



VALIDATION REPORT

Linjiang Erqi MSW Incineration for Power Project

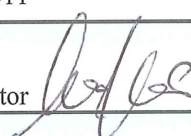
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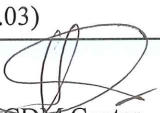
CDM Validation Report for Linjiang Erqi MSW Incineration for Power Project

Date of first issue 19 December 2011	Report Number JCI-CDM-VAL- 10-115		
Approved by Akio Yoshida, Executive Director 	Organizational Unit JCI CDM Center, Japan Consulting Institute (JCI)		
Client Eco-Frontier Carbon Partners Limited	Client ref., Mr. Chunlu Su		
Project name	Linjiang Erqi MSW Incineration for Power Project		
Host Country People's Republic of China	Methodology version AM0025 version 12	Sectoral scope 1 & 13	Technical Area 1.2 & 13.1
Size Large Scale	ER estimate 175,710 t-CO ₂ e / year (average)		
GHG Reducing Measure/ Technology	MSW incineration to generate electricity		

A summary of the validation process and its conclusions, validation opinion

Japan Consulting Institute (JCI) has performed a validation work of the "Linjiang Erqi MSW Incineration for Power Project". The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and the host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

- The review of the PDD and the subsequent follow-up interviews has provided JCI with sufficient evidence, to determine the fulfillment of stated criteria.
- The host country is People's Republic of China and the Annex I country is United Kingdom of Great Britain and Northern Ireland. Both countries fulfill the participation criteria and have approved the project and authorized the project participants. The DNA from People's Republic of China confirmed that the project assists in achieving sustainable development.
- The project correctly applies AM0025 "Avoided emissions from organic waste through alternative waste treatment processes", version 12 and reference tools.
- The total emission reductions from the project are estimated to be on the average 175,710 tCO₂e per year over the selected 10 years crediting period. The starting date of crediting period is from 01/07/2012 or the date on which the project be registered, whichever is later. The emission reduction estimate has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.
- Adequate training and monitoring procedures are expected to be implemented.
- In summary, it is JCI's opinion that the Linjiang Erqi MSW Incineration for Power Project as described in the PDD /2/meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology AM0025/6/.
- JCI thus provides a positive opinion and requests the registration of the proposed project as a CDM project activity.

Date of revision 18 September 2012 (Revision No.03)	<input checked="" type="checkbox"/> No distribution without permission from the Client or responsible organizational unit <input type="checkbox"/> Limited distribution <input type="checkbox"/> Unrestricted distribution
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Reviewed by Takayuki Abe, Technical Reviewer	
Work carried out by Toshiaki Takeda, Masatoshi Shibata	

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Abbreviations

AM0025	AM0025 version 12 “Avoided emissions from organic waste through alternative waste treatment processes
BKEC	Beijing Karbon Energy Consulting Co., Ltd.
BM	Build Margin
CNNC	CNNC China Nuclear Power Engineering Co., Ltd
CDM	Clean Development Mechanism
CERs	Certified Emission Reductions
CM	Combined Margin
CO ₂	Carbon dioxide
DOE	Designated Operational Entity
DNA	Designated National Authority
DRC	Development and Reform Commission
EFCP	Eco-Frontier Carbon Partners Limited
EIA	Environmental Impact Assessment
ERPA	Emission Reduction Purchase Agreement
ERs	Emissions Reductions
EB	Executive Board
EPB	Environmental Protection Bureau
GHG	Greenhouse Gas
JCI	Japan Consulting Institute
KP	Kyoto Protocol
LoA	Letter of Approval
MSW	Municipal Solid Waste
NDRC	The National Development and Reform Commission of PRC
OM	Operating Margin
PDD	Project Design Document
PRC	People’s Republic of China
SMB	Wenzhou City Sanitation Management Bureau
UNFCCC	United Nations Framework Convention for Climate Change
VVM	Clean Development Mechanism Validation and Verification Manual Version 01.2
ZPES R&D	Zhejiang Province Environmental Science Research & Design Institute
ZWEP	Zhejiang Weiming Environment Protection Co., Ltd.

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Appendix A: Validation Protocol

Appendix B: Certificate of Appointment of Validation Team

I. VALIDATION OPINION

Japan Consulting Institute (JCI) has performed validation of the Linjiang Erqi MSW Incineration for Power Project (hereafter referred as “the Project”). The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and the host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the project design document and the subsequent follow-up interviews have provided JCI with sufficient evidence to determine the fulfillment of stated criteria.

The host country is the People’s Republic of China and the Annex I country is United Kingdom of Great Britain and Northern Ireland. Both countries fulfill the participation criteria and have approved the project and authorized the project participants. The DNA from People’s Republic of China confirmed that the project assists in achieving sustainable development.

The project correctly applies AM0025 “Avoided emissions from organic waste through alternative waste treatment processes”/6/, and referenced “Tool for the demonstration and assessment of additionality/4/”, “Tool to calculate the emission factor for an electricity system/3/”, “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site/5/” and “Tool to determine project emission from flaring gases containing methane/12/”.

The emission reductions from the Project are estimated to be on the average 175,710 tCO₂e per year over the selected 10 year crediting period. The starting date of crediting period is from 01/07/2012 or the registration date, whichever is later. The emission reduction estimate has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

Adequate training and monitoring procedures are expected to be implemented.

In summary, it is JCI’s validation conclusion that the Project as described in the PDD /2/(hereafter referred as “the PDD”). The GSC version one is described as “the PDD/1/”) meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology AM0025/6/.

JCI thus provides a positive validation opinion and requests for the registration of the proposed project as a CDM project activity.

II. INTRODUCTION OF CDM VALIDATION

Eco-Frontier Carbon Partners Limited has commissioned JCI to perform validation of the Project. This report summarizes the findings of the validation of the Project, performed on the basis of CDM VVM/11/, and related UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, and the subsequent decisions by the CDM Executive Board.

1. Objective of CDM Validation

The purpose of validation is to ensure a thorough, independent assessment of proposed project activities submitted for registration as a proposed CDM project activity against the applicable CDM requirements.

JCI reports the results of its assessment in a validation report. JCI submits this validation report, along with the supporting documents to the CDM Executive Board as part of the request for registration of a project activity as a proposed CDM project activity.

The validation report shall include a positive validation opinion only if the proposed project activity complies with the applicable CDM requirements.

2. Validation Approach

The CDM is a rules-based mechanism. Therefore, it shall be JCI’s responsibility to ensure that, in accordance with the CDM VVM /11/and CDM requirements, these rules are complied with for any project activities requesting registration as a proposed CDM project activity.

During validation, JCI assesses whether the project design of the proposed CDM project activity meets the CDM requirements. For this, JCI, using objective evidence, assesses the completeness and accuracy of the claims and conservativeness of the assumptions made in the project design document (PDD). The evidence used in this assessment is not limited to that provided by the project participants.

In assessing evidence, JCI does not omit evidence that is likely to alter the validation opinion. In the assessment of evidence, JCI uses the acceptable approaches as specified in Chapter V. CDM Validation of section E. in CDM VVM/11/, and JCI ensures that the project activity complies with the relevant requirements set out in the CDM modalities and procedures, the applicability conditions of the selected methodology and guidance issued by the CDM Executive Board before submitting a request for registration.

In case the validation report includes a negative validation opinion, the validation report shall be sent to the CDM Executive Board.

3. Validation Methods

3.1 Means of validation

JCI applies standard auditing techniques to assess the correctness of the information provided by the project participants, including, where appropriate, but not limited to:

1) Document review, involving:

(i) Review of data and information to verify the correctness, credibility and interpretation of presented information;

(ii) Cross checks between information provided in the PDD and information from sources other than that used, if available, and if necessary independent background investigations

2) Follow-up actions (e.g., on-site visit and telephone or email interviews), including:

(i) Interviews with relevant stakeholders in the host country, personnel with knowledge of the project design and implementation;

(ii) Cross-check of information provided by interviewed personnel (i.e. by checking sources or other interviews) to ensure that no relevant information has been omitted from the validation;

3) Reference to available information relating to projects or technologies similar to the proposed CDM project activity under validation; and

4) Review, based on the approved methodology being applied, of the appropriateness of formulae and correctness of calculations.

3.2 Clarification requests, corrective action requests and forward action requests

If, during the validation of a project activity, the DOE identifies issues that need to be further elaborated upon, researched or added to in order to confirm that the project activity meets the CDM requirements and can achieve credible emission reductions, the DOE shall ensure that these issues are correctly identified, discussed and concluded in the validation report.

The DOE shall raise a corrective action request (CAR) if one of the following occurs:

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

(b) The CDM requirements have not been met;

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

The DOE shall raise a clarification request (CL) if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

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

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The DOE shall resolve or “close out” CARs and CLs only if the project participants modify the project design, rectify the PDD or provide adequate additional explanations or evidence that satisfies the DOE’s concerns. If this is not done, the DOE shall not recommend the project activity for registration to the CDM Executive Board.

The DOE shall report on all CARs, CLs and FARs in its validation report. This reporting shall be undertaken in a transparent and unambiguous manner that allows the reader to understand the nature of the issue raised the nature of the responses provided by the project participants, the means of validation of such responses and clear reference to any resulting changes in the PDD or supporting annexes. The validation protocol consists of two tables. The different columns in these tables are described as followings.

Validation protocol tables

Table 1: Requirement checklist

- ✧ **Requirement (Checklist Question) :**
The various requirements in Table 1 are checklist questions the project should meet. The checklist is organized in different sections, following the logic of the latest VVM, the PDD Guidelines and the large-scale PDD template, version 03 - in effect as of 28 July 2006. Each section is then further sub-divided.
- ✧ **Reference :**
Gives reference to documents where the checklist question or item is found. Paragraph No. of VVM is referred.
- ✧ **Check Comment :**
The column is used to elaborate and discuss the checklist question and/or the conformance to the question.
- ✧ **ID No. of CAR, CL and FAR :**
 - *ID No. of CAR, CL and FAR is described.*
 - *Corrective Action Request (CAR) is used due to non-compliance with the checklist question.*
 - *Clarification Request (CL) is used when the validation team has identified a need for further clarification.*
 - *Forward Action Request (FAR) is used to highlight issues related to project implementation that require review during the first verification of the project activity.*

Table 2: Resolution of Corrective Action and Clarification Requests

- ✧ **Clarifications and corrective action requests :**
If the conclusions from the draft Validation are either a CAR, a CL or a FAR, these should be listed in this section.
- ✧ **Ref. to checklist question in Table1 :**
Reference to the checklist question number in Table1 where the CAR, CL or FAR is explained.
- ✧ **Summary of project owner response :**
The responses given by the project participants during the communications with the validation team should be summarised in this section.
- ✧ **Validation team conclusion :**
This section should summarise the validation team’s responses and final conclusions.

The completed validation protocol for the project is enclosed in Appendix A to this report.

4. Stakeholder Consultation Process

JCI makes the PDD of the project activity under consideration publicly available in accordance with the latest version of the “Procedures For Processing And Reporting On Validation Of CDM Project Activities”^{*1}.

^{*1} <http://cdm.unfccc.int/Reference/Procedures/valid_proc02.pdf>.

During the validation of the project activity, JCI takes into account the comments received and the validation report shall include details of actions taken to take due account of the comments during the validation process.

If comments are not sufficiently substantiated or indicate that the Project activity does not comply with the CDM requirements, then JCI requests further clarification from the entity providing the comment. However, JCI is not required to enter into a dialogue with Parties, stakeholders or NGOs that comment on the CDM requirements. If no additional information or substantiation is provided in response to a request for clarification, JCI proceeds to assess the comments as originally provided.

III. VALIDATION WORK

JCI carried out the validation work to ensure that the project activity complies with the requirements of paragraph 37 of the CDM modalities and procedures.

1. Validation Team

Details of the validation team and the technical reviewer are shown in below Table.

Table 3. Details of the Validation Team members

Role/Qualification	Name	Qualified Technical Areas related to the Project	On-site Visit
All relevant issues /Team Leader	Toshiaki Takeda	1.2 Energy generation from renewable energy 13.1 Waste handling and disposal	✓
CDM auditor / Team Member	Masatoshi Shibata	1.2 Energy generation from renewable energy 13.1 Waste handling and disposal	-

Table 4. Details of the Technical Reviewer

Name	Qualified Technical Areas related to the Project
Takayuki Abe	1.2 Energy generation from renewable energy 13.1 Waste handling and disposal

2. Appointment certificate of JCI validation team member

The certificate of appointment of the validation team members is attached in Appendix B to this report.

3. Quality Control of the Validation Process

The draft validation report including the validation protocol underwent a technical review before being submitted to the project participants. The final validation report underwent another technical review before requesting registration of the Project activity to CDM EB.

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

4. Desk Review

4.1 Document list

The following table outlines the documentation reviewed during the validation.

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Table 5. Document list

No.	Title
PDD, Methodology, Tools, Guidance, Guidelines, Manual	
/1/	PDD of Linjiang Erqi MSW Incineration for Power Project version 01, dated 23/06/2011 (for GSC)
/2/	PDD of Linjiang Erqi MSW Incineration for Power Project version 06, dated 15/03/2012(for Registration)
/3/	Tool to calculate the emission factor for an electricity system (Version 02.2.1)
/4/	Tool for the demonstration and assessment of additionality (Version 06.0.0)
/5/	Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site (version 05.1.0)
/6/	AM0025 version 12 “Avoid emissions from organic waste through alternative waste treatment processes”
/7/	GUIDELINES FOR COMPLETING THE PROJECT DESIGN DOCUMENT (CDM-PDD) AND THE PROPOSED NEW BASELINE AND MONITORING METHODOLOGIES(CDM-NM) (Version 07)
/8/	Guidelines on the Assessment of Investment Analysis (Version 05)
/9/	GUIDELINES ON THE DEMONSTRATION AND ASSESSMENT OF PRIOR CONSIDERATION OF THE CDM (Version 04.0)
/10/	Glossary of the CDM terms (Version 06)
/11/	Clean Development Mechanism Validation and Verification Manual (Version 01.2)
/12/	Tool to determine project emissions from flaring gases containing methane (Version 01)
/13/	GUIDELINES FOR THE REPORTING AND VALIDATION OF PLANT LOAD FACTORS (Version 01)
/14/	Request for clarification on use of approved methodology AM0005 for several projects in China http://cdm.unfccc.int/UserManagement/FileStorage/AM_CLAR_QEJWJEF3CFBP1O_ZAK6V5YXPQKK7WYJ
/15/	
/16/	
General Reference	
/21/	The development of MSW LFG in China, Xu Haiyun http://www.globalmethane.org/documents/landfills_cap_china.pdf
/22/	Technical Code for Municipal Solid Waste Sanitary Landfill (CJJ17-2004)
/23/	Waste Management in China: Issues and Recommendations, Page 30, 2005, by World Bank
/24/	Notification of Inspection Outcome on China National Sanitary Landfill Site, Page1, 6 th Feb, 2007 by Ministry of Construction of China.
/25/	2006 IPCC Guidelines for National Greenhouse Gas Inventories
/26/	Municipal Solid Waste Management Rule PRC Ministry of Construction Order No.157

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No.	Title
/27/	Statistical Communiqué of the People's Republic of China on the National Economic and Social Development (2006 – 2010) compiled by National Bureau of Statistical of China http://www.stats.gov.cn/english/StatisticalCommuniques/
/28/	China Statistics Yearbook 2009
/29/	Notice on Strictly Prohibiting the Installation of Fuel-fired generators with the Capacity of 135MW or below Issued by State Council office, decree No. 2002-6
/30/	Design conditions of high efficiency MSW incineration and power generation plant www.env.go.jp/recycle/misc/he-wge_facil/ref1.p
/31/	Average salary of business sectors : Zhejiang Statistical Yearbook 2010
/32/	Technical Administrative Code of Energy Metering (DL/T448-2000)
/33/	Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects ([2002] No.623), published by the operations Department of Power Generation and Power Transmission of the State Power Corporation of China (Interim Rule)
/34/	China Electric Power Yearbook 2007-2009
/35/	China Energy Statics Yearbook 2007-2009
/36/	Record of the interests applied by the People's Bank of China issued on 06 April 2011
/37/	Notice on capital system for static asset investment projects issued by General Office of the State Council of the PRC on 23 August 1996
/38/	2010 Baseline Emission Factors for Regional Power Grids in China
/39/	Enterprise Income Tax Law of PRC PRC Presidential Decree No.63 Implement from 01/01/2008
/40/	VAT Regulations Notice issued on 10/11/2008 by General Office of the State Council of the PRC
/41/	Interim Provisional Regulations of the Peoples Republic of China on City Construction and Maintenance Tax issued on 01/01/1985 by China State Council
/42/	China Education Tax notice issued on 07/02/1994 by General Office of the State Council of the PRC
/43/	"Notice on VAT Policy for Resource Comprehensive Utilization and Other Product", Financial and Tax Document No. 156[2008] MSW Incineration VAT
/44/	National Environmental Regulations for Air Pollution issued by the Central People's Government of the PRC issued on 29/04/2000
/45/	National Environmental Regulations for Water Pollution issued by the Central People's Government of the PRC issued on 28/06/2008
/46/	National Environmental Regulations for Noise issued by the Central People's Government of the PRC issued on 29/10/1996
/47/	National Environmental Regulations for MSW issued by the Central People's Government of the PRC issued on 29/12/2004
/48/	Zhejiang Province Regulations for Air Pollution issued by the Central People's Government of Zhejiang Province issued on 27/06/2003
/49/	Zhejiang Province Regulations for MSW issued by the Central People's Government of Zhejiang Province issued on 31/03/2003

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No.	Title
/50/	Oil Price Notice issued by NDRC on 31/05/2009
/51/	Oil Price Notice issued by Zhejiang Province Price Bureau on 13/04/2010
/52/	Notice of National Fund Management Law for National Important Projects dated 10/09/1999
/53/	Provisional Legislations for Corporate Income Tax [1994] No3
/54/	Regulation on the BOT investment in the utilities sector issued by the Ministry of Construction of China in May 2004
/55/	
/56/	
/57/	
/58/	
/59/	
Evidence and Documents provided by the Project Participants	
/60/	LoA of China DNA issued on 22/03/2011
/61/	LoA of UK DNA issued on 15/07/2011
/62/	FSR compiled by CNCC in 12/2009
/63/	Approval letter of FSR issued by Zhejiang Province DRC dated 03/02/2010
/64/	EIA Report compiled by ZPES R&D in 08/2009
/65/	Approval letter of EIA Report issued by the EPB of Zhejiang Province on 30/09/2009
/66/	Business License of ZWEP issued on 29/12/2001 by Zhejiang Province Commerce and Industry Bureau
/67/	Registration record of the prior consideration of CDM for the Project activity as of 26/07/2010 on UNFCCC website
/68/	Application document for CDM to the Project activity to NDRC (Notification of "Prior Consideration of CDM" as per Annex46, EB41) submitted on 12/07/2010
/69/	Submission form of notice of CDM prior consideration, submitted to UNFCCC on 20/06/2010
/70/	BOT Agreement between Wenzhou Municipal Bureau of Parks and the Project Owner for the Linjiang Erqi Project signed on 21/01/2009
/71/	Minutes of the board meeting held on 15/02/2010 (CDM consideration)
/72/	Notice of Stakeholder Meeting issued on 01/06/2010
/73/	Minutes of Stakeholder Meeting dated on 30/06/2010
/74/	3 samples of answers by stakeholders to the question
/75/	Attendee list of local residents to the meeting
/76/	ERPA contracted between ZWEP and EFCP on 09/10/2010
/77/	Equipment purchase and technical service contract between ZWEP and Weiming Environmental Equipment Co., Ltd. signed on 20/03/2010

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No.	Title
/78/	Bank Loan contract between Wenzhou Weiming Environmental Protection and Energy Co. Ltd. and Agriculture Bank of China Co., Ltd. signed on 16/11/2010
/79/	Construction Contract between ZWEP and Hu'nan 5 th Engineering Co., Ltd. signed on 05/08/2010
/80/	Installation Contract between ZWEP and Zhejiang Industrial Equipment Co., Ltd. Signed on 04/06/2010
/81/	Cost Comparison Table between the FSR estimate and the actual contracts prepared by the PPs
/82/	Technical Protocol of Boiler agreed between the Vender and the Manufacturer on 07/04/2010
/83/	Technical Protocol of Turbine/Generator agreed between the Vender and the Manufacturer on 03/06/2010
/84/	Model Name and Serial Number of Watt-Hour Meter installed.
/85/	Outlines of all Landfill Sites (current and future provision) in Wenzhou City Area issued by Sanitation Management Bureau of the City
/86/	Overview Map of all Landfill Sites in Wenzhou City prepared by Sanitation Management Bureau of the City
/87/	MSW Analysis Report compiled by Hangzhou City Institute of Environmental Health Science Monitoring Station of Environmental Health issued on 27/09/2009
/88/	Operation and O&M Cost Data Summary of Existing Three MSW Incineration and Power Generation Plants in Wenzhou City for Last Three Years (2008-2010) prepared by the PPs
/89/	Comparison Table of all MSW Incineration with Power Generation Plants in Zhejiang Province
/90/	Spreadsheet for IRR Calculations
/91/	Spreadsheet for CER Calculations
/92/	Spreadsheet for Calculations of Low-cost\Must-run Ratio for ECPG
/93/	Tariff notice issued by the NDRC on 09/05/2005
/94/	BOT Agreement between Wenzhou City Ouhai District Construction Bureau and ZWEP for the Dongzhuang Project signed on 14/06/2001
/95/	BOT Agreement between Wenzhou City Sanitation Management Bureau and ZWEP for the Linjiang Yiqi Project signed on 12/10/2001
/96/	BOT Agreement between Wenzhou City Municipal Bureau of Parks and ZWEP for the Yongqiang Project signed on 18/11/2002
/97/	Power Purchase Agreement (PPA) with Wenzhou City Grid on 12/09/2011
/98/	
/99/	

5. Follow-up actions (Interviews with relevant stakeholders in the host country)

The on-site visit and interviews with project stakeholder were implemented from 22 through 24 August 2011 at the project site in Wenzhou City, Zhejiang Province, China.

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The names of interviewees are listed in the following table with topics discussed.

Table 5. List of interviewees

No.	Date	Name	Organization	Topics
/100/	22/08/2011	Mr. Cai Ke Ms. Ho Hyesun Ms. Jin Hee Shin Mr. Hongjae Lee Mr. Yaodong Lu Ms. Shanshan Yu	WCEPB ECOFRO KEIC	<u>Interview with Wenzhou City EPB(WCEPB)</u> <ul style="list-style-type: none"> ✓ Roles of the EPB in handling approval request of the EIA report and whole approval processes ✓ Laws/regulations to be applied to MSW incineration projects ✓ Subjects to be assessed for EIA report approvals ✓ Monitoring procedures applied to the Project activity ✓ Possible changes in MSW treatment system in the City area ✓ Process of organizing stakeholder meetings
/101/	22/08/2011	Mr. Chen Hong gang Ms. Ho Hyesun Ms. Jin Hee Shin Mr. Hongjae Lee Mr. Yaodong Lu Ms. Shanshan Yu	SMB ECFRO BKEC	<u>Interview with Wenzhou City Sanitation Management Bureau (SMB)</u> <ul style="list-style-type: none"> ✓ Roles of WCMB as a City Function ✓ Implications with BOT ✓ Tipping fee issue ✓ Role sharing with the PP in BOT ✓ Overview of current MSW treatment in the City, land fill and incineration ✓ Operation and maintenance plan ✓ Distance among the City's collection points, replaced land fill site and the Project site ✓ Wastewater regulations to be applied
/102/	22/08/2011	Mr. Ji Xudong Mr. Ye Yong hai Ms. Ho Hyesun Ms. Jin Hee Shin Mr. Hongjae Lee Mr. Yaodong Lu Ms. Shanshan Yu	WCG ECFR BKEC	<u>Interview with Wenzhou City Grid (WCG)</u> <ul style="list-style-type: none"> ✓ Power transmission system ✓ Current status of power generation at MSW incineration plants in the region ✓ PPA contract scheme ✓ Power purchase from plants; demand/supply balance in the

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No.	Date	Name	Organization	Topics
				<p>region covered by the Grid</p> <ul style="list-style-type: none"> ✓Electricity monitoring applied to the Project activity: meter specifications and installations, readings and calibration ✓Tariff deciding scheme to be applied to the Project activity
/103/	22/08/2011	Mr. Ye Mao Mr. Lin Ying Ms. Ho Hyesun Ms. Jin Hee Shin Mr. Hongjae Lee Mr. Yaodong Lu Ms. Shanshan Yu	The PO ECFR BKEC	<p><u>Interview with the Project Owner(PO)</u></p> <ul style="list-style-type: none"> ✓Company profile ✓Preferential policies granted to the Project activity ✓MSW incineration plans in operation in the region ✓Comparison with the phase-1 Linjiang project (non-CDM project) ✓Current status of the Project construction ✓Project development chronology ✓Outstanding issues
/104/	22/08/2011	Mr. Li Hai yne Ms. Ho Hyesun Ms. Jin Hee Shin Mr. Hongjae Lee Mr. Yaodong Lu Ms. Shanshan Yu	WCDRC ECFR BKEC	<p><u>Interview with Wenzhou City DRC (WCDRC)</u></p> <ul style="list-style-type: none"> ✓The Project FSR approval process ✓Details of the assessment by the DRC ✓Basic views to the MSW incineration projects
/105/	22/08/2011	Mr. Gao Youcai Ms. Ho Hyesun Ms. Jin Hee Shin Mr. Hongjae Lee Mr. Yaodong Lu Ms. Shanshan Yu	ZPES R&D ECFR BKEC	<p><u>Interview with the EIA report author (ZPES R&D)</u></p> <ul style="list-style-type: none"> ✓Profile of the Institute ✓Experiences of assessing the similar projects ✓Assessment points for MSW incineration projects ✓issues identified with the Lijiang project ✓Monitoring items required
/106/	22/08/2011	Mr. Cai Yinke Ms. Ho Hyesun Ms. Jin Hee Shin Mr. Hongjae Lee	CNNC ECFR	<p><u>Interview with the FSR author (CNNC)</u></p> <ul style="list-style-type: none"> ✓Profile of the Institute ✓Chronology of development of

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No.	Date	Name	Organization	Topics
		Mr. Yaodong Lu Ms. Shanshan Yu	BKEC	the FSR ✓ Compared with the phase-1 Linjiang project ✓ Design processes of the FSR ✓ Data/code referred to in the design ✓ Wastewater treatment system of the Project activity ✓ Residue treatment ✓ Data sources of the values of key financial parameters
/107/	23/08/2011	Mr. Chen Shaohua Mr. Zhang Mingwu Mr. Yu Zhongbin Ms Yu Xiangpei Lin Jianzhen Ms. Ho Hyesun Ms. Jin Hee Shin Mr. Hongjae Lee Mr. Yaodong Lu Ms. Shanshan Yu	Local Residents ECFR BKEC	<u>Interview with the Local Residents</u> ✓ Attendance at the stakeholder meeting ✓ Financial implications with the Project activity ✓ Assessment of the Project activity ✓ Anticipated adverse affects on local living conditions
/108/	24/08/2011	Ms. Ho Hyesun Ms. Jin Hee Shin Mr. Hongjae Lee Mr. Yaodong Lu Ms. Shanshan Yu	ECFR BKEC	<u>Interview with the PDD author (Beijing Karbon Energy Consulting Co., Ltd.)</u> ✓ VAT on MSW plant ✓ Concept of BOT ✓ Depreciation rate and residual value in financial calculations ✓ Project schedule

IV. VALIDATION FINDINGS

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

Findings issued through the validation

JCI issued 11 CARs, 32 CLs and 0 FAR as shown in the Validation Protocol, Appendix A of this report. All the CARs and CLs were resolved and then closed as shown in Table 2 of the Appendix A.

Major issues and its resolution processes through the CARs and CLs are described in following items according to VVM/11/.

1. Approval

JCI received copies of the two LoAs for the Project activity from the Project Participants: one is from the DNA of PRC issued on 22/03/2011/60/, and the other from the DNA of United Kingdom of Great Britain

and Northern Ireland issued on 15/07/2011/61/. The two LoAs were compared with samples of other projects which were obtained in the past and kept in JCI, and as a result their credibility was confirmed. JCI confirmed with the LoA issued by the DNA of the PRC that:

- 1) The PRC is a Party to the Kyoto Protocol;
- 2) It approved the Project activity and ZWEP as a voluntary participant to the project activity;
- 3) It addressed its assistance to sustainable development in the host country;
- 4) The title mentioned in LoA is the same as that mentioned in the PDD being submitted for registration; and
- 5) It is valid as on date.

JCI confirmed also with the LoA issued by United Kingdom of Great Britain and Northern Ireland DNA that:

- 1) United Kingdom of Great Britain and Northern Ireland ratified the Kyoto Protocol on 31st May 2002;
- 2) United Kingdom of Great Britain and Northern Ireland participates voluntarily in the CDM;
- 3) United Kingdom of Great Britain and Northern Ireland DNA approved the Project activity and EFCP as a voluntary participant to the project activity.

JCI concludes that the two LoAs are credible and fully comply with the requirements by the CDM per para 49 d) of VVM/11/.

2. Participation

JCI confirmed that the project participants are ZWEP of the PRC and EFCP of United Kingdom of Great Britain and Northern Ireland as being listed in tabular form in section A.3 of the PDD, and also confirmed that this information is consistent with the contact details provided in Annex 1 of the PDD. It is also confirmed that no entities other than the approved project participants are included in those sections of the PDD.

As described above, the project participants are authorized with the LoAs issued by the relevant DNAs as a voluntary participant to the Project activity.

3. Project Design Document

Through desk reviews and Q&A sessions with the PDD author, JCI confirmed that the PDD is described based on and referring to the following relevant methodology, tools, guidance, guidelines, and manual:

- (1) AM0025 version12 “Avoided emissions from organic waste through alternative waste treatment processes”/6/
- (2) Tool to calculate the emission factor for an electricity system /3/
- (3) Tool for the demonstration and assessment of additionality/4/
- (4) Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site/5/
- (5) GUIDELINES FOR COMPLETING THE PROJECT DESIGN DOCUMENT (CDM-PDD) AND THE PROPOSED NEW BASELINE AND MONITORING METHODOLOGIES(CDM-NM) /7/
- (6) GUIDELINES ON THE ASSESSMENT OF INVESTMENT ANALYSIS/8/
- (7) GUIDELINES ON THE DEMONSTRATION AND ASSESSMENT OF PRIOR CONSIDERATION OF THE CDM/9/
- (8) Glossary of CDM terms/10/
- (9) CDM VVM /11/
- (10) Tool to determine project emissions from flaring gases containing methane/12/

The project design was described using the PDD template of the latest version 03 as shown in the PDD that was confirmed through comparison with the template listed on the UNFCCC website.

As described above, JCI validated and concluded that the PDD is compiled with use of the appropriate format and is described based on appropriate tools, guidelines, manual and guidance which are specified and requested by the CDM procedures.

4. Project Description

The contexts of the PDD were checked during the on-site assessment conducted from 22 through 24 August 2011 with the following measures:

- 1) Observation of the project site
- 2) Cross-check of the construction site with relevant drawings and documents provided by the project participant
- 3) Interviews with the project participant, relevant organizations/entities, local stakeholders and the PDD author shown in Table 5

CAR-1 and CAR-8 were raised to request revision of the credit starting date and the CER amount estimate. As they were appropriately revised to reflect the validation schedule, CAR-1 and CAR-8 were closed.

As there was no description about the project lifetime, CL-1 was raised to demonstrate it appropriately. The lifetime was demonstrated in Table A.1 appropriately, CL-1 was closed.

In response to CL-11, the project participant addressed the steam amount balance in the MSW combusting and power generation. Following CL-11, CL-30 was raised to clarify the imbalance of steam amount. With the appropriate explanations by the project participant, CL-11 and CL-30 were closed accordingly.

CL-3 was raised to request clarification of available MSW amount for the project activity. The amount was correctly demonstrated by the project participant and which was confirmed with the interview with Sanitation Management Bureau of the City/101/, CL-3 was closed. According to the SMB of the City, MSW generation in the City has been 3,000 tons/day: 1,500 tons have been combusted currently at the three plants and remaining 1,500 tons land filled. After the project implementation, 1,200 tons out of the 1,500 tons would be combusted by the project activity and remaining 300 tons would be land filled.

As a result of the above steps, JCI validated and concluded that the descriptions of the PDD are correct and its content is sufficient, and well outlines the nature and technical aspects of the project activity.

The major features of the Project activity are summarized below:

- Location of the Project site: Shatou village, Linjiang town, Ouhai district, Wenzhou city, Zhejiang province, PR China
- Sectoral scope : 1 (Energy industries (renewable-/non-renewable resources))
13(Waste handling and disposal)
- Project type : the construction of a new MSW incineration plant with a power generation facility
- Major construction : a MSW incineration plant with a power generation facility, a leachate treatment plant consisting of anaerobic, aerobic and filtration treatment processes, and a brick manufacturing plant with use of incineration residue and by-products
- Installed capacity : MSW incineration....1,200 t/d (600t/d x 2)
Power generation.....24 MW (12 MW x 2)
- Final connecting grid : Eastern China Power Grid (ECPG)
- Estimated annual MSW treatment : 399,600 t/y
- Estimated annual power generation : 132,500 MWh/y
- Estimated emission reductions: 175,710 t-CO₂e/y
- Project lifetime : 25 years
- Crediting period : 10 years (fixed crediting period)

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➤ Expected credit starting date : 01/07/2012 (or the registration date, whichever is later)

Major changes of the content from the PDD/1/ to the PDD/2/ are summarized in the below table:

Table6. Major Changes in the Content of the PDDs

Subject and section in the PDD	Original content in the PDD/1/	Revised content in the PDD/2/	Issued CAR or CL Relevant tool, guidance, or guidelines applied
Credit starting date in section A.4.4. , B.6.4. and C.2.1.1.	The starting data was 01/01/2012	The starting data was changed to 01/07/2012 to reflect validation schedule and relevant reduction tables were revised accordingly	CAR-1, CAR-8
Assessment of likelihood of key parameters to cross the benchmark in Section B.5	There are no assessment results of the likelihood of key parameters to cross the benchmark	The likelihood was appropriately described.	CAR-2 Guidelines on the Assessment of Investment Analysis
Update of versions of the applied tools in section B.1.	Versions of some tools were not updated.	The additionality tool was updated to version 06.0.0. and the emission tool to version 02.2.1	CAR-3, CAR-6
Project lifetime in section 4.3.	There was no description about the lifetime	The lifetime was demonstrated to be 25 years appropriately.	CL-1
Inconsistency of the definition of M3 in section B.4	Descriptions about M3 were inconsistent between Step 1 and Step3	The descriptions were revised appropriately and consistently.	CL-4
Justification of the application of the benchmark derived from the Interim Rule in section B.5.	There were no descriptions about the justification of applying the benchmark.	The justification was appropriately demonstrated	CL-7 Guidelines on the Assessment of Investment Analysis
Input values of key parameters used in financial calculations in section B.5	Some key input values, such as tipping fee, tariff were not demonstrated in the relevant table B.3.	Necessary input values were added appropriately to demonstrate all the key values used in the financial calculations.	CL-10
Monitoring plan for the parameters in section B.7.1	Monitoring plan of some parameters was not demonstrated.	Necessary parameters were all demonstrated.	CL-26 Relevant methodology/6/
Project emissions from the	The emissions by methane generated by	The emissions were included as part of the	CAR-11

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wastewater treatment plant in section B.2, B.6 and B.7	the plant were not accounted for	project emissions. The inclusion was reflected to the definition of the project boundary, ER calculations and monitoring plan.	Relevant methodology/6/
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5. Baseline and Monitoring Methodology

5.1. Applicability of selected methodology to the project activity

JCI validates and concludes that the applicability of AM0025 version12 “Avoided emissions from organic waste through alternative waste treatment processes” /6/ to the project is appropriate and the version is the newest at the date of issue for registration to CDM project.

JCI confirms that all of the applicability stipulated in the methodology is applicable to this Project activity from the following steps and viewpoints:

1) Document review

FSR/62/ and EIA Report/64/ for the proposed project:

JCI has reviewed the FSR and EIA Report and confirmed that the proposed project will be newly constructed in Wenzhou City.

2) On-site visit from 22 through 24 August 2011 /100/ to /108/

JCI confirmed that the construction of the Linjiang Erqi plant was almost completed and was under trial operation. JCI, therefore, could confirm that the plant was constructed as per the PDD in accordance with national and local laws and regulations.

3) Confirmation of the Applicability

JCI's confirmation of applicability to the methodology is as follows:

- (1) *The project activity involves one or a combination of the following waste treatment options for the fresh waste that in a given year would have otherwise been disposed of in a landfill:*

(e) Incineration of fresh waste for energy generation, electricity and/or heat. The thermal energy generated is either consumed on-site and/or exported to a nearby facility. Electricity generated is either consumed on-site, exported to the grid or exported to a nearby facility. The incinerator is rotating fluidized bed or circulating fluidized bed or hearth or grate type.

JCI confirmed by the document review/62/./64/ and the interviews during the on-site assessment /100/ to /108/ that the Project activity is the installation of two grate type MSW incinerators for electricity generation. Electricity generated will be exported to the ECPG.

- (2) *In the case of incineration of the waste, the waste should not be stored longer than 10 days. The waste should not be stored in conditions that would lead to anaerobic decomposition and, hence, generation of CH₄.*

JCI confirmed by the document review and the site visit that the waste will be stored no longer than 8 days: the bunker capacity is total 8,000 tons and the waste incineration capacity of the plant is 1,200 tons/day.

- (3) *The proportions and characteristics of different types of organic waste processed in the project activity can be determined, in order to apply a multiphase landfill gas generation model to estimate the quantity of landfill gas that would have been generated in the absence of the project activity.*

JCI confirmed by the document review/62/ that the periodical sampling and analysis of waste in the monitoring plan can determine the proportions and characteristics of organic waste processed in the Project activity.

- (4) *The project activity may include electricity generation and/or thermal energy generation from the biogas, syngas captured, RDF/stabilized biomass produced, combustion heat generated in the*

incineration process, respectively, from the anaerobic digester, the gasifier, RDF/stabilized biomass combustor, and waste incinerator. The electricity can be exported to the grid and/or used internally at the project site. In the case of RDF/SB produced, the emission reductions can be claimed only for the cases where the RDF/SB used for electricity and/or thermal energy generation can be monitored.

JCI confirmed by the document review/62/ and the plant observation during the site visit that the project activity does not include the electricity generation and/or thermal generation from the biogas, syngas captured, RDF/stabilized biomass produced.

- (5) *Waste handling in the baseline scenario shows a continuation of current practice of disposing the waste in a landfill despite environmental regulation that mandates the treatment of the waste, if any, using any of the project activity treatment options mentioned above.*

JCI confirmed through the interviews with the project owner, the FSR author, the Wenzhou City EPB and Sanitation Management Bureau that there are neither mandate laws nor regulations requiring treatment of domestic waste by incineration or any other treatment options as per demonstrated in the PDD.

- (6) *The compliance rate of the environmental regulations during (part of) the crediting period is below 50%; if monitored compliance with the MSW rules exceeds 50%, the project activity shall receive no further credit, since the assumption that the policy is not enforced is no longer tenable.*

JCI confirmed the same as above there are no mandate law or regulation requiring treatment of domestic waste by incineration or any other treatment options. Currently in China landfills are the prevailing practice of waste treatment; more than 80 % of MSW was treated in landfills in 2007 according to an official survey report/24/. As demonstrated in the PDD, the compliance rate will be monitored annually during the crediting period.

- (7) *The project activity does not involve thermal treatment process of neither industrial nor hospital waste.*

JCI confirmed through the interview with the project owner and the Wenzhou City Sanitation Management Bureau that the industrial or hospital waste have not been collected and therefore will not be treated by the Project activity.

- (8) *In case of waste incineration, if auxiliary fossil fuel is added into the incinerator, the fraction of energy generated by auxiliary fossil fuel is no more than 50% of the total energy generated in the incinerator.*

JCI confirmed by the document /62/ that the project activity will use 200,000 kg of diesel fuel annually for mainly start up operation and the equivalent amount of the fraction of energy (GJ) is calculate to be 0.35% of the total thermal energy generated in the incinerator as demonstrated in the PDD, far below 50%.

- (9) *This methodology is not applicable to project activities that involve capture and flaring of methane from existing waste in the landfill.*

JCI confirmed through the observation during the site visit that the Project activity is designed to incinerate only fresh MSW and therefore, will not involve capture and flaring of methane from existing waste in the landfill, except flaring of methane generated in the wastewater treatment plant for leachate from the bunker.

CAR-3 was raised to request application of the latest version of the emission tool for the PDD. As the latest version 2.02.0 was applied and relevant descriptions in the PDD were appropriately revised, CAR-3 was closed.

CAR-9 was raised to request revision of calculation of the fraction of energy of the auxiliary fossil fuel to the total thermal energy. Currently the total energy was calculated based on energy of generated power. Calculation of the total thermal energy was appropriately revised to the thermal energy by MSW incineration; therefore, CAR-9 was closed.

5.2. Project boundary

JCI confirmed that the project boundary is appropriately defined for this project activity, from the following steps and viewpoints:

- 1) Document review

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- (1) FSR/62/ for the proposed project

JCI has reviewed the FSR/62/ of the proposed project and confirmed that the project activity is to combust MSW in two grate-type incinerators for electricity generation, and the generated electricity will be exported to the ECPG.

- (2) The power connection to ECPG was confirmed with the Power Purchase Agreement/97/ provided by the project participant.

- 2) Site visit from 22 through 24 August 2011

JCI has confirmed that the project boundary is correctly and appropriately delineated in the Figure B.1 in section B.3. of the PDD.

- (1) Fresh MSW, otherwise landfilled, will be transport from Wenzhou City to the Project site and combusted in the two grate type incinerators for power generation, of which conditions were visually confirmed as the plant was already under trial operation.
- (2) Generated power will be supplied finally to the ECPG, which was confirmed also with the interview with the Grid/102/ and the Power Purchase Agreement/97/.
- (3) The residue from the incinerators will be discarded to the exclusive-use landfill site next to the Project site.
- (4) Fly ash captured from the exhaust gas and gypsum produced as by-product from the waste gas treatment facility will be used to manufacture blocks. They will be transferred pneumatically to the small factory inside the Project site.
- (5) Leachate from the bunker will be treated by the new wastewater treatment plant under construction during the site visit, and then discharged to the municipal sewage. CH₄ from the plant will be fed to the incinerator and combusted as an auxiliary fuel.

- 3) Findings of CARs and CLs

JCI has raised CAR-11 to request inclusion of the methane emissions from the wastewater treatment plant. According to the FSR, leachate from the bunker was planned to be treated by the wastewater treatment plan including an anaerobic treatment unit. It, therefore, was requested to include emissions by generated methane as per the applied methodology. CAR-11 was closed as the emissions were appropriately addressed in the PDD and their amount will be calculate based on the flare tool/12/, as the generated methane will be combusted in the incinerator which can be regarded as a closed flare.

At the same time CL-20 was raised to request clarification of the specifications of the wastewater treatment system. As it was clarified with the FSR and the interview with the FSR author during the site visit/106/, CL-20 was closed.

The system boundary and the justification of associated emissions are summarized in the below table, according to AM0025 /6/.

Table 7. System Boundary and Emissions

	Source	Gas	Included?	Assessment
Baseline	Emissions from decomposition of waste at the landfill site	CH ₄	Included	OK. Confirmed with document review and on-site visit.
		N ₂ O	Excluded	OK. Confirmed with the methodology.
		CO ₂	Excluded	OK. Confirmed with the methodology.
	Emissions from electricity consumption	CO ₂	Included	OK CO ₂ is the major emission source from the grid in the baseline scenario.
		CH ₄	Excluded	OK. Confirmed with the methodology.
		N ₂ O	Excluded	OK. Confirmed with the methodology.
	Emission from thermal energy	CO ₂	Excluded	OK. Confirmed with document review and on-site visit.

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	Source	Gas	Included?	Assessment
	generation	CH ₄	Excluded	OK. Confirmed with the methodology
		N ₂ O	Excluded	OK. Confirmed with the methodology
Project Activity	On-site fossil fuel consumption due to the project activity other than for electricity generation	CO ₂	Included	OK. Confirmed with document review and on-site visit
		CH ₄	Excluded	OK. Confirmed with the methodology.
		N ₂ O	Excluded	OK. Confirmed with the methodology.
	Emissions from on-site electricity use	CO ₂	Included	OK. Confirmed with document review and on-site visit.
		CH ₄	Excluded	OK. Confirmed with the methodology.
		N ₂ O	Excluded	OK. Confirmed with the methodology.
	Direct emissions from the waste incineration processes	N ₂ O	Included	OK. Confirmed with document review and on-site visit.
		CO ₂	Included	OK. Confirmed with document review and on-site visit.
		CH ₄	Included	OK. Confirmed with document review and on-site visit.
	Emission from thermal energy generation	CO ₂	Excluded	OK. Confirmed with document review and on-site visit.
		CH ₄	Excluded	OK. Confirmed with the methodology.
		N ₂ O	Excluded	OK. Confirmed with the methodology.
	Emissions from wastewater treatment	CO ₂	Excluded	OK. Confirmed with the methodology.
		CH ₄	Included	OK. Confirmed that the treatment system includes anaerobic treatment this generates methane to be combusted by the incinerator (similar to a closed flare). This condition was confirmed with the document review and the site visit.
		N ₂ O	Excluded	OK. Confirmed with the methodology.

Furthermore, JCI has not identified the GHG emissions which will contribute more than 1% of the expected average annual emission reductions and which are not addressed in the AM0025 /6/ within the project boundary.

JCI validates and concludes that the definition of the project boundary is appropriate and fully complies with AM0025 /6/ and complies with Para 78 of VVM /11/.

5.3. Baseline identification

JCI validates and concludes that the PDD appropriately identified “The disposal of the waste in a landfill site without capturing landfill gas. The electricity is obtained from the grid. No heat generation is involved” as the credible and feasible baseline scenario to the Project activity, complying with the selected methodology/6/.

JCI confirms that the baseline identification is appropriate for this project activity from the following steps and viewpoints:

1) Document review

(1) FSR/62/ and EIA Report/64/ for the proposed project

JCI has reviewed the FSR and EIA Report of the proposed project and confirmed that the proposed project is to combust MSW in the two incinerators for power generation. The amount of MSW generated in Wenzhou City is estimated to over 3,000 tons/day in the FSR that was cross-checked with the interview with Wenzhou city Sanitation Management Bureau /101/.

(2) General reference documents about alternatives /21/-/24/, /29/, /30/

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JCI has reviewed the reference documents about alternative measures of MSW treatment and confirmed that the most plausible baseline alternative is the disposal of the waste in a landfill site without capturing landfill gas and continuation of electricity supply to the ECPG by the existing generation mix operation.

2) On- Site visit from 22 through 24 August 2011

JCI has confirmed through the interviews with Wenzhou City EPB/100/ and MSW Management Bureau /101/ that there are three existing MSW incineration for power generation plants in Wenzhou City with a total incineration capacity of 1,500 tons/day, while current MSW generation amount is around 3,000 tons/day. This means that MSW is discarded around 1,500 tons/day to landfill sites located outskirts of the City. Out of the 1,500 tons of MSW, 1,200 tons will be combusted by the Project activity and remaining 300 tons will be discard to landfill sites.

3) Findings of CARs and CLs

CL-4 was raised as an inconsistency about the descriptions of the definition of Alternative M3 was observed. This was revised appropriately and CL4 was closed.

To request provision of evidence relevant to other renewal energy available in the region, CL-2 was raised. As the project participant provided the evidence sufficiently, CL-2 was closed.

The PDD /2/ listed and analyzed the following three alternatives for the disposal/treatment in Step 1:

- M1. The project activity, incineration of waste, not implemented as a CDM project
- M2. Disposal of the waste at a landfill where landfill gas captured is flared
- M3. Disposal of the waste at a landfill without the capture of landfill gas

The PDD appropriately assessed that the alternatives M1 and M3 are a realistic and credible baseline alternative, but alternative M2 is not, that were justified as below:

M1: no mandatory laws or regulations prohibit incineration of disposed MSW

M2: financially not viable due to high investment and running costs

M3: currently the most commonly implemented method in China

JCI could confirm through the document review/21/,/22/,/23/,/24/ and the interviews during the site visit /100/,/101/ that above assessment and justification are appropriate and therefore concluded that M1 and M3 are both a realistic and credible baseline alternative.

The PDD also listed and assessed the following six alternatives for the realistic and credible power generation alternative as described in the methodology /6/:

- P1. Power generated from combustion heat from the waste incinerators, not undertaken as a CDM project activity;
- P2. Existing or construction of a new on-site or off-site fossil fuel fired cogeneration plant;
- P3. Existing or construction of a new on-site or off-site renewable based cogeneration plant;
- P4. Existing or construction of a new on-site or off-site fossil fuel fired captive power plant;
- P5. Existing or construction of a new on-site or off-site renewable based captive power plant;
- P6. Existing and/or new grid-connected power plants.

JCI confirmed that no heat generation is involved in the Project activity with the FSR/62/ and observation during the site visit. Alternatives P2 and P3, therefore, are excluded appropriately in the PDD.

P4 was appropriately excluded in the PDD with the justification that China regulation prohibits the construction of thermal power plants with an installed capacity below 135MW. JCI has confirmed the appropriateness of the exclusion with the evidence provided by the project participant/29/.

JCI also confirmed that P5 was excluded due to insufficient renewal resources available in the region for power generation according to the PDD. JCI could confirm that the justification for the exclusion is appropriate.

P1 and P6 are confirmed to be a realistic and credible power generation alternative: P1 is the same as part of the Project activity, but without CDM application and P6 is electricity supply of the same amount from the ECPG which is the same condition as it is in the region. And both of them fully comply with the current laws and regulations. Therefore JCI assessed that it is appropriate that the PDD did not exclude P1 and P6 from the list of the potential alternative for power generation.

As the outcome of Step 1, the PDD left M1, M3, P1 and P6 as a potential alternative for further discussions, which JCI could confirmed appropriate as argued above.

In Step 2, the PDD demonstrated the fuel availability of alternatives P1 and P6 as follows:

P1: There will be sufficient MSW amount necessary to fully operate the two incinerators of the Project activity. JCI already confirmed with the interview with the government authority/101/ that there are sufficient MSW amount currently landfilled and available to fully utilize the total capacity of the two incinerators of the Project activity as demonstrated above.

P6: There is no fuel supply constraint regarding electricity supply from the ECPG, since connecting thermal power plants have been consuming conventional fuels, such as gas and coal. JCI could confirm this situation with relevant evidence/34/.

In Step 3, the PDD assessed potential combinations of a waste management component and an energy component appropriately.

Firstly the combination of alternatives M1 and P1, the same as the Project activity, but without CDM application, was assessed economically unattractive: the project IRR of the Project activity was worked out to 5.27% without CDM revenue, lower than the benchmark IRR 8.0 % as shown in section B.5. The combination, therefore, was assessed financially not viable without CDM revenue. JCI confirmed the appropriateness of the assessment with the demonstration of the financial analysis in section B.5.

Secondary the combination of alternatives M3 and P6 was assessed the realistic and credible baseline scenario to the Project activity. The combination is the same as the current situation and does not require any additional investment or activities; therefore, it was analyzed to be a viable option. Through the desk review and the site visit, JCI could confirm that the combination of M3 and P6 is the same as current situation in the region and it is appropriate and reasonable to define the combination as the realistic and credible baseline scenario to the Project activity. JCI also confirmed that the identified baseline scenario fully complies with one of the two baseline options demonstrated in Table 1 of the methodology/6/.

In Step 4, the PDD appropriately addressed that only one alternative scenario was identified as the credible and plausible baseline scenario.

Complying with VVM ver. 1.2 Para 87/11/, JCI hereby confirms that:

- (a) All the assumptions and data used by the project participants are listed in the PDD, including their references and sources;
- (b) All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;
- (c) Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable;
- (d) Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD;
- (e) The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity.

5.4. Algorithms and/or formulae used to determine emission reductions

The algorithms and/or formula are validated on the following steps:

1. Application of baseline and monitoring methodology

JCI confirmed that the PDD fully complies with AM0025/6/ based on the baseline scenario selected. The calculations are conducted of the following:

- 1) Project emissions
- 2) Baseline emissions, including the grid emission factor
- 3) Leakage emissions
- 4) Emission reductions.

2. Project emissions (PE_y)

The PDD uses the following equation to calculate the project emissions as per AM0025:

$$PE_y = PE_{elec,y} + PE_{fuel, on-site,y} + PE_{i,y} + PE_{w,y}$$

Other emissions, $PE_{c,y}$, $PE_{a,y}$, $PE_{g,y}$, $PE_{r,y}$, $PE_{co-firing,y}$ were excluded as not relevant to the Project activity, which was confirmed by JCI with the FSR and also through the site observation.

The calculations of the emissions and used assumptions were validated below:

- 1) The PDD calculates the emissions from electricity use ($PE_{elec,y}$) according to the equation specified in the AM0025/6/ and concluded that the amount is zero since the project is assumed to use the generated electricity for the incineration plant operation and excess electricity will be exported to the ECPG; therefore, it is considered appropriate.

$$PE_{elec,y} = 0 \text{ (ex-ante calculation)}$$

- 2) The PDD calculates the emissions from fuel use on-site ($PE_{fuel, on-site,y}$) for start up of the incinerators, according to the equation specified in the AM0025/6/ and uses the net calorific value of diesel oil derived from the data from China Energy Statistic Yearbook 2008/35/ and uses the emission factor of diesel oil derived from the default value of 2006 IPCC Guidelines/25/. Therefore it is considered appropriate. As below, JCI confirmed that the emission from fuel use on-site was correctly calculated in the CER spreadsheet with use of appropriately applied values derived from appropriate data sources.

$$PE_{fuel, on-site,y} = F_{cons,y} \times NCV_{fuel} \times EF_{fuel}$$

$$= 200,000 \times 42.6552 \times 0.0000741 = 632$$

Table 8-1. Parameter Table & Assessment Result

Parameter	Description	Value used in the PDD (data source)	Assessment
$F_{cons,y}$	The fuel consumption on site in year y (kg)	200,000 (FSR)	OK, confirmed with the FSR
NCV_{fuel}	The net caloric value of 0# light diesel to be consumed (MJ/kg)	42.652 (China Energy Statistical Yearbook 2009)	OK, confirmed with the year book
EF_{fuel}	The CO ₂ emissions factor of 0# light diesel to be consumed (tCO ₂ /MJ)	0.0000741 (2006 IPCC Guidelines)	OK, confirmed with the Guidelines

- 3) The PDD calculates the emissions from waste incineration ($PE_{i,y}$) according to the equation specified in the AM0025 /6/, and using 2006 IPCC Guidelines/25/ for default values; therefore, it is considered appropriate. As below, JCI confirmed that the emission from fuel use on-site was correctly calculated in the CER spreadsheet with use of appropriately applied values derived from appropriate data sources.

$$PE_{i,y} = PE_{i,f,y} + PE_{i,s,y}$$

Where,

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$PE_{i, f, y}$: The fossil-based waste CO₂ emissions from MSW incineration in year y (tCO₂e)

$PE_{i, s, y}$: The N₂O and CH₄ emissions from the final stacks from MSW incineration in year y (tCO₂e)

$$PE_{i, f, y} = A_{MSW, y} \times FCF_{MSW} \times EF \times 44/12$$

$$= 399,600 \times 2.24\% \times 100\% \times 44/12$$

$$= 32,820$$

$$PE_{i, s, y} = Q_{biomass, y} \times (EF_{N_2O} \times GWP_{N_2O} + EF_{CH_4} \times GWP_{CH_4}) \times 10^{-3} \times CF$$

$$= 399,600 \times (0.05 \times 310 + 0.0002 \times 21) \times 10^{-3} \times 1.37$$

$$= 8,488$$

Table 8-2. Parameter Table & Assessment Result

Parameter	Description	Value used in the PDD (data source)	Assessment
$A_{MSW, y}$	The amount of MSW fed into the MSW incineration plant (t/yr)	399,600 (FSR)	OK, confirmed with the FSR
FCF_{MSW}	The fraction of fossil carbon in MSW (fraction)	2.24% (FSR and calculation)	OK, confirmed with the FSR
EF	The combustion efficiency for waste (fraction)	100% (Ex-ante assumption)	OK, assumed conservatively
44/12	The conversion factor (tCO ₂ /tC)	-	OK, as a theoretical data
$Q_{biomass, y}$	The amount of waste incinerated in year y (t/y)	399,600 (FSR)	OK, confirmed with the FSR
EF_{N_2O}	The aggregate N ₂ O emission factor for waste combustion (kgN ₂ O/t of waste)	0.05 (2006 IPCC)	OK, confirmed with 2006 IPCC
GWP_{N_2O}	The Global Warming Potential of nitrous oxide (tCO ₂ /tN ₂ O)	310 (2006 IPCC)	OK, confirmed with 2006 IPCC
EF_{CH_4}	The aggregate CH ₄ emission factor for waste combustion (kgCH ₄ /t of waste)	0.0002 (2006 IPCC)	OK, confirmed with 2006 IPCC
GWP_{CH_4}	The Global Warming Potential of methane (tCO ₂ /tCH ₄)	21 (2006 IPCC)	OK, confirmed with 2006 IPCC
CF	The conservativeness factor	1.37 (Ex-ante assumption from the data table in AM0025)	OK, assumed the most conservative value

- 4) The PDD /2/ calculates the emissions from wastewater treatment ($PE_{w, y}$) according to the equations specified in the AM0025/6/ and also the “Tool to determine project emissions from flaring gases containing methane (Version 01)”/12/.

According to the FSR, a wastewater treatment plant will be installed for the treatment of leachate, exudes from the bunker. The plant consists of anaerobic (UASB¹), aerobic (NBR²) and filtration treatment units. Methane generated in the UASB treatment unit will be collected and sent to the

¹ Up-flow Anaerobic Sludge Blanket

² Membrane Bio Reactor (a kind of aerobic treatment system)

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incinerators for combusting. The PDD applies the default flare efficiency stipulated in the relevant tool/12/ for the calculation of project emissions from the combusting (flaring referred to in the tool).

JCI assessed its application is reasonable and acceptable as confirmed that some registered projects have applied the same approach (example: ref.3837) and further in the methodology AMS III.D. version18, which stipulates in para 22 that “When the amount of methane that is combusted for energy and that is flared is separately monitored, a destruction efficiency of 100% can be used for the amount that is combusted for energy.”

Ex-ante calculation

According to AM0025, the CH₄ emissions from the wastewater treatment are calculated ex-ante when including the default value of flare efficiency as follows:

The CH₄ emissions can be calculated multiplying “the theoretical COD amount of the wastewater to be converted to methane during the UASB process” by “not combusted methane amount rate.”

$$\begin{aligned} PE_{CH_4,w,y} &= Q_{COD,y} * P_{COD,y} * B_0 * MCF_p * (1 - \eta_{flare,h}) \\ &= 81,918 * 0.05 * 0.265 * 0.8 * (1 - 0.9) \\ &= 86.83 \text{ (tCH}_4\text{/y)} \end{aligned}$$

Therefore,

$$\begin{aligned} PE_{w,y} &= PE_{CH_4,w,y} * GWP_{CH_4} \\ &= 86.83 * 21 \\ &= 1,823 \text{ (tCO}_2\text{e/y)} \end{aligned}$$

Table 8-3. Parameter Table & Assessment Result

Parameter	Description	Value used in the PDD (data source)	Assessment
$Q_{COD,y}$	Amount of wastewater treated anaerobically or released untreated from the project activity in year y (m ³ /y), which shall be measured monthly and aggregated annually	81,918 (Ex-ante calculation based on the FSR estimate: Leachate amount : 246m ³ /d Operation : 333 (d/y) $Q_{COD,y} = 246 * 333$ $= 81,918 \text{ (m}^3\text{/y)}$ amount actual data in the three plants in Wenzhou city. Average: 16.1% of MSW treated)	OK, confirmed with the FSR. The rate of Leachate amount to MSW treated (t/d) is 20.5%, which was conservatively estimated compared with the actual data of the three MSW incineration plants data in 2010/80/: Lijiang Yiqi 15.3% Yangqiang 16.0% Dongzhuang 17.1%
$P_{COD,y}$	Chemical Oxygen Demand (COD) of wastewater (tCOD/m ³), which will be measured monthly and averaged annually	0.05 (50,000 ppm)	OK, confirmed with the FSR, in which the COD concentrate of the wastewater is estimated at 50,000 ppm. The calculation assumes conservatively that all the COD (50,000 ppm) contained in leachate is treated by the UASB unit.

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B ₀	Maximum methane producing capacity (tCH ₄ /tCOD)	0.265 (AM0025)	OK, assumed conservatively as per AM0025
MCF _p	Methane conversion factor (fraction), preferably local specific value should be used. In absence of local values, default value from 2006 IPCC guidelines applied	0.8 (2006 IPCC)	OK, confirmed appropriately assumed based on 2006 IPCC default.
η _{flare,h}	Flare efficiency in hour h	0.9 (the default value from the relevant tool/12/)	OK, confirmed with the tool
GWP _{CH₄}	Global Warming Potential of methane valid for the commitment period	21 (2006 IPCC)	OK, confirmed with 2006 IPCC default

Monitoring

As per the relevant tool/12/, calculations of the project emissions from flaring (PE_{flare,y}) are calculated as follows:

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

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

Table 8-4. Parameter Table

Parameter	Unit	Description
TM _{RG,h}	kg/h	Mass flow rate of methane in the residual gas in the hour h
FV _{RG,h}	m ³ /h	Volumetric flow rate of the residual gas in dry basis at normal conditions in hour h
fV _{CH₄, RG,h}	-	Volumetric fraction of methane in the residual gas on dry basis in hour h
ρ _{CH₄,n}	kg/m ³	Density of methane at normal conditions (0.716)

Parameters to be monitored ex-post for the project emissions are appropriately addressed in section B.7.1 of the PDD.

JCI validated and concluded through cross-check with the methodology AM0025/6/, the relevant tool/12/ and references provided by the project participants as demonstrated above, that the project emissions have been correctly calculated using appropriately defined values of parameters assumed ex-ant or estimated in the FSR or calculated appropriately.

3. Baseline emissions (BE_y)

The PDD uses the following equation to calculate the baseline emissions as per AM0025.

$$BE_y = (MB_y - MD_{reg,y}) + BE_{EN,y}$$

1) Methane that would be destroyed in the absence of the project activity in year y (MD_{reg,y})

MD_{reg,y} is defined with the following equation:

$$MD_{reg,y} = MB_y \times AF$$

AF, Adjustment Factor (%) for MB_y was appropriately assumed to be zero which was justified as there are no legal or regulation requirements of landfill gas capturing and flaring in China.

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The compliance ratio $RATE^{compliance}$ is appropriately assumed to be zero for ex-ante calculations in the PDD, justified that there are no local or national mandatory regulations for destruction of methane released from landfills. Therefore the baseline emissions including the compliance ratio $BE_{y,a}$ ($= BE_y * (1 - RATE^{compliance})$) was replaced with BE_y for emission reductions calculations.

2) Methane generation from the landfill in the absence of the project activity (MB_y)

MB_y is defined with the following equation:

$$MB_y = BE_{CH_4, SWDS, y}$$

$$BE_{CH_4, SWDS, y} = \varphi \times (1-f) \times GWP_{CH_4} \times (1-OX) \times \frac{16}{12} \times F \times DOC_f \times MCF \times \sum_{x=1}^y \sum_j W_{j,x} \times DOC_j \times e^{-kj \times (y-x)} \times (1-e^{-kj})$$

Validated results of the value of each parameter used in the above equation are summarized in the below table:

Table 8-5. Parameter Table & Assessment Result

Parameter	Description	PDD		Assessment
		Value	Data source	
φ	Model correction factor to account for model uncertainties	0.9	Relevant tool /5/	OK, confirmed consistent with the tool/5/
f	Fraction of methane captured at the SWDS	0	FSR/62/	OK, confirmed during the site visit that no treatment of MSW was implemented at the landfill site.
GWP_{CH_4}	Global Warming Potential (GWP) of methane	21	IPCC 2006 default value as per the tool/5/	OK, confirmed consistent with the tool/5/
OX	Oxidation factor	0	IPCC 2006 default value as per the tool/5/	OK, confirmed consistent with the tool/5/.
F	Fraction of methane in the SWDS gas (volume fraction)	0.5	IPCC 2006 default value as per the tool/5/	OK, confirmed consistent with the tool/5/
DOC_f	Fraction of degradable organic carbon (DOC) that can decompose	0.5	IPCC 2006 default value as per the tool/5/	OK, confirmed consistent with the tool/5/
MCF	Methane correction factor	0.8	FSR/62/	OK, 0.8 was assumed. Though the landfill site was observed to be an almost managed SWDS with depth greater than 5meters; however, 0.8 was assumed in a conservative manner.
$W_{j,x}$	Amount of organic waste type j	Details demonstrated in Annex3 of the PDD	FSR /62/	OK, confirmed with provided evidence /62/,/87/

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DOC _j	Fraction of degradable organic carbon (by weight) in the waste type <i>j</i>	Details demonstrated in Annex3 of the PDD	IPCC 2006 default value as per the tool/5/	OK, confirmed consistent with the tool/5/
k _j	Decay rate for the waste type <i>j</i>	Details demonstrated in Annex3 of the PDD	FSR/62/ and IPCC 2006 default value as per the tool/5/	OK, confirmed the condition of “Boreal and temperature-Wet” was appropriately applied based on the data on MAT, MAP and PET as addressed in the FSR

With the updated CER spreadsheet, JCI can confirm that the CERs for the Project activity have been correctly calculated as per the relevant tool/5/ with use of appropriately defined the values of parameters as argued above.

3) Baseline emissions from generation of electricity displaced by the Project activity (BE_{EN,y})

BE_{EN,y} is defined as the sum of the electricity generation component and the thermal energy component as the following equations:

$$BE_{EN,y} = BE_{elec,y} + BE_{thermal,y}$$

As the Project activity does not involve any thermal energy component, the PDD appropriately defined that BE_{thermal,y} is zero. Therefore, BE_{EN,y} = BE_{elec,y}.

BE_{elec,y} is defined with the following equation:

$$BE_{elec,y} = EG_{d,y} \times CEF_d$$

EG_{d,y}, amount of electricity generated, is defined to be monitored ex-post by AM0025.

Determination of CEF_d

In case of connecting to the grid, use of the emission tool/3/ is defined by AM0025. CEF_d, therefore, is defined as the following equation:

$$CEF_d = EF_{grid, CM, y}$$

With use of the emission tool/3/, the PDD appropriately worked out EF_{grid, CM, y} which is validated on the following six steps:

Step 1: Identify the relevant electricity systems

ECPG is appropriately identified in Step 1 of the PDD as the grid included in the project boundary.

Data from the following official data sources are appropriately used for the calculations of emission factors and reductions.

- China DNA DRC website
- China Electric Power Yearbook (2005 - 2009)
- China Energy Statistical Yearbook (2007- 2009)
- Statistics from China Electricity Council

Step 2 Choose whether to include off-grid power plants in the project electricity system

Option1: only grid power plants are appropriately selected for the calculations.

Step-3 Select a method to determine the operation margin (OM)

JCI confirmed that OM emission factor is calculated correctly as described below:

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- The simple OM method is appropriately applied satisfying the applicable conditions specified by the relevant tool/3/: the dispatch data from the Grid in China is not publically available, and the ratios of low-cost/must-run resources to total grid generation of ECPG varied from 8.30 to 12.32% during the five years from year 2004 through 2008, thus satisfies the specified ratio less than 50%.
- Ex-ante option is selected and then a 3-year generation-weighted average, based on the most recent available data at the time of submission of the PDD/1/ for validation is appropriately worked out using grid data from year 2007 through 2009.

Step 4: Calculate the operating margin emission factor according to the selected method

Option B is properly selected for the calculation of simple OM considering the conditions of the connecting grid ECPG as:

- Necessary data, such as power generation data on each plant required for selecting Option A is not available in the PRC
- Only nuclear and renewable power generation are considered as low-cost/must –run power sources in ECPG
- The quantity of electricity supplied to ECPG by these sources is known, which can be obtained from the above data sources

Calculations are correctly conducted using equation (G-1) specified in the PDD consistent with the relevant tool/3/. The data and parameters used are appropriately derived from the data sources listed above. Electricity import from Central China Power Grid is appropriately reflected to the OM calculation.

As a result, the OM emission factor is calculated to be 0.8592 tCO₂e/MWh as shown in Annex 3 and attached spreadsheet, fully complying with the relevant tool/3/.

Step 5: Calculate the build margin (BM) emission factor

The PDD selected adoption of the ex-ante option (Option 1) in terms of vintage of the data.

As power generation data on each plant is not available in China, the PDD appropriately adopted the application of the approved deviation for BM calculations in selecting the sample group.

For calculations of the emission factor of new thermal power plants by fuel in ECPG, the efficiencies provided by the host country are applied according to the emission tool/3/: regarding the ratios of weight of CO₂ emission, 97.21% from coal-fueled, 2.31% from oil-fueled and 0.48% from gas-fueled power plants and the their thermal efficiencies are defined 39.08%, 51.46% and 51.46% respectively. These data are assessed appropriate as referring to relevant appropriate documents. As the result of the calculations, the thermal emission factor of ECPG $EF_{Thermal, y}$ is correctly calculated to be 0.7931 (tCO₂e/MWh).

The sample group of power units necessary for BM calculation has been appropriately selected as shown in Annex 3 of the PDD. The installed capacity addition from year 2006 through 2008 is selected as it stands for 21.53% of the total installed capacity of year 2008 as shown in Table A10 of Annex 3. This satisfies the specified threshold over 20%. The weight of fossil fueled power plants in newly added installed capacity during the three years is correctly calculated to be 85.60%.

Then the BM emission factor has been correctly calculated multiplying the thermal emission factor of ECPG $EF_{Thermal, y}$ 0.7931 (tCO₂e/MWh) by the above ratio of the weight of the thermal emission factor 85.60%.

As a result, the BM has been correctly worked out to be 0.6789 tCO₂/MWh complying with the emission tool/3/ which is demonstrated in Annex 3 of the PDD.

Step 6: Calculate the combined margin emissions factor

JCI confirmed that the CM emission factor is calculated to 0.7691tCO₂/MWh, correctly following the relevant tool/3/ and applying the default weight of 50% to both OM and BM emission factors.

CAR-5 was raised to request provision of the spreadsheet of emission factor calculations. As an appropriate sheet was provided by the project participant, CAR-5 was closed.

Ex-ante calculation of the baseline emissions from the electricity component ($BE_{elec, y}$)

From the above, $BE_{elec, y} = EG_{d, y} \times CEF_d$

From the FSR, $EG_{d, y} = 107,500$ MWh/y (Appropriateness of the value is examined in the below financial analysis section)

From the above calculation result, $CEF_d = EF_{grid, CM, y} = 0.7691$ tCO₂/MWh

Therefore, $BE_{elec, y} = 107,500 \times 0.7691 = 82,673$ tCO₂/y

As demonstrated above, JCI confirmed that the baseline emissions from the electricity component ($BE_{elec, y}$) were correctly calculated in the CER spreadsheet.

4. Leakage emissions (L_y)

Leakage emissions (L_y) of the Project activity consist of the emissions (1) from off-site transportation ($L_{t, y}$) of waste materials and (2) from the residual waste of MSW incinerator ($L_{i, y}$) as shown in the below equation:

$$L_y = L_{t, y} + L_{i, y}$$

The PDD defined that $L_{t, y}$ is zero ($L_{t, y} = 0$), since no increases in the distance of MSW transportation is estimated associated with implementation of the Project activity. During the site visit JCI measured on a map the distance 1) from the center of Wenzhou City to the current landfill site and 2) from the center of Wenzhou City to the Project site. As a result JCI confirmed both of them are 12km; therefore, no leakage emissions are assumed associated with the change in transport routing of MSW.

The PDD calculates the emissions from the residual waste of MSW incinerator ($L_{i, y}$) as follows :

The following equation is applied for the calculation of the emissions:

$$L_{i, y} = A_{residual, y} \times FC_{residual} \times \frac{44}{12}$$

$$L_{i, y} = 55,950 \times 3\% \times \frac{44}{12} = 6,155 \text{ t/y}$$

Table 8-6. Parameter Table & Assessment Result

Parameter	Description	Value used in the PDD (data source)	Assessment
$A_{residual, y}$	The amount of the residual waste from the incinerator (t/y)	55,950 (FSR)	OK, confirmed with the FSR
$FC_{residual}$	Fraction of residual carbon in the residual waste of MSW incinerator (%)	3% (FSR)	OK, confirmed with the FSR

JCI confirmed that the PDD appropriately applied the equation, applicable in case the residual waste from the incinerator contains up to 5% residual carbon. JCI also confirmed that the emissions are correctly calculated in the CER spreadsheet.

CL-22 was raised to request clarification of whether the leakage emissions from increased transport need to be included in the project emissions. As this was clarified in the PDD that it is not necessary to include them as no increase of transportation distance was estimated associated with the project implementation. CL-22 was closed accordingly.

5. Emission reductions (ER_y)

ER_y is defined by AM0025 as the following equation:

$$ER_y = BE_y - PE_y - L_y$$

The PDD calculated ER_y in section B.6.3 of the PDD estimated the emission reductions as summarized in Table 9.

Table 9. Emission Reductions Summary

Item	Emission source	Parameter	tCO ₂ e/10 years
Baseline Emissions (BE)	Methane generation	MB	1,429,548
	Methane destroyed as per laws/regulations	MD _{reg}	0
	Grid electricity displaced	BE _{EN}	826,730
	Total Baseline Emissions	BE	2,256,278
Project Emissions (PE)	Electricity use	PE _{elec}	0
	Fuel use on-site	PE _{fuel, on-site}	6,320
	MSW incineration	PE _i	413,080
	Wastewater treatment	PE _w	18,230
	Total Project Emissions	PE	437,630
Leakage Emissions (L)	Residual waste	L _i	61,550
Emission Reductions		ER	1,757,098

In conclusion, JCI validated and concluded that the emission reductions are correctly worked out complying with AM0025/6/ and the relevant tool/3/, and parameters and data for the calculations are sourced from proper data sources.

CAR-7 was raised to request provision of the spreadsheet of CER calculations, which was closed as an appropriate sheet was provided by the project participant.

6. Additionality of project activity

JCI assessed the additionality of the Project activity with the below steps, complying with VVM/11/.

6.1 Prior consideration of CDM

Below summarizes how the project participant demonstrates the prior consideration of CDM and JCI validated in accordance with the guideline of CDM prior consideration/9/ and VVM/11/.

1. Project start date definition

The PDD defines 20/03/2010 as the project starting date, after 2 August 2008, on which the equipment purchase contract for the Project activity was signed by the project owner and a vender/77/. As demonstrated in the timeline of Table 10, the equipment purchase contract is the first commitment by the project participant for a large-amount expenditure.

After interviewed with the project owner/103/ and local government authorities/100/, /104/ and assessed against the national regulation “Regulation on the BOT investment in the utilities sector/57/” stipulated by the Ministry of Construction of China in May 2004, JCI validated that the signed BOT Agreement is one of the indispensable documents as requested by the DRC and EPB which are responsible for the approval of FSR and EIA respectively. The BOT contract is just one step in the project preparation procedure. So the date of signed the BOT Agreement cannot be considered as the project starting date as per the Glossary of CDM terms.

Confirmed that the relevant timelines are correct with the evidence provided by the project owner, JCI, therefore, judges that the project starting date is appropriately defined complying with the Glossary of CDM terms/9/.

On 04/09/2012 the review request was issued by UNFCCC secretariat regarding validation of the start date of project activity as below:

1) The DOE has validated the start date of the project activity as 20 March 2010(signing of the equipment purchase contract). However a BOT agreement had also been signed on 21 Jan 2009. The DOE shall provide information on the steps taken to validate the project starting date, in particular, the DOE shall provide information to justify why the signature of the BOT agreement (21/01/2009) was not considered

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as either the implementation or construction or real action of the proposed CDM project. Please refer to VVM version 1.2 paragraph 104 (a), EB 66 Annex 63.

Response:

JCI has validated the definition of the start date of the project activity demonstrated in the PDD /2/ with the following steps:

Step 1: JCI has validated that the Table B.2 the timeline of the project of the PDD /2/ covers all the key activities taken by the project participant relevant to the proposed project activity. For the assessment JCI has referred to the timeline tables of past some similar MSW CDM projects, the results of the interviews with relevant entities and groups /100/ - /108/ during the site visit and auditors' sectoral expertise.

Step 2: JCI has validated the correctness of all the activities listed in the timeline table with the evidence provided by the project participants, as demonstrated in the two tables of the Validation Report: 1) Table 10. Timeline of the key milestones and 2) Table 5. Document list. Especially the four contracts of the Equipment Purchase /77/, the Installation /80/, the Construction /79/ and the Bank Loan /78/ were checked for its contracted scope; whether the scope covers all the necessary items/subjects required for construction and completion of the project activity or meets with project requirements. Through desk reviews of the four contracts, JCI could confirm the completeness of the four contracts in implementing and constructing the proposed project activity.

Step 3: JCI has assessed the compliance of all the listed activities with Glossary of CDM terms (EB 66 Annex 63) referring to the EB clarification on the definition of the start date of project activity in paragraph 67 of EB 41. And as a result, JCI has validated that the PDD /2/ appropriately defined the start date of the project activity as 20 March 2010 on which the Equipment Purchase contract was signed, complying with the Glossary and the clarification.

The Glossary stipulates the start date as *"In the context of a CDM project activity or PoA, the earliest date at which either the implementation or construction or real action of a CDM project activity or PoA begins."*

Further the EB clarified in paragraph 67 of EB 41 that the "Glossary of CDM terms" defines the start date of a CDM project activity as: *"the earliest date at which either the implementation or construction or real action of a project activity begins"*. To facilitate the clear definition of this term the Board further clarified that: *"In light of the above definition, **the start date shall be considered to be the date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity. Minor pre-project expenses, e.g. the contracting of services /payment of fees for feasibility studies or preliminary surveys, should not be considered in the determination of the start date as they do not necessarily indicate the commencement of implementation of the project.....**"*

Based on the above definition and the clarification, with desk reviews JCI has identified the following four contracts as the activities involving the commitment by the project participant to expenditures related to the implementation or related to the construction of the project activity:

1. Equipment Purchase contract dated 20 March 2010
2. Installation contract dated 4 June 2010
3. Construction contract dated 5 August 2010
4. Bank loan contract dated 16 November 2012

JCI also could confirm that all the other activities, including the BOT agreement /70/, did not involve commitment by the project participant to the expenditures as demonstrated in the two timeline tables (Table B.2 of the PDD and Table 10 of the Validation Report).

Regarding the BOT agreement JCI has confirmed with desk reviews of relevant documents /54/, /70/ and the interviews with the local authority /101/ that the agreement was made between the project participant and Wenzhou Municipal Bureau of Parks to define the framework of the project activity in line with the "Regulation on the BOT investment in the utilities sector" stipulated by the Ministry of Construction of China in May 2004 /54/ as one of indispensable legal processes for the

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project activity followed by the FSR/the EIA report compilation and the approvals by the relevant government authority respectively.

The BOT agreement stipulates the rights/responsibilities/duties of the two parties, and some basic conditions such as the tipping fee and the tariff to be applied to the project activity, while it didn't define expenditure commitment by the project participant thus it doesn't fulfill the definition of project activity starting date as mentioned above.

In conclusion JCI has validated that the PDD/2/ appropriately defined the start date of the project activity as 20 March 2010 on which the Equipment Purchase contract was signed, since the date was the earliest date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity as argued above.

With the above response, it is expected that JCI has provided information on the steps taken to validate the project starting date and also information to justify why the signature of the BOT agreement (21/01/2009) was not considered as either the implementation or construction or real action of the proposed CDM project, thus resolved the review comment.

2. Prior consideration of CDM

Timeline of key milestones of the Project activity is tabulated below:

Table 10. Timeline of key milestones

Time	Event	Evidence used for cross reference
21/01/2009	BOT Agreement	BOT agreement with signatures/70/
08/2009	EIA report completion	EIA report compiled by ZPES R&D/64/
30/09/2009	EIA report approval	EIA report approval letter issued by Zhejiang Province EPB /65/
12/2009	FSR completion	FSR compiled by CNCC/62/
03/02/2010	FSR approval	FSR report approval letter issued by Zhejiang Province DRC/65/
15/02/2010	Board decision on the application of CDM to the Project activity	Board meeting minutes/71/
20/03/2010	Contract of equipment purchase (the starting date of the Project activity)	Equipment purchase and technical service contract/77/
04/06/2010	Contract of installations	Installation contract/80/
18/06/2010	Submission of the CDM Consideration Notification to NDRC (China DNA)	Submitted notification that also confirms the receipt by NDRC on 12/07/2010/68/
20/06/2010	Submission of the notification of CDM prior consideration to UNFCCC by the project owner	UNFCCC Prior Consideration of the CDM Form (F-CDM-Prior consideration)/69/
26/07/2010	Registration of the CDM prior consideration by the project owner to UNFCCC	UNFCCC website/67/
05/08/2010	Contract of construction	Construction contract/80/
16/11/2010	Contract of Bank Loan	Bank loan contract /78/
22/03/2011	Issuance of Chinese LoA	Chinese LoA /60/
15/07/2011	Issuance of UK's LoA	UK's LoA/61/
29/06/2011	Publication of the PDD for GSC on UNFCCC website	UNFCCC website

Following the guidelines of CDM prior consideration/9/, the project owner submitted registration request of its prior consideration of CDM to UNFCCC on 20/06/2010 and it was registered on 26/07/2010. Also to China DNA, the project owner submitted the same request on 18/06/2010 and it was officially received on 12/07/2010.

JCI concludes that as argued above, the prior consideration of CDM by the project owner is appropriately demonstrated: the two notices of CDM prior consideration were registered within 6 months after the project starting date and then one year later the PDD/1/ was published for GSC, which are assessed to have fully complied with the relevant guidelines/9/.

6.2 Identification of alternative

JCI validates and concludes that as described in the above section “5.3 Baseline identification”, the PDD analyzed potential alternatives stipulated by AM0025: three (3) alternatives for the disposal/treatment of the MSW and six (6) alternatives for power generation, and then selected the most suitable scenario as the baseline scenario, which complies with AM0025.

Thus JCI validated and concluded that the finally selected combination of the two alternatives (one is for the disposal/treatment of the MSW component and the other for the power generation component) is considered credible and plausible complying with methodology AM0025.

6.3 Investment analysis

6.3.1 Benchmark Analysis

For the investment analysis, benchmark analysis was applied and the project IRR after tax (hereafter IRR) was calculated to be 5.27% without CERs revenue, and 8.22% with CERs revenue in the PDD. Compared with the benchmark IRR 8% stipulated in “the Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects”/33/, it is, therefore, concluded that the project activity is not financially attractive.

Regarding the applicability of the Interim Rule to the project activity, CL-7 was raised to request its clarification. As explained sufficiently in the response, CL-7 was closed.

CL-9 was also raised to request provision of the IRR spreadsheet. As an appropriate spreadsheet was provided, CL-9 was closed.

The investment analysis implemented in line with the additionality tool/4/ in the PDD is validated with the below steps:

1. Application of benchmark analysis

Selection of the benchmark analysis is justified appropriately as below, following the additionality tool/4/ and the paragraph 113 a), b) and c) of VVM/11/:

- 1) The additionality tool provides three options (Option I, II and III) for the methods of investment analysis. Option I (Apply simple cost analysis) and II (Apply investment comparison analysis), however, were not applicable, since the project activity aims to obtain revenue from electricity sale and MSW incineration in addition to revenue from CERs, and the specified baseline was not an investment project. Only Option III (Benchmark analysis), therefore, could be applied to the project activity.
- 2) There is an official benchmark IRR 8% applicable to the project activity published in “the Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects”/33/, widely used in the PRC for the financial evaluation of power generation projects.
- 3) JCI confirmed that the project owner has an experience of applying to a MSW incineration for power project to CDM³, in which the benchmark analysis has been applied in the investment analysis. JCI can conclude that the application of the benchmark analysis was justified with the reference.

³ Such as Linhai MSW Incineration project, ref No. 5586

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JCI reviewed the baseline scenario of the PDD, cross-checked “the Interim Rule”/33/ and validates and concludes that the selection of benchmark analysis for investment analysis of the project activity is appropriate and fully complies with the additionality tool/4/ and VVM/11/.

2. Validation of input values used for the IRR calculation

The validation was conducted in accordance with the additionality tool, the paragraph 113 a), b) and c) of VVM/11/, and the relevant guidelines/9/.

As demonstrated in the timeline table of Table B.2 of the PDD, the project participant decided the implementation of the project activity with provision of CDM application within three months after the completion of the FSR/62/. The FSR had recommended the project owner to apply CDM to solve financial difficulties of the Project activity as the project IRR was estimated below the benchmark.

JCI, therefore, could validate that the FSR has been the basis of the decision by the project owner to proceed with the investment in the project with provision of CDM application: the period of time between the finalization of the FSR and the investment decision is sufficiently short, within three months; therefore, JCI can confirm that it is unlikely in the context of the underlying project activity that the input values would have materially changed during the period.

In summary, JCI concluded that the Project activity complies with the paragraph 113 a) of VVM/11/ appropriately.

JCI could confirm that the key input values used for financial analysis in the PDD are consistent with the FSR as compared in the below table; therefore, the Project activity fully complies with the paragraph 113 b) of VVM/11/:

Table 11. Comparison of input values of investment analysis between PDD and FSR

Parameter	Unit	PDD	FSR/62/	Consistency
Annual MSW Treatment Amount	Thousand tons	399.6	399.6	OK
Installed generator capacity	MW	24	24	OK
Construction Period	Years	2	2	OK
Operation Period	Years	25	25	OK
Electricity exported to ECPG	MWh/y	107,500	107,500	OK
Total investment	Million CNY	429.97	429.97	OK
Average annual O&M costs	Million CNY	53.92	53.92	OK
Electricity tariff (Including Tax)	CNY/kWh	0.5463	0.5463	OK
Tipping fee	CNY/ton MSW	73.80	73.80	OK
Value Added Tax	%	17	17	OK
Income Tax	%	25	25	OK
Urban Maintenance and Construction Tax	%	7	7	OK
Educational Sur-charge	%	3	3	OK
Residual Rate	%	0	0	OK
Expected CER price	EUR/tCO ₂	10.0	10.0	OK
Expected Exchange rate	CNY/EUR	9.5	9.5	OK

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For complement the contents of Table B.3 of the PDD, CL-8 and CL-10 were raised: CL-8 for clarification of data sources used and CL-10 for demonstration of more parameters. The Table B.3 was revised sufficiently, both CL-8 and CL-10 were closed.

On the basis of its specific local and sectoral expertise, confirmation was provided, by cross-checking or other appropriate manner, that the input values from the FSR are valid and applicable at the time of the investment decision.

In line with the paragraph 113 c) of VVM, the validity and applicability of the input values from the FSR were assessed on below three steps. For cross checking, the below table summarizes the input values of key parameters used in other CDM MSW incineration projects. The projects were selected with the following criteria from UNFCCC website:

- 1) Located in China
- 2) Equipped with power generation, but without co-generation function
- 3) Equipped with the grate type incinerator with a MSW treatment capacity of 600-1,800 tons/day (+/- 50% of the Linjiang project capacity)
- 4) Applies AM0025
- 5) Officially published, or registered in UNFCCC (as relevant data are available)

As a result, following 25 projects were identified:

Table 12. Cross-check table of input values of major parameters

Name	Capacity (t/d)	Generator (MW)	Investment (mill. CNY)	Annual O&M cost (mill. CNY/y)	Annual MSW Treatment (t/y)	Annual Net Power Supply (GWh/y)	Investment Index (CNY/t/d)	Annual O&M Cost Index (CNY/t/d)	Annual Operation Hours
Baoding	1,200	24	425.73	50.67	350,000	134.4	354,775	42,225	7,000
Changshu ⁴	660	12	297.5	20.76	219,780	54.4	450,758	31,455	7,992
Fuqing	900	18	440.77	30.69	300,000	87.7	489,744	34,100	8,000
Haining ⁵	600	7.5	256.88	28.65	219,000	56.6	428,133	47,750	8,760
Hui'an	1,200	24	515.37	N/A	400,000	112.4	429,475	NA	8,000
Huzhou ⁶	800	15	248.87	22.62	266,000	59.1	311,088	28,275	7,980
Jiujiang	1,800	36	713.37	54.51	650,000	156.0	396,317	30,283	8,667
Kunshan	1,050	18	394.48	35.33	349,000	85.2	375,695	33,648	7,977
Luodai ⁷	1,200	24	502.75	30.5	400,000	117.3	418,958	25,417	8,000
Nanhai	1,500	30	612.12	64.85	495,000	134.9	408,080	43,233	7,920
Qidong	600	15	243.84	26.65	198,000	56.7	406,400	44,417	7,920
Qinhuangdao	1,000	18	453.63	29.82	365,000	95.4	453,630	29,820	8,760
Tianjin	1,500	30	774.72	85.29	500,000	85.9	516,480	56,860	8,000
Tianyi	900	20	407.05	33.86	270,000	104.5	452,278	37,622	7,200
West Qinhuangdao	650	12	247.71	27.45	217,000	61.5	381,092	42,231	8,012
Wuhan	1,000	22	393.86	41.84	365,000	86.0	393,860	41,840	8,760
Xiamen Eastern	600	12	306.02	24.93	200,000	50.9	510,033	41,550	8,000
Xiamen Western	600	12	312.48	24.81	200,000	50.9	520,800	41,350	8,000
Yangzhou ⁸	1,000	18	502.98	36.37	365,000	100.8	502,980	36,370	8,760
Linhai	700	12	268.29	31.29	233,100	68.1	383,271	44,700	7,992
Yongkang	800	15	303.94	35.83	267,000	75.0	379,925	44,788	8,010
Yuhuan	700	15	268.92	31.53	233,100	68.1	384,171	45,043	7,992
Zhoushan	700	15	242.15	N/A	220,000	51.0	345,929	NA	7,543

⁴ Ref 4824

⁵ Ref 3480

⁶ Ref 3525

⁷ Ref 3837

⁸ Ref 3694

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Guanzhuang	1,000	20	554.43	42.65	365,000	100.8	554,430	42,650	8,760
Xinagfu	1,800	36	816.43	N/A	650,000	196.0	453,572	NA	8,667
Average	978	19	420	37	331,879	90.0	428,075	39,347	8,107
Maximum	1,800	36	816	85	650,000	196.0	554,430	56,860	8,760
Minimum	600	8	242	21	198,000	51.0	311,088	25,417	7,000
Lijiang Erqi	1200	24	429.97	53.92	399,600	107.5	358,308	44,933	7,992

1) Static investment

The value of the static investment 429.97 Million CNY is considered appropriate. As shown in the above Table 12, the investment index of the proposed project is worked out at 358,308 CNY/ton/day, over 16 % lower than the average 428,075 CNY/ton/day of the other 25 projects in China.

For further validation of the value, JCI compared the estimated cost in the FSR with the actual contracted amount in the below Table 13. Total of the compared cost items accounts for 85% of the static investment of the FSR.

The table shows that the actually contracted total amount is almost the same as that estimated total amount in the FSR. This indicates that the FSR estimated the costs correctly and appropriately. The amount by category differs to some extent due to the differences of scope of work included between the FSR and actual contracts.

In summary JCI concluded that the static investment for the Project activity was estimated in the FSR appropriately.

Table 13. Investment cost comparison between estimate in FSR and actual contract amount

Estimate in FSR/62/ (Million CNY)		Actual Contracted Amount (Million CNY)		Reference
Civil Construction	83.16	Construction and Electric & Water Installation	40.1450	Construction contract/79/
Installation	25.5262	Installation	27.02	Installation Contract/80/
Equipment Purchase	257.2020	Equipment & Material & Service	293.0605	Equipment purchase and technical service contract /77/
Total ⁹	365.8882	Total	360.2255	

2) Electricity tariff (Including VAT)

The tariff of 0.5463CNY/kWh (incl. VAT) used in the investment analysis in the PDD is sourced from the FSR/62/. The FSR itself sourced the tariff from the BOT contracted between the project owner and Wenzhou Municipal Bureau of Parks signed on 29/01/2009/70/. The actual tariff of the project was confirmed to be 0.5463 CNY/kWh with the PPA/97/, the same as that of the FSR and the BOT.

JCI confirmed that as above the tariff was correctly sourced from the FSR, and also the FSR sourced from the BOT. Furthermore as shown in the Tables 14 and 15, the tariff of the Project was cross-checked with other similar projects: With the Table 14, JCI could confirm the tariff applied to the Project is reasonable though slightly lower than the two other projects in Zhejiang province. However even with the highest tariff 0.59 (CNY/ kWh) of the Zhoushan project, higher by 8% than that of the Project, the project IRR would not cross the benchmark as demonstrated in the below sensitivity analysis. Also with the Table 15, JCI could confirm the tariff is reasonable compared with the other three projects in Wenzhou city, of

⁹ Excludes other cost (64.0863 Million CNY) for such as issuance and contingency.

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which BOTs were contracted 7 to 8 years before the Project. The tariff of the Project is set at a slightly higher level than the average of the other three projects reflecting inflation during the 7 to 8 years.

JCI, thus, validated and concluded that the tariff in the PDD was appropriately estimated.

Table 14. Tipping fee and tariff applied CDM MSW incineration for power projects located in Zhejiang province excluding the three plants in Wenzhou city

Project Name	Plant Capacity t/d	Tipping Fee CNY/t	Tariff (Inc.VAT) CNY/ kWh
Zhoushan	700	78	0.59
Huzhou	900	80	NA
Hanyang	600	70	0.56
Lijiang Erqi	1,200	78.3	0.5463

Table 15. Tipping fee and tariff applied to non-CDM MSW incineration for power projects located in Wenzhou city

Project Name	Plant Capacity t/d	Tipping Fee CNY/t	Tariff (Inc.VAT) CNY/ kWh	BOT signed date
Dongzhuang	385	73.8	0.50	14/06/2001/94/
Linjiang Yiqi	600	73.8	0.52	12/10/2001/95/
Yongqiang	600	65.0	0.52	18/11/2002/96/
Linjiang Erqi	1200	73.8	0.5463	29/01/2009/70/

3) Tipping fee

JCI confirmed that the tipping fee was correctly sourced from the FSR, and also the FSR sourced from the BOT. Furthermore as shown in the Tables 14 and 15, the tipping fee of the Project was cross-checked with other similar projects: With the Table 14, JCI could confirm the tipping fee applied to the Project is reasonable as slightly higher than the average of the three projects 76 (CNY/t). Though the Huzhou project tipping fee is higher than the proposed Project, but with its tipping fee 80 (CNY/t), the project IRR would not cross the benchmark as demonstrated in the below sensitivity analysis. Also with the Table 15, JCI could also confirm the tipping fee is reasonable compared with the other three projects in Wenzhou city. The tipping fee of the Project is set at almost the same level as those of the three projects.

JCI, thus, validated and concluded that the tipping fee in the PDD was appropriately estimated.

4) O&M cost

The PDD estimated the annual average operation and maintenance (O&M) cost at 53.92 Million CNY/year which is assessed appropriate and reasonable. As shown in the below Table 16 the breakdown of the O&M was assessed by item. As a result they were validated to have been estimated appropriately based on appropriate data sources. Further as demonstrated in the below Table 17, raw materials cost and treatment costs in the O&M cost estimated for the Project activity were compared with the actually incurred costs in year 2010 at the three MSW incineration plants located in Wenzhou city. With the comparison JCI could assess the O&M cost of the Project activity was estimated appropriately rather in a conservative manner.

With the cross-check in the above Table 12, the annual O&M cost index of the Project activity is around the average of the other similar 25 projects in China, which also supports the above arguments.

JCI can conclude that the O&M cost estimated in the FSR for the Project activity is appropriate and reasonable.

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Table 16. O&M Cost Breakdown and Result of Assessment

Cost Item	Value	Unit	Amount in FSR CNY/y	Assessment result
Repair	3.0	% of total static investment	12,833,700	OK, assessed reasonable. The Chinese Code Interim Rule/33/ stipulates to apply 1.5 -2.5%; however, when considering that the portion of equipment costs of the MSW incineration for power projects is higher than others' projects, such as hydro projects, the application of 3% as the repair cost is acceptable.
Labor			7,341,600	OK.
<ul style="list-style-type: none"> No. of employees Average Salary Welfare 	115 48,000 33	Persons CNY/year/person % of salary		<ul style="list-style-type: none"> No. of employees is confirmed reasonable through a review of the plant manning plan designed in the FSR.¹⁰ The salary used is conservative compared with the average wage of 68,050 CNY/year/person indicated in 2010 Zhejiang Statistical Yearbook for workers in the sector of electricity, gas, and water production and supply for year 2008. % of the welfare to the total salary is estimated conservatively to 33%, while in case of Chinese projects 40% plus have been applied.
Raw materials				
<ul style="list-style-type: none"> Lime Activated Carbon Ammonia Bag filter Diesel oil 	1,648,000 1,540,000 4,125,000 4,650,000 1,500,000	CNY/year CNY/year CNY/year CNY/year CNY/year	13,200,000	OK, reasonable as compared with other three plants' actual data in the below table.
<ul style="list-style-type: none"> Industrial and demineralised water treatment 			5,300,000	OK, reasonable as compared with other plants' actual data in the below table.
<ul style="list-style-type: none"> Fly ash treatment 			6,400,000	OK, reasonable as compared with other plants' actual data in the below table.

¹⁰ Plant Mgr/Vice Mgr:3; Operation group on 3-shift: 69; Maintenance/Engineering group:23; Environment/Security group:9; Administration group: 11

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● Leachate treatment			5,900,000	OK, reasonable as compared with other plants' actual data in the below table.
● Others			2,950,600	OK, reasonable. The others cost includes costs such as construction supervisor fees and issuance fees. The applicable standard in China, "Municipal public service projects financial evaluation methods and parameters" stipulates that the other cost is 8 to 12 % of the total operation and maintenance cost excluding the other cost. The other cost of the Project is calculated to 5.8% of the total O&M cost excluding the other cost. Therefore JCI validates that the other cost was estimated appropriately and conservatively.
Total			53,925,900	

Table 17. Comparison of O&M cost by item with the three plants' actual data in year 2010 /88/

Plant	Capacity (t/d)	Cost (CNY/ton-MSW treated)			
		Water treatment	Raw ¹¹ materials	Residue and fly ash treatment	Leachate treatment
Linjiang Yiqi	600	13.7	33.8	20.7	13.9
Yongqiang	600	14.1	36.2	20.9	16.4
Dongzhuang	385	15.0	37.7	20.7	16.4
The Project activity (FSR estimate)	1,200	13.3	33.0	16.0	14.8

5) Plant Load Factor (PLF)

The PLF of the Project activity is worked out as follows:

Annual MSW treatment amount : 399,600 t/y (FSR)

MSW incineration capacity: 1,200 t/d (FSR)

Therefore, annual operation hours = $399,600 / 1200 * 24 = 7,992$ h/y (the FSR rounded up to 8,000 h/y)

Then, $PLF = 7,992 / 24 / 365 = 91.2\%$

As demonstrated in the above Table 11, the annual MSW treatment amount is estimated in the FSR by a certified design institute CNNC, which fully complies with the relevant guidelines/13/.

The cross-check Table 12 indicates that the annual operation hours of the Project activity 7,992 is almost the same as the average 8,107 h/r, lower by only 1.4% and well in the center of the range 7,000 - 8,760 h/y.

¹¹ Includes costs of fuel, active carbon, ammonia, bag filter and lime

In conclusion JCI assesses the PLF of the Project activity was appropriately estimated in the FSR complying with the relevant guidelines/13/.

6) Annual electricity supply to the grid

Below JCI cross checked the annual generated electricity, the internal consumption and annual electricity supplied to the grid. For relevant data request, CL-11 was raised and closed after confirmation of sufficient data provision by the project participant.

The FSR estimated values of relevant parameters as follows:

- Low calorific value of MSW : 6,080 kJ/kg (analysis result)
- Annual generated electricity (AG) : 132,500 MWh/y
- Internal consumption (IC) : 25,000 MWh/y (18.9%)
- Transmission loss (TL): 0%
- Annual electricity supplied to the grid(SE): 107,500 MWh/y
- Specified installed capacity (SI) of all the electric facilities : 4,000 kW/h
- Actual installed capacity (AI): 3,600 kW/h (90% of the specification)

Annual generated electricity

Total generated thermal energy = $6,080 \times 399,600 = 2,429,568,000$ MJ/y

From the total generated thermal energy (TE), the annual electricity generation (AE) can be calculated as follows:

$AE \text{ (MWh/y)} = TE \text{ (MJ/y)} / 3600 \text{ (MWh/MJ)} \times F \text{ (conversion efficiency)}$

In the case of MSW incineration for power generation, F is assumed to be 20% referring to the data of Japan¹². Japan has many references of power generation from MSW for many years and is considered as a benchmark in this sector. Therefore, $EG \text{ (MWh/y)} = 2,429,568,000 / 3,600 \times 20\% = 135,000$

The FSR assumes 19.6% ($= 132,500 / 135,000 \times 20$) as F value, JCI can assess that the annual generated electricity is estimated appropriately since almost the maximum conversion efficiency is assumed for the calculation.

Internal consumption

The application of 90% to convert the installed capacity from the specification to the actual is considered appropriate as the specified installed capacity is designed with some room over actual operating conditions. AI estimated in the FSR, therefore, is applied in the below calculations.

$\text{Internal Consumption (IC)} = AI \times \text{Running Rate (RR)} \times \text{Annual Operation Hours} (= 7,992 \text{ h/y})$

Though the two incinerators are designed to run continuously, many electrical equipment will run intermittently and electrical loads of them will go up and down below AI. Usually 85% RR is assumed as a high estimate.

Therefore, $IC = 3,600 \times 85\% \times 7,992 = 24,500$ MWh/y

Since the FSR estimates 25,000 MWh/y as the internal consumption, higher than this calculation result by 500 MWh/y, JCI can assess the internal consumption was appropriately estimated rather conservatively. This is also supported with the comparison with actual consumption in the three plants in Wenzhou city, which is shown in below Table 18.

Annual electricity supplied to the grid

As the transmission loss is assumed zero%, the annual electricity supplied to the grid (AS) is appropriately calculated in the PDD deducting the internal consumption (IC) from the annual generated electricity (AG)

$AS = AG - IC = 132,500 - 25,000 = 107,500$ MWh/y

¹² “Survey Report on MSW Treatment Status in Japan in 2009” issued by Ministry of Environment, Japan, which reported the conversion efficiency distribution of 304 MSW incineration for power plants: average 11%, and range 5% to 20%

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In conclusion JCI can assess that the annual electricity supplied to the grid applied in the PDD was appropriately and conservatively estimated in the FSR.

Table 18. Comparison of operation data of the three plants in year 2010 with the FSR estimate

Plant	Annual power generation (MWh/y)	Annual internal consumption rate (%)
Linjiang Yiqi	64,500	20.1
Yongqiang	68,300	18.9
Dongzhuang	25,900	21.9
Project activity	132,500	18.9

7) Interest and debt-equity ratio

Appropriateness of the input values of the above two parameters used in the financial calculations were validated against the requirements in para.11 of the relevant guidelines /8/as below:

In China, the interest applied by the People's Bank of China (the Central Bank of China) has been regarded as the representative interest. According to its interest record/36/, the interest applied to over 5-years loans was 5.94% from 23/12/2008 onward; and 6.14 % from 20/10/2010 onward. Since the FSR/62/ was completed in 12/2009 and its final editing period, therefore, is considered to fall in-between the two dates, the application of 5.94% as the interest for the financial calculations in the PDD based on the FSR is assessed correct and appropriate.

According to the official notice/37/, in the case of capital investments in power industries, the ratio of equity is specified as over 20% yet subjected to approval of the FSR by relevant government authority. JCI confirmed that the PDD and the FSR/62/ assumed a bank loan of 250 Million CNY, which is equivalent to 58% of the total investment. This means the equity ratio of 42%, which clearly complies with the notice/37/.

JCI thus concluded that the above arguments sufficiently demonstrate the appropriateness of the use of the two input values and thus fully clarified the requirements by para.11 of the relevant guidelines/8/.

8) Tax

JCI confirmed that the PDD appropriately applied Chinese taxes in the IRR calculations, in line with the Chinese laws and notices as demonstrated below:

Table 19. Rate of Taxes used in FSR and PDD/IRR Sheet

Tax	Rate (%)	Assessment of tax application in the IRR calculations in the spreadsheet/91/	Relevant evidence
VAT	17	OK, correctly applied as per Chinese notices as follows: <ul style="list-style-type: none"> VAT charged on the equipment purchase for the project construction will be refunded VAT to be charged on raw materials purchase will be refunded every year 	“VAT Regulations Notice” /40/ “Notice on VAT Policy for Resource Comprehensive Utilization and Other Product” /43/
City Maintenance and Construction	7 (% of VAT)	OK, correctly applied to the total amount of VAT charged and calculated in the spreadsheet as per the relevant regulations/41/	“Interim Provisional Regulations of the Peoples Republic of China on City

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Tax			Construction and Maintenance Tax” /41/
Educational Surcharge	3 (% of VAT)	OK, correctly applied to the total amount of VAT charged and calculated in the spreadsheet as per the relevant regulations/42/	“Interim Provisional Regulations of the Peoples Republic of China on Education Tax” /42/
Income tax	25	OK, correctly applied to the amount of “Profit before income tax” and calculated in the spreadsheet	“Enterprise Income Tax Law” /39/

JCI, thus, validated and concluded that the taxes in the PDD were appropriately applied in the financial calculations.

9) Depreciation

JCI checked the spreadsheet provided by the project participant/90/ and confirmed that the depreciation rate is 4.0%, which complies with the relevant Chinese regulations/56/. The regulations stipulate that companies can select the depreciation rate within the range of below 5%. The depreciation period of the IRR calculation in the sheet/90/ is 25 years that is consistent with the specified 25 years of operation of the Project activity in the BOT. It was also confirmed that the salvage value is appropriately assumed to be 0% after the 25-year operation period, in which the ownership of the MSW incineration plant will be transferred to the local government as per the BOT.

JCI can assess the depreciation is appropriately calculated in the spreadsheet complying with the relevant Chinese regulations and the relevant CDM guidelines.

In summary of the above arguments, JCI can conclude with its local expertise that the PDD fully complies with the para113 (c) of VVM. By cross checking, it was confirmed that the input values from the FSR are valid and applicable at the time of the investment decision.

6.3.2. Sensitivity analysis

The sensitivity analysis has been validated with two steps: 1) assessment of $\pm 10\%$ variation results and 2) assessment of the likelihood of variations to reach the benchmark IRR complying with relevant guidance and tool.

- 1) The $\pm 10\%$ variation analysis is conducted using the five parameters, A) Static Investment, B) O&M Cost, C) Electricity Tariff, D) Electricity Output and E) Tipping Fee.

The result of the PDD showed that within the $\pm 10\%$ variation range, the IRRs did not reach the benchmark 8%: at (-) 10% of Static Investment, the IRR reached at 6.34%; at (-) 10% of O&M Cost, it reached at 6.44%; at (+) 10% of Electricity Tariff, it reached at 6.53%; at (+) 10% of Electricity Output, it reached at 6.53% and at (+) 10% of Tipping Fee, it reached at 5.93%. They were all below the benchmark 8%.

- 2) According to the calculation results of the PDD, to reach the benchmark, Static Investment needs to decrease by 22.83%, or O&M Cost to decrease by 24.25%, or Electricity Tariff to increase by 22.56%, or Electricity Output to increase by 22.56% and Tipping Fee to increase by 44.11%.

CAR-2 was raised to request demonstration of variations of key parameters to reach the benchmark IRR and their likelihood assessments with supporting evidence. The variations and their likelihood assessment results were appropriately demonstrated in the PDD, CAR-2 was closed.

Their likelihood is analysed by parameter as below:

A) Static Investment

It is unlikely that Static Investment decreases by 22.83%. As argued above, 85% of cost items of the static investment estimated by the FSR were already contracted at almost the same price in total. This means

even remaining investment is assumed to be zero (this is an unrealistic assumption though), yet the project IRR cannot reach the benchmark.

Therefore JCI can conclude that the decrease of the static investment to reach the benchmark is unlikely.

B) O&M Cost

As demonstrated in the above breakdown table, most of the O&M cost constitutes of inflation sensitive items: raw materials and fuel fees, and labor related costs. As shown below Table 20, the indices of the raw materials and the salary have been increasing except the raw materials in year 2009. It, therefore, is anticipated that more or less the same inflation trend would continue beyond the construction period.

Under such situation, it is unrealistic and therefore, unlikely that O&M Cost decreases by 24.25 as the annual average throughout 25 years of the operation.

Table 20. Growth Rate of Index for 5 Years (year 2006 – year 2010)

Index	Change of Index vs. Last Year (%)					Reference
	2006	2007	2008	2009	2010	
Raw materials, fuel and energy	6.0	4.4	10.5	-7.9	9.6	Statistical Communiqué of the People's Republic of China on the National Economic and Social Development (2006 -2010)
Salary ¹³	14.8	17.8	15.1	8.7	NA	China Statistical Yearbook 2010

C) Electricity Tariff

It is considered unlikely that Electricity Tariff increases by 22.56%, as it is already defined by the BOT agreement to remain the same throughout the contracting period of 25 years. The fixing of the tariff was confirmed with the interview with the representative of Wenzhou City Sanitation Management Bureau of Wenzhou City/101/. There might be a possibility for the tariff to increase to some extent in future, but that will be for compensating cost increases for plant operation due to inflation. Therefore, the project owner can not enjoy profit increase from the tariff increase as most of incremental profit increase would be eroded by the inflation.

D) Electricity Output

JCI considers it is unlikely that Electricity Output increases by 22.56% by the increase of annual operation hours of the Project activity or by the increase of conversion efficiency from thermal energy to power generation or by reduction of electricity loss factors.

The annual operation hours of the Project activity is estimated already at approx. 8,000 in the FSR, equivalent to 333-days full-load (100% load) operation annually. The 22.56% increase, therefore, means 408-days full-load operation annually. This is physically impossible.

The conversion efficiency was estimated in the FSR at 18.9% which is close to 20% considered at present attainable maximum efficiency for power generation from MSW combustion. Even assumed 20% conversion efficiency, it increases by only below 6%, not sufficient to reach the benchmark IRR.

The FSR estimated the internal consumption at 18.9% of the generated electricity and the line loss at 0%. To increase the electricity output by 22.56%, as the estimated line loss is already zero, the internal consumption needs to decrease from the estimated 25,000 MWh/y to 748 MWh/y, or decrease by over 97%. This is considered unrealistic and therefore, unlikely.

E) Tipping Fee

¹³ National overall average of the sector “Production and Distribution of Electricity, Gas and Water” derived from the sheet A-16 “Average Wage of Employed Person in Urban Units by Sector and Region”

As demonstrated above, the tipping fee used in the PDD was validated appropriate and reasonable. Further in the BOT, it is specified that the fee will be applied throughout the contracting period of 25 years.

Under such situation it is considered unlikely that the tipping fee increases by 44.11% as the average over the 25 years.

Even if increased in future, it is only when the local government confirms that the project owner faces financial difficulties in continuing plant operation due to inflation. The increase of the fee, therefore, is just for compensating increases in operation costs and therefore, would not mean the project owner can enjoy incremental profit out of the increase.

JCI assesses that the above arguments clearly demonstrate that it is unlikely that the project IRR may exceed the benchmark within reasonable variations of financial parameters.

In summary JCI concludes that the result of the above investment analysis with use of the benchmark analysis is robust and then the project activity is financially unattractive.

6.4 Barrier analysis

With the above arguments, it is concluded that the proposed CDM project activity is financially unattractive. The barrier analysis, therefore, has been skipped according to “Tool for the demonstration and assessment of additionality /4/.

6.5 Common practice analysis

The PDD analyzed the Project activity on the four steps as per the additionality tool/4/:

In step 1, the PDD appropriately defined the similar scale to be $\pm 50\%$ (600 – 1,800 tons/day) of the Project activity’s capacity of daily MSW treatment. As the project capacity, the daily MSW treatment capacity was selected, which was validated appropriate in screening similar MSW incineration for power projects rather than the capacity of power generation. In case of MSW incineration for power projects, the daily MSW treatment capacity is the deciding factor in designing key project parameters; the power generation can be decided once the daily MSW treatment capacity is designed and relevant data on MSW thermal energy are obtained.

In step 2, Zhejiang province was selected as the similar region appropriately. As discussed in the PDD the investment climate in China differs significantly by province, such as investment policies and financial conditions.

Similar projects were identified appropriately through screening with the following four conditions which were confirmed to comply with the additionality tool:

- 1) With an installed capacity of MSW treatment from 600 to 1,800 t/d
- 2) Located in Zhejiang province
- 3) Started commercial operation before 20/03/2010 on which the proposed project started.
- 4) Neither registered as a CDM project, nor under validation for CDM application

As a result of the screening, as demonstrated in the Table B.7 of the PDD, a total of 13 MSW incineration for power plants were identified. For the screening, information on MSW incineration plants obtained from websites demonstrated in the footnotes 25-39 in the PDD were cross checked. As the outcome of step-2, N_{all} was appropriately defined as 13 in the PDD.

In step 3, 9 out of the 13 plants were appropriately excluded as they have applied a technology different that the technology applied in the proposed Project activity. The 9 plants employ a Circulating Fluidized Bed Combustor (CFB) which needs to combust also coal for co-firing, while the propose Project activity employs two Grate Incinerators which do not require co-firing with an auxiliary fuel, except co-firing for start up of the Incinerator. In the case of the Project activity, the FSR estimated to consume 200 tons of the light diesel oil annually for the start up.

Further 2 out of the remaining 4 plants were appropriately excluded as invested under a different investment climate. The 2 plants were developed by state-owned companies according to the relevant references (foot note 31 and 35) provided by the project participant. They indicate the 2 plants could enjoy favorable financial conditions, such as easy access to finance. The proposed Project, however, is

invested by a private company Zhejiang Weiming Environment Protection Co., Ltd. The company can't enjoy the favorable financial condition.

Lastly the remaining 2 plants (Linjiang Yiqi and Yongqiang) were also appropriately excluded as they were invested under a different investment climate.

The Linjiang Yiqi plant was listed in the "State Plan for High-Tech Research and Development (863 program)" by the Ministry of Science and Technology, which was confirmed with the evidence of the footnote 36 provided by the project participant. This listing indicates that the Linjiang Yiqi plant could have favorable financial conditions that the proposed Project activity cannot have. After checked the BOT Agreement of the Linjiang Yiqi plant/95/, it was also confirmed that part of investment was borne by the local government.

The Yongqiang plant also was listed in the "National Special fund for technical renovation programs of the State" by the NDRC. According to the notice on the relevant law issued by government organizations /52/, the projects listed were entitled to receive subsidiary on the interest payment by Chinese government. Furthermore, through checking with the BOT Agreement with the local government/96/, the Yongqiang plant could have financial assistance by the government that the proposed Project activity cannot have.

As a result of above arguments, all the 13 plants were identified to have different technologies that the technology applied in the proposed project activity and therefore, N_{diff} was appropriately defined as 13 in the PDD.

In step 4, the PDD correctly calculated the factor F to be 0 (zero): $1 - N_{diff}/N_{all} = 1 - 13/13 = 0$, based on the outcomes from the step 1 through the step 3. As the factor F is zero, not greater than 0.2, the PDD appropriately concluded that the proposed project is not common practice and therefore, is additional.

JCI can confirm this conclusion by the PDD, also with the calculation of " $N_{all} - N_{diff}$ ", which is zero as both of them are 13 and therefore, not greater than 3.

In summary JCI can validate that the PDD appropriately and correctly conducted the analysis of common practice as per the additionality tool and concluded that the Project activity is not common practice in the province and therefore, is additional.

During the validation of the common practice section, the following Clarification Requests were raised:

CL-12 and CL-13: clarification of identification criteria

CL-14: clarification of data sources used

CL-16 and CL-17: clarifications of different technologies

CL-30 and CL-31: provision of relevant evidence.

They were all resolved and then closed.

Conclusion of assessment of additionality

JCI validates and concludes that the PDD clearly demonstrates as shown in the above that the Project activity is additional, not financially attractive and therefore, would not occur without CDM revenue provision. Serious consideration of CDM by the project participant prior to the project start is clearly and sufficiently demonstrated. The investment and sensitivity analyses clearly demonstrate the Project activity is not financially viable without CDM revenue. The common practice analysis revealed the Project activity is not common practice in the province.

7. Monitoring plan

The monitoring plan demonstrated in the PDD is validated as follows:

1) Applied methodology and tool

JCI confirmed that the PDD correctly and appropriately applied following methodology and tool to the monitoring plan for the Project activity:

- AM0025 "Avoided emissions from organic waste through alternative waste treatment processes" version 12
- "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" version 05.1.0
- "Tool to calculate the emission factor for an electricity system" version 02.2.1

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- “Tool to determine project emissions from flaring gases containing methane” version 01

2) Monitoring organization

According to the PDD it is planned to establish “Monitoring Management” scheme, in which organizations and persons relevant to monitoring were specified with each responsibility. Appropriate QA/QC procedures are incorporated in the scheme.

An appropriate training program also is planned to be provided to plant staffs before starting plant commissioning.

JCI assessed the planed scheme is feasible and appropriate in meeting CDM requirements.

3) Monitoring parameters

JCI confirmed that the monitoring parameters were appropriately listed in section B.7.1 in the PDD in accordance with the above methodology and the tools applied, which are listed below:

Table 20. Monitoring parameters listed in section B.7.1 of the PDD

Parameter	Description
-	Energy generated by auxiliary fossil fuel added in the incinerator
Other flare operation parameters	Including all data and parameters that are required to monitor whether the flare operates within the range of operating conditions according to the manufacturer's specifications
$A_{MSW,y}$	Amount of MSW fed into the waste incineration plant
$A_{residual}$	The amount of the residual waste from the incinerator
EF	Combustion efficiency for waste
EF_{CH_4}	Aggregate CH_4 emission factor for waste incineration
GWP_{CH_4}	Global Warming Potential (GWP) of methane
EF_{N_2O}	Aggregate N_2O emission factor for waste incineration
GWP_{N_2O}	Global Warming Potential (GWP) of N_2O
$EG_{d,y}$	Amount of electricity generated utilizing combustion heat from incineration in the project activity displacing electricity in the baseline during the year y
$EG_{PJ,FF,y}$	Amount of electricity consumed from the grid as a result of the project activity
f	Fraction of methane captured at the SWDS and flared, combusted or used in another manner
FCF_{MSW}	Fraction of fossil carbon in MSW
$F_{cons,y}$	Fuel consumption on-site during year y of the crediting period
$FC_{residual}$	Fraction of residual carbon in the residual waste of MSW incinerator
$fV_{CH_4, FG,h}$	Volumetric fraction of methane in the biogas in dry basis in the hour h
$FV_{RG,h}$	Volumetric flow rate the biogas in dry basis at normal (NTP) conditions in the hour h
T	Temperature of the biogas
P	Pressure of the biogas
MB_y	Methane produced in the landfill in the absence of the project activity in year y
$P_{n,i,x}$	Weight fraction of the waste type i in the sample n collected during the year y
$Q_{biomass,y}$	Amount of waste incinerated in year y
$RATE_{Compliance,y}$	Rate of compliance
T_{flare}	Temperature in the exhaust gas of the enclosed flare
z	Number of samples collected during the year x
W_x	Total amount of organic waste prevented from disposal in year x

4) Implementation plan of monitoring

The implementation plan was assessed as below:

(1) MSW amount combusted in the incinerators

According to the PDD, the MSW amount will be weighed by a weighing bridge system. During the site visit, JCI confirmed that the weighing bridge system was under construction as per the PDD and a

wireless card-recognition system for truck identification was under installation. With this combination, MSW carried into the plant would be recorded automatically.

JCI assessed the amount would be weighed and monitored as planned in the PDD.

(2) Electricity amount

The amount supplied to and from the grid would be monitored by the bi-directional meters installed at the project site and their monitoring results are to be used for CER calculations, as shown in Fig. B.3. The sales invoices and purchase receipts to be issued by the grid company will be used for cross checking of the meter readings.

JCI assessed that the monitoring of the electricity amount is appropriately planned in the PDD.

(3) Flaring of methane

The PDD indicates the monitoring instrument configuration in Figure B.4 for the monitoring of flaring of methane from the wastewater treatment plant. JCI confirmed the configuration complies with the relevant tool/12/.

JCI assessed that the monitoring of the flaring of methane is appropriately planned in the PDD.

CL-27 was raised to request demonstration of the wired-diagram of the monitoring system and countermeasures against electricity meter malfunction. They were appropriately demonstrated in the PDD, CL-27 was closed.

5) Calibration plan of monitoring equipment

JCI confirmed that the calibration of all the relevant monitoring equipment is arranged to be implemented in accordance with the methodology, the tools, China regulations and the manufacturer's specification.

Regarding the demonstration of calibration frequency of electricity meters, CL-28 was raised to request its clarification. The frequency was appropriately demonstrated, CL-28 was closed.

6) Implementation of the monitoring plan

JCI could confirm with the desk review of relevant documents and through the interviews with the project owner that the monitoring arrangements described in the monitoring plan are feasible within the project design and the means of implementation of the monitoring plan, including the data management and quality assurance and quality control procedures, are sufficient to ensure that the emission reductions can be achieved by the proposed CDM project activity as estimated ex-ante. JCI also confirmed that the project participants already have been running three similar MSW incineration for power plants in Wenzhou city as shown in the Table 15.

In summary JCI can conclude the monitoring plan complies with VVM ver. 1.2 Para 124.

8. Sustainable development

JCI has confirmed that the LoA/60/ issued by the DNA of the host Party PRC confirmed the contribution of the proposed CDM project activity to the sustainable development of the host Party, which has been already described in Section IV 1.

9. Local stakeholder consultation

The invitation was taken place in June 2010, distributing 63 sheets of the questionnaire to local representatives with a variety of age, gender, academic carrier, and occupation/72/-/75/. All sheets were returned with comments, and appropriately summarized in the PDD.

In summary, all of respondents supported the project activity considering its economical benefits to local economy. They believed the project activity would give no significant adverse impacts on local environment, since the project site is located in a desert area apart from residential areas.

As one of the on-site assessment processes, JCI interviewed with five (5) residents/107/ living near the project site, and confirmed the local stakeholder consultation process had been implemented by the project owner appropriately as described in the PDD, and found that they were all supportive to the Project activity.

Based on the above, JCI validates and concludes that the Project activity, supported by local stakeholders, would give no significant adverse impacts on local environment, and instead contribute to the development of local economy and also to the improvement of infrastructure.

10. Environmental impacts

Environmental Impact Assessment (EIA) was conducted by ZPES R&D to ensure that the project complies with relevant national, regional and local regulations, and its report was issued in 08/2009/64/ and then approved by the Environmental Protection Bureau of Zhejiang Province on 30/09/2010/65/.

CL-29 was raised to request demonstration of the EIA report author in the PDD. As the author was demonstrated in the PDD appropriately, CL-29 was closed.

The EIA report addressed anticipated environmental impacts by the Project activity both during the construction period and after the operation start, and suggested mitigation measures against anticipated pollution of water and air, noise, and solid waste. No significant ecological impact on the local area was addressed.

Through the observation during the on-site assessment, JCI confirmed that appropriate mitigation measures had been taken as described in the PDD and no serious issues were observed. JCI validates and concludes that given the project participant would take necessary mitigation measures after the operation start as well as during the construction period, anticipated environmental impacts by the project activity would be controlled at a minimum level.

11. Result of stakeholder consultation process

The PDD /1/ was made publicly available on the UNFCCC website and Parties, Stakeholders and NGOs were invited to provide comments during a 30 days period from 29/06/2011 to 28/07/2011.

As a result of the consultation, JCI received public comments from two senders: one sender was a personnel and the other a NGO both in China.

JCI has concluded that the comments from the personnel is not authentic as JCI received no response from the personnel to the inquiry by JCI about the name and the contact details of the individual, which was submitted in line with the Annex48 of EB50 "Procedures for Processing and Reporting on Validation of CDM Project Activities". JCI, therefore, has taken no further actions on the comments received from the personnel.

As received an appropriate response from the NGO to our inquiry, JCI has requested the project participant to provide response to the comments received from them.

The NGO's comments, the project participant's response and JCI's response are shown below:

Linjiang Erqi MSW Incineration for Power Project

Comment written by Tian Qian and Li Jiamin

Contact Email: tianqian85@gmail.com

Wuhu Ecology Center

Submitted 28th July 2011

Whether waste incineration is a clean, environment friendly, resource saving approach is still disputable all over the world. Although waste incineration causes serious pollution, such as emission of dioxins, furans and heavy metals, seriously affect communities and environment, through the CDM a number of waste incineration projects have been approved. For us it is incomprehensible.

Regarding the application of the “Linjiang Erqi Waste Incineration Project”, we argue that the discussion of baseline and additionality in the PDD is neither sufficient nor convincing. Furthermore, we think the statements that the incineration project improves the local environment, increases job opportunity, reduces coal-burning and is supported by local stakeholders needs to be seriously questioned. Also, we doubt that whether the plant can implement the measures as set out in EIA, because of the environmental behavior of the 1st phase of the Linjiang Incineration Project which is demonstrated in the EIA report.

(Linjiang Erqi MSW incineration is 2nd phase of the complete Linjiang Incineration Project)

Supported by the arguments below, the Wuhu Ecology Center and eight other Chinese environmental NGOs strongly recommend the rejection of this project under the CDM.

1. Insufficiency of alternate scenarios discussion

Under the CDM the developer is required to compare the proposed project with alternative scenarios: yet none of the described alternatives propose other means for handling the organic waste (methane-generating) (p.12), which is improper in current situation that MSW in China consists to more than 50% of organic waste (World Bank, 2005) and it would need more auxiliary fuel because of organic waste (see point #5 below). Animal feed, composting and anaerobic digestion are three proven, low-technology and low-capitalization means for handling organic waste and avoiding methane emissions. These should be considered alongside the development of recycling management systems. Especially in recent two years, central and local government has paid much more attention to organic waste disposal and waste recycling. Cities like Beijing, Guangzhou, Hangzhou begin to launch waste classification in communities: In the State Council routine conference held by State Council Premier Wen Jiabao on 23th March 2011, it is announced that waste classification would be launched and 50% cities with districts should achieve separated transportation and disposal of organic waste by 2015^[1]. In this sense, waste classification and organic waste handling must be included in alternate scenarios.

These two rational alternate scenarios have not been considered in the PDD, so the demonstration of baseline and additionality in this PDD is disconfirmed.

2. Insufficient demonstration of additionality

Back to 21st January 2009, BOT Privilege Agreement of Linjiang Erqi Municipal Solid Waste Incineration Power Plant was officially signed^[2]. On 14th September 2009, the Department of Environment Protection in Zhejiang posted the public announcement of the Environment Impact Assessment^[3]. On 8th September 2010, the power plant was reported to be completed in January 2011^[4]. All the information reveals that this project has started before the approval date of CDM, indicating insufficient additionality. Meanwhile, the developer has not provided any document to demonstrate that the income of this CDM project has been examined with strict measures.

3. Questioning the statement of ‘Improvement local environment’

3.1 Burning waste emits dioxins, which is a highly toxic substance and has become a serious phenomenon in China. In China, waste is not sorted before incineration, resulted in an increasing emission of dioxins from burning plastic wastes. Moreover, the kitchen wastes are more than half of all types of waste in China. According to the investigation results from the Environment Science and Engineering Department of Pecking University in 2008, the moisture content of waste in Beijing is 50.19 per cent. The excessive amount of moisture lowers the caloric value of the waste and induces incomplete combustion, resulted in an increasing probability of dioxins emission. If detrimental waste is not excluded, flue gas and dust would pollute the environment during the incineration process. In addition, China has not established effective monitoring systems to address the dioxins emissions from waste-incineration. All the above is current situation of waste incineration power plants in China, which have already created substantial negative impacts on communities and environment. However, such important background information has not been provided in the PDD.

3.2 The PDD says in p.54: “The main air pollutants in the operating process comprise acid gases (SO₂, HCl, and HF), heavy metals, dioxins and NO_x from the flue gas generated during the incineration process, and dust and odor from MSW tanks”, but the other pollutants such as furans, PCBs (all of which are regulated under the Stockholm Convention), brominated and brominated-chlorinated aromatic hydrocarbons in the process of incinerating are not included in the PDD. In this sense, the PDD shows a total lack of scientific rigour when it states, “The Project has no significant environmental impacts during the construction phase and the operation phase” (p.55). The World Bank estimates that China’s push to increase waste incineration will double the global production of dioxins alone. These pollutants will have significant health impacts on the Chinese population as well as globally, because of the long-distance transport of some chemicals.

3.3 Burning waste also causes vast amounts of fly ash containing hyper toxic substances, which are particularly susceptible to dissolution in water, resulting in pollution of surface and ground water. It causes substantial influence on both environment and human health. On p.54 of the PDD it is said 'The fly ash as hazardous solid waste will be treated by a professional entity', but it does not specify how and where and by whom the fly ash will be professionally treated. In China, fly ash treatment is difficult to establish and monitor. In November 2010, the Macaw Solid Waste Incineration Power Plant, which has been considered as the prototype project of waste incineration power plant in China, was reported its fly ash scandal. Scandals like this are more likely to happen in the Mainland. On p.54 of the PDD shows 'The slag will be reused as raw materials for brick making', which also needs to be questioned or further explained in detail. Because during the incineration process, heavy metal is everlasting toxin, dioxins and furan are persistent pollutant. If the slag is used e.g. for road construction, when the road surface would be damaged or removed, it will lead to the release of hazardous dust particles.

To sum up, on p.2 of the PDD document, the statement "Improvement local environment-The project prevents waste from being left to decay...a potent greenhouse gas and potential fire hazard" does not sufficiently reveal the objective facts, and severely compromises the objective of the CDM to promote sustainable development.

4. Questioning the statement of 'Job creation'

Tens or hundreds of thousands of individuals make a living by recovering recyclable materials from municipal waste. Although their working conditions are often insalubrious, it is the best or only way of employment available to them. If the incinerator burns recyclable materials, they will lose even this livelihood. The PDD misleads the readers when it says that it achieves "Job creation – A large number of local staff will be employed during the construction stage and also to operate and maintain the project" (p.2), as there is no mention about the number of people who will be deprived of their livelihoods. Ultimately, this negative impact on employment is in no way consistent with the CDM's goal of sustainable development.

5. Questioning the statement of 'Fossil fuel consumption reduction'

5.1 On p.10 of the PDD it is stated "Approximately 200 tons light diesel will be used annually as auxiliary fuel for the start-up of the incinerator", in fact much more fossil fuel may be used. Because the main content of waste in China is organic kitchen waste (Word Bank, 2005), according to a research done by the College of Environmental Science and Engineering, Peking University, 69.32% of the municipal waste in Beijing is kitchen waste, which caused 50.19% of water content. This has to some extent reflected the reality of the composition of waste in China. The calorific value of the municipal waste in China is low and the incinerators need to constantly feed in fossil fuel to sustain operation combustion temperature. The developer should be required to include scientific and reliable data about the composition of MSW in Wenzhou city and provide a rigorous account of how much auxiliary fuel will be

needed depending on the calorific value of MSW. The actual amount of fossil fuel needed based on the real quality of the municipal waste in Wenzhou city shall be clearly explained.

5.2 With the incentive of national subsidy on electricity, the waste incineration power plant will likely mix huge amounts of fossil fuel with the waste to maximize the profit. In the national regulation on waste incineration power generation project, it is clearly stated that coal as auxiliary fuel shall not exceed 20%. However, this PDD only mentioned “The fraction of energy generated by fossil fuel is far below 50% of the total energy generated in the incinerator” (p.10), in addition that there is no third party monitoring to guarantee the proportion of fossil fuel would fulfill the national requirement and the commitment in PDD, in order to avoid the waste incineration to become a fossil power plant.

5.3 The current waste incineration is mixed-combustion. Recyclable resources such as paper and plastic will also be used as fuel. This not only results in waste of non-renewable resources, but will also increase GHG emission and energy consumption through the production of the materials which are supposed to be recycled. This part of emissions is not considered in the PDD. It is disputable to argue that such waste incineration power plants reduce overall GHG emission when the whole life cycle is considered. Wasting resources and indirectly increasing GHG emission violates the principle of sustainable development of the CDM.

To conclude, the statement “Fossil fuel consumption reduction- By utilizing waste as the primary fuel for energy generation... need to rely on imported fossil fuels” (p.2) is not sufficient.

6. Questioning the statement of ‘Stakeholders’ comments’

On P.57 of PDD file is information about the stakeholder consultation and their attitudes to this project. We have different opinions on several points. First, the PDD document does not include the methodology they use for stakeholder consultation. Second, approximately 16000 villagers from 16 villages would be influenced because of the project^[5], but only 63 of them were investigated.

The sample size is much too small to be representative and there is no further description of the sample sites. Third, the consultation result shows the support rate is 92% without any objections, of which the reliability is really worthy to be questioned.

In China there are still many problems in environment impact assessment for waste incinerator projects, especially concerning the public engagement part. In 2010, an incineration plant in Qinhuangdao forged public opinion, while the residents around the plant require legal compliance.^[6] In June, 2011, the information on stakeholders consultation of an environment impact assessment report of the Beijing Sujiatuo waste incineration plant proved to be false. Although the project has been questioned by environment NGOs, it was still approved by Beijing Environment Protection Bureau^[7]. Thus, in this context, we request more detailed submission of the investigation methods, the original document of participants’ information to prove the support from the stakeholders of this project.

7. Questioning the implement of the measures in EIA of this project

Linjiang Erqi MSW incineration is the 2nd phase of the whole Linjiang Incineration Project. According to demonstration of environmental performance of the 1st Phase in the EIA report of Linjiang Erqi MSW incinerator (abridged version)^[5] the following points have been made: Gas emission has reached the Standard of Incineration (GB18485-2001); Dioxins emission cannot reach EU standard; odor exceeds national standards; noise pollution higher than normal at night; fly ash stored in the plant after solidification and both of store site and solidification site are shabby, lacking of leachate and dust control measures, which cannot meet the requirements of environmental protection standards. The current capacity of leachate treatment is 30t/d, which does not meet the requirements of the plant. In this sense, there already exist many unresolved problems with the environmental performance behavior of the plant, especially the treatment of fly ash. Therefore we question the statement on noise, gas emission and solid waste treatment in this PDD (p.54) and the statement that “All the measures set out in the EIA will be implemented.”(p.57). With the multitude of problems of 1st phase of the Linjiang Erqi plant, it is very questionable whether the 2nd phase project will be without faults.

Given the problems outline above, it is unacceptable for this PDD to maintain statements such as “Improvement on local environment” (p.2) or “The project has no significant environmental impacts during the construction phase and the operation phase.” (p.55) And it is highly questionable that “The survey shows that the Project receives strong support from the local community, which is closely linked to the fact that the majority of local residents have some understandings of the Project.” and “All the measures set out in the EIA will be implemented”(p.57).

Therefore it is the opinion and request of Wuhu Ecology Center that this project’s application for validation should be rejected, a request which is also supported by eight other Chinese environmental NGOs (see below).

Related information:

[1] <http://stock.stockstar.com/JI2011032600001663.shtml> (in Chinese)

[2] <http://www.wzszyl.cn/cn/view.asp?ArticleID=5831> (in Chinese)

[3] http://www.zjepb.gov.cn/hbtmlhwtz/bsdt/xzxkspgs/200911/t20091101_8958.htm (in Chinese)

[4] <http://www.wzszyl.cn/cn/view.asp?ArticleID=6986> (in Chinese)

[5] http://www.zjepb.gov.cn/hbtmlhwtz/bsdt/xzxkspgs/200911/t20091101_8958.htm (in Chinese)

[6] http://news.ifeng.com/fhzk/detail_2011_03/01/4905732_0.shtml (in Chinese)

[7] <http://green.sina.com.cn/news/roll/2011-06-16/101822651473.shtml> (in Chinese)

The following Chinese environmental NGOs support this comment:

安徽绿满江淮环境咨询中心
Green-An Hui Environmental Development Center



创绿中心
Greenovation Hub

道和环境与发展研究所
Insitute of Environment and Development



达尔问自然求知社
Green Beagle



福建省绿家园环境友好中心
Fujian Green Home Environment-Friendly Center



绿色潇湘
Green Hunan



厦门市绿十字环保志愿者中心
Xiamen Greencross Association



自然之友
Friends of Nature



芜湖生态中心
Wuhu Ecology Center



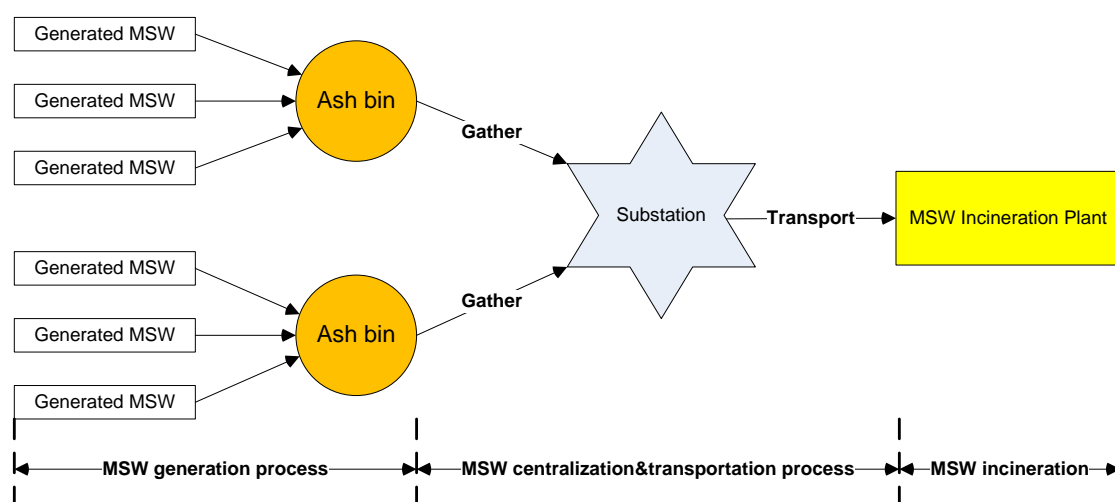
Response to the comment from Wuhu Ecology Center for Linjiang Erqi MSW Incineration for Power Project

Firstly, we appreciate the concerns and suggestions for the project received from public comments during the GSC stage. While, through carefully reading and researching, it seems that there were some preconceived and misunderstanding view point regarding to the MSW incineration technology and its impact, which needed to be clarified. Thus we prepare the following clarification regarding to the comments as follows:

1. Waste classification and alternate scenarios discussion

1.1 Waste classification

The processes of the MSW incineration project are as follows:



There has been set up 8 pilot sites which are Beijing, Shanghai, Nanjing, Shenzhen, Hangzhou, Xiamen, and Guilin to promote the MSW classification policy since Apr. 2004¹. The MSW classification activity started to extend since 2009 and still in the early stage currently. It should be noted that all the countries which have established mature classification system spent long time to implement this policy due to lack of compulsory system and supporting facilities. The essence is to separate the recyclable waste such as paper, plastics, metals, rubber, glass and poisonous waste such as disused battery from other waste for rational use or harmless treatment. Thus usually the MSW classification were/are conducted in the MSW generation and centralization & transportation process denoted in the above figure. The MSW

¹ <http://info.ep.hc360.com/2008/08/27102754866.shtml>

<http://www.cn-hw.net/html/31/200711/5033.html>

Beijing: <http://www.bast.net.cn/xsxh/xhqk/bjcx/288448.shtml>

http://news.xinhuanet.com/politics/2009-01/16/content_10666217.htm

Guangzhou: <http://news.sina.com.cn/c/2009-12-11/141919240561.shtml>

Hangzhou: <http://city-hzrb.hangzhou.com.cn/system/2010/01/25/010379047.shtml>

incineration process is the final step of the waste treatment cycle, which will not affect the collection and transportation stage, thus is not directly conflict with the MSW classification. On the contrary, to classify MSW helps to control the percentage of waste which is potential to generate harmful flue gas during incineration procedure thus control the air pollution in the MSW incineration plants.

1.2 Other alternate scenarios

Through on-site visit and interview with relevant government officers, it could be found that currently the most popular MSW treatment option in China is still disposing in landfill sites. It is true that there are some other alternate options such as incineration, composting² and anaerobic digestion as presented in the methodology as other CDM project activity. The latter two options are mainly depends on the kitchen waste such as food, animal and other organic waste which highly relies on the MSW classification. As stated above, the MSW classification is still at an elementary stage in China only in well developed big cities. But in the middle/small scale cities, considering the huge daily MSW generation amount and the limited market demand of the composting products, the incineration options is more realistic for MSW treatment at the current stage.

Thus, the alternative scenario demonstration and analysis in the PDD reflected the actual situation of MSW treatment in the project area and its conclusion is reasonable for the baseline selection.

2. Timeline and CDM prior consideration

2.1 Timeline

According to the 'Glossary of CDM terms' (Version 05)³, the **starting date** of a CDM project activity is the **earliest date** at which either the implementation or construction or real action of a project activity begins. The start date shall be considered to be the date on which the project participant has committed to **expenditures related to the implementation or related to the construction of the project activity** ... **Minor pre-project expenses**, e.g. the contracting of services /payment of fees for feasibility studies or preliminary surveys, should not be considered in the determination of the start date as they do not necessarily indicate the commencement of implementation of the project...In the context of the above definition, **pre-project planning is not considered "real action"**.

The three projects are all BOT (*Build-Operate-Transfer*) projects, regarding to the signed BOT Agreement, as clarified by the national regulation "*Regulation on the BOT investment in the utilities sector*"⁴ stipulated by the Ministry of Construction of China in May 2004, the pre-signed BOT Agreement should be one of the indispensable documents as requested by the Commission of Development and Reform of China and Ministry of Environment Protection of China which are respectively responsible for the approval of FSR and EIA. The BOT Agreement, FSR Approval and EIA Approval are just necessary steps in the project preparation procedure. So the BOT Agreement, EIA approval and FSR approval was not

² <http://www.cn-hw.net/html/32/200708/3636.html>

³ http://cdm.unfccc.int/Reference/Guidclarif/glos_CDM.pdf

⁴ http://www.mohurd.gov.cn/zcfg/jsbgz/200611/t20061101_159064.htm

considered a “real action” and is not the starting date of the projects (Refer to the P.16 of the final validation report on the Hanyang Municipal Solid Waste Incineration for Energy Generation Project in Haining City (Ref:3480) for the description on the BOT Agreement). Comparing with other contracts such as installation contract, plant construction, bank loan contract and so on, the earliest real action for Linjiang Erqi MSW Incineration for Power Project is signed the Equipment Purchasing Contract which is 20 Mar. 2010.

2.2 CDM consideration

The project is a “*new project activity*” due to the a starting date was after 02 August 2008 according to the definition on the ‘*Guidelines on the demonstration and assessment of prior consideration of the CDM*’ (Version 04)⁵, it also mentions that “*the project participate should inform a Host Party DNA and the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status and such notification must be made within six months of the project activity start date.*”

Seriously considered the CDM assistance to the unattractive financial index, the project participate submitted the CDM prior consideration form to the UNFCCC secretariat in 20 Jun. 2010. Obviously, the project developer has submitted the CDM prior consideration form within six months of the starting date which fully satisfies the requirements defined in the guideline mentioned above.

3. Environmental influence

3.1 Air pollution

According to the present national standard ‘*Standard for pollution control on the municipal solid waste incineration*’ (GB18485-2001)⁶, the incineration plant’s air pollutions include dust, optical density, CO, NO_x, SO₂, HCl, heavy metal (Hg, Cd and Pb), and dioxins category. As per the definition of the dioxins category, dioxins category is the general name for Polychlorinated dibenzo-p-dioxins (PCDDs) which include 75 similar substances and Polychlorinated dibenzofurans (PCDFs) which include 135 similar substances⁷. Furans mentioned in the comment is one member of the PCDFs. The following mentioned dioxins refer to dioxins category.

As mentioned in the comment ‘In China, waste is **not sorted before incineration**, resulted in an **increasing emission of dioxins** from burning plastic wastes. Moreover, the **kitchen wastes...half of all types of waste** in China. According to....the **moisture content...**is 50.19 per cent. **The excessive amount of moisture lowers the caloric value of the waste and induces incomplete combustion, resulted in an increasing probability of dioxins emission.**’ It’s true that the waste is not sorted before incineration at present or may be continued for a long time and the moisture content is high, but it is not suitable to conclude that it will lead to a large amount of dioxins’ emission. According to the research⁸ of relevant experts, the dioxins’ emission is influenced by incineration temperature mostly, when the

⁵ http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid04.pdf

⁶ <http://www.shenyang.gov.cn/html/1825/2006100610550853.html>

⁷ <http://www.cn-hw.net/html/sort071/200710/4599.html>

⁸ <http://www.chinaqking.com/%D4%AD%B4%B4%D7%F7%C6%B7/2008/23924.html>

incineration temperature is lower than 800°C, trace amount dioxins started to be generated. Based on the experts' research, the incineration temperature must maintains over 850°C to avoid the dioxins' emission in line with the national standard GB18485-2001, and the temperature will be on-line continuously monitored. Moreover, in the following flue gas treatment process, a large amount of active carbon will be introduced to absorb the trace amount generated dioxins, finally the dioxins emission will be lower than the national standard or even lower than the EU standard. Through on-site visit and interview with relevant government officers, the dioxins' emission will be regularly monitored⁹ and spot checked in accordance with the national standard.

It is mentioned in the comment that 'but the other pollutants such as furans, **PCBs** (all of which are regulated under the Stockholm Convention), **brominated** and **brominated-chlorinated aromatic hydrocarbons** in the process of incinerating are not included in the PDD.' As mentioned in the former paragraph, furans are member of dioxins category and will be monitored. PCBs is the class of 209 similar substances of which only 12 substances' character with higher toxic level which is similar with dioxins named as dioxins-like polychlorinated biphenyls (dl-PCBs). Research found that PCBs are mainly produced in cement, steel manufactory, the PCBs produced from MSW incineration only account for 0.028%¹⁰, and the level of toxicity is much lower than PCDDs and PCDFs. Furthermore, It found that the PCBs' generation mechanism¹¹ is similar as the dioxins (Carbon and chlorine element resource reacts by catalyzes such as copper and other metallic compounds which adsorbed in the fly ash when temperature lower than 800°C), the preferred PCBs' treatment fashion is incineration in high temperature¹².

Due to the PCBs' trace emission amount and lower toxic than toxins, thus the PCBs' emission limit is not included at the present national standard GB18485-2001. It is a good opportunity for stakeholders submitting revision suggestions of national standard to authorized department (such as national environmental protection bureau). The project owner is willing to follow any stricter standard, which is officially published, implementing the project.

3.2 Fly ash and slug

According to the national standard '*Standard for pollution control on the municipal solid waste incineration*' (GB18485-2001), the fly ash contains heavy metal, dioxins and other toxic substance which should be special treated. In the three projects, fly ash will be mixed with chelating agent and solidified by cement. The solidified fly ash will be tested by qualified monitoring institute through dipping water measurement; according to the national standard '*Standard for pollution control on the storage and disposal site for general industrial solid wastes*' (GB18599-2001), if the constituents' concentration in the dipping water are lower than the highest discharge amount stated in the national standard '*Integrated wastewater discharge standard*' (GB8978-1996), then the solidified fly ash can be disposed in normal

⁹ <http://news.sina.com.cn/green/2011-07-06/150722767285.shtml>

¹⁰ Xiang Shuwei, Huang Jun, Yu Gang. Discussion on main emission source of unintentionally produced HCB and PCBs. Environmental Pollution & Control. P.82~85, 32(7), 2010.

¹¹ <http://www.cn-hw.net/html/27/201007/16439.html>

¹² <http://baike.baidu.com/view/480147.htm>

landfill sites, if the constituents' concentration in the dipping water are higher than the highest discharge amount, the solidified fly ash must be treated in dangerous treatment plant. According to the test report on the fly ash from other operational incineration plants, all the constituents' concentration satisfy the national standard GB8978-1996 and the solidified fly ash can be disposed in normal landfill sites.

The slug is the residual waste of MSW after incineration treated, according to the national standard GB18485-2001, due to there is no toxic substance contained, slug is normal industrial waste which can be treated in normal landfill sites or comprehensive utilization.

4. Job creation

Due to there is potential fire hazard in the landfill site which didn't install LFG recovery system, the landfill sites are always controlled by governments and it should be pointed out that great majority of rag-pickers who lives depend on waste recycle are mainly working during the waste generation and centralization& transportation stage. As stated above, these two processes are controlled by the local government and it is not relevant with the project activity. The comment only paid attention on the small group of people working at the landfill sites while neglected the much larger group of rag-picker working at the waste collection and transportation stage, these people could continue living on collecting recyclable waste freely and will not be influenced by the project activity.

In addition, all the cities implementing MSW incineration plants will preserve several landfill sites, since the incineration plants are limited by their design capacity and cannot meet the increasing MSW amount, so there is always some landfill sites preserved after the incineration plants come into operation. The rag-pickers still can work on it and it will not affect them too much. Considering the new job created by the incineration plants (both during construction period and operation period), it could be concluded that the project would bring positive impact on the job creation.

5. Fossil fuel consumption

The comment only pointed out that due to the low calorific value of MSW, auxiliary fuel might be needed for the incineration process, while it neglected the essential distinction between the different types of incinerator regarding to the necessity of co-firing fossil fuel. The conclusion that all the waste incineration plants would treat MSW by co-firing with "huge amount of fossil fuel to make profit" is not substantial and convincible.

There are mainly two types of incinerator: grate and circulation fluidized bed (CFB)¹³. The latter type needs to co-fire with fossil fuel (coal usually) during the incineration process to start-up, dry MSW and maintain the combustion temperature. The fossil fuel should be mixed with MSW with a certain ratio before poured to the incinerator.

While the former incinerators utilize fossil fuel (diesel usually) only to start-up, use the burning MSW to dry other MSW and maintain the combustion temperature without co-firing with fossil fuel during the incineration process. Otherwise, there is no facility to mix the MSW with fossil fuel in the plants implementing this kind of incinerator. Only when the combustion temperature is lower than 850℃, fossil fuel (diesel usually) is sprayed to prevent from producing toxic

¹³ Zhaoqing. Analysis and selection of the incineration type for MSW incineration treatment. Guide of Sci-tech Magazine, Vol.15, 2011

dioxin emission. Furthermore, considering the expensive diesel price¹⁴, considering the net calorific value of diesel is around 42.652GJ/t, assuming the conversion efficiency of the heat to electricity is 100%, the cost to generate electricity using diesel is 0.633 CNY/kWh, taken into account other operation cost, definitely it is higher than the electricity tariff and no profit would be achieved. The actual operation data of the other plants operated by the same PO has been provided which also confirmed the amount of the diesel is quite low.

Thus, it is misunderstanding that all MSW incineration technology would consume a large amount of fossil fuel and should be seriously clarified.

Furthermore, as stated above, the MSW incineration, as the final step of the waste treatment process, is not relevant with the early stages such as collection and transportation, where the classification and recycling happens. It will not affect the above process and generate extra emission related with the production of recyclable materials.

6. Stakeholder comments

According to the '*Interim measures of the public participation during the environmental impact assessment*'¹⁵, published by National Environment Bureau in 14th Feb. 2006, publics' comments have been collected through newspaper, websites, posters, questionnaires and other channels during the EIA designing period by the EIA design institute before the implementation of the projects.

The MSW incineration plants locates at rural area or suburbs, there are some villages around the plants' location which was defined as the Environmental Sensitive Areas (ESAs) of the project. The people from every ESA (Stakeholders) have been informed and invited to make comments on the project through questionnaires and meeting. The process as follows:

Firstly, the stakeholders were impersonally introduced the project's information such as technology, advantages, potential pollution on the air, water and environment of MSW incineration, flue gas and waste water treatment system. Secondly, the comments from stakeholders were gathered, questionnaires from each ESA were included which show that the result is fair and rational. The stakeholders' comments and concerns were seriously concerned in the waste treatment system improvement and operation period.

After considering the CDM revenues assistance to the unattractive financial index, the project participates decided to apply for CDM. In order to get the stakeholders' comment on the proposed CDM project, some representatives from ESAs were invited to attend the CDM stakeholders' meeting. Due to the people know well of the whole project, almost everyone gave positive comment during the CDM stakeholders' comment.

7. Implement of the measures in EIA of this project

According to the environmental problems occurred in the Linjiang Yiqi Phase, the following measures have been introduced:

- Efficient flue gas purification system was installed in order to make the gas pollutions (heavy metal, acid gas, dioxins) reach the relevant national standard. Plenty of active

¹⁴ <http://www.zjpi.gov.cn/Resource/ContentShow/ItemHtml/2010-12/1487777542/753385618.html>

The diesel price is around 7,500 CNY/ton

¹⁵ <http://news.sina.com.cn/c/2006-02-23/11208282984s.shtml>

carbon to added to absorb the coproduced dioxins in order to reach the EU standard;

- The MSW was all treated in negative pressure enclosed environment, and efficient deodorization facility will be installed at the top of the bunker to prevent the odor;
- All the equipments such as generators, fans and pumps were installed with silencer in order to ensure the normal value;
- The 1st Phase project has amended the present fly ash treated workshop and the project has introduced a new fly ash treatment workshop in line with relevant environmental standard, the fly ash will be solidified with cement and chelating agent.
- An advanced waste water treatment plant was introduced to treat Erqi phase incineration plant's leachate and waste water. The discharge index of the plant can satisfy the national standard.

JCI's response:

1. Insufficiency of alternative scenarios discussion

It is not possible to define the recycling as an alternative scenario to the project activity, since at present the applied methodology AM0025 (version 12) does not include it as a potential alternative scenario.

As demonstrated in the project participant response, the recycling of MSW can co-exist with the incineration of MSW. As demonstrated in many countries the recycling has been contributing to reduction in the amount of MSW to be treated by land filling or incineration.

2. Insufficient demonstration of additionality

As argued in the above validation section, JCI has validated in line with the relevant guidelines that the project owner sufficiently demonstrated their prior consideration of CDM application to the proposed project, as part of demonstration of additionality of the proposed project.

3. Questioning the statement of "Improvement of local environment"

JCI has confirmed that mitigation measurements against anticipated pollution of environment associated with the implementation of the Project activity are addressed by both the EIA report and the FSR. And they were approved by relevant local authorities. Monitoring of potential environmental impacts by the proposed project activity has been planned by local authorities during the construction period and also after the commissioning confirmed through the interviews during the site visit.

It is of JCI's opinion that that if the mitigation measurements are implemented by the project owner as planned, and the environmental monitoring by local authorities is implemented to ensure its appropriate implementation, then local environment would be improved as addressed in the PDD.

4. Questioning the statement of "Job creation"

JCI has confirmed that according to the FSR a total of 115 persons will be employed for plant operation. Though there is no clear statistics available on how many persons currently working at landfill sites would be affected by the project implementation, it can be assessed that the creation of 115 new job positions with the project implementation is preferable than maintaining current recycling-related job positions at landfill sites from overall viewpoints, such as worker's health and pollution caused by land filling.

5. Questioning the statement of "Fossil fuel consumption reduction"

JCI has confirmed that the grate-type incinerator is designed to use fossil fuel only for start up; during normal operation, the fuel is not required for co-firing. Therefore the proposed project activity is not the case addressed in the comments.

6. Questioning the statement of "Stakeholders' comments"

JCI assesses that the stakeholder consultation was implemented appropriately. According to the EIA report, the project owner invited for the consultation a total of 21 groups (companies, village governments, village assemblies) located around the project site, in addition to a total of 100 households from 16 villages scattering around the project site. And the EIA report was approved by the province EPB.

The sender raised an issue about the sample size of stakeholders to invite; however this is a general issue regarding to relevant Chinese laws or regulations on the stakeholder consultation. JCI, therefore, considers the issue is out of the scope of validation of the project activity from a CDM perspective.

7. Questioning the implementation of the measures in EIA of this report

JCI considers that the issues with the Linjiang Yiqi plant raised in the comments are not relevant to the validation of the Lijiang Erqi plant. As a DOE, JCI has been requested to validate the Lijiang Erqi project.

As a summary of the above arguments, JCI concludes that the project owner does not need to change the content of the PDD/2/ and JCI does not need to change the validation report accordingly.



APPENDIX A: CDM VALIDATION PROTOCOL

(Version 06)

Lijiang Erqi MSW Incineration for Power Project

1. INTRODUCTION

This document is prepared as the Validation Protocol on Lijiang Erqi MSW Incineration for Power Project.

The validation protocol is prepared for the following purposes:

- To ensure that, in accordance with the Validation Verification Manual version 01.2 (Annex 1, CDM-EB55, "VVM"), and CDM requirements, these rules are complied with for any project activities requesting registration as a proposed CDM project activity.
- To ensure a thorough, independent assessment of proposed project activities submitted for registration as a proposed CDM project activity against the applicable CDM requirements.
- To assess whether the project design of the proposed CDM project activity meets the CDM requirements, using objective evidence, and to assess the completeness and accuracy of the claims and conservativeness of the assumptions made in the project design document.

The validation protocol is consisted of the following two types of tables, which are effective for the purposes of validation above.

TABLE-1 contains the checklist with questions along with the thematic chapter of VVM.

TABLE-2 shows the corrective actions or clarifications which are requested to be taken in **TABLE-1** and the response from the PP.

<Index>

TABLE-1 Requirements Checklist Page 1-1

TABLE-2 Resolution of Corrective Actions and Clarification Requests Page 2-1

2. CLARIFICATION REQUESTS, CORRECTIVE ACTION REQUESTS AND FORWARD ACTION REQUESTS

If, during the validation of a project activity, issues are identified that need to be further elaborated upon, researched or added to in order to confirm that the project activity meets the CDM requirements and can achieve credible emission reductions, these issues shall be ensured that are correctly identified, discussed and concluded in the validation report.

➤ **CAR** : a corrective action request (**CAR**) is raised, if one of the following occurs:

- (a) The PPs have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;
- (b) The CDM requirements have not been met;
- (c) There is a risk that emission reductions cannot be monitored or calculated.

➤ **CL** : a clarification request (**CL**) is raised,

If information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

➤ **FAR** : a forward action request (**FAR**) is raised,

During validation to highlight issues related to project implementation that require review during the first verification of the project activity.

FARs shall not relate to the CDM requirements for registration.

The CARs and CLs are resolved or "closed out" only if the project participants modify the project design, rectify the PDD or provide adequate additional explanations or evidences that satisfy the requirements. If this is not done, the project activity will not be recommended for registration to the CDM EB.

All CARs, CLs and FARs will be reported on in its validation report. This reporting shall be undertaken in a transparent and unambiguous manner that allows the reader to understand the nature of the issue raised, the nature of the responses provided by the project participants, the means of validation of such responses and clear reference to any resulting changes in the PDD or supporting annexes.


	JCI CDM Center	APPENDIX A	No : JCI-CDM-VAL-10-115	Rev.No 02
CDM Validation Protocol on Lijiang Erqi MSW Incineration for Power Project				

TABLE-1 REQUIREMENTS CHECKLIST		(OK/No/NA/Tbv)		
No.	Requirement	Refer. Para. VVM	Check Comment	ID. No.
1.	Approval	Para.44-50 VVM	--	--
	<Requirement to be validated> All Parties involved shall approve the project activity.	Para.44 VVM	--	--
1.1	The LoA shall confirm that: 1) The Party is a Party to the Kyoto Protocol 2) Participation is voluntary 3) The proposed CDM project activity contributes to the sustainable development of the country 4) It refers to the precise proposed CDM project activity title in the PDD being submitted for registration	Para.45 VVM	OK, the two LoAs from PRC and UK confirm the 4 subjects listed in the left.	
2.	Participation	Para.51-54 VVM	--	--
	<Requirement to be validated> All project participants shall be listed in a consistent manner in the project documentation, and their participation in the project activity shall be approved by a Party to the Kyoto Protocol.	Para.51 VVM	--	--
2.1	The project participants shall be listed in tabular form in section A.3 of the PDD, and this information shall be consistent with the contact details provided in annex 1 of the PDD.	Para.52 VVM	OK, the consistencies of information on the two PPs were confirmed.	
1)	The participation of each project participant shall be approved by at least one Party involved, either in a letter of approval or in a separate letter specifically to approve participation.	ditto	OK, the both PPs are approved by the relevant Parties. .	
2)	No entities other than those approved as project participants shall be included in these sections of the PDD.	ditto	OK, no inclusions were confirmed.	
2.2	The approval of participation shall be issued from the relevant DNA.	Para.53 VVM	OK, it was confirmed the relevant DNAs issued the approvals.	
3.	Project Design Document	Para.55-57 VVM	--	--
	<Requirement to be validated> The PDD used as a basis for validation shall be prepared in accordance with the latest template and guidance from the CDM Executive Board available on the UNFCCC CDM website. http://cdm.unfccc.int/Reference/PDDs_Forms/PDDs/index.html	Para.55 VVM PDDs Forms	--	--
3.1	The PDD shall be in accordance with the applicable CDM requirements for completing PDDs. < http://cdm.unfccc.int/Reference/Guidclarif/pdd/index.html >	Para.56 VVM	OK	
3.2	PDD template shall not be altered, that is, shall be completed using the same font without modifying its format, headings or logo. 1) Tables and their columns shall not be modified or deleted. Rows may	PDD Guidelines	OK, the template is not altered.	


	JCI CDM Center	APPENDIX A	No : JCI-CDM-VAL-10-115	Rev.No 02
CDM Validation Protocol on Lijiang Erqi MSW Incineration for Power Project				

TABLE-1 REQUIREMENTS CHECKLIST		(OK/No/NA/Tbv)		
No.	Requirement	Refer. Para. VVM	Check Comment	ID. No.
	be added, as needed. If sections of the CDM-PDD are not applicable, it shall be explicitly stated that the section is left blank on purpose.			
2)	The presentation of values in the PDD should be international standard format.	ditto	OK	
4.	Project Description	Para.58-64 VVM	--	--
	<Requirement to be validated> The PDD shall contain a clear description of the project activity that provides the reader with a clear understanding of the precise nature of the project activity and the technical aspects of its implementation.	Para.58 VVM	--	--
4.1	Project description in section A.2 of the PDD (Max 1 page) shall be a brief summary of that in A.4.3 and B.3. This shall include: <ul style="list-style-type: none"> ● The purpose of the project activity ● The view of the project participants of the contribution of the project activity to sustainable development. and explain ● How the proposed project activity reduces GHG emissions. 	PDD Guidelines	OK	
4.2	In section A.4.3 of the PDD, a description of how environmentally safe and sound technology and know-how to be used is transferred to the host Party (ies) shall be included. It should also further explain the purpose of the project. <ul style="list-style-type: none"> ● The scenario existing prior to the start of the project, with equipment list and systems in operation ● The scope of project, with equipment list and systems ● The baseline scenario, with equipment list and systems If the baseline scenario is the same as the scenario existing prior to the start of the project, there is no need to repeat, but only state that both are the same. The description of the scenario should include; <ul style="list-style-type: none"> ● A list and arrangement of the main manufacturing technologies, systems and equipment ● The emission sources and the GHG, and existing and forecast energy and mass flows and balances of the systems and equipment ● The types and levels of services 	ditto	Not OK: 1) The project lifetime shall be demonstrated 2) Available MSW by the Project activity shall be clarified. 3) Inconsistency of the definition of M3 shall be clarified. 4) Land space arrangements by the project owner shall be clarified. 5) Imbalance of steam amount between the boiler capacity and the turbine requirement shall be clarified.	CL-1 CL-3 CL-4 CL-5 CL-30
4.3	In section A.4.4 of the PDD, <ul style="list-style-type: none"> ● The chosen crediting period shall be indicated. ● The total estimation of emission reductions as well as annual estimates for the chosen crediting period shall be provided. ● Information on the emission reductions shall be indicated using the decided tabular format. ● International standard format for values shall be used. 	ditto	Not OK: 1) The chosen crediting period shall be revised to reflect the current	CAR-1


	JCI CDM Center	APPENDIX A	No : JCI-CDM-VAL-10-115	Rev.No 02
CDM Validation Protocol on Lijiang Erqi MSW Incineration for Power Project				

TABLE-1 REQUIREMENTS CHECKLIST			(OK/No/NA/Tbv)	
No.	Requirement	Refer. Para. VVM	Check Comment	ID. No.
			validation schedule. 2) The emission reduction table shall be revised in line with the revision of the crediting period.	CAR-8
4.4	If the DOE does not undertake a physical site inspection, it shall be appropriately justified.	Para.62 VVM	NA, as the site visit was conducted.	
4.5	If the proposed CDM project activity involves the alteration of an existing installation or process, Does the project description clearly state the differences resulting from the project activity compared to the pre-project situation?	Para.63 VVM	NA, as the Project activity is to install a new MSW incineration plant with a power generation facility.	
5.	Baseline and monitoring methodology	Para.65-93 VVM	--	--
(b)	Applicability of the selected methodology to the project activity	Para.68-77 VVM	--	--
	<Requirement to be validated> The selected baseline and monitoring methodology previously approved by the CDM Executive Board shall be validated to be applicable to the project activity, including that the used version is valid. Specific guidance provided by the CDM Executive Board in respect to any approved methodology shall be applied.	Para.68 VVM Para.69 VVM	--	--
5.1	The methodology shall be ensured to be correctly quoted and applied by comparing it with the actual text of the applicable version of the methodology available on the UNFCCC CDM website. Referring to the UNFCCC CDM web site for the title and reference list as well as the details of approved baseline methodologies, the following contents shall be indicated in section B.1 of the PDD. <ul style="list-style-type: none"> the approved methodology the version of the methodology that is used any methodologies or tools which the approved methodology draws upon and their version 	Para.70 VVM	Not OK, though the version of the methodology is updated, but the version of the emission tool is not updated.	CAR-3
5.2	The choice of methodology shall be justified and the project participants shall show that the project activity meets each of the applicability conditions of the approved methodology or any tool or other methodology component referred to therein in section B.2 of the PDD.	Para.71 VVM	OK.	
2)	The documentation referred to in the PDD and its content shall be correctly quoted and interpreted in the PDD.	ditto	OK.	
5.	Baseline and monitoring methodology	Para.65-93 VVM	--	--
(c)	Project boundary	Para.78-80 VM	--	--


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TABLE-1 REQUIREMENTS CHECKLIST		(OK/No/NA/Tbv)		
No.	Requirement	Refer. Para. VVM	Check Comment	ID. No.
	<Requirement to be validated> The PDD shall correctly describe the project boundary, including the physical delineation of the proposed CDM project activity included within the project boundary for the purpose of calculating project and baseline emissions for the proposed CDM project activity.	Para.78 VVM	--	--
5.3	The delineation in the PDD of the project boundary shall be correct and meet the requirements of the selected baseline methodology, which shall also be demonstrated by documented evidence and corroborated by a site visit.	Para.79 VVM	OK	
1)				
2)	All emission sources and GHGs required by the methodology shall be included within the project boundary for the purpose of calculating project emissions and baseline emissions, using the standardized table.	ditto	Not OK, the methane emissions from the wastewater treatment plant were not included.	CAR-11
3)	If the methodology allows project participants to choose whether a source or gas is to be included within the project boundary, the project participants shall justify the choice by supporting documented evidences.	ditto	OK	
4)	In section B.3 of the PDD, a flow diagram of the project boundary shall be described including all the equipment, systems, flows of mass and energy, the emission sources/gases and the monitoring variables.	PDD Guidelines	OK	
5.	Baseline and monitoring methodology	Para.65-93 VVM	--	--
(d)	Baseline identification	Para.81-88 VVM	--	--
	<Requirement to be validated> The PDD shall identify the baseline for the proposed CDM project activity, defined as the scenario that reasonably represents the anthropogenic emissions by sources of GHGs that would occur in the absence of the proposed CDM project activity.	Para.81 VVM	--	--
5.4	If the methodology requires several alternative scenarios to be considered in the identification of the most reasonable baseline scenario, it shall be determined whether all scenarios that are considered by the project participants and are supplementary to those required by the methodology, are reasonable in the context of the proposed CDM project activity and that no reasonable alternative scenario has been excluded.	Para.83 VVM	OK, the possible alternative scenarios are predetermined in the methodology	
5.5	It shall be determined whether the baseline scenario identified is reasonable by validating the assumptions, calculations and rationales used, as described in the PDD.	Para.84 VVM	OK, it was confirmed that the baseline scenario is identified appropriately.	
	The documents and sources referred to in the PDD shall be correctly quoted and interpreted. All data used to determine the baseline scenario shall be illustrated in a transparent manner, preferably in a table form.	ditto	Not OK, it is requested to provide evidence relevant to other renewal resources	CL-2


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TABLE-1 REQUIREMENTS CHECKLIST		(OK/No/NA/Tbv)		
No.	Requirement	Refer. Para. VVM	Check Comment	ID. No.
5.6	All applicable CDM requirements shall be taken into account in the identification of the baseline scenario for the proposed CDM project activity, including "relevant national and/or sectoral policies and circumstances." (See decision 3/CMP.1, annex, paragraph 45, currently located at < http://cdmunfccc.int/Reference/COPMOP/08a01.pdf#page=6 >, and Latest "Clarifications on the consideration of national and/or sectoral policies and circumstances in baseline scenarios".	Para.85 VVM Para.45 CDM/M&P	OK, relevant national and/or sectoral policies and circumstances are appropriately taken.	
5.7	The PDD shall provide a verifiable description of the identified baseline scenario, including a description of the technology that would be employed and/or the activities that would take place in the absence of the proposed CDM project activity.	Para.86 VVM	OK, it was confirmed that the identified baseline scenario is verifiable.	
5.	Baseline and monitoring methodology	Para.65-93 VVM	--	--
(e)	Algorithms and/or formulae used to determine emission reductions	Para.89-93 VVM	--	--
	<Requirement to be validated> The steps taken and equations applied to calculate project emissions, baseline emissions, leakage and emission reductions shall comply with the requirements of the selected baseline and monitoring methodology.	Para.89 VVM	--	--
5.8 1)	The equations and parameters in the PDD shall be correctly applied by comparing them to those in the selected approved methodology.	Para.90 VVM	OK	
2)	If the methodology provides for selection between different options for equations or parameters, adequate justification shall be provided (based on the choice of the baseline scenario, context of the project activity and other evidence) and the correct equations and parameters shall be used, in accordance with the methodology selected.	ditto	Shown below.	
3)	Grid emission factor <i>Step 1: Identify the electricity systems</i> Is the relevant electricity system selected appropriately with sufficient justification	Emission tool	OK, ECOG is selected as the relevant electricity system with justification.	
4)	<i>Step 2: Choose whether to include off-grid power plants in the project electricity system (optional)</i> Is the Option selected appropriately.	ditto	OK, Option 1 was chosen appropriately according to China DNA's data.	
5)	<i>Step 3: Select a method to determine the operating margin (OM)</i> Is the calculation method for OM selected appropriately.	ditto	OK, the calculation method, Simple OM was selected appropriately with sufficient justification.	
6)	<i>Step 4: Calculate the operating margin emission factor according to the selected method</i> Is OM calculated appropriately.	ditto	OK, OM was calculated based on Option B selected appropriately.	


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TABLE-1 REQUIREMENTS CHECKLIST			(OK/No/NA/Tbv)	
No.	Requirement	Refer. Para. VVM	Check Comment	ID. No.
6)	<i>Step 5: Calculate the build margin (BM) emission factor</i> Is BM calculated appropriately.	ditto	OK, Option I is selected appropriately with justification and BM was calculated correctly.	
7)	<i>Step 6: Calculate the combined margin (CM) emissions factor,</i> Is BM calculated appropriately.	ditto	OK, OM was calculated correctly.	
5.9 1)	The justification shall be given in the PDD for the choice of data and parameters used in the equations.	Para.91 VVM	Not OK, as shown below	
2)	If data and parameters will not be monitored throughout the crediting period of the proposed CDM project activity but have already been determined and will remain fixed throughout the crediting period, it shall be demonstrated that all data sources and assumptions are appropriate and calculations are correct, applicable to the proposed CDM project activity and will result in a conservative estimate of the emission reductions.	ditto	Not OK, 1) Inconsistency of parameters OX and MCF shall be corrected. 2) Version of the emission tool used and sections relevant landfill management level shall be revised. 3) Background or justification of selecting the conservative emission factor shall be demonstrated.	CAR-4 CAR-6 CL-19
3)	If data and parameters will be monitored on implementation and hence become available only after validation of the project activity, it shall be demonstrated that the estimates provided in the PDD for these data and parameters are reasonable.	ditto	Not OK, 1) Data source of the diesel oil shall be clarified. 2) Values of AF and compliance rate shall be justified.	CL-18 CL-21
5.10	In section B.6.2 of the PDD, Where time series of data is used, where several measurements are undertaken or where surveys have been conducted, detail information shall be provided in Annex 3 of the PDD. The choice for the source of data shall be explained and justified. Clear and transparent references or additional documentation shall be provided in Annex 3 of the PDD.. Where values have been measured, a description of the measurement methods shall be included. More detail information can be provided in Annex 3 .	PDD Guidelines	Not OK, an appropriate spreadsheet for the emissions factors shall be provided.	CAR-5
5.11	In section B.6.3 of the PDD, a transparent ex-ante calculation of project emissions, baseline emissions and leakage emissions expected during	ditto	Not OK, 1) the relevant	CAR-7


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TABLE-1 REQUIREMENTS CHECKLIST		(OK/No/NA/Tbv)		
No.	Requirement	Refer. Para. VVM	Check Comment	ID. No.
	PDD for stakeholder comments it shall be demonstrated that the CDM benefits were considered necessary in the decision to undertake the project as a proposed CDM project activity.			
6.1	The start date of the project activity, reported in the PDD, shall be in accordance with the latest "Glossary of CDM terms".	Para.99 VVM	OK, the definition of the date is in accordance with the Terms.	
	The starting date of a CDM project activity is the date on which the implementation or construction or real action of a project activity begins. In section C.1 of the PDD, the description should contain not only the date, but also a description of how this start date has been determined, and a description of the evidence available to support this start date.	Ditto	OK, the date is appropriately defined with justification and evidence.	
	In particular, for project activities that require construction, retrofit or other modifications, the date of commissioning cannot be considered the project activity start date.	Ditto	OK, the project starting date of the project activity is the date on which the equipment purchase was contracted.	
6.2	It shall be identified whether it is a new project activity (a project activity with a start date on or after 02 August 2008) in accordance with the guidance from the CDM Executive Board, or an existing project activity (a project activity with a start date before 02 August 2008) (See Annex 22 of EB 49 report : Guidelines on the Demonstration and Assessment of Prior Consideration of the CDM)	Para.100 VVM Annex 22 EB49	OK, the necessity of the notification of the prior consideration was confirmed.	
6.3	For a new project activity, for which PDD has not been published for global stakeholder consultation or a new methodology proposed to the CDM Executive Board before the project activity start date, the DOE shall ensure by means of confirmation from the UNFCCC secretariat that PPs had informed the host Party DNA and the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status. If such a notification has not been provided by the project participants within six months of the project activity start date, the DOE shall determine that the CDM was not seriously considered in the decision to implement the project activity.	Para.101 VVM	OK, the PP has submitted the notification of their intention of applying CDM to the project activity to China DNA and UNFCCC as per the relevant guidelines.	
6.4	For an existing project activity, for which the start date is prior to the date of publication of the PDD for global stakeholder consultation, the project participant's prior consideration of the CDM shall be demonstrated by providing the following evidence (preferably official, legal and/or other corporate). In such cases the PP shall provide an implementation timeline of the project in section B.5 of the PDD.	Para.102 VVM	NA.	
1)	Evidence to indicate awareness of the CDM prior to the project activity start date, and evidence to indicate that the benefits of the CDM were a decisive factor in the decision to proceed with the project shall be provided.	ditto	NA	
2)	Evidence to support this would include, inter alia, minutes and/or notes related to the consideration of the decision by the Board of Directors, or equivalent, of the project participant, to undertake the project as a proposed CDM project activity.	ditto	NA	
3)	Reliable evidence that must indicate that continuing and real actions were taken to secure CDM status for the project in parallel with its implementation.	ditto	NA	
4)	Evidence to support this should include, inter alia, • contracts with consultants for CDM/PDD/methodology services,	ditto	NA	


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TABLE-1 REQUIREMENTS CHECKLIST		(OK/No/NA/Tbv)		
No.	Requirement	Refer. Para. VVM	Check Comment	ID. No.
	<ul style="list-style-type: none"> Emission Reduction Purchase Agreements or other documentation related to the sale of the potential CERs (including correspondence with multilateral financial institutions or carbon funds), Evidence of agreements or negotiations with a DOE for validation services, Submission of a new methodology to the CDM Executive Board, Publication in newspaper, Interviews with DNA, Earlier correspondence on the project with the DNA or the UNFCCC secretariat. 			
6.	Additionality of a project activity	Para.94-121 VVM	--	--
(b)	Identification of alternatives	Para.105-107 VVM	--	--
	<Requirement to be validated> The PDD shall identify credible alternatives to the project activity in order to determine the most realistic baseline scenario, unless the approved methodology that is selected by the proposed CDM project activity prescribes the baseline scenario and no further analysis is required.	Para.105 VVM	--	--
6.5	The list of alternatives shall includes as one of the options that the project activity is undertaken without being registered as a proposed CDM project activity;	Para.106 VVM	OK	
1)	The list shall contains all plausible alternatives that are considered, on the basis of local and sectoral knowledge, to be viable means of supplying the outputs or services that are to be supplied by the proposed CDM project activity.	ditto	OK, the list includes all plausible alternatives.	
2)	The alternatives shall comply with all applicable and enforced legislation.	ditto	OK	
6.	Additionality of a project activity	Para.94-121 VVM	--	--
(c)	Investment analysis	Para.108-114 VVM	--	--
6.6	<Requirement to be validated> If investment analysis has been used to demonstrate the additionality of the proposed CDM project activity, the PDD shall provide evidence that the proposed CDM project activity would not be: The most economically or financially attractive alternative; or Economically or financially feasible, without the revenue from the sale of certified emission reductions (CERs).	Para.108 VVM	--	--
6.7	Project participants can show this through one of the following approaches, by demonstrating that:	Para.109 VVM	--	--
1)	Demonstrate that the proposed CDM project activity would produce no financial or economic benefits other than CDM-related income. Document the costs associated with the proposed CDM project activity and the alternatives identified and demonstrate that there is at least one alternative which is less costly than the proposed CDM project activity;	ditto	NA	
2)	The proposed CDM project activity is less economically or financially attractive than at least one other credible and realistic alternative;	ditto	NA	
3)	Financial returns of the proposed CDM project activity would be insufficient to justify the required investment.	ditto	OK, it is demonstrated that the IRR of the project activity is lower than the	


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TABLE-1 REQUIREMENTS CHECKLIST			(OK/No/NA/Tbv)	
No.	Requirement	Refer. Para. VVM	Check Comment	ID. No.
			benchmark IRR.	
4)	An appropriate analysis method has been selected with sufficient justification, out of the three options provided in the additionality tool.	Relevant Tool	Not OK, descriptions about the analysis method selection are not sufficient.	CL-6
6.8	The DOE shall comply with the latest version of the “Guidelines on the Assessment of Investment Analysis” as provided by the CDM Executive Board and with other relevant guidance including the latest guidelines on plant load factors “guidelines for the reporting and validation of plant load factors” (See EB 51 report, annex 58 currently located at < http://cdm.unfccc.int/Reference/Guidclarif/reg/reg-guid03.pdf >.)	Para.110 VVM Annex 58 EB51	--	--
1)	Project participants should provide spreadsheet versions of all investment analysis. All formulas used in this analysis be readable and all relevant cells be viewable and unprotected.	Annex 58 EB51	Not OK, an appropriate spreadsheet shall be provided.	CL-9
2)	The evidences on which input values in the investment analysis are based shall be provided.	ditto	Not OK, some key input values are not demonstrated and appropriate evidences shall be provided to justify the use of the input values.	CL-8 CL-10
6.9 1)	All parameters and assumptions used in calculating the relevant financial indicator shall be validated thoroughly, and the accuracy and suitability of these parameters shall be verified using the available evidence and expertise in relevant accounting practices.	Para.111 VVM	ditto	CL-8 CL-10
2)	Input values used in all investment analysis should be valid and applicable at the time of the investment decision taken by the project participant.	Annex 58 EB51	OK	
3)	The cost of financing expenditures (i.e. loan repayments and interest) should not be included in the calculation of project IRR.	ditto	OK, the cost is not included in the calculation	
4)	In the case of project activities for which implementation ceases after the commencement and where implementation is recommenced due to consideration of the CDM the investment analysis should reflect the economic decision making context at point of the decision to recommence the project. Therefore capital costs incurred prior to the revised project activity start date can be reflected as the recoverable value of the assets, which are limited to the potential reuse/resale of tangible assets.	ditto	NA	
5)	Only variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation (all parameters varied need not necessarily be subjected to both negative and positive variations of the same magnitude), and the results of this variation should be presented in the PDD and be reproducible in the associated spreadsheets.. Where a variable which constitute less than 20% has a material impact on the analysis, this variable shall be included in the sensitivity analysis. As a general point of departure variations in the sensitivity analysis should at least cover a range of +10% and –10%, unless this is not deemed appropriate in the context of the specific project circumstances.	ditto	OK, the sensitivity analysis is conducted appropriately covering all the applicable parameters	
6)	Such evidence for the evaluation of investment analysis as invoices, receipts, price indices, feasibility reports, public announcements,	ditto	Not OK, appropriate	


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No.	Requirement	Refer. Para. VVM	Check Comment	ID. No.
	audited actual project cost and annual financial reports shall be provided upon request of the DOE.		evidence shall be provided to justify the use of the input values.	
7)	The likelihood of all the subjected parameters with -10% to +10% variations is appropriately demonstrated.	ditto	OK	
8)	The variation of each parameter necessary to reach the benchmark IRR is calculated and its likelihood is appropriately demonstrated with justification supported with evidence.	ditto	Not OK, the variations and likelihood shall be demonstrated.	CAR-2
9)	Plant Load Factor of the proposed project activity shall be estimated by an appropriate third party, such as a certified engineering company.	PLF Guidance	Not OK, the PLF is estimated by a certified third party who has designed the FSR; however, relevant efficiency/loss factors are not demonstrated.	CL-11
6.10	The suitability of any benchmark applied in the investment analysis:	Para.112 VVM	-	--
1)	In cases where a benchmark approach is used the applied benchmark shall be appropriate to the type of IRR calculated. Local commercial lending rates or weighted average costs of capital (WACC) are appropriate benchmarks for a project IRR. Required/expected returns on equity are appropriate benchmarks for an equity IRR. Benchmarks supplied by relevant national authorities are also appropriate if the DOE can validate that they are applicable to the project activity and the type of IRR calculation presented.	Annex 58 EB62	Not OK, the justification of the application of the code is insufficient.	CL-7
2)	If the proposed baseline scenario leaves the project participant no other choice than to make an investment to supply the same (or substitute) products or services, a benchmark analysis is not appropriate and an investment comparison analysis shall be used. If the alternative to the project activity is the supply of electricity from a grid this is not to be considered an investment and a benchmark approach is considered appropriate.	ditto	NA	
3)	The effectiveness of the applied benchmark shall be demonstrated with appropriate evidence.	ditto	Not OK, the justification of the application of the code is insufficient.	CL-7
4)	The PPs shall demonstrate that it is reasonable to assume that no investment would be made at a rate of return lower than the benchmark by, for example, showing previous investment decisions by themselves involved and demonstrating that the same benchmark has been applied, or if there are verifiable circumstances that have led to a change in the benchmark.	Para.112 VVM	OK	
6.11	The CDM Executive Board clarified that in cases where project participants rely on values from Feasibility Study Reports (FSR) that are approved by national authorities for proposed CDM project activities, it is required to ensure that:	Para.113 VVM Para.54 EB38	--	--


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TABLE-1 REQUIREMENTS CHECKLIST		(OK/No/NA/Tbv)		
No.	Requirement	Refer. Para. VVM	Check Comment	ID. No.
1)	The period of time between the finalization of the FSR and the investment decision shall be sufficiently short for the DOE to confirm that it is unlikely in the context of the underlying project activity that the input values would have materially changed;	ditto	OK, the project implementation was decided on 15/02/2010, three months after the FSR approval in 12/2009 and two weeks after its approval on 03/02/2010.	
2)	The values used in the PDD and associated annexes shall be fully consistent with the FSR, and where inconsistencies occur the appropriateness of the values shall be explained.	ditto	OK, the values used are consistent with the FSR or the BOT.	
3)	It shall be confirmed that the input values from the FSR are valid and applicable at the time of the investment decision.	ditto	OK, the validity of the input values at the time of the project decision is confirmed.	
6.	Additionality of a project activity	Para.94-121 VVM	--	--
6.12	d) Barrier Analysis <Requirement to be validated> If barrier analysis has been used to demonstrate the additionality of the proposed CDM project activity, the PDD shall demonstrate that the proposed CDM project activity faces barriers as below.	Para.115 VVM	--	--
1)	(a) Prevent the implementation of this type of proposed CDM project activity; (See latest guidelines for objective demonstration and assessment of barriers., currently located at (b) Do not prevent the implementation of at least one of the alternatives.	Para.115 VVM	NA	
6.13 1)	Issues that have a clear direct impact on the financial returns of the project activity cannot be considered barriers and shall be assessed by investment analysis. This does not refer to either (a) Risk related barriers, for example risk of technical failure, that could have negative effects on financial performance, or (b) Barriers related to the unavailability of sources of finance for the project activity.	Para.116 VVM	NA	
6.14 1)	The available evidence shall be provided and/or interviews with relevant individuals (including members of industry associations, government officials or local experts if necessary) shall be arranged to demonstrate that the barriers listed in the PDD exist.	Para.117 VVM	NA	
2)	The existence of barriers shall be substantiated by independent sources of data such as relevant national legislation, surveys of local conditions and national or international statistics.	ditto	NA	
6.	Additionality of a project activity	Para.94-121 VVM	--	--
(e)	Common practice analysis	Para.119-121 VVM	--	--


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TABLE-1 REQUIREMENTS CHECKLIST		(OK/No/NA/Tbv)		
No.	Requirement	Refer. Para. VVM	Check Comment	ID. No.
	<Requirement to be validated> For proposed large-scale CDM project activities, <u>unless the proposed project type is first-of-its kind</u> , common practice analysis shall be carried out as a credibility check of the other available evidence used by the project participants to demonstrate additionality. This is to confirm that the project activity is not widely observed and commonly carried out in the region..	Para.119 VVM	--	--
6.15 1)	The project participants shall clearly define “activities that are similar to the proposed project activity” in terms of scale and justify the definition in CDM-PDD.	Additional ity Tool	Not OK: 1) Criteria used are not clearly defined. 2) There are no descriptions about the CDM projects.	CL-12 CL-13
2)	Screening (selection) criteria for the common practice analysis shall be demonstrated with appropriate evidences and justification.	ditto	Not OK, the same as the above.	CL-12 CL-13
3)	The relevant geographical area for undertaking the common practice analysis should in principle be the host country of the proposed CDM project activity. A region within the country could be the relevant geographical area if the framework conditions vary significantly within the country.	ditto	OK, Zhejiang province has been selected as the similar region with appropriate justification.	
4)	All the data used in the implementation of common practice analysis and reported in the PDD shall be supported by documentation and the PDD shall clearly state the complete reference of such documentation to enable access to it by a third party.	ditto	Not OK, the data sources used for the screening shall be clearly demonstrated.	CL-14 CL-31 CL-32
5)	Where documented information may be difficult to access or unavailable, local expert analysis on a common practice shall be provided.	ditto	Not required as necessary information has been provided.	
6)	Different technologies applied between the proposed project and the other similar projects shall be sufficiently demonstrated.	ditto	Not OK, 1) Process of similar project identification shall be clearly demonstrated 2) The essential distinctions shall be demonstrated more specifically 3) Implications with the Linjiang WtE plant shall be clarified	CL-15 CL-16 CI-17
7)	Common practice analysis is conducted based on the appropriate tool or the guidelines and concluded appropriately.	ditto	OK, the analysis has been conducted based on appropriate tool and concluded.	


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No.	Requirement	Refer. Para. VVM	Check Comment	ID. No.
7.	Monitoring plan	Para.122-124 VVM	--	--
	<Requirement to be validated> The PDD shall include a monitoring plan. This monitoring plan shall be based on the approved monitoring methodology applied to the proposed CDM project activity.	Para.122 VVM	--	--
7.1	<u>Compliance of the monitoring plan with the approved methodology</u>			
1)	(i)- The list of parameters required by the selected approved methodology shall be identified.	Para.123 VVM	Not OK, current parameter lists of both monitored and not monitored shall be revised in accordance with the methodology and the relevant tools applied.	CL-26
2)	(ii) The monitoring plan shall contain all necessary parameters, and the means of monitoring described in the plan shall comply with the requirements of the methodology;	ditto	Ditto	CL-18 CL-19 CI-24 CL-25 CL-28 CAR-9 CAR-10
3)	For each parameter, the following information shall be explicitly described in the standardized table in the PDD. <ul style="list-style-type: none"> ● Data unit ● Description ● Source of data ● Measurement procedures ● Monitoring frequency ● Value of data applied (Ex-ante parameters) ● QA/QC procedures ● Any comment, if any (Note): Data monitored and required for verification and issuance are to be kept for two (2) years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.	PDD Guidelines	Ditto	CL-18 CL-19 CI-24 CL-25 CL-28 CAR-9 CAR-10
4)	The operational and management structure that the project operator will implement in order to monitor emission reductions and leakage effects generated by the project activity shall be clearly described in the PDD (section 7.2) including the responsibilities for and institutional arrangements for data collection and archiving.	ditto	OK, the establishment of an appropriate monitoring organization is planned.	
5)	<u>Implementation of the plan</u> (i) The monitoring arrangements described in the monitoring plan shall be feasible within the project design;	Para.123 VVM	OK	
6)	(ii) The means of implementation of the monitoring plan, including the data management and quality assurance and quality control procedures, shall be sufficient to ensure that the emission reductions achieved by/resulting from the proposed CDM project activity can be reported ex post and verified.	ditto	OK	
7.2	Relevant further background information, if any, shall be provided in Annex 4 of the PDD.	PDD Guidelines	Not required	
7.3	An appropriate wired-diagram shall be demonstrated to delineate the monitoring system		Not OK, currently no diagram is	CL-27


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TABLE-1 REQUIREMENTS CHECKLIST			(OK/No/NA/Tbv)	
No.	Requirement	Refer. Para. VVM	Check Comment	ID. No.
			provided.	
7.4	Appropriate measures shall be arranged in advance against possible malfunction of monitoring instruments		Not OK, currently sufficient countermeasures against monitoring instrument malfunction are not demonstrated.	CL-27
8.	Sustainable development	Para.125-127 VVM		--
	<Requirement to be validated> CDM project activities shall assist Parties not included in Annex I to the Convention in achieving sustainable development.	Para.125 VVM	--	--
8.1	The letter of approval by the DNA of the host Party shall confirm the contribution of the proposed CDM project activity to the sustainable development of the host Party.	Para.126 VVM	OK, the contribution is confirmed in the LoA by the host Party.	
9.	Local stakeholder consultation	Para.128-130 VVM	--	--
	<Requirement to be validated> Local stakeholders shall be invited by the PPs to comment on the proposed CDM project activity prior to the publication of the PDD on the UNFCCC website.	Para.128 VVM Glossary of CDM terms	--	--
9.1	Comments by local stakeholders that can reasonably be considered relevant for the proposed CDM project activity shall be invited in an open and transparent manner.	Para.129 VVM	OK.	
1)	The summary of the comments received as provided in the PDD shall be complete.	ditto	OK.	
3)	The project participants shall demonstrate that they have taken due account of any comments received and shall describe/explain this process in the PDD.	ditto	OK.	
10.	Environmental impacts	Para.131-133 VVM	--	--
	<Requirement to be validated> Project participants shall submit documentation to the DOE on the analysis of the environmental impacts of the project activity in accordance with paragraph 37(c) of the CDM modalities and procedures.	Para.131 VVM Para.37(c) CDM/M&P	--	--
10.1	Project participants shall submit documentation to the DOE on the analysis of the environmental impacts of the project activity	Para.131 VVM	OK, the EIA report is submitted.	
10.2	Project participants shall also provide all references to support documentation of a EIA if required by the host Party	Para.132 VVM	OK	
10.3	Author and approver of the EIA report of the project activity shall be demonstrated with relevant dates		Not OK, information on the EIA report demonstrated in the PDD is not sufficient.	CL-29


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TABLE-2 Resolution of Corrective Actions and Clarification Requests

No. CAR, CL	Clarifications and corrective action requests by validation team	Sec. No. in TABLE-1	Summary of project owner response	Validation team Conclusion
CAR Corrective Action Requests				
CAR-1	Credit starting date Considering the current validation schedule, the starting date shall be revised (postponed).	4.3	The starting date has been revised according to the current validation schedule.	OK, the credit starting date was revised appropriately. CAR-1 was closed.
CAR-2	Variations of key parameters to reach the benchmark The variations shall be estimated, demonstrated in the PDD and their likelihood shall be assessed with appropriate supporting documents in accordance with the guidelines of the investment analysis.	6.9	The critical point analysis and demonstration has been added in the revised PDD.	OK, the variations were calculated and their likelihood was assessed in the PDD. CAR-2 was close.
CAR-3	Version up of the applied emission tool In the GSC PDD, version 02.1.0 emission tool is used; however, considering validation schedule it is requested to update to version 02.2.0 with some changes of descriptions relevant to the changes of calculation method from the 7 steps to the 6 steps.	5.1	The latest tools have been updated in the revised PDD. Please refer to the section B.6.1 of the PDD.	OK, the version of the emission tool was updated CAR-3 was closed.
CAR-4	Inconsistency of parameters OX and MCF There found inconsistency between the parameters OX and MCF, regarding the explanation of landfill management level. Therefore relevant descriptions and/or values assumed shall be corrected.	5.9	The parameter OX has been updated according to the latest ' <i>Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site</i> '. The OX has been corrected as 0.1.	OK, OX was revised appropriately. CAR-4 was closed.
CAR-5	Spreadsheet of emission factors calculations It is requested to provide an active spreadsheet so that the calculations can be reproduced for verification.	5.10	The Spreadsheet of emission factors calculation has been provided.	OK, the sheet was provided. CAR-5 was closed.
CAR-6	Ex-ante data and parameters Following shall be revised appropriately: 1) Version of the emission tool applied 2) Sections relevant to landfill management level	5.9	The relevant information has been added in the revised PDD.	OK, relevant correction has ben confirmed. CAR-6 was closed.


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TABLE-2 Resolution of Corrective Actions and Clarification Requests

No. CAR, CL	Clarifications and corrective action requests by validation team	Sec. No. in TABLE-1	Summary of project owner response	Validation team Conclusion
CAR-7	Spreadsheet of calculations of project, baseline and leakage emissions It is requested to provide a spreadsheet that demonstrates the calculations of the three emissions. Appropriate data sources of input values of parameters and calculation formulae used for the calculations shall also be demonstrated.	5.11	The spreadsheet has been provided.	OK, the sheet was provided. CAR-7 was closed.
CAR-8	Revision of project emission reduction table The reductions shall be revised reflecting the revision of the credit start date.	4.3 5.12	The emission reduction table has been updated according to the revised starting date of crediting period.	OK, the table was revised appropriately in line with the revision of the credit starting date. CAR-8 was closed..
CAR-9	Calculation of the fraction of energy generated by auxiliary fossil fuel Current calculation of the total energy based on generated power shall be revised to the total energy based on thermal energy by combustion of MSW.	7.1	Fraction of energy generated by auxiliary fossil fuel was calculated based on the energy content of MSW incineration (estimated by multiply the MSW treatment amount and net calorific value of MSW). Refer to footnote 1 of the PDD for details.	OK, the calculation was revised appropriately based on the total thermal energy by MSW incineration. CAR-9 was closed.
CAR-10	Amount of light diesel consumption The amount of the diesel in B.7.1 is incorrect.	5.2 7.1	According to FSR, annual diesel consumption amount is 200 tons, which equivalent to 200,000 kg. The value in B.7.1 was corrected.	OK, the amount was revised appropriately. CAR-10 was closed.
CAR-11	Inclusion of project emissions from the wastewater treatment plant Methane generation from the wastewater treatment plant shall be accounted for project emissions. According to the FSR, leachate from the tanker will be treated by the plant including an anaerobic treatment unit which generates methane. As methane will be combusted in the two incinerators regarded as a kind of flare plant. Therefore, it shall be accounted in line with the methodology and the relevant tool. This inclusion shall be reflected to all the relevant sections in the PDD and CER calculations.	5.3	The project emission from wastewater treatment system was included in the ER calculation. Considering the biogas produced during wastewater treatment system and destroyed in the enclosed flared (the incinerator), the "Tool to determine project emissions from flaring gases containing methane" was introduced to estimate the project emission.	OK, the inclusion of the project emissions from the wastewater treatment plant have been appropriately reflected to the project boundary, CER calculations and the monitoring plan. CAR-11 was closed.
CL	Clarification Requests			


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TABLE-2 Resolution of Corrective Actions and Clarification Requests

No. CAR, CL	Clarifications and corrective action requests by validation team	Sec. No. in TABLE-1	Summary of project owner response	Validation team Conclusion
CL-1	Demonstration of project life estimate It shall be clearly demonstrated how long the project life is estimated. This shall be consistent with the IRR calculation period.	4.2	According to the project FSR, the project operation period is 27 years (including two years' construction period) used for IRR calculation. The value is consistent with the operation period mentioned in the BOT Agreement; and according to the Technical Protocol of boiler and Turbine generator, the lifetime of boiler and turbine is also 25 years.	OK, the power plant lifetime is described in the PDD appropriately as the representative of the project lifetime. CL-1 was closed.
CL-2	Evidence relevant to cost or resource for renewal power generation It is requested to provide relevant evidence to support descriptions in the PDD about the cost or resources. Solar PV, Geothermal and Biomass are explained not commercially feasible due to high investment, and hydropower due to insufficient resources at the project site. Also please clarify rational of limiting to at the project site in case of hydropower.	5.5	The evidence has been added in the revised PDD as footnotes. Please refer to the section B.4 of the PDD.	OK, relevant data were provided in the PDD. CL-2 was closed.
CL-3	Available MSW amount The PDD addressed that daily MSW amount in Wenzhou city already reaches 1,200t/d. Does this mean that the Project activity can be operated at full capacity from day 1? Aren't any other incineration plants in the area to share the MSW? Also please clarify the data sources of the amount.	4.2	There are three MSW incineration plants in operation in Wenzhou city, the other three plants have already full-loaded and can't dispose the extra MSW. Please refer to the historical record of MSW treatment amount of the three MSW incineration plants in the recent three years. According to the statement from the local government, the actual amount of daily un-incinerated MSW which is disposed in landfill site currently is more than 1,200 tons.	OK, the available amount for the project activity was confirmed with the documents provided and also with the interview with the local government in charge of the MSW treatment during the site visit. CL-3 was closed.
CL-4	Inconsistency of the definition of M3 In the Step3 M3 is explained as the current situation, whilst in Step1 there is the following description: For the alternative M3, disposing the waste through incineration.	4.2	There is some error in the description; the description has been corrected in the revised PDD.	OK, the description about M3 has been corrected. CL-4 was closed.


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TABLE-2 Resolution of Corrective Actions and Clarification Requests

No. CAR, CL	Clarifications and corrective action requests by validation team	Sec. No. in TABLE-1	Summary of project owner response	Validation team Conclusion
CL-5	Clarification of land arrangements for the construction of the incineration plant Please clarify the arrangements of the land by the project participant for preparing the project site for the construction (purchase of the right of its use or borrowing).	4.2	According to the BOT Agreement, the land of the project is free for use in the operation period and the relevant capital was not included in the total investment estimation. Please refer to the BOT agreement and FSR investment estimation.	OK, the land arrangement was confirmed also with the interview with the project owner. CL-5 was closed.
CL-6	Selection results of Options I,II and III All the selection results shall be demonstrated appropriately. Currently the results of Options I and II are addressed in the PDD, but not of Option III.	6.7	The result of the Option III has been addressed in the revised PDD	Ok, the selection process was revised to include the result appropriately. CL-6 was closed.
CL-7	Applicability of the benchmark of the Interim Rules to the Project activity It shall be justified why the benchmark stipulated in the Interim Rules can be applied to the Project activity. Currently there are no descriptions about the justification for the application.	6.10	The benchmark of project IRR is derived from <i>Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects</i> , issued by Operation Department of Power Generation and Transmission in State Power Corporation, where the IRR benchmark of the total investment (after tax) of power industry is 8%. The benchmark was available when the investment decision was made and was chosen for FSR financial analysis and was consistently used in similar projects assessment with similar risks.	OK, the applicability is appropriately justified. CL-7 was closed.
CL-8	Clarification of Data Sources of the Values in the Table B.3 Data sources of the values shall be demonstrated in the table.	6.8	The data source has been added in the revised PDD.	OK, the data source of each parameter is added appropriately to Table B.3. CL-8 was closed.
CL-9	Spreadsheet of IRR Calculations Please provide the spreadsheet used to calculate and demonstrate the project IRR.	6.8	The IRR Calculation Spreadsheet has been provided. Some default value used for baseline emission calculation such as OX will be revised according to the updated ' <i>Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site</i> ' and ' <i>Tool to calculate the emission factor for an electricity system</i> ' in the 63 rd EB Meeting.	OK, the spreadsheet was provided. CL-9 was closed.
CL-10	Revisions of the Table B.3 1) Tipping fee shall be listed	6.8	1) The Tipping fee has been added in the revised PDD. 2) The power tariff used for IRR calculation includes	OK, the key major parameters with input values are added


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No. CAR, CL	Clarifications and corrective action requests by validation team	Sec. No. in TABLE-1	Summary of project owner response	Validation team Conclusion
	2) Tariff shall be demonstrated together with VAT information: included or excluded 3) Estimated CER price and Exchange Rate		17% VAT. 3) The expected CER price and Exchange rate has been added in the revised PDD.	appropriately. CL-10 was closed.
CL-11	Clarification of the data on electricity generation and supply 1) Calculations of the annual total power generation 2) Calculations of the annual total internal consumption 3) Coefficient of effective electricity (%) 4) Line loss (%) Above data shall be incorporated appropriately in the PDD.	6.9	1) The power generation estimation was based on the boilers' steam evaporation rate, steam turbine generator's steam consumption rate and the annual operation hours. According to the FSR, the single boiler's steam evaporation rate at the design working condition is 43.5t/h, there are two boilers and the total steam evaporation rate is 87.0 t/h. The generator's steam consumption rate is 5.26 kg/kWh, thus the hourly power generation amount = $87.0(t/h) \div 5.26 \text{ kg/kWh} \times 1,000(kg/t) = 16,539.92 \text{ kWh/h}$. The annual operation hours is 8,000, thus the annual electricity generation = $16,539.92 \text{ kWh/h} \times 8,000(h) \div 1,000 \text{ kWh/MWh} = 132,319 \text{ MWh}$. 2) The annual total internal consumption amount was based on the estimated installed capacity equipments in FSR. The actual equipments' installed capacity is larger than the FSR value, thus the annual internal electricity consumption amount is conservative. Furthermore, the actual operation data of the other MSW incineration plants operated by the same project owner has been provided. These plants applied similar technology, it could be found that the actual internal consumption rate is around 19% which confirmed the estimation in the FSR is reasonable. The FSR and the actual equipments list have been provided. 3) & 4) The coefficient of effective electricity and line loss were ignored in the electricity supply estimation.	Not OK, At an appropriate section, all the relevant calculations of the electricity generation, internal consumption and export shall be demonstrated. In the section, all relevant parameters with their input values shall be also demonstrate with supporting documents. If the coefficient is assumed 100% and the loss 0%, they shall be rather interpreted as "estimated conservatively."
			The description of how to estimate the annual electricity generation amount based on technical parameters has been added in the Section B.5 of the revised PDD.	OK, the estimate of the power generation was added to footnote 13 of section B.5. The contents were cross check and confirmed


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TABLE-2 Resolution of Corrective Actions and Clarification Requests

No. CAR, CL	Clarifications and corrective action requests by validation team	Sec. No. in TABLE-1	Summary of project owner response	Validation team Conclusion
				appropriate. CL-11 was closed..
CL-12	Clear demonstration of the criteria used to select similar projects The criteria used to identify similar projects shall be clearly demonstrated with justification. Current descriptions about the criteria are not clear and its justification is insufficient. Conformance of the selected criteria with the additionality tool shall be also demonstrated.	6.15	The criteria of similar have been described in details in the revised PDD.	Not OK, the timing of commercial operation of similar projects shall be more specifically defined. Current definition is not sufficient.
			The MSW incineration projects which in operation before the project's starting date (20 th Mar. 2010) are considered in common practice.	OK, it was confirmed that the new criterion was added to the common practice analysis section as per the new guidelines. CL-12 was closed.
CL-13	Descriptions about CDM projects It shall be clarified whether CDM projects were excluded from the identification of similar projects, in line with the additionality tool.	6.15	The CDM projects were excluded from the common practice, and it has been added in the Section B.5 of the revised PDD.	OK, it was confirmed that CDM projects were excluded. CL-13 was closed.
CL-14	Demonstration of data sources used for selecting similar projects All the data sources used in the identification of similar projects shall be clearly demonstrated.	6.15	The data source of similar project has been added in the revised PDD.	Not OK, though candidate similar projects are listed with their individual information at the footnote, but there are no descriptions about the data sources for making the list of the projects
			The data source of similar projects derived from the 'China Urban Construction Statistical Yearbook 2009' compiled by <i>Ministry of Housing and Urban-Rural Development</i> .	OK, all the relevant data were provided by the project participant and confirmed they are sufficient to support the descriptions. CL-14 was closed.
CL-15	Clarification of identification process of similar projects It is requested to transparently demonstrate the identification processes as well as the result. Currently	6.15	The relevant section has been described in details.	OK, the identification processes are clearly demonstrated. CL-15 was closed.


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TABLE-2 Resolution of Corrective Actions and Clarification Requests

No. CAR, CL	Clarifications and corrective action requests by validation team	Sec. No. in TABLE-1	Summary of project owner response	Validation team Conclusion
	only the final result is demonstrated, that is considered insufficient.			
CL-16	Specific distinctions and relevant data sources Distinctions from the identified similar projects shall be demonstrated more specifically and relevant data sources shall be also demonstrated and provided.	6.15	The relevant section has been described in details.	OK, relevant data sources were demonstrated appropriately. CL-16 was closed.
CL-17	Implications with the Linjiang WtE plant There is the Linjiang WtE plant identified as a similar project in the common practice analysis, which has the same project name as the proposed project. It, therefore, is requested to clarify implications of the proposed project with the Linjiang WtE plant, which shall be explained in the PDD, if appropriate.	6.15	The description of Linjiang first phase project has been added in the common practice of the PDD.	Not OK, the added description does not clearly demonstrate the implication: the subjected project the phase one and the proposed project is the phase two project.
			The description of Linjiang first phase project has been added in the common practice of the PDD. Please Refer to the Section B.5 of the PDD for details.	OK, the relevant descriptions were added to the PDD appropriately. CL-17 was closed.
CL-18	Clarification of data sources of diesel oil consumption The consumption of 0# light diesel oil is assumed 200t/a. Its data source shall be demonstrated appropriately.	7.1	The auxiliary fuel consumption used for ex-ante CER calculation derives from FSR, and the actual consumption from the other plants has been provided to show that the FSR value is conservative.	OK, the data source was confirmed that it derived from the FSR and the amount was justified with the provided CL-18 was closed.
CL-19	Selection of conservativeness factor The background or justification of the selected factor shall be demonstrated.	7.1	The maximum conservativeness factor 1.37 was selected for project emission calculation for conservative.	OK, the background of the selection was confirmed. CL-19 was closed.
CL-20	Specification of the wastewater treatment plant to be constructed Specifications of the wastewater plant shall be clarified and potential emissions from the plant shall be addressed.	5.11	According to the FSR, the methane generated during the wastewater treatment process will be destroyed in the enclosed incinerator. According to the 'Tool to determine project emissions from flaring gases containing methane', the default flare efficiency 90% was introduced in the ex-ante project emission from wastewater treatment process calculation.	OK, it was confirmed that in the FSR the specifications of the plant were described appropriately. Also it was confirmed that the flare tool was appropriately introduced to account for the project emissions from the plant. CL-20 was closed.


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TABLE-2 Resolution of Corrective Actions and Clarification Requests

No. CAR, CL	Clarifications and corrective action requests by validation team	Sec. No. in TABLE-1	Summary of project owner response	Validation team Conclusion
CL-21	Justification of zero AF and zero compliance rate In the PDD AF is assumed zero and also the compliance rate is assumed zero, which shall be justified with appropriate evidence.	5.11	According to the statement from the local government, MSW disposed in landfill sites without landfill gas recovery is the current practice to deal with the MSW without the implementation of the project. Thus the parameter AF is zero. Since there's no mandatory regulations or laws requires the implementation of MSW incineration in China, the parameter compliance rate is zero. All the two parameters are included in the monitoring plan to ensure that the policy will not change during the crediting period.	OK, the appropriateness of the two values assumed was confirmed with the interviews with the local government offices during the site visit. CL-21 was closed.
CL-22	Leakage emission from increased transport ($L_{t,y}$) It shall be addressed whether the project activity involves the captioned emission or not. Currently there are no descriptions about the emission by the project activity. This result shall be reflected to the calculation in the leakage calculation in section B.6.3.	5.11	Due to the transport distance will not increase, thus the leakage emission from increased transport is ignored.	Not OK, relevant situation shall be demonstrated in the PDD appropriately. Currently there are no descriptions about the emissions though neglected.
			The statement from local government indicated that the project did not increase the transportation distance. The statement has been provided.	OK, it was confirmed during the site visit through the interview with the local government authority that the transportation distance would not be increased by the implementation of the project activity. This was confirmed also with a detailed city map indicating relevant locations. CL-22 was closed.
CL-23	Treatment method of residual waste It shall be clarified how the residual waste would be treated and whether it would be necessary to account for emissions due to the treatment.		According to the P.24 of the Meth AM0025, 'In case of waste incineration, leakage emission from the residual waste of MSW incinerator should be account for...', the leakage emission from residual waste included in the CER calculation no matter the treated option.	OK, it was confirmed leakage from the residual waste was accounted for. CL-23 was closed.


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TABLE-2 Resolution of Corrective Actions and Clarification Requests

No. CAR, CL	Clarifications and corrective action requests by validation team	Sec. No. in TABLE-1	Summary of project owner response	Validation team Conclusion
CL-24	Measurement method for light diesel oil consumption There are no descriptions about the measurement method of the consumption, though QA/QC procedure is described. It is, therefore, requested to describe the measurement method to be applied for the project consistent with the monitoring plan.	7.1	The relevant description has been added in the revised PDD. Purchase invoice will be utilized for monitoring the light diesel oil amount.	OK, an appropriate monitoring method was added. CL-24 was closed.
CL-25	Specification of electricity meters It is requested to add some specifications of the electricity meters employed to measure both import and export electricity, such as unidirectional or bidirectional, and the accuracy	7.1	The relevant description has been added in the revised PDD. The meters are bidirectional to monitor the import and export electricity amount.	Not OK, there are no descriptions about the specifications.
			The description of the meters has been added in the revised PDD.	OK, descriptions about the meter specification were added appropriately. CL-25 was closed.
CL-26	Demonstration of monitoring plan for all the parameters Monitoring plan shall cover all the parameters to be monitored with project implementation. Current monitoring plan in the PDD does not cover some parameters to be monitored.	7.1	The relevant parameters have been added in the revised PDD, such as FCF _{MSW} (fraction of fossil carbon in MSW), AF (Methane destroyed due to regulatory or other requirements) and so on.	OK, it was confirmed that required parameters were all listed in the monitoring plan. CL-26 was closed.
CL-27	Monitoring plan of electricity import and export It shall be clarified about the following: 1) A wired-diagram of electricity monitoring be provided to clearly delineate the monitoring plan, especially the locations of electricity meter installations 2) Countermeasures against malfunction of main meter	7.4	The diagram of electricity monitoring with the location of meters has been added in the revised PDD. Measures under the condition that main meter were in malfunction have been added in the PDD.	Not OK, there are no descriptions about the wired-diagram in of the monitoring section. Figure B.1 is not sufficient for the delineation. And countermeasures against malfunctions of the meters are insufficient as well as those for the weighing bridge; current descriptions are not specific and not sufficient.


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TABLE-2 Resolution of Corrective Actions and Clarification Requests

No. CAR, CL	Clarifications and corrective action requests by validation team	Sec. No. in TABLE-1	Summary of project owner response	Validation team Conclusion
			<p>A diagram was added in the Section B.7.2 which shows all the monitoring parameters and meters, and the description of each parameter also added in the Section B.7.2.</p> <p>The measure against malfunction also detailed described in the Section B.7.2.</p>	<p>Not OK, an appropriate diagram shall be added. Countermeasures against meter malfunctions are not clearly addressed.</p>
			<p>The diagram of the electricity monitoring and monitoring meters of wastewater treatment system was added in the B.7.2, the backup electricity meter was also added in the diagram, when the main electricity meter in abnormal, the backup meter will be used for data collection.</p>	<p>OK, An appropriate diagram was provided for both electricity monitoring and biogas flaring monitoring.</p> <p>CL-27 was closed.</p>
CL-28	Calibration of electricity meters The meter shall be calibrated by a certified entity to comply with the CDM requirement and relevant national code.	7.1	<p>The relevant has been added in the revised PDD.</p>	<p>Not OK, the meters shall be calibrated not only based on the relevant contracts, but also national codes. This shall be applied as well to the weighing bridge.</p>
			<p>The electricity meters and weighbridge will be calibrated in line with relevant regulations, the description of the two meters have been updated in the revised PDD.</p>	<p>OK, it was confirmed that the calibration of the weighing bridge and the electricity meters are described in the PDD appropriately.</p> <p>CL-28 was closed.</p>
CL-29	Clarification of EIA report author It shall be clarified and demonstrated the EIA report has been completed by what entity and when.	10.3	<p>The EIA author and completion date have been added in the revised PDD.</p>	<p>OK, it was confirmed that necessary descriptions were added appropriately to the PDD.</p> <p>CL-29 was closed.</p>


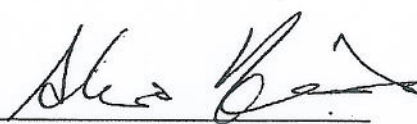
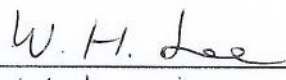
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No. CAR, CL	Clarifications and corrective action requests by validation team	Sec. No. in TABLE-1	Summary of project owner response	Validation team Conclusion
CL-30	Clarification of steam amount imbalance between the boiler steam generation capacity and the turbine steam requirement. According to Table A.1. of the technical specifications, the steam generation capacity of the boiler does not match with the turbine steam requirement that is also addressed in the above response to CL-11. This shall be clarified.	4.2	According to the technical protocol of boiler, the boiler's rated steam evaporation rate is 43.5t/h, and the total steam evaporate amount of two boilers is 87.0t/h which is based on the MSW's net caloric value 6,080kJ/kg. According to FSR, the present MSW's net caloric value is only 4,800kJ/kg, furthermore considering part of steam will be used to preheat air, thus the turbine generator with rated throttle flow 61.64t/h is suitable. The electricity generation estimation is based on the boilers' steam evaporation, it is conservative for the IRR calculation.	OK, the imbalance between the steam evaporation rate by the boilers and the its requirements by the generators are clarified by the explanation left. CL-30 was closed.
CL-31	Evidence of listing by the government entity Provision of relevant evidence of the listing by the government entities of the two remaining projects be provided	6.15	The BOT Agreements of the two projects has been provided, which shows that part of the investment was supplied by local government.	OK, the listing by the government was confirmed and their financial supports were confirmed with the BOTs. CL-31 was closed.
CL-32	Specific demonstration of favorable financial environment "More favorable financial environment" enjoyed by the two remaining projects shall be specifically demonstrated with supporting evidence.	6.15	The BOT Agreements of the two projects has been provided, which shows that part of the investment was supplied by local government.	Not Ok, Pls. provide the two BOTs for validation. We have not yet received them.
			The two BOT were provided as per the request.	OK, the two BOTs were provided and the financial assistance by the local government was confirmed. CL-32 was closed.

APPENDIX B**Certificate of Appointment of Validation Team**

Project Title	Linjiang Erqi MSW Incineration for Power Project
Applied Methodology	AM0025-Ver.12
	Sectoral Scope 13
Designated Operational Entity: Japan Consulting Institute (JCI)	
<p>Reflecting the competence criteria of JCI in accordance with "Criteria for operational entities of LIST of SECTORAL SCOPEs", this is to certify the appointment of validation team of JCI specified below for the CDM project activity above, as per CDM Project Activity Registration Form, "F-CDM-REG" adopted at the 24th Meeting of CDM Executive Board, and Validation Procedure established by JCI CDM Center.</p> <p style="text-align: right;">Date: 02/11/2011</p> <p style="text-align: right;">Signature </p> <p style="text-align: right;">Akio Yoshida, Executive Director, JCI CDM Center</p>	
Client: Eco Frontier	
<p>Reflecting the curricula vitae provided, this is to agree the validation team of JCI specified below for the CDM project activity above, as per Validation Procedure established by JCI CDM Center.</p> <p>It is also agreed that Mr. Mutsuo KATO of JCI participates in the validation activities of the said project for the quality issues under its quality management scheme.</p> <p style="text-align: right;">Date: 08/11/2011</p> <p style="text-align: right;">Signature </p> <p style="text-align: right;">(Name) Wonhee Lee</p> <p style="text-align: right;">(Title) Director, Carbon Business Division</p>	

Validation Team

Validation Team	Name	Assigned Role
Leader	Toshiaki TAKEDA	All relevant issues
Member	Masatoshi SHIBATA	CDM auditor

Technical Reviewer	Takayuki ABE	Waste Handling
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