



# VERIFICATION REPORT

for the CDM Project Activity

## Shenyang Laohuchong LFG Power Generation Project

in

# China

Report No. 01 997 9105079148

Version 02.1, 2014-12-14

Designated Operational Entity (DOE)

**TÜV Rheinland (China) Ltd.**

Unit 707, AVIC Building, No. 10B, Central Road, East 3<sup>rd</sup> Ring Road,  
Chaoyang District, Beijing 100022,  
People's Republic of China.

Tel.: +86 10 65 66 66 60 (ext.169)

FAX: +86 1065 66 66 67

E-mail: [doe@chn.tuv.com](mailto:doe@chn.tuv.com)

**I. Project data:**

<b>Project title:</b>	Shenyang Laohuchong LFG Power Generation Project		<b>Report No.:</b> 01 997 9105079148
<b>Registration No. / Date:</b>	1906/ 25 December 2008		<b>Current revision No.:</b> 02.1
<b>Monitoring period:</b>	from 01/08/2011 to 31/07/2014		<b>Date of current revision:</b> 2014-12-14
<b>Methodology:</b>	ACM0001, Version 06, "Consolidated baseline methodology for landfill gas project activity"		<b>Date of first issue:</b> 2014-11-05
<b>Publication of MR:</b>	The monitoring report (Version 01, dated 25/09/2014) was published at UNFCCC website on 26 Sep. 2014.		
<b>Emission reductions:</b>	Estimated:	391,189 tCO <sub>2</sub> e It is estimated based on different specific annual emission reductions as indicated in the registered PDD (Version 03, dated 16/06/2008), and the monitoring period from 01/08/2011 to 31/07/2014, including both days.	<b>Total verified:</b> 353,828 tCO <sub>2</sub> e of this monitoring period from 01/08/2011 to 31/07/2014, totally 1,096 days, including both days
			<b>Verified for CP1:</b> 166,741 tCO <sub>2</sub> e
			<b>Verified for CP2:</b> 187,087t CO <sub>2</sub> e
<b>GHG reducing measure/technology:</b>	utilizing the captured landfill gas for power generation and flaring the captured gas		

<b>Party</b>	<b>Project participants</b>	<b>Party considered a project participant (Yes/No)</b>	<b>Contract Project Participant</b>
China(Host)	Shenyang Laohuchong Municipal Solid Waste Management Co., Ltd.	No	<input type="checkbox"/>
Italy	Asja Ambiente Italia S.p.A.	No	<input checked="" type="checkbox"/>
Switzerland	ICF- International Clean Fund LLC	No	<input type="checkbox"/>

**II. Verification Team:**

Verification team			Role									
Full name	Affiliation TÜV Rheinland	Appointed for Sectoral Scopes (Technical Areas)	Team leader	Acting Team Leader	Local Expert	Team Member (Auditor)	Technical Expert	Acting Tech. Expert	Trainee Auditor	Technical Reviewer	Expert to TR	Trainee TR
Mr. YAN Chong	China	1.2, 2.1, 3.1, 4.3, 4.5, 9.1	X									
Ms. SUN Na	China	1.2, 13.1					X					
Mr. Walter TANG	China	1.1, 1.2, 2.1, 2.2, 3.1, 4.3, 4.5, 13.1								X		

**Verification Phases:**

- ☒ Desk Review  
☒ Follow up interviews  
☒ Corrective Actions / Clarifications Requested  
☒ Resolution of outstanding issues

**Verification Status:**

- ☒ Full Approval and Submission for Issuance  
☐ Rejected

**III. Verification Report:**

Final approval	Released	Distribution
<input checked="" type="checkbox"/>	By: Mr. Henri PHAN	<input checked="" type="checkbox"/> No distribution without permission from the Client or responsible organizational unit
Date: 2014-12-16		<input type="checkbox"/> Unrestricted distribution

## Abbreviations

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

## Verification opinion — summary

The verification team assigned by the DOE (TÜV Rheinland (China) Ltd.) concludes that the CDM Project Activity “Shenyang Laohuchong LFG Power Generation Project” in China, as described in the registered PDD (Version 03, dated 16/06/2008) and Monitoring Report (Version 02, dated 07/11/2014), meets all relevant requirements of the UNFCCC for CDM project activities including article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakesh Accords) and the subsequent decisions by the COP/MOP and CDM Executive Board. The verification is conducted in line with the VVS requirements.

### Verification methodology and process

The verification has been performed as described in the VVS Version 07.0 and constitutes the following steps:

- Publication of the MR on the UNFCCC website (starting from 26 Sep. 2014)
- Desk review of the MR and the relevant documents
- On-site assessment (20 Oct. 2014 to 21 Oct. 2014)
- Issuance of Verification Report

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

## TABLE OF CONTENTS

1.	INTRODUCTION.....	7
1.1	Objective	7
1.2	Scope	7
2.	METHODOLOGY.....	8
2.1	Desk review	8
2.2	On-site visit and follow-up interviews with project stakeholders	13
2.3	Resolution of outstanding issues	14
2.4	Internal quality control	14
2.5	Verification team	15
3.	VERIFICATION FINDINGS.....	15
3.1	Project implementation	15
3.2	Assessment Opinion on Post Registration Change	19
3.3	Compliance of the monitoring plan with the monitoring methodology including applicable tool(s)	19
3.4	Compliance of the Actual monitoring with monitoring plan in the PDD	19
3.5	Assessment of data and calculation of greenhouse gas emission reductions	40
3.6	Issues remaining from the previous verification period	42

Appendix A: Verification Protocol

Appendix B: Certification Statement

Appendix C: Certificates of Competence

## 1. Introduction

The organization “Asja Ambiente Italia S.p.A.” has commissioned the DOE TÜV Rheinland (China) Ltd. to perform a verification of the CDM Project Activity “Shenyang Laohuchong LFG Power Generation Project” in China (hereafter “the project”). This report summarises the findings of the verification of the project, performed on the basis of paragraph 62 of the CDM modalities and procedures, as well as criteria given to provide for consistent project operations, monitoring and reporting and the subsequent decisions by the CDM Executive Board. Verification is required for all registered CDM project activities intending to confirm their achieved emission reductions and proceed with request for issuance of CERs. This report contains the findings from the verification and a certification statement for the certified emission reductions.

### 1.1 Objective

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

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

The objective of this verification was to verify and certify emission reductions reported for the “Shenyang Laohuchong LFG Power Generation Project” in country “China” for the period from 01/08/2011 to 31/07/2014.

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

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

### 1.2 Scope

The scope of the verification is:

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

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

## 2. Methodology

The verification consists of the following four phases:

- 1) Completeness check and webhost of the monitoring report for public commenting;
- 2) Desk review of the monitoring plan, monitoring report, monitoring methodology, project design document, applicable tools in particular attention to the frequency of measurements, quality of metering equipment including calibration requirements, QA/QC procedures and other relevant documents;
- 3) On-site visit (including follow-up interviews with project stakeholders, when deemed necessary). The on-site assessment includes the following;
  - An assessment of implementation and operation of project activity with respect to registered PDD or approved revised PDD;
  - Review of information flows for generating, aggregating, calculating and reporting the monitoring parameters;
  - Interview with relevant personals to determine whether the operational and data collection procedures are implemented and in accordance with monitoring plan of the registered PDD or approved 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 in-line 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.

The following sections outline each step in more detail.

### 2.1 Desk review

The following table outlines the documentation reviewed during the verification:

Ref No.	Reference Document
/1/	Final Monitoring Report of Shenyang Laohuchong LFG Power Generation Project, Version 02, dated 07/11/2014
/2/	Webhosted Monitoring Report of Shenyang Laohuchong LFG Power Generation Project, Version 01, dated 25/09/2014
/3/	Registered PDD of Shenyang Laohuchong LFG Power Generation Project, Version 03, dated 16/06/2008
/4/	Validation report of Shenyang Laohuchong LFG Power Generation Project, Version 01, dated 30/06/2008
/5/	Revision to the approved consolidated baseline methodology ACM0001 "Consolidated baseline methodology for landfill gas project activities", Version 06
/6/	ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 6, EB 24, Annex 7, dated 12/05/2006
/7/	Tool for demonstration and assessment of additionality, Version 04, EB 36, Annex



	16, dated 30/11/2007															
/8/	Tool to determine project emissions from flaring gases containing methane, EB 28, Annex 13															
/9/	Clean Development Mechanism Validation and Verification Standard, Version 07.0, EB 79, Annex 4, dated 01/06/2014															
/10/	Clean Development Mechanism Project Standard, Version 07.0, EB 79, Annex 3, dated 01/06/2014															
/11/	Monitoring Report Form (F-CDM-MR), Version 04.0, 25/06/2014															
/12/	F-CDM-MR Attachment “Instructions for filling out the monitoring report form”, dated 25/06/2014															
/13/	Guideline on the application of materiality in verifications, Version 01.0, EB 69, Annex 6, dated 13/09/2012															
/14/	Verification and monitoring reports for previous 2 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>															
/15/	Verification report for 2 <sup>nd</sup> monitoring period from 01/04/2010 to 31/07/2011, Version 1.1, dated 17/02/2012															
/16/	Initial emission reductions calculation spreadsheet															
/17/	Final emission reductions calculation spreadsheet															
/18/	Electricity monitoring data records covering the monitoring period from 01/08/2011 to 31/07/2014															
/19/	Landfill gas flow monitoring data records covering the monitoring period from 01/08/2011 to 31/07/2014															
/20/	Monitoring data records on the methane fraction in the landfill gas covering the monitoring period from 01/08/2011 to 31/07/2014															
/21/	Monitoring data records on the gas engine working hours, flare working hours and temperature of flare exhaust gas covering the monitoring period from 01/08/2011 to 31/07/2014															
/22/	Electricity transaction notes covering the monitoring period from 01/08/2011 to 31/07/2014															
/23/	2006 IPCC Guidelines for National Greenhouse Gas Inventories															
/24/	Electric line diagram of Shenyang Laohuchong LFG Power Generation Project															
/25/	Calibration certificate of electric meters issued by covering the monitoring period from 01/08/2011 to 31/07/2014, details as following, <table><tr><td>Serial No.</td><td>Accuracy Level</td><td>Certificate No.</td><td>Validity</td><td>Calibration Entity</td></tr><tr><td>8007472</td><td>0.5S</td><td>Shen Dian Jiao Zi 2008-11</td><td>12/10/2008-11/10/2013</td><td>Power Metrology Institute of Shenyang Power Supply Company</td></tr><tr><td></td><td></td><td>DC1310SY201</td><td>10/10/2013-</td><td>Northeast Electric</td></tr></table>	Serial No.	Accuracy Level	Certificate No.	Validity	Calibration Entity	8007472	0.5S	Shen Dian Jiao Zi 2008-11	12/10/2008-11/10/2013	Power Metrology Institute of Shenyang Power Supply Company			DC1310SY201	10/10/2013-	Northeast Electric
Serial No.	Accuracy Level	Certificate No.	Validity	Calibration Entity												
8007472	0.5S	Shen Dian Jiao Zi 2008-11	12/10/2008-11/10/2013	Power Metrology Institute of Shenyang Power Supply Company												
		DC1310SY201	10/10/2013-	Northeast Electric												

				09/10/2018	Power Research Institute Co., Ltd.
	0103200014423	1	Jian Zi No. 090201	19/02/2009-18/02/2014	Su Jiatun Agro electricity Bureau Calibration and Testing Center
	010112300001515158	0.5s	DC1312SY202	17/07/2013-16/07/2018	Northeast Electric Power Research Institute Co., Ltd.
	0103200019480	1	Jian Zi No. 090101	05/01/2009-04/01/2014	Su Jiatun Agro electricity Bureau Calibration and Testing Center
			DC1312SY203	26/12/2013-25/12/2018	Northeast Electric Power Research Institute Co., Ltd.
/26/	Calibration certificate of gas flow meters issued by Liaoning Provincial Institute of Measurement covering the monitoring period from 01/08/2011 to 31/07/2014, details as following,				
	Serial No.	Accuracy Level	Certificate No.	Validity	
	01726699	±0.9%	Liao Ji 10091402102	14/09/2010-13/09/2011	
			Liao Ji 11091302125	13/09/2011- 12/09/2012	
			Liao Ji 12020403291	11/09/2012- 10/09/2013	
			Liao Ji 13020403866	09/09/2013- 08/09/2014	
	01746509	±2%	Liao Ji 10091402101	14/09/2010-13/09/2011	
			Liao Ji 11091302124	13/09/2011- 12/09/2012	
			Liao Ji	11/09/2012- 10/09/2013	

			12020403290	
			Liao Ji 13020403865	09/09/2013- 08/09/2014
	01746510	±2%	Liao Ji 10091402103	14/09/2010-13/09/2011
			Liao Ji 11091302123	13/09/2011- 12/09/2012
			Liao Ji 12020403289	11/09/2012- 10/09/2013
Liao Ji 13020403864			09/09/2013- 08/09/2014	
/27/	Calibration certificate of gas analyzer issued by Liaoning Provincial Institute of Measurement covering the monitoring period from 01/08/2011 to 31/07/2014, details as following,			
	Serial No.	Accuracy Level	Certificate No.	Validity
	0708404	≤2%	Liao Ji 10091306807	13/09/2010-12/09/2011
Liao Ji 11090206802			02/09/2011- 01/09/2012	
Liao Ji 12051214895			01/09/2012- 31/08/2013	
Liao Ji 13051223986			31/08/2013- 30/08/2014	
/28/	Certificates of new thermocouples covering the monitoring period from 01/08/2011 to 31/07/2014, details as following,			
	Type	Quality check date	Replacement date	Validity
	WRMK-331	April 2011	12/04/2011	12/04/2011-11/04/2012
March 2012		10/04/2012	10/04/2012- 09/04/2013	
February 2013		21/03/2013	21/03/2013- 20/03/2014	
January 2014		18/02/2014	18/02/2014- 17/02/2015	
/29/	Laboratory accreditation certificate for Power Metrology Institute of Shenyang Power Supply Company issued by China National Accreditation Service for Conformity Assessment, No. CNAS L1064, dated 04/01/2007 and valid to 03/01/2010			
/30/	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			
/31/	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			
/32/	1. 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 2. Laboratory accreditation certificate for Liaoning Provincial Institute of Measurement issued by China National Accreditation Service for Conformity Assessment, No. CNAS L0954, dated 28/06/2007 and valid to 27/06/2012
/33/	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
/34/	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
/35/	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
/36/	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
/37/	Verification Regulation of Working Base Metal Thermocouple (JJG351-1996) issued by China National Technical Supervision Bureau, valid from 01/03/1997
/38/	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
/39/	Operation log indicating the operation of #4 and #5 power generating sets, dated 27/03/2012
/40/	Flare installation acceptance report, dated 20/10/2007
/41/	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
/42/	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;
/43/	1. Power purchase agreement for Shenyang Laohuchong LFG Power Generation Project with validity from 26/03/2012 to 25/03/2022, dated 26/03/2012 2. Power purchase agreement for Shenyang Laohuchong LFG Power Generation Project with validity from 10/01/2018 to 09/01/2013, dated 10/01/2008
/44/	Management Manual of Shenyang Laohuchong LFG Power Generation Project, dated in Oct. 2007
/45/	Daily operation & maintenance logs
/46/	Meter change notes of electric meter A, dated 23/07/2013
/47/	Current transformer change note from magnification ratio 1,500 to 4,000, dated 08/11/2011
/48/	CDM training records

/49/	Operational qualifications of staff
/50/	F-CDM-MOC: Annex 2 to add ICF- International Clean Fund LLC as project participant, dated 13/07/2011
/51/	Annex I Country Approval: Switzerland, Federal Department of the Environment, Transport, Energy and Communications DETEC, Ref. H115-0624, dated 26/05/2011
/52/	Regulation on the installation and management of energy measurement devices for energy using entities (GB/17167-2006)
/53/	Technical administrative code of electric energy metering (DL/T448-2000) issued by National Economy Trade Committee of China, valid from 01/01/2001

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

TÜV Rheinland verification team carried out an on-site visit on 20 Oct. 2014 to 21 Oct. 2014 and performed interviews with the project representatives and stakeholders.

**Table 1**

	Date	Name	Organization	Topic
/i/	20/10/2014	Mr. PAN Libo Mr. LI Wei Mr. LI Baobin	Shenyang Laohuchong Municipal Solid Waste Management Co., Ltd.  Asja Ambiente Italia S.p.A.	- Project Implementation - Project operation - Monitoring devices' calibration - Management and Operational procedures - Data collection procedure - Data QA/QC procedures - Environmental impacts and mitigation measures
/ii/	21/10/2014	Mr. DIAO Xianlan Ms. WANG Xia	Asja Ambiente Italia S.p.A.	- Monitoring results reporting - ER calculation

## 2.3 Resolution of outstanding issues

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

The verification protocol serves the following purposes:

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

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

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

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

Requests for clarification (CLs) are raised, if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

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

## 2.4 Internal quality control

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

## 2.5 Verification team

Table 2

verification team			Type of Involvement							
Full name	Affiliation TÜV Rheinland	Appointed for Sectoral Scopes (Technical Areas)	Supervising the work	Desk review	Site Visit + Interview	Report and protocol Writing	Technical Expert Input	Reporting Support	Trainee Technical Review	Technical Review
Mr. YAN Chong	China	1.2, 2.1, 3.1, 4.3, 4.5, 9.1	X	X	X	X				
Ms. SUN Na	China	1.2, 13.1		X	X		X			
Mr. Walter TANG	China	1.1, 1.2, 2.1, 2.2, 3.1, 4.3, 4.5, 13.1								X

## 3. Verification findings

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

### 3.1 Project implementation

#### 3.1.1 The implementation of the project activity

As reflected on UNFCCC website <http://cdm.unfccc.int/Projects/DB/DNV-CUK1214898000.95/view>, the project was registered with Registration No. 1906 on 25 December 2008, under the approved methodology ACM0001, Version 06 "Consolidated baseline methodology for landfill gas project activity"/5/, its referred methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (Version 6)/6/, "Tool for the demonstration and assessment of additionality" (Version 04)/7/, and "Tool to determine project emissions from flaring gases containing methane"/8/. And the chosen fixed crediting period is from 25 Dec. 2008 to 24 Dec. 2018, hence the monitoring period from 01/08/2011 to 31/07/2014 is confirmed to fall within the crediting period, and also the verification for the monitoring period from 01/08/2011 to 31/07/2014 is the third periodical verification of the project.

By means of on-site inspection and documents review against the registered PDD/3/, the verification team can ensure below,

- The project is a bilateral CDM project activity/3/ and is owned by Shenyang Laohuchong Municipal Solid Waste Management Co., Ltd. as reflected in its business license/41/, and other participants are Asja Ambiente Italia S.p.A. from Italy. and ICF- International Clean Fund LLC from Switzerland DNA/14//15/. During the monitoring period from



01/08/2011 to 31/07/2014, there was no change on the project participants, which is confirmed by interviewing with Mr. PAN Libo(i.e. Project manager of Shenyang Laohuchong Municipal Solid Waste Management Co., Ltd.)/i/;

- In line with the registered PDD/3/, the project is located in Tashan Farm, Chenxiang Town, Su Jiatun District, Shenyang, Liaoning Province, China. And the geographical coordinates of the project activity are confirmed to be consistent with that described in the registered PDD by using GPS device, 123°34'E, 41°33'N;
- 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. During on site inspection, 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/i/, 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.
- As clearly indicated in the electric line diagram of the project/24/ and the power purchase agreement/43/, the electricity generated by the project is delivered to Northeast Power Grid via 110kV transmission line after being raised from 10.5kV to 110kV, which is consistent with the registered PDD/3/;

As part of the site visit, the verification team was able to confirm that the project implementation is in accordance with the project description contained in the registered PDD (Version 03, dated 16/06/2008)/3/. The verification took cognizance para.260 of VVS Version 07.0.

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

**Table 3**

Subject	Webhosted Monitoring Report (MR)		Correction to webhosted MR in the final MR submission for issuance with DOE assessment and reason of acceptance.	
Project description	MR B.1		- Pls. refer to CAR 2 of Table 2 in Appendix A.	
Values of monitoring parameters	EL <sub>LFG</sub>	11,168,400MWh	EL <sub>LFG</sub>	31,506.115MWh
	EL <sub>PR</sub>	Meter A: 831.39MWh Meter B: 0.073MWh	EL <sub>PR</sub>	Meter A: 886.419MWh Meter B: 0.067MWh
	PE <sub>flare</sub>	17,354.63tCO <sub>2</sub> e	PE <sub>flare</sub>	17,022.39tCO <sub>2</sub> e
			Pls. refer to CAR 3 and CAR 4 of Table 2 in Appendix A.	
Emission reductions during	353,617 tCO <sub>2</sub> e		353,828 tCO <sub>2</sub> e	



the monitoring period		Pls. refer to CAR 3 and CAR 4 of Table 2 in Appendix A.
<p><i>Please refer to Appendix A of this report for details of each change between webhosted MR and the final MR for submission. The verification team has carried out the verification process based on the Webhosted MR and raised CARs/CLs against the project by issuing the verification protocol.</i></p> <p><i>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.</i></p> <p><i>It is concluded that the verification team has reviewed the project in line with the VVS (Version 07.0) 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.</i></p>		

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

As accurately reported in the monitoring report for the monitoring period from 01/08/2011 to 31/07/2014 /1/, the actual operation of the project is well organized and fully in compliance with the registered PDD/3/, detailed assessment as following,

#### (a) Operation Status of the project activity:

By means of on-site interviewing with Mr. PAN Libo/i/ (i.e. the project manager of the project) and checking the daily operation & maintenance logs/45/, the verification team can confirm that the project activity operated well, and no any event which may impact the applicability of the methodology occurred during the monitoring period from 01/08/2011 to 31/07/2014.

In addition, the implementation and actual operation timeline of the project is as listed in the Table 4,

**Table 4**

Milestone	Date	The verification team's opinion
Construction	01/07/2007	The construction start date of 01/07/2007 can be confirmed in the registered PDD/3/, the validation report/4/ and the previous 2 verification and monitoring reports/14/.
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 2 verification and monitoring reports/14/. Besides, it has been verified by checking the flare installation acceptance report/40/.
Operation starting of 1#, 2# and 3# power generators	04/03/2008	The operation start date of 18/10/2007 for 1#, 2# and 3# can be confirmed in the registered PDD/3/, the validation report/4/ and the previous 2 verification and monitoring reports/14/. Besides, it has been verified by checking the statement issued by local power company/38/.
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/39/.

**(b) Technology applied by the project activity:**

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 showned in the table 5. And also their technical specification is verified to be consistent with that described in the registered PDD/3/.

**Table 5**

Project equipment	Implementation in accordance with PDD	Assessment approach
Gas generating Set (Unit rated capacity: 500kW Type: 500GF-N)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	On-site inspection
Flare (Type: TOR-30-A1)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	On-site inspection

**(c) Monitoring arrangement of the project activity:**

According to the previous monitoring reports and verification reports/14/, 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 20 Oct. 2014 to 21 Oct. 2014 and interview/i/. The power purchase agreements/43/ covering the whole monitoring period are checked, and can demonstrate that the electricity generated by the project activity is delivered to the Northeast Power Grid. And the electric line diagram showing three meters/24/ is confirmed to be accurately indicated in the monitoring report/1/.

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, both of which 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 2 monitoring and verification reports/14/.

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 2 monitoring and verification reports/14/.

In summary, the monitoring period is reasonable and the actual implementation of the project activity is appropriate to its CDM development. The verification took cognizance para.261 of VVS Version 07.0..

### 3.2 Assessment Opinion on Post Registration Change

As assessed in the above section 3.1, the project has been fully implemented and operated in accordance with registered PDD/3/, thus it is not applicable.

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

During the on-site assessment, the whole project operation process was carefully inspected and reflected the emission sources included in the project boundary to be consistent with the registered PDD/3/ and the validation report/4/.

The verification team is thus able to confirm that the monitoring plan under implementation is in compliance with ACM0001, Version 06/5/, the approved methodology applied by the registered CDM project activity. The verification took cognizance para.264 of VVS Version 07.0.

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

The monitoring has been carried out in accordance with the monitoring plan contained in the registered PDD Version 03, dated 16/06/2008/3/ and the approved revised monitoring plan/8/.

The verification team determined against all the information provided in MR to check if the actual monitoring plan is in-line with the applied monitoring methodology. The verification took cognizance para.268 of VVS Version 07.0.

Table 6

Determination Requirements	Criteria fulfilled	Determination and reporting by the verification team
Has any MP revision or deviation been sought and approved by EB for the project.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	N/A
Is complete set of data for the specified monitoring period available	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Yes. The monitoring data records covering the monitoring period from 01/08/2011 to 31/07/2014/18/ has been provided to the verification team, and can be confirmed to be complete for the verification.
Has the required information provided in the monitoring report been cross-checked with other sources	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Yes, the electricity monitoring data records/18/ have been cross checked with the electricity transaction notes/22/.
Is the calculation of baseline emissions and project activity emissions and leakage in accordance with the formule and methods described in monitoring plan and the applied methodology.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Yes. 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/17/,

Determination Requirements	Criteria fulfilled	Determination and reporting by the verification team
		is in accordance with the formule and methods described in monitoring plan of the registered PDD/3/ and the applied methodology ACM0001, Version 06/5/.
Have all assumptions used for emission calculation been justified	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<p>Yes.</p> <p>For the emission reductions calculation, the adopted ex-ante emission factor of 1.05176tCO<sub>2</sub>e/MWh, GWP<sub>CH<sub>4</sub></sub> of 21 and <math>\rho_{CH_4,n,h}</math> of 0.0007168tCH<sub>4</sub>/m<sup>3</sup>CH<sub>4</sub> are confirmed to be in compliance with with the approved revised monitoring plan /8/.</p>
Have appropriate emission factors, IPCC default values and other reference values been correctly applied	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<p>Yes.</p> <p>As clearly reflected in the monitoring report/1/ and the emission reductions calculation spreadsheet/17/, the ex-ante reference values are correctly applied in the emission reductions calculation.</p>

### 3.4.1 Monitored parameters

According to the registered PDD/3/, the emission reductions achieved by the project are determined as follows,

$$ER_y = (MD_{project,y} - MD_{reg,y}) * GWP_{CH4} + EL_{LFG,y} \cdot CEF_{elec,BL,y} - EL_{PR} \cdot CEF_{elec,PR,y} + ET_{LFG,y} * CEF_{ther,BL,y} - ET_{PR,y} * EF_{fuel,PR,y}$$

Where,

$$MD_{project,y} = MD_{flare,y} + MD_{electricity,y} = (LFG_{flare,y} * w_{CH4,y} * D_{CH4}) - (PE_{flare,y} / GWP_{CH4}) + LFG_{electricity,y} * w_{CH4,y} * D_{CH4}$$

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

Based on the on-site inspection and documents review/24//42//43//44//45/, the verification team can verify below,

- 1) the project does not produce thermal energy by utilizing the landfill gas during the monitoring period from 01/08/2011 to 31/07/2014;
- 2) the project does not consume any fossil fuel during the monitoring period from 01/08/2011 to 31/07/2014;
- 3) the project operation complies with the relevant regulatory requirements/42/ during the monitoring period from 01/08/2011 to 31/07/2014.

thus it is reasonable to determine  $MD_{reg,y}$ ,  $ET_{LFG,y}$  and  $ET_{PR,y}$  as zero, as reflected in the monitoring report/1/.

Besides, as per the applied methodology ACM0001, Version 06/5/, no leakage effects need to be accounted under this methodology.

Hence, in line with the registered PDD/3/, the ex-post monitored parameter for the emission reductions calculation is confirmed as listed in the Table 7-18,

**Table 7**

Monitoring Parameter Requirement	Assessment/ Observation by the DOE			
1. Data / Parameter: (as in monitoring plan of PDD):	LFG <sub>total,y</sub> / Total amount of landfill gas captured			
2. Type of Monitoring equipment	Item	Type	Accuracy Level	Serial No.
	Flow meter	Annubar 485	±0.9%	01726699
3. Measuring frequency/Time Interval:	Continuously measured			
4. Reporting frequency:	Recorded every 5 minutes			
5. Monitored value:	42,393,746 Nm <sup>3</sup>			
6. 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 the registered PDD /3/ and the monitoring methodology ACM0001, Version 06/5/.			
7. Is accuracy of the monitoring	No, the accuracy of the proposed flow meter not			

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?	stated in the PDD/3/. However, based on the on-site inspection, the gas flow meter has the accuracy level of $\pm 2\%$ , 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)"/52/.
8. If applicable, has the reported data been cross-checked with other available data?	N/A
9. How were the values in the monitoring report verified?	The values presented in the monitoring report/1/ and the emission reductions calculation spreadsheet/17/ have been verified against the original electronic data automatically stored in the Factory DataStorage (FDS) via PLC/19/, and all of them are accurately reported.
10. 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/44/. In addition, during the on-site assessment, the CDM training records /48/and operational qualifications of staff/49/ were checked valid to demonstrate the data management competence of CDM monitoring team.
11. 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 Parameter Requirement	Assessment/ Observation by the DOE			
1. Data / Parameter: (as in monitoring plan of PDD):	LFG <sub>flare,y</sub> / Amount of landfill gas flared			
2. Type of Monitoring equipment	Item	Type	Accuracy Level	Serial No.
	Flow meter	Annubar 485	$\pm 2\%$	01746509
3. Measuring frequency/Time Interval:	Continuously measured			
4. Reporting frequency:	Recorded every 5 minutes, and aggregated hourly, daily, monthly and yearly.			
5. Monitored value:	21,282,634 Nm <sup>3</sup>			
6. Is measuring and reporting	Yes. The frequency of continuously measurement and			



frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	recording every 5 minutes is fully in accordance with the the registered PDD /3/ and the monitoring methodology ACM0001, Version 06/5/.
7. 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 $\pm 2\%$ , 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)"/52/.
8. If applicable, has the reported data been cross-checked with other available data?	N/A
9. How were the values in the monitoring report verified?	The values presented in the monitoring report/1/ and the emission reductions calculation spreadsheet/17/ have been verified against the original electronic data automatically stored in the Factory DataStorage (FDS) via PLC/19/, and all of them are accurately reported.
10. 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/44/. In addition, during the on-site assessment, the CDM training records /48/and operational qualifications of staff/49/ were checked valid to demonstrate the data management competence of CDM monitoring team.
11. 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 9

Monitoring Parameter Requirement	Assessment/ Observation by the DOE			
1. Data / Parameter: (as in monitoring plan of PDD):	LFG <sub>electricity,y</sub> / Amount of landfill gas combusted in power plant			
2. Type of Monitoring equipment	Item	Type	Accuracy Level	Serial No.
	Flow meter	Annubar 485	$\pm 2\%$	01746510
3. Measuring frequency/Time Interval:	Continuously measured			

4. Reporting frequency:	Recorded every 5 minutes, and aggregated hourly, daily, monthly and yearly.
5. Monitored value:	21,281,971 Nm <sup>3</sup>
6. 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 the registered PDD /3/ and the monitoring methodology ACM0001, Version 06/5/.
7. 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 $\pm 2\%$ , 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)" /52/.
8. If applicable, has the reported data been cross-checked with other available data?	N/A
9. How were the values in the monitoring report verified?	The values presented in the monitoring report/1/ and the emission reductions calculation spreadsheet/17/ have been verified against the original electronic data automatically stored in the Factory DataStorage (FDS) via PLC/19/, and all of them are accurately reported..
10. 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/44/. In addition, during the on-site assessment, the CDM training records /48/and operational qualifications of staff/49/ were checked valid to demonstrate the data management competence of CDM monitoring team.
11. 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 Parameter Requirement	Assessment/ Observation by the DOE			
1. Data / Parameter: (as in monitoring plan of PDD):	EL <sub>LFG</sub> / Net amount of electricity generated using landfill gas			
2. Type of Monitoring equipment	Item	Type	Accuracy Level	Serial No.



	Electric meter	DSSD331-3	0.5s	8007472
3. Measuring frequency/Time Interval:	Continuously measured			
4. Reporting frequency:	Monthly recorded			
5. Monitored value	31,506.115 MWh			
6. 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 the registered PDD /3/ and the monitoring methodology ACM0001, Version 06/5/.			
7. 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)" /53/.			
8. 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/22/.			
9. How were the values in the monitoring report verified?	The values presented in the monitoring report/1/ and the emission reductions calculation spreadsheet/17/ have been verified against the official electricity transaction notes from grid company/22/, and conservative value has been taken for the calculation of emission reductions as reflected in the ER calculation spreadsheet/17/. Especially, the verification team checked the operation logs and detected that the current transformer (Manification ratio of 1,500) was replaced with new one (Manification ratio of 4,000) by the grid company on 8 Nov. 2011, and all changing readings have been kept and accurately used for ER calculatio, as reflected in the ER calculation spreadsheets/17/.			
10. 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/44/. In addition, during the on-site assessment, the CDM training records /48/and operational qualifications of staff/49/ were checked valid to demonstrate the data management competence of CDM monitoring team.			
11. 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	N/A			

or has a request for deviation been approved?	
---	--

Table 11

Monitoring Prameter Requirement	Assessment/ Observation by the DOE			
1. Data / Parameter: (as in monitoring plan of PDD):	EL <sub>PR</sub> / Total amount of electricity required to meet the project requirement			
2. Type of Monitoring equipment	Item	Type	Accuracy Level	Serial No.
	Electric meter A	DTSD482	1	0103200014423
		DTZ188	0.5s	010112300001515158 <sup>1</sup>
	Electric meter B	DTS51	1	0103200019480
3. Measuring frequency/Time Interval:	Continously measured			
4. Reporting frequency:	Monthly recorded			
5. Monitored value:	886.486MWh (i.e. Electricity meter A: 886.419MWh, Electricity meter B:0.067MWh, thus EL <sub>PR</sub> is 886.486MWh in total during the monitoring period)			
6. Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency of continously measurement and monthly recording is fully in accordance with the the registered PDD /3/ and the monitoring methodology ACM0001, Version 06/5/.			
7. 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 current electric meter A (SN: 010112300001515158) has the accuracy of 0.5s, and it conservatively replaced the origianl one (SN: 0103200014423) with less accuracy of 1 on 23 July 2013 as reflected in the operation logs/46/. While the electric meter B has no any change during the monitoring period from 01/08/2011 to 31/07/2014, and kept its accuracy of 1. By reviewing against relevant regulatory requirement, these adopted accuracy levels are all confirmed to be in comliance with the national standard of “Technical administrative code of electric energy metering (DL/T448-2000)”/53/.			
8. If applicable, has the reported data been cross-checked with other	Yes, the reported data has been cross checked with the official electricity transaction notes from grid company/22/.			

<sup>1</sup> The electric meter (SN: 010112300001515158) with accuracy of 0.5s replaced the electric meter (SN: 0103200014423) with accuracy of 1 on 23 July 2013, which is more conservative and accurate for the monitoring of EL<sub>PR</sub>.

available data?	
9. How were the values in the monitoring report verified?	The values presented in the monitoring report/1/ and the emission reductions calculation spreadsheet/17/ have been verified against the official electricity transaction notes from grid company/22/, and conservative value has been taken for the calculation of emission reductions as reflected in the ER calculation spreadsheet/17/.
10. 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/44/. In addition, during the on-site assessment, the CDM training records /48/and operational qualifications of staff/49/ were checked valid to demonstrate the data management competence of CDM monitoring team.
11. 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> 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 18/07/2011 to 19/08/2011 as the electricity consumption from 01/08/2011 to 19/08/2011, the monitoring data from 17/07/2014 to 13/08/2014 as the electricity consumption from 17/07/2014 to 31/07/2014 respectively, both of which are considered most conservative assumption for the emission reductions calculation.

Table 12

Monitoring Parameter Requirement	Assessment/ Observation by the DOE			
1. Data / Parameter: (as in monitoring plan of PDD):	w <sub>CH<sub>4</sub>y</sub> / Methane fraction in the landfill gas			
2. Type of Monitoring equipment	Item	Type	Accuracy Level	Serial No.
	Gas analyzer	XGF-4043	≤2%	0708404
3. Measuring frequency/Time Interval:	Continuously measured			
4. Reporting frequency:	Recorded every 5 minutes			
5. Monitored value:	Pls. refer to the ER calculation spreadsheets for specific values/17/.			
6. 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 the registered PDD /3/ and the monitoring methodology ACM0001, Version 06/5/.			

7. 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 $\leq 2\%$ 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)"/36/.
8. If applicable, has the reported data been cross-checked with other available data?	N/A
9. How were the values in the monitoring report verified?	The values presented in the monitoring report/1/ and the emission reductions calculation spreadsheet/17/ have been verified against the original electronic data automatically stored in the Factory DataStorage (FDS) via PLC/19/, and all of them are accurately reported.
10. 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/44/. In addition, during the on-site assessment, the CDM training records /48/and operational qualifications of staff/49/ were checked valid to demonstrate the data management competence of CDM monitoring team.
11. 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 Parameter Requirement	Assessment/ Observation by the DOE		
1. Data / Parameter: (as in monitoring plan of PDD):	$T_{\text{flare}}$ / Temperature in the exhaust gas of the enclosed flare		
2. Type of Monitoring equipment	Item	Type	Accuracy Level
	N-type thermocouple	WRMK-331	$\pm 2.5^{\circ}\text{C}$
3. Measuring frequency/Time Interval:	Continuously measured		
4. Reporting frequency:	Recorded every 5 minutes		
5. Monitored value:	Pls. refer to the ER calculation spreadsheets for specific values/17/.		

6. 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 the registered PDD /3/ and the monitoring methodology ACM0001, Version 06/5/.
7. 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 $\pm 2.5^{\circ}\text{C}$ 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)" /37/.
8. If applicable, has the reported data been cross-checked with other available data?	N/A
9. How were the values in the monitoring report verified?	The values presented in the monitoring report/1/ and the emission reductions calculation spreadsheet/17/ have been verified against the original electronic data automatically stored in the Factory DataStorage (FDS) via PLC/19/, and all of them are accurately reported.
10. 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/44/. In addition, during the on-site assessment, the CDM training records /48/ and operational qualifications of staff/49/ were checked valid to demonstrate the data management competence of CDM monitoring team.
11. 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 Parameter Requirement	Assessment/ Observation by the DOE		
1. Data / Parameter: (as in monitoring plan of PDD):	EWH / Engine working hours of power plant		
2. Type of Monitoring equipment	Item	Type	Accuracy Level
	Programmable Logic Controller (PLC)	Siemens S7-300	<10s per day



3. Measuring frequency/Time Interval:	Continuously measured
4. Reporting frequency:	Recorded every 5 minutes
5. Monitored value:	25,760h
6. 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 the registered PDD /3/ and the monitoring methodology ACM0001, Version 06/5/.
7. 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 ther expertize of verification team, the adopted accuracy level represents good monitoring practices.
8. If applicable, has the reported data been cross-checked with other available data?	N/A
9. How were the values in the monitoring report verified?	The values presented in the monitoring report/1/ and the emission reductions calculation spreadsheet/17/ have been verified against the original electronic data automatically stored in the Factory DataStorage (FDS) via PLC/19/, and all of them are accurately reported.
10. 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/44/. And the PLC has been maintained in line with manufacturer's recommendations as reflected in the operation & maintenance logs/45/. In addition, during the on-site assessment, the CDM training records /48/and operational qualifications of staff/49/ were checked valid to demonstrate the data management competence of CDM monitoring team.
11. 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 Prameter Requirment	Assessment/ Observation by the DOE
1. Data / Parameter: (as in monitoring plan of PDD):	FWH / Flare working hours

2. Type of Monitoring equipment	Item	Type	Accuracy Level
	Programmable Logic Controller (PLC)	Siemens S7-300	<10s per day
3. Measuring frequency/Time Interval:	Continuously measured		
4. Reporting frequency:	Recorded every 5 minutes		
5. Monitored value:	25,869h		
6. 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 the registered PDD /3/ and the monitoring methodology ACM0001, Version 06/5/.		
7. 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 ther expertize of verification team, the adopted accuracy level represents good monitoring practices.		
8. If applicable, has the reported data been cross-checked with other available data?	N/A		
9. How were the values in the monitoring report verified?	The values presented in the monitoring report/1/ and the emission reductions calculation spreadsheet/17/ have been verified against the original electronic data automatically stored in the Factory DataStorage (FDS) via PLC/19/, and all of them are accurately reported.		
10. 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/44/. And the PLC has been maintained in line with manufacturer's recommendations as reflected in the operation & maintenance logs/45/. In addition, during the on-site assessment, the CDM training records /48/and operational qualifications of staff/49/ were checked valid to demonstrate the data management competence of CDM monitoring team.		
11. 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 16

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
1. Data / Parameter: (as in monitoring plan of PDD):	$PE_{flare}$ / Project emissions from flaring of the residual gas stream in year y
2. Type of Monitoring equipment	Not applicable. As per the applied methodology ACM0001, Version 06/5/, it is calculated following the procedures described in the «Tool to determine project emissions from flaring gases containing methane»/8/, i.e. $PE_{flare,y} = \sum_{h=1}^{8760} TM_{RG,h} \times (1 - \eta_{flare,h}) \times \frac{GWP_{CH_4}}{1000}$
3. Measuring frequency/Time Interval:	N/A
4. Reporting frequency:	N/A
5. Monitored value:	17,022.39tCO <sub>2</sub> , detailed as reflected in the ER calculation spreadsheet/17/.
6. Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	N/A
7. 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
8. If applicable, has the reported data been cross-checked with other available data?	N/A
9. How were the values in the monitoring report verified?	The values presented in the monitoring report/1/ and the emission reductions calculation spreadsheet/17/ have been verified against the original electronic data automatically stored in the Factory DataStorage (FDS) via PLC/19/, and all of them are accurately reported.
10. 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/44/. In addition, during the on-site assessment, the CDM training records /48/and operational qualifications of staff/49/ were checked valid to demonstrate the data management competence of CDM monitoring team.
11. 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	N/A



the most conservative assumption theoretically possible been applied or has a request for deviation been approved?

Table 17

Monitoring Prameter Requirement	Assessment/ Observation by the DOE			
1. Data / Parameter: (as in monitoring plan of PDD):	fv <sub>CH4,RG,h</sub> / Volumetric fraction of methane in the residual gas on dry basis in hour h			
2. Type of Monitoring equipment	Item	Type	Accuracy Level	Serial No.
	Gas analyzer	XGF-4043	≤2%	0708404
3. Measuring frequency/Time Interval:	Continuously measured			
4. Reporting frequency:	Recorded every 5 minutes			
5. Monitored value:	Pls. refer to the ER calcaultion spreadsheets for specific values/17/.			
6. Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency of continously measurement and recording every 5 minutes is fully in accordance with the the registered PDD /3/ and the monitoring methodology ACM0001, Version 06/5/.			
7. 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 comliance with the national standard of “Verification Regulation of Catalysis Combustion Type Methane Measuring Device (JJG678-2007)”/36/.			
8. If applicable, has the reported data been cross-checked with other available data?	N/A			
9. How were the values in the monitoring report verified?	The values presented in the monitoring report/1/ and the emission reductions calculation spreadsheet/17/ have been verified against the original electronic data automatically stored in the Factory DataStorage (FDS) via PLC/19/, and all of them are accurately reported.			
10. 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/44/. In addition, during the on-site assessment, the CDM training records /48/and operational qualifications of staff/49/ were checked valid to demonstrate the data management competence of CDM monitoring team.			
11. In case only partial data are	N/A			

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?	
--	--

Table 18

Table 10

Monitoring Prameter Requirement	Assessment/ Observation by the DOE								
1. Data / Parameter: (as in monitoring plan of PDD):	$FV_{RG,h}$ / Volumeric flow rate of the residual gas in dry basis at normal conditions in the hour h								
2. Type of Monitoring equipment	<table><tr><td>Item</td><td>Type</td><td>Accuracy Level</td><td>Serial No.</td></tr><tr><td>Flow meter</td><td>Annubar 485</td><td>±2%</td><td>01746509</td></tr></table>	Item	Type	Accuracy Level	Serial No.	Flow meter	Annubar 485	±2%	01746509
Item	Type	Accuracy Level	Serial No.						
Flow meter	Annubar 485	±2%	01746509						
3. Measuring frequency/Time Interval:	Continuously measured								
4. Reporting frequency:	Recorded every 5 minutes, and aggregated hourly, daily, monthly and yearly.								
5. Monitored value:	Variable								
6. Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency of continously measurement and recording every 5 minutes is fully in accordance with the the registered PDD /3/ and the monitoring methodology ACM0001, Version 06/5/.								
7. 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 comliance with the national standard of “Regulation on the installation and management of energy measurement devices for energy using entities (GB/17167-2006)”/52/.								
8. If applicable, has the reported data been cross-checked with other available data?	N/A								
9. How were the values in the monitoring report verified?	The values presented in the monitoring report/1/ and the emission reductions calculation spreadsheet/17/ have been verified against the original electronic data automatically stored in the Factory DataStorage (FDS) via PLC/19/, and all of them are accurately reported.								
10. Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions	Yes. The well organized CDM monitoring manual has been documented in place for the project/44/. In addition, during the on-site assessment, the CDM training records /48/and operational qualifications								

and are necessary QA/QC processes in place?	of staff/49/ were checked valid to demonstrate the data management competence of CDM monitoring team.
11. 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

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

**Table 19**

Default values used:	1.05176tCO <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, <ul style="list-style-type: none"> <li>- registered PDD (Version 03, dated 16/06/2008) /3/;</li> </ul>

**Table 20**

Default values used:	21 tCO <sub>2</sub> /tCH <sub>4</sub> for GWP <sub>CH<sub>4</sub></sub>
Source and Verification of the source	The default value used for GWP <sub>CH<sub>4</sub></sub> can be verified correct by checking following sources, <ul style="list-style-type: none"> <li>- registered PDD (Version 03, dated 16/06/2008) /3/;</li> <li>- IPCC 2006/23/.</li> </ul>

**Table 21**

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, <ul style="list-style-type: none"> <li>- registered PDD (Version 03, dated 16/06/2008) /3/;</li> <li>- Tool to determine project emissions from flaring gases containing methane/8/.</li> </ul>

**Table 22**

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, <ul style="list-style-type: none"> <li>- registered PDD (Version 03, dated 16/06/2008) /3/;</li> <li>- GB16889-1997 and GB16889-2008/42/.</li> </ul>

In summary, the verification team confirms that all the ex-ante and ex-post parameters are monitored in accordance to the approved monitoring plan and applied methodology. The verification took cognizance para.268 of VVS Version 07.0.

### 3.4.2 Monitoring responsibility

During the on-site visit, the verification team interviewed with the management representative and on-site operators/i/, and confirmed that the structure of monitoring management team and the responsibilities of team have been defined and followed well in accordance with the registered PDD/3/. And also one well organized CDM monitoring manual was found being documented in place for the monitoring of the project/44/.

The monitoring personnel are well trained/48/ and have got relevant national operation qualifications/49/, which demonstrates that they have sufficient competence to carry out the relevant monitoring tasks.

### 3.4.3 Accuracy of equipment and calibration frequency

The monitoring equipments have been installed in the project activity according to the monitoring plan in the registered PDD/3/.

- For the monitoring of electricity imported from grid, the power company replace original Meter A (SN: 0103200014423, Accuracy class: 1) with Meter (SN: 010112300001515158, Accuracy class: 0.5s) on 23 Jul. 2013, during the monitoring period from 01/08/2011 to 31/07/2014, as reflected from the daily operation & maintenance logs of the project/45/. Further, by checking the meter change notes/46/ and interviewing with monitoring engineer/i/, all immediate end readings and start readings of relevant meters have been recorded for the accurate calculation of electricity generation, which is transparently reflected in the emission reductions calculation spreadsheet/17/;
- 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/; and
- For the monitoring of other parameters, no any change can be detected during the monitoring period from 01/08/2011 to 31/07/2014 from the daily operation & maintenance logs of the project/45/.

The table below summarizes relevant specifications of monitoring equipments:

**Table 23**

<b>Monitoring Equipment:</b>	Electricity meter	
<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</b>	EL <sub>LFG</sub>	EL <sub>PR</sub>

parameter:						
Serial number:	8007472		Electricity meter A		Electricity meter B	
			0103200014423	010112300001515158	0103200019480	
Accuracy:	0.5s		1	0.5s	1	
Frequency of calibration:	5 years		5 years			
Calibration date:	12/10/2008	10/10/2013	19/02/2009	17/07/2013	05/01/2009	26/12/2013
Calibration certfcate no.	Shen Dian Jiao Zi 2008-11	DC1310SY 201	Jian Zi No. 090201	DC1312SY 202	Jian Zi No. 090101	DC1312SY 203
Name of the certifier	Power Metrology Institute of Shenyang Power Supply Company/29/	Northeast Electric Power Research Institute Co., Ltd./30/	Su Jiatun Agro electricity Bureau Calibration and Testing Center/31/	Northeast Electric Power Research Institute Co., Ltd./30/	Su Jiatun Agro electricity Bureau Calibration and Testing Center/31/	Northeast Electric Power Research Institute Co., Ltd./30/
Vadility of calibration:	12/10/2008 - 11/10/2013	10/10/2013 - 09/10/2018	19/02/2009 - 18/02/2014	17/07/2013 - 16/07/2018	05/01/2009 - 04/01/2014	26/12/2013 - 25/12/2018
Relevant sectoral standard:	Verification Regulation of Electrical Energy Meters with Electronics(JJG596-1999) /33/					
Authority of the certifier and validity of certifier	1. Laboratory accreditation certificate for Power Metrology Institute of Shenyang Power Supply Company issued by China National Accreditation Service for Conformity Assessment, No. CNAS L1064, dated 04/01/2007 and valid to 03/01/2010 /29/; 2. 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 /30/; 3. 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 /31/.					

Table 24

<b>Monitoring Equipment:</b>	Gas flow meter		
<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</b>	LFG <sub>total,y</sub>	LFG <sub>flare,y</sub>	LFG <sub>electricity,y</sub>

<b>parameter:</b>			
<b>Serial number:</b>	01726699	01746509	01746510
<b>Accuracy:</b>	±0.9%	±2%	±2%
<b>Frequency of calibration:</b>	Yearly	Yearly	Yearly
<b>Calibration date:</b>	14/09/2010, 13/09/2011, 11/09/2012, 09/09/2013	14/09/2010, 13/09/2011, 11/09/2012, 09/09/2013	14/09/2010, 13/09/2011, 11/09/2012, 09/09/2013
<b>Calibration certificate no.</b>	Liao Ji 10091402102, Liao Ji 11091302125, Liao Ji 12020403291, Liao Ji 13020403866	Liao Ji 10091402101, Liao Ji 11091302124, Liao Ji 12020403290, Liao Ji 13020403865	Liao Ji 10091402103, Liao Ji 11091302123, Liao Ji 12020403289, Liao Ji 13020403864
<b>Name of the certifier</b>	Liaoning Provincial Institute of Measurement/32/		
<b>Validity of calibration:</b>	14/09/2010-13/09/2011, 13/09/2011- 12/09/2012, 11/09/2012- 10/09/2013, 09/09/2013- 08/09/2014	14/09/2010-13/09/2011, 13/09/2011- 12/09/2012, 11/09/2012- 10/09/2013, 09/09/2013- 08/09/2014	14/09/2010-13/09/2011, 13/09/2011- 12/09/2012, 11/09/2012- 10/09/2013, 09/09/2013- 08/09/2014
<b>Relevant sectoral standard:</b>	Verification Regulation of Differential Pressure Type Flowmeter (JJG640-1994)/35/		
<b>Authority of the certifier and validity of certifier</b>	1. 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 2. Laboratory accreditation certificate for Liaoning Provincial Institute of Measurement issued by China National Accreditation Service for Conformity Assessment, No. CNAS L0954, dated 28/06/2007 and valid to 27/06/2012		

Table 25

<b>Monitoring Equipment:</b>	Gas analyzer
<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>	≤2%
<b>Frequency of calibration:</b>	Yearly
<b>Calibration date:</b>	13/09/2010, 02/09/2011, 01/09/2012, 31/08/2013
<b>Calibration certificate no.</b>	Liao Ji 10091306807, Liao Ji 11090206802,



	Liao Ji 12051214895, Liao Ji 13051223986
<b>Name of the certifier</b>	Liaoning Provincial Institute of Measurement/32/
<b>Vadility of calibration:</b>	13/09/2010-12/09/2011, 02/09/2011- 01/09/2012, 01/09/2012- 31/08/2013, 31/08/2013- 30/08/2014
<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>	<ol style="list-style-type: none"> <li>1. 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</li> <li>2. Laboratory accreditation certificate for Liaoning Provincial Institute of Measurement issued by China National Accreditation Service for Conformity Assessment, No. CNAS L0954, dated 28/06/2007 and valid to 27/06/2012</li> </ol>

Table 26

<b>Monitoring Equipment:</b>	N-type thermocouple
<b>Ownership:</b>	The project owener
<b>Location:</b>	At the flare
<b>Monitored parameter:</b>	$T_{\text{flare}}$
<b>Accuracy:</b>	$\pm 2.5^{\circ}\text{C}$
<b>Frequency of calibration:</b>	Yearly replaced with same new one
<b>Replacement date:</b>	12/04/2011, 10/04/2012, 21/03/2013, 18/02/2014
<b>Vadility of replacement:</b>	12/04/2011-11/04/2012, 10/04/2012- 09/04/2013, 21/03/2013- 20/03/2014, 18/02/2014- 17/02/2015
<b>Relevant sectoral standard:</b>	Verification Regulation of Working Base Metal Thermocouple (JJG351-1996)/37/

In summary, the verification team is able to verify that the accuracy of the monitoring equipments were set according to relevant sectoral standard/33//34//35//36//37/. Furthermore, all calibration procedures were carried out according to the monitoring plan in the registered PDD/3/, and the calibration vadility of all monitoring equipments is confirmed to effectively cover the monitoring period from 01/08/2011 to 31/07/2014. Therefore, accuracy of monitoring equipments is assured. The verification took cognizance para.272 of VVS Version 07.0.

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

Not applicable for the monitoring period from 01/08/2011 to 31/07/2014.

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

A complete set of data records for the monitoring parameter as stated in the monitoring report/1/ from 01/08/2011 to 31/07/2014 are available for verification/18//19//20//21/.

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/22/, 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.

Regarding the change of both the electric meter A and the current transformer, by checking the meter change notes/46//47/ and interviewing with monitoring engineer/i/, all immediate end readings and start readings of relevant meters have been recorded for the accurate calculation of electricity imported from grid and electricity exported to the grid on both dates of 23 Jul. 2013 and 8 Nov. 2011 respectively, which is transparently reflected in the emission reductions calculation spreadsheet/17/.

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 18/07/2011 to 19/08/2011 as the electricity consumption from 01/08/2011 to 19/08/2011, the monitoring data from 17/07/2014 to 13/08/2014 as the electricity consumption from 17/07/2014 to 31/07/2014 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/19/, and considered that they are accurately applied for the calculation of emission reductions in line with the applied methodology ACM0001, Version 06 "Consolidated baseline methodology for landfill gas project activity"/5/.

Based on the assessment in the section 3.4.1, the total emission reductions for the monitoring period from 01/08/2011 to 31/07/2014 is verified to be 353,828 tCO<sub>2</sub>e as detail reflected in the calculation spreadsheet/17/, within which the actual GHG emission reductions achieved during the period up to 31/12/2012 is 166,741 tCO<sub>2</sub>e and the actual GHG emission reductions during the period from 01/01/2013 onwards is 187,087t CO<sub>2</sub>e.

In conclusion, to the verification team's opinion, the monitored data for this monitoring period is complete, the formulas and default values are applied correct and all results are verifiable and transparent. The verification took cognizance para.279 of VVS Version 07.0.



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

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

Table 27

<b>Estimated Emission Reduction as per Registered/Approved PDD:</b>	391,189 tCO <sub>2</sub> e from 01/08/2011 to 31/07/2014 including both days and it is based on different specific annual emission reductions as indicated in the registered PDD (Version 03, dated 16/06/2008)
<b>Actual Emission Reduction for the Monitoring Period</b>	353,828 tCO <sub>2</sub> e of this monitoring period from 01/08/2011 to 31/07/2014, totally 1,096 days, including both days
<b>Is any increase of CER's occurred?</b>	No. The actual achieved emission reductions of 353,828 tCO <sub>2</sub> e is lower than the estimated value of 391,189 tCO <sub>2</sub> e.

In summary, the verification team confirms that actual emission reduction is lower than the estimate of the registered PDD for the current monitoring period. The verification took cognizance of VVS Version 07.0.

### 3.5.2 Assessment on materiality in verification

In compliance with Guidelines on the application of materiality in verifications (version 01.0)/13/, the assessment on the materiality in verification is conducted in the following step-wised procedures,

- 1) According to the registered PDD/3/, the project is a large-scale CDM project activity achieving a total emission reduction less than 300,000tCO<sub>2</sub>e per year. As per the subparagraph (c) of Guidelines on the application of materiality in verifications (version 01.0)/13/, 2% materiality threshold shall be applied;
- 2) As stipulated in the paragraph 17 of Guidelines on the application of materiality in verifications (version 01.0)/13/, the materiality threshold shall apply to the total emission reductions or removals actually achieved. As verified in the section 3.4, the total emission reductions actually achieved during the monitoring period is 353,828 tCO<sub>2</sub>e, thus the materiality threshold of the project activity is identified to be 7,076.56tCO<sub>2</sub>e, i.e.  $353,828 \text{ tCO}_2\text{e} \times 2\% = 7,076.56 \text{ tCO}_2\text{e}$ ;
- 3) The risk assessment for this waste gas recovery for power project was developed as flowing three major steps:
  - a) both the monitoring data records/18//19//20//21/ and ETNs/22/ were checked to be complete data set to reasonably calculate the total emission reductions achieved during the monitoring period;
  - b) both the calibration certificate of monitoring meters/25//26//27//28/ and the metrological authorization to the calibration entity/29//30//31//32/ were checked to sufficiently ensure the accuracy of all meters during the monitoring period;
  - c) After cross checking the initial emission reduction calculation spreadsheet/17/ with the monitoring data records/25//26//27//28/ and ETNs/22/, the verification team detected that PE<sub>flare</sub> was not correctly reported in the initial MR/2/, no cross checking for electricity was applied in the initial emission reduction calculation spreadsheet/16/, which is not an isolated occurrence. And the quantified error of

total emission reductions caused by such detected error is verified to be 211tCO<sub>2</sub>e.

- 4) Considering that the error of 211tCO<sub>2</sub>e is less than the materiality threshold of 7,076.56tCO<sub>2</sub>e identified in the step (2), the verification team can determine that the detected error is immaterial in aggregate;
- 5) In accordance with the VVS Version 07.0, the PP has revised the above detected error as requested by **CAR 3** and **CAR 4**, which can be reflected in the revised monitoring report/1/ and updated emission reductions calculation sheet/17/. After that, no further error within the data set was identified by the verification team, and the total emission reductions actually achieved during the monitoring period shall be 353,828 tCO<sub>2</sub>e as verified in the section 3.5.
- 6) To sum, the verification team can conclude that the claimed emission reductions of 353,828 tCO<sub>2</sub>e during the monitoring period from 01/08/2011 to 31/07/2014 are free from material errors, omissions or misstatements, with a reasonable level of assurance.

### 3.6 Issues remaining from the previous verification period

The verification for the monitoring period from 01/08/2011 to 31/07/2014 is the 3rd verification of the project. By means of checking the previous two verification reports/14/, no FAR was found.

## **Appendix A**

---

### **CDM Verification Protocol**

**Shenyang Laohuchong LFG Power Generation Project**

**in**

**China**

**to Report No. 01 997 9105079148**

Checklist question	Ref.	MoV <sup>2</sup>	Findings, comments, references, data sources	Draft conclusion	Final conclusion
<b>1. Implementation</b>					
1.1 Have all physical features proposed in the registered PDD been implemented at the project site? § 262 of CDM VVS Version 07.0	/2/ /3/ /4/ /14/ /43/	DR I	<p>Yes.</p> <p>The verification team conducted an on-site visit during the period from 20 Oct. 2014 to 21 Oct. 2014.</p> <p>1) The project is confirmed to be located on in Tashan Farm, Chenxiang Town, Su Jiatun District, Shenyang, Liaoning Province, China, and capture landfill gas for power generation and flare, with design total installation of 3MW (6*0.5MW). And currently only five gas power engines have been installed for operation due to unstable landfill gas supply;</p> <p>2) By means of on-site checking equipment's nameplates, the technical specification of all equipment applied in the project activity is verified to be consistent with registered PDD;</p> <p>3) As reflected in the power purchase agreements, the electricity generated by the project is delivered to Northeast Power Grid.</p> <p>To sum, the verification team can confirm that all physical features proposed in the registered PDD have been implemented at the project site during the monitoring period from 01/08/2011 to 31/07/2014.</p>	OK	OK
1.2 Has the project activity been operated in accordance with the project scenario described in the registered PDD and relevant guidance?	/2/ /3/ /4/	DR I	<p>Yes.</p> <p>The project activity has been operated in accordance with the project scenario described in the approved revised PDD, as confirmed by means of on-site interview with operation</p>	OK	OK

<sup>2</sup> MoV = Means of Verification, DR = Document Review, I = Interview, www = internet search.

§ 262 of CDM Version 07.0	/45/ /i/		technician// and checking the daily operation & maintenance logs.		
1.3 If the project activity is implemented on a number of different locations, has the Monitoring report provided the verifiable starting dates for each site? § 263 (a) of CDM VVS Version 07.0	/2/ /3/ /4/ /i/	DR I	Not applicable since the project activity is implemented on the only one location proposed in the registered PDD.	OK	OK
1.4 Is the start date of monitoring period consistent?	/2/	DR www	Yes. By means of checking the webhosted monitoring report against the UNFCCC website, the start date of 3 <sup>rd</sup> monitoring period is confirmed to just follow the ending date of the 2 <sup>nd</sup> monitoring period.	OK	OK
1.5 Is the monitoring report consistently filled with respect to all sections as required by its guideline of filling the monitoring report?	/2/ /11/ /12/	DR www	CAR 1 The monitoring period number of this monitoring period is not indicated in the MR.  CAR 2 The description in the MR the section B.1 is not in compliance with the instructions for filling out the monitoring report form annexed to the latest MR form (Version 04.0).	CAR 1  CAR 2	OK
1.6 Does the CER obtained for the monitoring period fall within the limit of estimate in the registered PDD? Is the claimed CER's justifiable?	/2/ /3/ /17/	DR	Yes.	OK	OK
1.7 Is the monitoring system provided in line diagrams showing all relevant	/2/	DR	Yes.	OK	OK

monitoring points?	/3/ /8/ /14/ /24/ /43/		The electric line diagram showing all relevant monitoring points have been correctly indicated in the monitoring system, which is verified to be consistent with the registered PDD, the approved revised monitoring plan, the previously issued monitoring reports and the power purchase agreements.		
<b>2. Monitoring plan and methodology</b>					
2.1 Is the monitoring plan established in accordance with the monitoring methodology? § 264 of CDM VVS Version 07.0	/2/ /3/ /5/	DR	Yes. The monitoring plan established for the monitoring period is in compliance with the registered PDD, it is thus in accordance with the monitoring methodology ACM0001, Version 06.	OK	OK
2.2 In case the implemented monitoring plan defers from the monitoring methodology, has any requests for revision to or deviation from the monitoring methodology been officially communicated to the CDM EB? § 287 of CDM VVS Version 07.0	/2/ /5/ /24/ /43/	DR www	Not applicable since no change on the monitoring plan occurs in this monitoring period from 01/08/2011 to 31/07/2014.	OK	OK
2.2.1 Have the above changes to the monitoring plan been approved by the CDM EB?	/2/ /3/ /5/ /24/ /43/		Not applicable.	OK	OK
<b>3. Monitoring and the monitoring plan</b>					
3.1 Is monitoring established in full compliance with the monitoring plan, contained in the registered PDD (or new monitoring plan approved by the	/2/ /3/ /5/	DR i	By means of on-site inspection and checking the power purchase agreement covering the monitoring period, the verification team verify that the monitoring is confirmed to be fully in compliance with the registered PDD and the	OK	OK

CDM EB)? § 264 of CDM VVS Version 07.0	/14/ /24/ /43/		previously 2 issued monitoring reports.		
3.2 Are all baseline emission parameters monitored and updated in accordance with monitoring plan, monitoring methodology and relevant CDM EB decisions?	/2/ /3/ /5/ /18/ /19/ /20/ /21/ /22/ /23/	DR	Yes.	OK	OK
3.2.1 Was the monitoring equipment for baseline emission parameters controlled and monitoring results recorded as per approved frequency?	/3/ /5/ /14/ /18/ /19/ /20/ /21/ /i/	DR I	Yes, the monitoring frequency for baseline emission parameters is consistent with the previous 2 monitoring reports approved by EB.	OK	OK
3.2.2 Was the monitoring equipment for baseline emission parameters calibrated in accordance with QA & QC procedures described in the registered monitoring plan?	/2/ /3/ /25/ /26/ /27/ /28/	DR	CL 1 During the on-site inspection, the verification team detected that the serial number of gas flow meter for monitoring landfill gas is 01746511, which is different from that presented in the MR section D.2 for this MP and the MRs of both 1 <sup>st</sup> and 2 <sup>nd</sup> MP, thus pls. clarify if the difference has any impact on the final emission reductions calculation during the monitoring period.	CL-4	OK



3.3 Are all project emission parameters monitored and updated in accordance with monitoring plan, monitoring methodology and relevant CDM EB decisions?	/2/ /3/ /5/ /18/ /22/	DR	Yes.  The monitoring parameters for project emissions have been monitored in accordance with the monitoring plan contained in the registered PDD and the applied methodology, as reflected in the monitoring data records for the monitoring period.	OK	OK
3.3.1 Was the monitoring equipment for project emission parameters controlled and monitoring results recorded as per approved frequency?	/2/ /3/ /5/ /14/ /19/ /20/	DR	CL 2  It is required to clarify when and why the original electric meter A (SN: 0103200014423) was replaced by the meter (SN: 010112300001515158), and also clarify if the change has any impact on the final emission reductions calculation during the monitoring period.	CL-2	OK
3.3.2 Was the monitoring equipment for project emission parameters calibrated in accordance with QA&QC procedures described in the registered monitoring plan?	/2/ /3/ /5/ /25/ /28/	DR	Yes.	OK	OK
3.4 Are all leakage emission parameters monitored and updated in accordance with monitoring plan, monitoring methodology and relevant CDM EB decisions?	/2/ /3/ /5/	DR	Not applicable.  No leakage effects need to be considered under the applied methodology.	OK	OK
3.4.1 Was the monitoring equipment for leakage emission parameters controlled and monitoring results recorded as per approved frequency?	/2/ /3/ /5/	DR	Not applicable.	OK	OK
3.4.2 Was the monitoring equipment for leakage emission parameters calibrated in accordance with QA&QC	/2/ /3/	DR	Not applicable.	OK	OK

procedures described in the registered monitoring plan?	/5/				
3.5 Were all monitoring parameters available and verifiable through the whole monitoring period?	/2/ /18/ /19/ /20/ /21/ /22/	DR	Yes. A complete set of monitoring data records have been provided to the verification team together including the calibration certificates of all monitoring equipments.	OK	OK
3.6 In case, only partial monitoring data is available and PP(s) provide estimations or assumptions for the rest of data, was it possible to verify those estimations and assumptions? § 280(a) of CDM VVS Version 07.0	/2/ /18/ /19/ /20/ /21/ /22/	DR	CL 3 It is required to justify the appropriateness of electricity imported from grid on both first month and last month selected for the calculation of emission reductions.	<del>CL-3</del>	OK
3.6 Was management and operation system established and operated in accordance with the monitoring plan?	/2/ /3/ /44/ /45/	DR	Yes. The CDM monitoring manual incorporating the management and operation system has been established in accordance with the monitoring plan of the registered PDD. And it has been also operated accordingly as reflected in the daily operation & maintenance logs.	OK	OK
3.7 Was it possible to verify that involved management and operation personal is fully aware of the responsibilities and perform all operations according to the registered monitoring plan and internally developed manuals?	/45/ /48/ /49/	DR I	Yes. During the on-site visit, the operation staff/i/ were interviewed and confirmed to be competent in performing all operations in accordance with the approved revised monitoring plan. In addition, the training records and the operational qualifications of operators have been checked to further substantiate the above.	OK	OK

3.8 Does the monitoring system provide organizational structure, role and responsibilities, emergency procedures?	/44/	DR	Yes. As documented in the CDM monitoring and QA control manual for the project, the organizational structure, role and responsibilities, emergency procedures are clearly defined, which is verified to be consistent with the approved revised monitoring plan.	OK	OK
3.9 Are any uncertainties identified and addressed?	/2/ /45/ /i/	DR I	No uncertainties were identified during the on-site visit.	OK	OK
<b>4. Parameters</b>					
4.1 <b>Monitored parameter</b>	/2/ /3/ /17/ /18/ /19/ /20/ /21/ /22/	DR	<p>CAR 3 The value for <math>PE_{flare}</math> in MR D.2 is not consistent with the ER calculation.</p> <p>CAR 4 No cross checking can ben detected for the monitoring data of both <math>EL_{LFG}</math> and <math>EL_{PR}</math> .</p>	<p><del>CAR 3</del></p> <p><del>CAR 4</del></p>	OK
4.2 <b>Default parameter</b>	/2/ /3/ /4/ /5/ /8/ /14/ /17/ /23/	DR I	Yes, those default parameters applied in the monitoring period are consistent with the applied methodology, registered PDD, tool and previous monitoring reports approved by EB.	OK	OK
<b>5. Calculations</b>					

5.1	Have all the calculations related to the baseline emissions been carried according to the formulae and methods described in the registered PDD and applied methodology? § 280 (c) of CDM VVS Version 07.0	/2/ /3/ /5/ /17/	DR	Yes, as reflected in the emission reductions calculation spreadsheet, all the calculations related to the baseline emissions are confirmed to be carried according to the formulae and methods described in the registered PDD and applied methodology.	OK	OK
5.2	Have all the calculations related to the project emissions been carried according to the formulae and methods described in the registered PDD and applied methodology? § 280 (c) of CDM VVS Version 07.0	/2/ /3/ /5/ /17/	DR	Yes, as reflected in the emission reductions calculation spreadsheet, all the calculations related to the project emissions are confirmed to be carried according to the formulae and methods described in the registered PDD and applied methodology.	OK	OK
5.3	Have all the calculations related to the leakage emissions been carried according to the formulae and methods described in the registered PDD and applied methodology? § 280 (c) of CDM VVS Version 07.0	/2/ /3/ /5/ /17/	DR	According to the registered PDD and the applied methodology, no leakage is considered, which has been correctly applied in the monitoring report and the emission reductions calculation spreadsheet.	OK	OK

Table 2: List of Requests for Corrective Action (CAR) and Clarification (CL)

Observation	Reference	Summary of project owner response	Verification team conclusion
<b>CAR 1</b> The monitoring period number of this monitoring period is not indicated in the MR.	1.5	The monitoring period number of this monitoring period has been added in the MR.	OK. The monitoring period number is correctly indicated in the revised MR. Therefore, CAR 1 is closed.
<b>CAR 2</b> The description in the MR the section B.1 is not in compliance with the instructions for filling out the monitoring report form annexed to the latest MR form (Version 04.0).	1.5	The description in the MR the section B.1 has been corrected as per the latest MR form.	OK. The project implementation status has been updated in the revised MR, and they could be cross checked with relevant evidences. Therefore, CAR 2 is closed.
<b>CAR 3</b> The value for $PE_{flare}$ in MR D.2 is not consistent with the ER calculation.	4.1	This data is not correctly reported in the MR D.2, and have been revised accurately as referred in the ER calculation spreadsheet.	OK. It has been revised accurately in line with the ER calculation spreadsheet. Therefore, CAR 3 is closed.
<b>CAR 4</b> No cross checking can be detected for the monitoring data of both $EL_{LFG}$ and $EL_{PR}$ .	4.1	The monitoring data for $EL_{LFG}$ and $EL_{PR}$ has been conservatively cross checked in the ER calculation spreadsheet.	OK. Both parameters have been cross checked with the ETNs, and conservative values have been applied in the ER calculation spreadsheets, i.e. $EL_{LFG}$ is 315,506.115MWh, $EL_{PR}$ is 886.486MWh respectively, which resulting in the final emission reductions of 353,828tCO <sub>2</sub> e for the monitoring period. Therefore, CAR 4 is closed.
<b>CL 1</b> During the on-site inspection, the verification team detected that the serial number of gas flow meter for monitoring landfill gas is 01746511, which is different from that presented in the MR section D.2 for this MP and the MRs of both 1 <sup>st</sup> and 2 <sup>nd</sup> MP, thus pls. clarify if the difference has any impact on the	3.2.2	The flow meter of the torch line with the S.N 01746509 was dismantled to do calibration on 05/09/2014, and it was replaced by the new one 01746511. This replacement didn't occur in the monitoring period, thus it has no impact on the emission calculation.	OK. The verification team has checked the daily operation logs, and detected that the flow meter with SN 01746511 was used to replace the previous flow meter with SN 01746509 for normal calibration on 5 Sep. 2014, which indeed not occurred in the monitoring period.

final emission reductions calculation during the monitoring period.			Therefore, the replacement has no any impact on the emission reductions calculation for the monitoring period from 01/08/2011 to 31/07/2014, accordingly CL 1 is closed.
<p>CL 2</p> <p>It is required to clarify when and why the original electric meter A (SN: 0103200014423) was replaced by the meter (SN: 010112300001515158), and also clarify if the change has any impact on the final emission reductions calculation during the monitoring period.</p>	3.3.1	The power grid company replaced the previous current transformer (magnification ratio of 1,500) with new one (magnification ratio of 4,000) on 8 Nov. 2011, and also replaced the energy meter (SN: 010300014423, Accuracy level: 1.0) with higher accuracy of meter (SN: 010112300001515158, Accuracy level: 0.5s) on 23 July 2013 respectively. Besides, the changing readings have been kept for the emission reductions calculation. Thus, these changes have no impact on the actual monitoring for the monitoring period.	<p>OK.</p> <p>The verification team checked the daily operation logs, and confirmed that both meter and current transformer changes are accurately reported in the revised MR, and all changing readings have been correctly reflected in the ER calculation spreadsheet.</p> <p>Therefore, these changes have no impact on the monitoring and even in the ER calculation spreadsheets, accordingly CL 2 is closed.</p>
<p>CL 3</p> <p>It is required to justify the appropriateness of electricity imported from grid on both first month and last month selected for the calculation of emission reductions.</p>	3.6	The values of 391,189tCO <sub>2</sub> e estimated against the registered PDD has been calculated transparently in MR.	<p>OK.</p> <p>The detailed calculation for the estimate of 391,189tCO<sub>2</sub>e has been reasonably reported in the revised MR fully based on the different annual ERs in the registered PDD.</p> <p>Therefore, CL 3 is closed.</p>



**Table 3: List of forward action requests (FARs)**

Observation	Reference	Summary of project participants' response	Verification team conclusion
N/A			

## **Appendix B**

---

Certification Statement  
to the Verification Report 01 997 9105079148

## Certification Statement

TÜV Rheinland (China) Ltd., the DOE, has performed the verification of the registered CDM project activity "UNFCCC Registration No. 1906", "Shenyang Laohuchong LFG Power Generation Project" in China. The project activity is designed to generate emission reductions by utilizing the captured landfill gas for power generation and flaring the captured gas.

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

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

The verification is based on:

- Registered PDD of Version 03, dated 16/06/2008;
- Approved monitoring methodology ACM0001, Version 06, "Consolidated baseline methodology for landfill gas project activity";
- Approved Validation Report of Version 01, dated 30/06/2008;
- Monitoring Report of Version 02, dated 07/11/2014.

This statement covers verification period of 1,096 days from 01/08/2011 to 31/07/2014.

The DOE has raised 4 corrective action requests and 3 requests for clarification, all of which have been successfully resolved by PPs.

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

The breakdown of the emission reductions for the monitoring period has also been clearly demonstrated, with emission reduction for second commitment period and the following is verified to be correct:

Actual emission reduction for the monitoring period up to (and including) 31 December 2012	166,741 tCO <sub>2</sub> e
Actual emission reduction for the monitoring period from (and including) 1 January 2013 onwards	187,087t CO <sub>2</sub> e

The DOE, hereby certifies that the project activity, achieved emission reductions by sources of GHG equal to 353,828 tCO<sub>2</sub>e and all monitoring requirements have been fulfilled.

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

2014-12-16  
Date

2014-12-15  
Date

2014-12-14  
Date



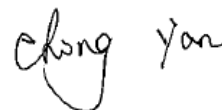
---

Mr. Henri PHAN  
DOE Manager  
TÜV Rheinland (China) Ltd.



---

Mr. Walter TANG  
Technical Reviewer  
TÜV Rheinland (China) Ltd.



---

Mr. YAN Chong  
Team Leader  
TÜV Rheinland (Shanghai)  
Ltd.

## **Appendix C**

---

### Certificates of Competence

## Qualification

Yan, Chong /

### Emission Trading

#### United Nations Framework Convention on Climate Change

Auditor No. :  
(AuditorenRegNr)

Appointed:  
(Zugelassen)

☒ ja

Qualification Level: Lead Auditor  
(Qualifikationsstufe)

External:  
(Externer)

☐ ja

Add. reviewer: ☒ yes  
(Zusätzlicher Prüfer)

EAC Scopes:  
(EAC Branchen)

CDM 01 – Energy industries (renewable – / non-renewable sources)  
CDM 02 – Energy distribution  
CDM 03 – Energy demand  
CDM 04 – Manufacturing industries  
CDM 09 – Metal production

Add. qualification:  
(zus. Qualifikation)

First Appointment: 12/15/2011  
(Erstberufung)

Valid to: 12/14/2017  
(Gültig bis)

Remarks: Valid for TA 1.2, 2.1, 3.1, 4.3, 4.5, 9.1  
+ Part Time TR

Languages: Chinese  
English

### Experience Exchange

Date

Location

Remarks

Accredita

### Monitoring

Latest Monitoring:  
(letzte Beurteilung)

Next  
Monitoring:  
(nächste  
Beurteilung)

Remarks:

[View](#) / [Edit Monitoring](#)



## History of scope allocation

Date: 2012-01-10  
Change: EAC CDM, CDM, CDM, CDM, CDM added  
By: Manfred Brinkmann  
Reason: Valid for TA 1.2, 2.1, 3.1, 4.3, 4.5, 9.1

## History

Created:	01/28/2011 10:33:30 AM	Chong Yan/Shg/Chn/TUV
Modified:	09/19/2014 03:33:52 PM	Lixin Li/Chn/TUV
	09/28/2012 11:54:16 AM	Praveen Urs/Chn/TUV
	01/10/2012 08:49:02 AM ZE9	Manfred Brinkmann/Jpn/TUV
	11/14/2011 06:09:04 PM	
	01/28/2011 10:33:53 AM	

## Export to ICMS

Last Export:

## Qualification

NA, SUN /

### Emission Trading

#### United Nations Framework Convention on Climate Change

Auditor No. :  
(AuditorenRegNr)

Appointed:  
(Zugelassen)

☒ ja

Qualification Level: Lead Auditor  
(Qualifikationsstufe)

External:  
(Externer)

☐ ja

Add. reviewer: ☒ yes  
(Zusätzlicher Prüfer)

EAC Scopes:  
(EAC Branchen)

CDM 01 – Energy industries (renewable – / non-renewable sources)  
CDM 13 – Waste handling and disposal

Add. qualification:  
(zus. Qualifikation)

First Appointment: 06/23/2013  
(Erstberufung)

Valid to: 06/22/2016  
(Gültig bis)

Remarks: CDM 01: valid for TA1.2 – Renewable Energies  
CDM 13: valid for TA 13.1– Waste handling & disposal

Languages: Chinese  
English

### Experience Exchange

Date	Location	Remarks	Accredita
2011-06-18	Beijing	Beijing CDM Seminar-EB61/62	United Nations Framework Convention
2010-12-21	Beijing	GC CDM Auditor Experience Exchange, Beijing, 2010-12-21to23	United Nations Framework Convention on Climate Change

### Monitoring

Latest Monitoring:  
(letzte Beurteilung)

Next  
Monitoring:  
(nächste  
Beurteilung)

Remarks:

### History of scope allocation

Date: 2010-06-24  
Change: EAC CDM, CDM added  
By: Manfred Brinkmann  
Reason: Scope 1 c) - Renewable Energies except Biomass generation

## History

Created:	05/11/2010 09:57:32 AM	Na Sun/Bj/Chn/TUV
Modified:	09/30/2013 11:52:31 AM	Henri Phan/Chn/TUV
	09/22/2013 03:23:41 PM	Daxun Li/Chn/TUV
	10/22/2012 10:39:55 PM	Praveen Urs/Chn/TUV
	02/11/2012 12:15:14 PM	
	01/13/2011 03:42:06 PM	ZE9
	01/13/2011 03:41:24 PM	ZE9
	11/10/2010 05:56:12 PM	ZE9
	06/24/2010 10:02:50 PM	ZE9

## Export to ICMS

Last Export:

## Qualification

Tang, Walter /

### Emission Trading

#### United Nations Framework Convention on Climate Change

Auditor No.:

(AuditorenRegNr)

Appointed:  
(Zugelassen)

☒ ja

Qualification Level: Lead Auditor  
(Qualifikationsstufe)

External:  
(Externer)

☐ ja

Add. reviewer: ☒ yes  
(Zusätzlicher Prüfer)

EAC Scopes:  
(EAC Branchen)

CDM 01 – Energy industries (renewable – / non-renewable sources)  
CDM 02 – Energy distribution  
CDM 03 – Energy demand  
CDM 13 – Waste handling and disposal  
CDM 04 – Manufacturing industries

Add. qualification:  
(zus. Qualifikation)

First Appointment: 2011/10/11  
(Erstberufung)

Valid to: 2015/09/11  
(Gültig bis)

Remarks: Appointed as Technical Reviewer for TA 1.1, 1.2, 2.1, 2.2, 3.1 Direct work experience. TA 4.3, 4.5, 13.1 based on Annex D para 9 of the Accreditation Standard

Languages: Chinese simplified  
English

### Experience Exchange

Date

Location

Remarks

Accredita

### Monitoring

Latest Monitoring:  
(letzte Beurteilung)

Next  
Monitoring:  
(nächste  
Beurteilung)

Remarks:

## History of scope allocation

Date:	2012-02-13
Change:	EAC CDM added
By:	Praveen Urs
Reason:	
Date:	2012-02-13
Change:	EAC CDM, CDM, CDM, CDM added
By:	Praveen Urs
Reason:	

## History

Created:	2011/12/06 17:00:51	Walter Tang/Chn/TUV
Modified:	2012/07/06 16:47:48	Praveen Urs/Chn/TUV
	2012/07/02 15:08:57	Praveen Urs/Chn/TUV
	2012/07/02 15:08:48	Praveen Urs/Chn/TUV
	2012/05/15 15:30:46	
	2012/02/13 20:00:10	
	2011/12/06 17:01:30	

## Export to ICMS

Last Export: