 PS§274	N/A	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK



# VERIFICATION CHECKLIST - VVSv9.0

VERIFICATION REQUIREMENT CHECKLIST	REF. §§	VERIFICATION TEAM COMMENTS		CONCLUSION	
		COMMENTS	EVIDENCE	DRAFT	FINAL
viii. Determine exact period for which deviation applies	VVS§416	N/A	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
<b>H.2. Corrections (Section 9.5.2 of VVSv9.0)</b>					
a. Is there any corrections made to the project information or the parameters determined at validation by PP and identified during verification?	VVS§420	No	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
b. Do such corrections affect the design of the registered project activity?	PS Appendix 1; §1	No	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
c. Is the corrected information accurately reflects the actual project information?	VVS§410(a)	N/A	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
d. Is the corrected parameter(s) in accordance with the applied methodology?	VVS§410(b)	N/A	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
<b>H.3. Change in the Start date of the crediting period</b>					



# VERIFICATION CHECKLIST - VVSv9.0

VERIFICATION REQUIREMENT CHECKLIST	REF. §§	VERIFICATION TEAM COMMENTS		CONCLUSION	
	VVS	COMMENTS	EVIDENCE	DRAFT	FINAL
<b>(Section 9.5.3 of VVSv9.0)</b>					
a. Does PP wish to change the start date of the crediting period in accordance with section 13.8 of CDM Project Standard?	VVS§410	N/A	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK
b. Confirm if the change in the start date of crediting period results in the less conservative baseline.	VVS§410	N/A	ACM0001 version 06 /5/ PDD /3/ MR /2/	OK	OK





# VERIFICATION CHECKLIST - VVSv9.0

**TABLE 2: RESOLUTION OF ISSUES IDENTIFIED IN TABLE 1 OF THE VALIDATION CHECKLIST**

DRAFT REPORT CLARIFICATION REQUESTS, CORRECTIVE ACTION REQUESTS			SUMMARY OF PP RESPONSE	VERIFICATION TEAM ASSESSMENT
CAR/CL №	DESCRIPTION OF CAR/CL	REFERENCE		
CAR 1	<b>Assessment: 01</b> <b>Date: 07 August 2015</b> In registered PDD, there are no separate calculations of PEs due to imported electricity. Kindly re-check and revise the entire ER calculation discussion to make it consistent with the registered PDD.	G.3.	The formulae have been revised to make it consistent with that of registered PDD.	OK CAR 1 was closed.
CAR 2	<b>Assessment: 01</b> <b>Date: 07 August 2015</b> Global warming potential of methane, $GWP_{CH_4}$ should be 25 $tCO_2/t CH_4$ from year 2013 as per EB's guidance for conservative consideration, instead of being 21 $tCO_2/t CH_4$ in the registered PDD.	G.5.	The $GWP_{CH_4}$ value has been corrected into 25 from 21 in the updated monitoring report and ER calculation spreadsheet.	OK CAR 2 was closed.
CL 1	<b>Assessment: 01</b> <b>Date: 07 August 2015</b> It is not clearly shown how the sum of the quantities fed to the flare(s), to the power plant(s) were compared with the total quantity of methane generated, to reach conservative values of $MD_{project,y}$ .	E.2.	According to the applicable methodologies, the sum of the quantities fed to the flare(s), to the power plant(s) must be compared annually with the total quantity of methane generated, and all the three parameters were recorded and compared every 5 minutes during the monitoring period for a conservative approach. The lowest value of the two must be adopted as $MD_{project,y}$ .	OK In revised MR, the example was given to illustrate the approach of choosing the lowest values of instant of methane destructured to arrive at the conservative of $MD_{project,y}$ . CL 1 was closed.



# VERIFICATION CHECKLIST - VVSv9.0

DRAFT REPORT FORWARD ACTION REQUEST			SUMMARY OF PP RESPONSE	VERIFICATION TEAM ASSESSMENT
FAR No	DESCRIPTION OF FAR	REFERENCE		
No	Assessment: 01 Date: 07 August 2015			
	N/A			



# VERIFICATION CHECKLIST - VVSV9.0

## APPENDIX B – VERIFICATION TEAM DETAILS

TEAM MEMBER NAME	COMPETENCY /ROLE	EXPERIENCE
<b>Zhang Xiaojun</b> <b>Johnsen</b>	Lead Verifier / Sectoral expert 13.1	<p>holds a Master Degree in Metallurgical Physical Chemistry and obtained his MBA in project management. Also he majored in Chemistry, which involves organic, inorganic, structure and analysis chemistry as bachelor degree. He has an overall experience of 26 years. Johnsen had an overall experience of 4 years in glass manufacturing industry covering production, energy efficiency improvement and commissioning. Later on he gained combined experience of more than 15 years in the iron and steel industry, while he worked as researcher and management personnel in Central Iron and Steel Institute, the sector covering the refractory, iron &amp; steel, waste heat recovery, solid waste disposal, waste fuel treatment, waste energy efficiency and relevant environmental affairs. His experience also covers the fields of environmental management, resource conservation and cleaner production in various manufacturing and metallurgical industries. He has also gained the experience in Management System Audits such as ISO 9001, ISO 14001 standards in various industrial sectors for more than 3 years for industrial plants.</p> <p>Johnsen has experience of more than 4 years in validation and verification of numerous CDM projects from his current and previous companies (PJRCES and D.N.V). Over the years, he has worked in over 70 projects in China and internationally, in various sectors including Renewable Energy (biomass power, &amp; gas energy projects), Waste heat recovery projects, Raw material substitution projects in the cement sector, Blended cement projects, Coal Mine Methane projects (CMM) and biodiesel projects. He has experience in working in wide range of standards – regulated and voluntary markets.</p> <p>For financial analysis and investment, he has gained the relevant knowledge through his MBA course; and through the feasibility case study in the iron and steel sector while he worked as management personnel, he gradually gained concerted experience in cost accounting, financial analysis and investment input parameter assessment.</p> <p>His qualification, industrial and investment experience and experience in CDM demonstrate him sufficient sectoral competence in “Glass”, “Iron and Steel”, “Energy Generation from Renewable Energy Sources” and “Waste Handling and Disposal”.</p>
<b>Wu Jianmin</b>	Sector expert 1.1	<p>Wu jianmin, male, senior engineer, 1983 - 1987 East China University of Science &amp; Technology, Chemical engineering, Bachelor.</p> <p>1987- 2003 Sino steel Xingtai Machinery &amp; Mill Roll Co.,LTD. Engaged in chemical analysis and quality management work, participated in the laboratory quality certification training, presided over written a</p>



# VERIFICATION CHECKLIST - vvs9.0

		<p>enterprise standards and participated in a technical transformation.</p> <p>2004-2008 Two Lions (zhangjiagang) fine chemical Co., LTD. Sulfuric acid Waste heat power generation workshop, in charge of production and technical work on-site, participated in more than two technical renovation;</p> <p>2008 - so far, Shanghai Normal University , College of Life and Environmental sciences, teach chemical principle, chemical machinery, chemical technology, clean production &amp; circulation economy and practice teaching , familiar with all kinds of chemical process,</p> <p>I also joined the “ gold standard” 、 ” ISO9001 ” 、 ” ISO14001 ” and “ enterprise energy audit technology general rules ” training, host more than 30 industry &amp; building Energy audit including taopu thermal company in shanghai , Participated in writing more than 20 environmental assessment, participated in written wuxi taohuashan landfill gas power generation project CDM manuscripts, apply for a patent , presided over a item of Shanghai municipal education commission, a university-level subject, published more than ten article.</p>
<b>Anjana Sharma</b>	Independent Technical Reviewer	<p>Anjana Sharma holds a Bachelor in Chemical Engineering. She has a combined experience of 14 years. Prior to her entry into the CDM world, she worked for 3 years in Chlor-Alkali industry wherein she was involved mainly in the plant operations, energy conservation measures and QMS. During her stint in industry, her technical responsibilities included involvement in day-to-day plant operations, analysis of consumption of different inputs to the Chlor-Alkali process (primarily the raw material, power, fuels like FO/HSD for boilers etc) on daily basis and preparation of consolidated monthly report. Based on that, she, in consultation with Head of Works, would identify the potential areas of improvement and presenting the same to the management. Being the member of Technical Services Cell of the company, she was actively involved in market research for the energy efficient technologies for the Chlor-Alkali process. Apart from above technical part, she was also an internal auditor for ISO 9001. She has been trained as an internal auditor for QMS as well as Lead Auditor for QMS (ISO 9001) and EMS (ISO 14001).</p> <p>Her experience in CDM includes 9 years in validation and verification of projects in regulated as well as non-regulated market. Prior to joining PJRCMD, she worked as a CDM Validator and Technical Reviewer at DNV for 4 years. She has handled validation and verification of numerous CDM projects, both in India &amp; abroad in different areas like renewable energy, energy efficiency, waste heat recovery, waste handling and disposal (especially landfill gas recovery and utilization, and waste gas treatment), fuel switch etc.</p> <p>Her sufficient sectoral competence in renewable energy based energy generation, energy efficiency and waste handling and disposal is sufficiently demonstrated through her education qualification, industry experience and experience in CDM.</p>



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# VERIFICATION CHECKLIST - vVsv9.0

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