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# VALIDATION REPORT

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## YUN'AN COUNTY GAOLI STARCH FACTORY WASTEWATER TREATMENT AND BIOGAS RECOVERY PROJECT

:

REPORT No. 2011-01

VERSION No. 04

**KOREAN FOUNDATION FOR QUALITY**



## VALIDATION REPORT

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Client: HANWHA Europe GmbH		Client ref.: Ms. Hye Young Yang	

Summary:

**Project Title :** Yun'An County Gaoli Starch Factory Wastewater Treatment and Biogas Recovery Project

**Annex I project :** Germany

**Host Country :** People's Republic of China

**Project Participants :** Yun'An County Gaoli Starch Factory  
HANWHA Europe GmbH

**Applied Methodology(ver) :** AMS III H (Version 16), AMS I C (Version 19)

**Sectoral Scope :** 1- Energy industries (renewable - / non-renewable sources) (TA 1.1)  
13- Waste handling and disposal (TA 13.1)

**Technology/Measure to be employed :** 5,000 m<sup>3</sup> UASB reactor / Biogas recovery

**Crediting Period :** Fixed 10 years crediting period

**Estimated ER :** 37,880t CO<sub>2</sub>e / year

**Project Size :** Small scale

**Validation Report Status**

☐ CAR/CL Requested


☐ Before DNA approval

☐ Resolution of Outstanding issues

☒ Full approval and submission for registration

As the result of the validation, it can be confirmed that ***Yun'An County Gaoli Starch Factory Wastewater Treatment and Biogas Recovery Project*** as described in the revised PDD of 4 November 2011 (Ver. 1.6), meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the simplified baselines and monitoring methodology AMS III H (Version 16) and AMS I C (Version 19). KFQ thus requests the registration of the project as a CDM project activity.

Work carried out by :

  
 Nam Hoon KIM (Audit team Leader, GHG auditor)  
 Sung Han YOON (Audit team member, GHG auditor)  
 Pyung Hee JANG (Audit team member, GHG auditor)

Work Verified by :

  
 Ji Young SONG  
  
 Jong Mun PARK

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VALIDATION REPORT

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**Abbreviations**

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CL	Clarification request
CO <sub>2</sub>	Carbon dioxide
CO <sub>2e</sub>	Carbon dioxide Equivalent
DNA	Designated National Authority
GHG	Greenhouse gas(es)
KFQ	Korean Foundation for Quality
MoV	Means of verification
MP	Monitoring Plan
NGO	Non-governmental Organisation
ODA	Official Development Assistance
OM	Operating Margin
BM	Build Margin
PDD	Project Design Document
PP	Project Participant
UNFCCC	United Nations Framework Convention for Climate Change

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Appendix A: Validation Protocol

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## **1 INTRODUCTION**

Korean Foundation for Quality (KFQ) has been engaged by HANWHA Europe GmbH to perform a validation of the Yun'An County Gaoli Starch Factory Wastewater Treatment and Biogas Recovery Project in People's Republic of China. This validation report summarizes the findings of the validation of the project, performed on the basis of UNFCCC and host party's criteria for CDM project, 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.

All the validation team's conclusion and opinion on this project activity are made the PDD of Ver.1.5, 4 July 2011, as a basis. Final PDD will be followed the structure and guidance in the latest relevant PDD template (CDM-PDD, Ver.03) and the 'Guidelines for Completing the Project Design Document (CDM- SSC-PDD), and the form for Proposed New Small Scale Methodologies (CDM-SSC-NM, Ver.05) for Small-Scale CDM project.

The Project is classified with sectoral scope 13 - Waste handling and disposal (TA 13.1) for methane recovery from waste water treatment and biogas utilization and sectoral scope 1 – Energy Industries (renewable / non-renewable sources) (TA 1.1) for heat generation component in Yun'An County Gaoli Starch Factory.

It is estimated that the proposed project activity will recover and utilize 3 million m<sup>3</sup> methane which can be replaced 2,250 tones of coal for heating and expected CO<sub>2</sub> reduction is estimated to be 37,880 tCO<sub>2</sub>e per year and 378,800 tCO<sub>2</sub>e over 10 years crediting period.

### **1.1 Objective**

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, the monitoring plan (MP), and the project's compliance with relevant UNFCCC and host countries criteria are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

### **1.2 Scope**

The validation scope is defined as an independent and objective review of the project design

document (PDD), the project's baseline study, monitoring plan and other relevant documents. The information in these documents is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed on the Marrakech Accords and the relevant decisions by the CDM Executive Board including the approved baseline and monitoring methodology. KFQ has employed a risk-based approach to the validation that is based on the recommendation in the Validation and Verification Manual.

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

### **1.3 Validation Team**

The validation team consisted as follows:

Nam Hoon KIM (Audit team Leader, GHG auditor)  
Sung Han YOON (Audit team member, GHG auditor)  
Pyung Hee JANG (Audit team member, GHG auditor)

Technical review was implemented by technical reviewers, Ji Young SONG and Jong Mun PARK.

The qualification of each individual verification team member and a technical reviewer are detailed in Appendix B and Appendix C to this report.

## **2 METHODOLOGY**

The validation consists of the following three phases:

- I a desk review of the project design documents
- II follow-up interviews with project stakeholders
- III The resolution of outstanding issues and the issuance of the final validation report and opinion.

In order to ensure transparency, a validation protocol for CDM project was customized for the project, according to the Validation and Verification Manual. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organizes details and clarifies the requirements a CDM project is expected to meet;

- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of three tables. The different columns in these tables are described in Figure 1. The completed validation protocol is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of validation protocol criteria or where a risk to the fulfilment of project objectives is identified. Corrective Action Requests (CAR) are issued, where:

- mistakes have been made with a direct influence on project results;
- validation protocol requirements have not been met; or
- there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

The term Clarification (CL) is issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

The validation team has assessed the proposed CAR with a positive result and after the closure of these CARs and CLs the proponent has issued the final version of the PDD. On the basis of this the final validation report and opinion were issued.

<b><i>Validation Protocol Table 1: Requirements and Means of Validation for Clean Development Mechanism Project Activity</i></b>				
<b><i>Checklist Question</i></b>	<b><i>Reference</i></b>	<b><i>Criteria</i></b>	<b><i>Comment</i></b>	<b><i>Draft and/or Final Conclusion</i></b>
<i>The various requirements in Table 2 are linked to checklist questions the project should meet. The checklist is organised in five different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.</i>	<i>Gives reference to criteria documents where the answer exists.</i>	<i>The requirement number in criteria document</i>	<i>The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached. N/A means not applicable.</i>	<i>This is either acceptable based on evidence provided (OK), or a <b>Corrective Action Request (CAR)</b> due to non-compliance with the checklist question (See below). <b>Clarification Request (CL)</b> is used when the validation team has identified a need for further clarification.</i>

<b>Validation Protocol Table 2: Resolution of Corrective Action and Clarification Requests</b>			
<b><i>Draft report clarifications and corrective action requests</i></b>	<b><i>Ref. to checklist question in table 2</i></b>	<b><i>Summary of project owner response</i></b>	<b><i>Validation conclusion</i></b>
<i>If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.</i>	<i>Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.</i>	<i>The responses given by the Client or other project participants during the communications with the validation team should be summarised in this section.</i>	<i>This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".</i>

**Figure 1 Validation Protocol Tables**

## 2.1 Desk review of the Documents

The Project Design Document (PDD) version 1.1 was submitted on 12 March 2010 and reviewed with additional background documents related to the project design including baseline and additionality of the project. A complete list of all documents and proofs reviewed is in section 6, Reference, to this report.

Main changes between the versions published for the 30 days stakeholders commenting period and the final version submitted for registration:

- Changes related to the CARs and CLs identified in the KFQ's validation report
- Changes related to the methodologies revision
- Changes related to Request for Review from EB

## 2.2 Follow-up Interviews with Project Stakeholders

Issues identified by KFQ during the subsequent stages of the validation have been clarified through continuous communication with the project participants. The project participants have also provided underlying documentation for review by KFQ, confirming selected information and resolving issues identified in the validation

In the period of 12 April 2010 to 13 April 2010, KFQ performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. The main topics of the interviews are summarized in Table 1.



**Table 1 Interview topics**

Interviewed organisation	Interview topics
Yun'An County Gaoli Starch Factory - Huang Zhenhua - Zhu Feng	<ul style="list-style-type: none"> <li>➤ <i>Project design</i></li> <li>➤ <i>Project technology, operation, maintenance</i></li> <li>➤ <i>Sustainable development issues</i></li> <li>➤ <i>Additionality</i></li> <li>➤ <i>Environmental impacts(incl. EIA approval)</i></li> <li>➤ <i>Stakeholder consultation process</i></li> <li>➤ <i>Monitoring plan</i></li> </ul>
Baraka Global Advisors - Cui Xin  IT Power - Penny Chen - Kathy Yin	<ul style="list-style-type: none"> <li>➤ <i>Applicability of selected methodology</i></li> <li>➤ <i>Baseline determination</i></li> <li>➤ <i>Additionality</i></li> <li>➤ <i>Emission reductions calculation</i></li> <li>➤ <i>Crediting Period</i></li> <li>➤ <i>Approval by the host country</i></li> </ul>
Local government - Huang Qing Xiao - Luo Jin Tao - Wu Hong Feng - Zeng Xue Rong - Zhu Mu Yuan	<ul style="list-style-type: none"> <li>➤ <i>Environmental issues</i></li> <li>➤ <i>Stakeholder comments</i></li> <li>➤ <i>Sustainable development issues</i></li> </ul>
Representative of local stakeholder - Huang Xing Dong - Pan Jin Quan - Huang Qing Jing	<ul style="list-style-type: none"> <li>➤ <i>Environmental issues</i></li> <li>➤ <i>Stakeholder comments</i></li> <li>➤ <i>Sustainable development issues</i></li> </ul>

## 2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation is to resolve any outstanding issues which need to be clarified prior to KFQ's positive conclusion on the project design. In order to guarantee the transparency of the validation process, the concerns raised by KFQ and responses provided by project participant are documented in Table 2 of the validation protocol in Appendix A.

For this project, twelve(12) Corrective Action Requests (CAR) and three(3) requests for Clarification (CL) were identified. These requests were presented to the project participant in a CAR/CL report on 25 April 2010. The additional information provided by the project participant to address these requests and revised PDD of 4 November 2011 resolved the all Corrective Action Request and requests for Clarification an Request for Review to KFQ's entire satisfaction.

## 2.4 Internal Quality Control

According to KFQ's Procedure for deciding whether to proceed request for registration, the final validation report and validation findings underwent a technical review before being submitted to the project participants for requesting registration of the project activity. The technical review was performed by a technical reviewer qualified in accordance with KFQ's qualification scheme for CDM validation and verification.

### **3 VALIDATION FINDINGS**

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

#### **3.1 Participation Requirements**

The project participants are Yun'An County Gaoli Starch Factory (hereinafter, PP or Project owner) as the project owner from the host Party, People's Republic of China, and HANWHA Europe GmbH, representing the Annex I Party, Germany. Both Parties meet the requirements to participate in the CDM.

The Letter of Approval (LoA) from China was obtained on 30 July 2010 authorizing Yun'An County Gaoli Starch Factory and HANWHA Europe GmbH as project participants. The LoA also confirms that the project activity assists China in achieving sustainable development. The approval letter was provided by PP and the validation team checked the website of China DNA \* to confirm the approval of the project.

The DNA of Germany has also issued a LoA on 9 June 2011. This LoA authorizes HANWHA Europe GmbH as project participant. The validation team checked detail information of the LoA of Germany such as address, website, signature & name on LoA and website<sup>†</sup> of Germany DNA as well. And we found that all information is consistent with the registered CDM projects approved by Germany and found the proposed project was on the website of Germany DNA correctly. Thus the validation team confirmed that there is no doubt on LoA of Germany provided from the PP.

The validation team has confirmed the consistency of project participant's information in section A.3 and Annex 1 of the PDD, DNA approval letters and MoC. The approval letters are also in accordance with paragraphs 45-48 of VVM ver. 01.2.

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\* <http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File2473.pdf>

† <https://www.jicdm.dehst.de/promechg/pages/project1.aspx>

The validation did not reveal any information indicating that the project can be seen as a diversion of official development assistance (ODA) funding towards China. The financing structure of the project activity is 100% from equity of project owner.

Nevertheless, CAR 1 was raised in the course of the validation. and was successfully closed (ref Annex: Validation Protocol- Table 3).

### **3.2 Project Design**

The proposed project activity is the Methane Recovery Project of Yun'An County Gaoli Starch Factory Wastewater Treatment and Biogas Recovery which is developed by the Yun'An Gaoli Starch Factory and it is a methane recovery project from wastewater treatment and biogas utilization for heat generation.

Yun'An County Gaoli Starch Factory produces the starch from cassava and generates about 2,000m<sup>3</sup> of wastewater per day of which the influent COD is around 23,000mg/l. In the proposed project activity, wastewater is treated by a sequential wastewater treatment system composed of Upflow Anaerobic Sludge Bed (UASB) reactor, aerobic pond and a sedimentation pond and then discharged to the local river. A methane recovery system was introduced to the wastewater treatment system and the recovered methane was combusted in an existing furnace which used to use coal as fuel to produce hot air to dry out the starch for the starch production process.

The project will reduce greenhouse gas emissions through avoidance of methane emissions to the atmosphere from wastewater treatment and reduction of coal consumption for hot air generation by using recovered methane as fuel. It is estimated that the proposed project activity will recover and will utilized about 2.9 million m<sup>3</sup> methane which can be replaced 2,250 tonne of coal for heating and the expected CO<sub>2</sub> reduction is estimated to be 37,880tCO<sub>2</sub>e per year and 378,800 t CO<sub>2</sub>e over the 10 years fixed crediting period. Moreover, the project will contribute to sustainable development by reducing air pollution by SO<sub>x</sub> and PM from coal combustion and reducing coal ash waste generation and reducing health damage and danger from biogas diffusion, such as odor and danger of explosion of methane furthermore it will contribute to the local economic development through creation of new employment.

The starting date of the project has been validated by KFQ as 6 June 2008 which represents the date of construction contract including equipments purchasing between PP and Hainan Zhenyuan Environmental Technical Limited. KFQ confirmed that this starting date is the earliest date at which either the implementation or construction or real action of a project activity begins after reviewing the documents below.

To confirm this date, validation team examined following dates:

- Construction contract including equipments purchasing : 6 June 2008

- Construction commencement: 11 June 2008
- Operation start : June 2009

Thus, KFQ regarded ‘construction contract including equipments purchasing’ as an official implementation to proceed with the project activity and accepted it as the starting date because it is the earliest date at which either the implementation or construction or real action of a project activity begins. And also project owner was committed to expenditures related to the implementation or related construction of the project activity.

The designed operational life time of the project is estimated as 20 years by the FSR and a fixed crediting period of 10 year is selected starting in 1 July 2011 or on the date of registration of the CDM project activity whichever is later.

The remaining lifetime of main project equipments(UASB, furnace) are demonstrated through statement for equipments(UASB, furnace) remaining lifetime from the equipment supplier according to Indicative Simplified Baseline and Monitoring Methodologies for Selected Small-Scale CDM Project Activity Categories(Ver. 13), EB54 Annex 14. Thus KFQ confirmed the remaining lifetime of installed equipments (22 years) cover the operation lifetime(20 years) and crediting period of the project activity as well.

All the description of the project as contained in the PDD was identified through objective evidences such as Feasibility Study Report, Environment Impact Assessment, construction contract of this project activity and the Board meeting minute etc. as well as physical site visit. KFQ also confirms that the PDD is in compliance with relevant forms and guidances. Through above assessment, the validation team conclude that the PDD is complying with relevant forms and guidance and the project description is accurate and complete.

The process undertaken to validate the accuracy and completeness of the project description includes document review and cross-check with the relevant approvals. Complying with para.64/VVM version 01.2, KFQ hereby is able to confirm that the project description in PDD is accurate and complete in all respects.

Nevertheless, CAR 2 was raised in the course of the validation and was successfully closed (ref Annex: Validation Protocol- Table 3).

### **3.3 Baseline Determination**

#### **Project boundary**

The project boundary was assessed through the physical site inspection, interviews and the

evidence received on the design of the project.

In the baseline scenario, the boundary includes the starch factory, the lagoon-based system and one furnace with coal as fuel. And in the project scenario, the parts affected by the project activity include the newly built wastewater treatment system with biogas recovery(UASB) and utilization replacing original lagoon-based system which consists of a Sedimentation pond, UASB reactor, Aerobic pond with equipped blowing device and Final sedimentation pond. Furthermore, the furnace was retrofitted to dual-fired furnace(biogas and coal used as fuel) without expanding its capacity. Since electricity sourced from China Southern Power Grid (CSPG) will be used in the project activity, the power grid is also included in the project boundary.

The validation team checked FSR which was established by Hainan Construction Project Planning Design Research Institute dated on September 2007 in order to confirm the project boundary and confirmed that the identified boundary and the selected sources and gases as documented in the PDD are justified for the project activity.

#### **Applicability of the selected methodology to the project activity**

All the applicability criteria listed by AMS III H (Version 16) and AMS I C (Version 19) have been discussed in the PDD with corresponding evidences provided as below table and it has been validated that AMS III H (Version 16) and AMS I C (Version 19) is applicable to the proposed project activity.

Above options are all considered to be in compliance with all mandatory applicable legal and regulatory requirements. Thus the validation team concludes that the “Combined tool to identify the baseline scenario and demonstrate additionality” (Version 3.0) has been correctly applied to the identification of alternatives to the project activity and the identification of alternatives are complete under relevant national and/or sectoral policies and circumstances.

[Table 1] Applicability AMS III H and validation result

Applicability	Validation result with Evidence
1.This methodology comprises measures that recover biogas from biogenic organic matter in wastewater by means of one, or a combination, of the following options:  (f) Introduction of a sequential stage of wastewater treatment with biogas recovery and combustion, with or without sludge treatment, to an anaerobic wastewater treatment system without biogas recovery	The project introduced a sequential stage of wastewater treatment including UASB reactor with methane recovery to replace the open anaerobic lagoons without methane recovery. It was confirmed by on- site check and reviewing the FSR.
2.In cases where baseline system is anaerobic lagoon the methodology is applicable if:	(a) The depth of lagoon in baseline system is greater than two meters confirmed by direct measurement

<p>(a) The lagoons are ponds with a depth greater than two meters, without aeration. The value for depth is obtained from engineering design documents, or through direct measurement, or by dividing the surface area by the total volume. If the lagoon filling level varies seasonally, the average of the highest and lowest levels may be taken;</p> <p>(b) Ambient temperature above 15°C, at least during part of the year, on a monthly average basis;</p> <p>(c) The minimum interval between two consecutive sludge removal events shall be 30 days.</p>	<p>and by PP and checking the lagoon through site visit.</p> <p>(b) Monthly average ambient temperature in baseline system is above 15 °C during most of the year confirmed by statistical temperature record issued by the Guangdong province.</p> <p>(c) The sludge removal event in baseline system was not conducted since starting the wastewater inflow to the lagoon confirmed by checking status of lagoon management and interview with PP. Thus the sludge removal events in baseline system are greater than 30 days.</p>
<p>3.The recovered biogas from the above measures may also be utilised for the following applications instead of combustion/flaring:</p> <p>(a) Thermal or mechanical,2 electrical energy generation directly;</p> <p>(b) Thermal or mechanical, electrical energy generation after bottling of upgraded biogas, in this case additional guidance provided in Annex 1 shall be followed; or</p> <p>(c) Thermal or mechanical, electrical energy generation after upgrading and distribution, in this case additional guidance provided in Annex 1 shall be followed:</p> <p>(i) Upgrading and injection of biogas into a natural gas distribution grid with no significant transmission constraints;</p> <p>(ii) Upgrading and transportation of biogas via a dedicated piped network to a group of end users; or</p> <p>(iii) Upgrading and transportation of biogas (e.g. by trucks) to distribution points for end users.</p> <p>(d) Hydrogen production;</p> <p>(e) Use as fuel in transportation applications after upgrading.</p>	<p>The proposed project is covered under (a). The recovered methane is utilized directly for thermal energy generation. It was confirmed by site-visit and reviewing the FSR.</p>
<p>4.If the recovered biogas is used for project activities covered under paragraph 3 (a), that component of the project activity can use a corresponding methodology under Type I.</p>	<p>PP used the approved baseline and monitoring methodology AMS I.C.(ver. 19) for the heat generation component of the project activity.</p>
<p>5.For project activities covered under paragraph 3 (b), if bottles with upgraded biogas are sold outside the project boundary, the end-use of the biogas shall be ensured via a contract between the bottled biogas vendor and the end-user. No emission reductions may be claimed from the displacement of fuels from the end use of bottled biogas in such situations. If however the end use of the bottled biogas is included in the project boundary and is monitored during the crediting period CO2 emissions avoided by the displacement of fossil fuel can be claimed under the corresponding Type I methodology, e.g. AMS-I.C .Thermal energy production with or without electricity.</p>	<p>The proposed project is covered under 3(a).</p> <p>Thus, not applicable</p>
<p>6.For project activities covered under paragraph 3 (c) (i), emission reductions from the displacement of the use of natural gas are eligible under this methodology, provided the</p>	<p>The proposed project is covered under 3(a).</p>

geographical extent of the natural gas distribution grid is within the host country boundaries.	Thus, not applicable
7.For project activities covered under paragraph 3 (c) (ii), emission reductions for the displacement of the use of fuels can be claimed following the provision in the corresponding Type I methodology, e.g. AMS-I.C.	The proposed project is covered under 3(a).  Thus, not applicable
8.In particular, for the case of 3 (b) and (c) (iii), the physical leakage during storage and transportation of upgraded biogas, as well as the emissions from fossil fuel consumed by vehicles for transporting biogas shall be considered. Relevant procedures in paragraph 11 of Annex 1 of AMS-III.H .Methane recovery in wastewater treatment. shall be followed in this regard.	The proposed project is covered under 3(a).  Thus, not applicable
9.For project activities covered under paragraph 3 (b) and (c), this methodology is applicable if the upgraded methane content of the biogas is in accordance with relevant national regulations (where these exist) or, in the absence of national regulations, a minimum of 96% (by volume).	The proposed project is covered under 3(a).  Thus, not applicable
10.If the recovered biogas is utilized for the production of hydrogen (project activities covered under paragraph 3 (d)), that component of the project activity shall use the corresponding methodology AMS-III.O .Hydrogen production using methane extracted from biogas.	The proposed project is covered under 3(a).  Thus, not applicable
11.If the recovered biogas is used for project activities covered under paragraph 3 (e), that component of the project activity shall use corresponding methodology AMS-III.AQ .Introduction of Bio-CNG in road transportation.	The proposed project is covered under 3(a).  Thus, not applicable
12.New facilities (Greenfield projects) and project activities involving a change of equipment resulting in a capacity addition of the wastewater or sludge treatment system compared to the designed capacity of the baseline treatment system are only eligible to apply this methodology if they comply with the relevant requirements in the .General guidelines to SSC CDM methodologies. In addition the requirements for demonstrating the remaining lifetime of the equipment replaced, as described in the general guidelines shall be followed.	The project is not a Greenfield project and the project activity does not involve a change of equipment resulting in a capacity addition of the wastewater or sludge treatment system. It was validated through plant design and equipment specification.
13.The location of the wastewater treatment plant as well as the source generating the wastewater shall be uniquely defined and described in the PDD.	The location of the wastewater treatment plant can be uniquely defined. The location is confirmed by the map and coordination on PDD.
14.Measures are limited to those that result in aggregate emissions reductions of less than or equal to 60 kt CO <sub>2</sub> equivalent annually from all Type III components of the project activity.	Annual emission reduction is estimated as 37,880 t CO <sub>2e</sub> , which is less than the 60,000 t CO <sub>2e</sub> stipulated as threshold for this project category. To ensuring the annual emission reduction below than 60,000 t CO <sub>2e</sub> , PP provided the future production plan made on 17 January 2005, indicating the current production

	line is proved to be most suitable and feasible design for the plant by pre-study and running result. Furthermore, the installed capacity of the production line is 60 tons per day, and current production has reached 54 ~58 tons/day. In a very long-term, the PP will keep the production stable at 58 ~ 60 tons per day. And the validation team simulated emission reduction with full capacity of the production line (daily production amount as 60 tons) in project scenario. As a result of simulation, KFQ confirmed that emission reduction of this project activity in full capacity is still less than 60,000 t CO <sub>2e</sub>
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[Table 2] Applicability AMS I C and validation result

Applicability	Validation result with Evidence
1.This methodology comprises renewable energy technologies that supply users with thermal energy that displaces fossil fuel use. These units include technologies such as solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel.	The project activity comprises biomass energy technologies that supply users with thermal energy that displaces coal use.
2.Biomass-based cogeneration systems are included in this category. For the purpose of this methodology .cogeneration. shall mean the simultaneous generation of thermal energy and electrical energy in one process. Project activities that produce heat and power in separate element processes (for example heat from a boiler and electricity from a biogas engine) do not fit under the definition of cogeneration project.	The proposed project is only generates heat. It is not cogeneration system. It was checked by FSR and on-site check.
3.Emission reductions from a biomass cogeneration system can accrue from one of the following activities: (a) Electricity supply to a grid; (b) Electricity and/or thermal energy (steam or heat) production for on-site consumption or for consumption by other facilities; (c) Combination of (a) and (b).	Generated thermal energy (heat) is used for on-site consumption. It was checked through FSR and on-site check.
4.The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW thermal (see paragraph 6 for the applicable limits for cogeneration project activities).	The total installed thermal energy generation capacity of the furnace (co-fired systems, both fossil and renewable fuel) in the proposed project is 1.4MW confirmed by the furnace specification, which is less than 45MW thermal.
5.For co-fired systems, the total installed thermal energy generation capacity of the project equipment, when using both fossil and renewable fuel, shall not exceed 45 MW thermal (see paragraph 6 for the applicable limits for	The total installed thermal energy generation capacity of the furnace (co-fired systems, both fossil and renewable fuel) in the proposed project is 1.4MW



cogeneration project activities).	confirmed by the furnace specification, which is less than 45MW thermal.
<p>6.The following capacity limits apply for biomass cogeneration units:</p> <p>(a) If the project activity includes emission reductions from both the thermal and electrical energy components, the total installed energy generation capacity (thermal and electrical) of the project equipment shall not exceed 45 MW thermal. For the purpose of calculating this capacity limit the conversion factor of 1:3 shall be used for converting electrical energy to thermal energy (i.e. for renewable energy project activities, the maximal limit of 15 MW(e) is equivalent to 45 MW thermal output of the equipment or the plant);</p> <p>(b) If the emission reductions of the cogeneration project activity are solely on account of thermal energy production (i.e. no emission reductions accrue from the electricity component), the total installed thermal energy production capacity of the project equipment of the cogeneration unit shall not exceed 45 MW thermal;</p> <p>(c) If the emission reductions of the cogeneration project activity are solely on account of electrical energy production (i.e. no emission reductions accrue from the thermal energy component), the total installed electrical energy generation capacity of the project equipment of the cogeneration unit shall not exceed 15 MW.</p>	<p>The proposed project is only generates heat. It is not cogeneration system. It was checked through design and equipment specification and FSR and on-site check.</p> <p>Thus, not applicable</p>
7.The capacity limits specified in the above paragraphs apply to both new facilities and retrofit projects. In the case of project activities that involve the addition of renewable energy units at an existing renewable energy facility, the total capacity of the units added by the project should comply with capacity limits in paragraphs 4 to 6, and should be physically distinct <sup>5</sup> from the existing units.	<p>The proposed project activity is not involved the addition of renewable energy units at an existing renewable energy facility.</p> <p>Thus, not applicable.</p>
8.Project activities that seek to retrofit or modify an existing facility for renewable energy generation are included in this category.	The proposed project is retrofit an existing facility(furnace) for renewable energy generation(CH <sub>4</sub> ). It was checked PDD and on-site check.
9.New Facilities (Greenfield projects) and project activities involving capacity additions compared to the baseline scenario are only eligible if they comply with the related and relevant requirements in the .General Guidelines to SSC CDM methodologies.	<p>The project is not a Greenfield project and the project activity is involved a capacity addition in heat generation system</p> <p>It was validated through plant design and equipment specification.</p>
10.If solid biomass fuel (e.g. briquette) is used, it shall be demonstrated that it has been produced using solely renewable biomass and all project or leakage emissions associated with its production shall be taken into account in the emissions reduction calculation.	<p>The proposed project is not use a solid biomass fuel. The project uses biogas such as CH<sub>4</sub>.</p> <p>Thus, not applicable</p>
11.Where the project participant is not the producer of the processed solid biomass fuel, the project participant and the producer are bound by a contract that shall enable the project participant to monitor the source of the renewable biomass to	The proposed project is not use a solid biomass fuel. The project uses biogas such as CH <sub>4</sub> .

account for any emissions associated with solid biomass fuel production. Such a contract shall also ensure that there is no double-counting of emission reductions.	Thus, not applicable
12.If electricity and/or steam/heat produced by the project activity is delivered to a third party i.e. another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into that ensures there is no double-counting of emission reductions.	The produced heat is consumed only for internal use such as starch production process. It was checked through the FSR
13.If the project activity recovers and utilizes biogas for power/heat production and applies this methodology on a stand alone basis i.e. without using a Type III component of a SSC methodology, any incremental emissions occurring due to the implementation of the project activity (e.g. physical leakage of the anaerobic digester, emissions due to inefficiency of the flaring), shall be taken into account either as project or leakage emissions.	Because the proposed project activity includes the biogas recovery, the proposed project applies the approved small scale methodology AMS III H “Methane recovery in wastewater treatment” (Version 16) with this methodology. It was checked through project design and FSR.
14.Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources provided: (a) Charcoal is produced in kilns equipped with methane recovery and destruction facility; or (b) If charcoal is produced in kilns not equipped with a methane recovery and destruction facility, methane emissions from the production of charcoal shall be considered. These emissions shall be calculated as per the procedures defined in the approved methodology AMS-III.K.7 Alternatively, conservative emission factor values from peer reviewed literature or from a registered CDM project activity can be used, provided that it can be demonstrated that the parameters from these are comparable e.g. source of biomass, characteristics of biomass such as moisture, carbon content, type of kiln, operating conditions such as ambient temperature.	The proposed project is not use charcoal based biomass energy generation. The project uses biogas such as CH <sub>4</sub> from the wastewater treatment. It was checked through project design and FSR.  Thus, not applicable

Furthermore, the validation team confirmed the proposed project activity also meets the requirements in General Guideline to SSC CDM methodologies (Ver. 15) such as eligibility, debundling, equipment performance, IPCC default values for emission coefficients and monitoring as well. The assessment for applicability of the SSC CDM methodologies for the proposed project has been described in the Appendix A of the report.

**Identification of alternatives to the project activity consistent with current laws and regulations**

Four alternative baseline scenarios including the proposed project activity without CDM have been identified as follows.

**Sub-step 1a: Define alternative scenarios to the proposed CDM project activity**

For the heat generation component, according to paragraph 16 of AMS I.C (Version 19), the simplified baseline is the fuel consumption of the technologies that would have been used in the absence of the project activity, times an emission factor for the fossil fuel displaced. For the proposed project, the fossil fuel displaced is coal.

Therefore, the baseline scenarios for the heat generation that are available to the project participant can be listed as follows:

- Scenario H1: Heat generation using co-fuel (coal and biogas) in a furnace (the proposed project activity undertaken without being registered as a CDM project activity);
- Scenario H2: Heat generation using coal in a furnace (correspond with the baseline scenario of AMS I.C. stipulated in paragraph 16).

Alternative scenarios for wastewater treatment (W) that are available to the project participant include:

- Scenario W1: Anaerobic digester with methane recovery (the proposed project activity undertaken without being registered as a CDM project activity);
- Scenario W2: The untreated wastewater being discharged into sea, river, lake, stagnant sewer or flowing sewer and
- Scenario W3: The (existing) anaerobic wastewater treatment system without methane recovery.

Thus, possible and reasonable combinations of each scenario are described as follows;

- Combination 1: H1 and W1
- Combination 2: H2 and W2
- Combination 3: H2 and W3

**Sub-step 1b: Consistency with mandatory applicable laws and regulations**

According to the “Discharge limits of water pollutants (DB44/26-2001, 20 August 2001)” of Guangdong province, the wastewater which is discharged into the sea, river, lake, stagnant sewer or flowing sewer, has to be reduced of COD in wastewater lower than 100 mg/l. Because the wastewater from the starch production line before wastewater treatment will contain as much as about 22,560mg/l of COD, alternative Scenario W2, untreated wastewater being discharged into sea, river, lake, stagnant sewer or flowing sewer, does not comply with the mandatory applicable laws and regulations and thus Scenario W2 eliminated from the alternative scenarios.

Therefore, the Combinations 1 and 3 remain as baseline scenarios for the proposed CDM

project activity. Regard to the combination 1, the validation team described its financial unfeasibility to the next Investment analysis section in the report. Thus, Combination 3 remains as baseline scenario.

Thus the validation team concludes that the baseline scenario has been correctly established through applying AMS I.C(Ver. 19), AMS III.H(Ver.16) and Combined tool to identify the baseline scenario and demonstrate additionality (Ver 3.0) and the identification of alternatives are complete under relevant national and/or sectoral policies and circumstances.

### **Algorithms and/or formulae used to determine emission reductions**

The validation team has assessed the calculations of project, baseline, leakage emissions as well as the emission reductions. Corresponding calculations were carried out based on calculation spread-sheets. The parameters and equations presented in the PDD and further documentation have been compared with the information and requirements presented in the methodologies and respective tools. The equation comparison has been made explicitly in regard of formulae presented in PDD and the emission reduction calculation spreadsheet.

The assumptions and data used to determine the emission reductions are listed in the PDD and all the sources have been checked and confirmed. Based on the information reviewed, it can be confirmed that the sources used are correctly quoted and interpreted in the PDD. And the values presented in the PDD are considered reasonable based on the documentation reviewed, further references and the result of the interviews.

Finally, the validation team has confirmed that the application, discussion and determination of the chosen baseline methodologies are transparent and reasonable and baseline for this project activity is reasonably determined by considering relevant national and/or sectoral policies and circumstances. Also validation team validated the key assumption, calculations and rationales used in the PDD by checking the documents and sources referred to in the PDD and methodologies.

#### **(1) Baseline emission**

The calculation of the baseline emissions followed the procedures described in the methodologies AMS-III.H, version 16 and AMS-I.C, Version 19. Emission reductions within the impact of proposed project activity are divided into two components:

- Component 1 : the methane emission reductions caused by biogas capturing, and
- Component 2 : the CO<sub>2</sub> emission reductions resulted from the displacement of fossil fuel with biogas captured to generate heat.

The baseline emissions are therefore divided into two components:

**Component 1:**

The project activity would introduce the UASB digester with methane recovery facilities instead of the existing open lagoons system, and the recovered methane would be used to the fuel for the existing furnace which was operated from November 2004.

The project activity does not involve a capacity addition of the wastewater treatment system compared to the design capacity of baseline treatment system. And the project activity introduces a Sedimentation pond, UASB reactor, Aerobic pond with equipped blowing device and Final sedimentation pond. The wastewater treatment system's capacity is unaffected.

The FSR clearly shows that the capacity of the project system can treat the quantity of wastewater 600,000m<sup>3</sup>/y with the COD load around 23,000mg/l. Since the project activity does not affect the starch production system, the capacity of the project activity corresponds to the production capacity. The project system for wastewater treatment is matched to the existing production line capacity designed by the authorized third party design institute. And the validation team checked the capacity of production was not changed due to the project activity.

The formulae required for the determination of baseline emissions for component 1 is correctly presented, enabling a complete identification of parameters to be used and/ or monitored. The validation on each baseline emission parameter and associated estimation for baseline emission are described in below Table 3.

The formulae for baseline emissions for component 1 is :

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

Where,

Baseline emissions of the sludge treatment systems affected by the project activity in year y( $BE_{s,treatment,y}$ ) regarded as zero because baseline emission of the project does not include sludge treatment component. Therefore the items concerning sludge treatment will be regarded as zero.

Baseline methane emissions from anaerobic decay of the final sludge produced in year y( $BE_{s,final,y}$ ). The sludge of the project is used for soil application in the baseline situation therefore this term is regarded as zero.

[Table 3] Equation and parameters for baseline emission

Parameter Title	Final Value	Description	Means of Verification	Comment	
<b>BE<sub>power,y</sub></b>	66 tCO <sub>2</sub> /yr	Baseline emissions from electricity or fuel consumption in year y	Calculated value $BE_{power,y} = EC_{BL,y} * EF_{grid,CM,y} * (1+TDL_y)$	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes
<b>EC<sub>BL,y</sub></b>	79.2 MWh/yr	Quantity of electricity that would be consumed by the baseline electricity consumption source in year y	Investigated the electrical equipment such as capacity(11KW) and operation hour that are used in baseline scenario. Thus, we confirmed the value is calculated appropriately and valid.	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes
<b>EF<sub>grid,CM,y</sub></b>	0.7880 tCO <sub>2</sub> /MWh	Combined margin emission factor of the grid system	Investigated CO <sub>2</sub> emission factor of identified grid for the project activity, for the proposed project, the identified grid is China Southern Power Grid. And average technical transmission and distribution losses for providing electricity from grid in the project activity which is the most updated data resource from the China Southern Power Grid.	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes

Parameter Title	Final Value	Description	Means of Verification	Comment	
<b>TDL<sub>y</sub></b>	6.22%	Average technical transmission and distribution losses for providing electricity from grid in the project activity	Investigated China Electric Power Yearbook 2009	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
<b>BE<sub>ww,treatment,y</sub></b>	37,719 tCO <sub>2</sub> /yr	Methane emissions from the baseline wastewater treatment systems affected by the project	Calculated value $BE_{ww,treatment,y} = \sum Q_{ww,i,y} * COD_{removed,i,y} * MCF_{ww,treatment,BL,i} * B_{o,ww} * UF_{BL} * GWP_{CH4}$	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
<b>Q<sub>ww,i,y</sub></b>	509,543 m <sup>3</sup> /year	Volume of wastewater treated in baseline wastewater treatment system <i>i</i> in year <i>y</i>	Volume of wastewater was an average value of 10 days' measurement record(16/07/2010 ~25/07/2010). It was verified by checking measurement record.  Annual operation day is taken from FSR and it was checked that the historical two year operation records (2007 and 2008) and found the records show that the plant operated 300 days and 298 days in 2007 and 2008 respectively. Because the starch production facility got two months' maintenance period every year, the annual operational day is around 300 days. Also	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes

Parameter Title	Final Value	Description	Means of Verification	Comment	
			we found the other similar projects applied 300 days for annual operation day. Thus we confirmed annual operation day applied to the proposed project activity is valid and appropriate for this project. Thus, 300 days applied for operation day is valid.		
<b>COD<sub>ww,removed,i,y</sub></b>	0.020000703 tons/ m <sup>3</sup>	Chemical oxygen demand removed by baseline treatment system <i>i</i> in year <i>y</i> (tonnes/m <sup>3</sup> ), measured as the difference between inflow COD and the outflow COD in system <i>i</i>	The COD <sub>removed</sub> uses the measured data from 10 days' continuous monitoring record(02/03/2009 ~ 30/03/2009). It was confirmed that the measurement is undertaken during a period that is representative for the typical operation conditions of the systems by checking the temperature record and production record in that period by the document "Demonstration of representative of measurement campaign condition" dated on 24 September 2010.	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes
<b>MCF<sub>ww,treatment,BL,i</sub></b>	0.8	Methane correction factor for baseline wastewater treatment systems <i>i</i>	AMS III.H default value applied  As the project activity falls in Type of wastewater treatment and discharge pathway or system for selecting MCF : Anaerobic deep lagoon (depth more than 2 metres), 0.8 is valid choice.	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes
<b>B<sub>o,ww</sub></b>	0.25 ton CH <sub>4</sub> /ton COD	Methane producing capacity of the wastewater	IPCC 2006 lower value applied	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of	Yes



Parameter Title	Final Value	Description	Means of Verification	Comment	
				parameter?	
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes
UF <sub>BL</sub>	0.89	Model correction factor to account for model uncertainties	AMS III.H default value applied	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes
BE <sub>ww,discharge,y</sub>	18 tCO <sub>2</sub> /yr	Methane emissions from degradable organic carbon in treated wastewater discharged in e.g., a river, sea or lake in the baseline situation	Calculated value $BE_{ww,discharge,y} = MEP_{y,ww,bl} * GWP_{CH_4}$ $MEP_{y,ww,bl} = Q_{y,ww} * \sum (COD_{y,discharge,i} * B_{o,ww} * UF_{BL} * MCF_{ww,discharge,i})$	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes
COD <sub>y,ww,discharge,i</sub>	0.000077697 tons/ m <sup>3</sup>	Chemical oxygen demand of the treated wastewater discharged into sea, river or lake in the baseline situation in the year y	The COD <sub>y,ww,discharge,i</sub> uses the measured data from 10 days' continuous monitoring record(02/03/2009 ~ 30/03/2009). It was confirmed that the measurement is undertaken during a period that is representative for the typical operation conditions of the systems by checking the temperature record and production record	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes

Parameter Title	Final Value	Description	Means of Verification	Comment	
			in that period by the document “Demonstration of representative of measurement campaign condition” dated on 24 September 2010.	Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes
<b>MCF<sub>ww,discharge,i</sub></b>	0.1	Methane correction factor based on discharge pathway in the baseline situation	AMS III.H default value applied  * Type of wastewater treatment and discharge pathway or system for selecting MCF : Discharge of wastewater to sea, river or lake	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes
<b>GWP<sub>CH4</sub></b>	21 ton CO <sub>2e</sub> /ton CH <sub>4</sub>	Global Warming Potential for methane	CO <sub>2</sub> emission factor of the fossil fuel type used in the boiler for heat generation in the absence of the project activity	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes

**Component 2:**

This part of emission is counted according to the para. 22 of methodology AMS-I.C, Version 19. The installed capacity of the production line is 60tons/day, and current production has reached 54~58 tons/day. In a very long-term, PP will try to keep the production stable at 58~60 tons/day thus the amount of coal displaced will not significantly exceed historical consumption record and we could regard the amount of coal displaced limited to the maximum production capacity.

The baseline emissions from the fossil fuel displacement component are calculated by converted caloric value from the amount of coal displaced.

The formulae for baseline emissions for component 1 is :

$$BE_{thermal,y} = CC_{y, displaced} * NCV_{coal} * EF_{CO2}$$

And  $EG_{thermal,y}$  for ex-ante and ex-post is calculated by as following equations.

$$EG_{thermal,y,ex-ante} = NCV_{CH4} * COD_{removed,UASB} * B_{0,ww} * MCF_{UASB} / D_{CH4}$$

$$EG_{thermal,y,ex-post} = \Delta H_y - C_{co-fired,y} * NCV_{coal} = H_{hot-air,y} - H_{air,y} - C_{co-fired,y} * NCV_{coal}$$

Thus, this part of baseline emissions is fully in accordance with AMS I.C (version 19). The assessment for equation, parameters and its estimation for baseline emission are shown in Table 4.

[Table 4] Equation and parameters for baseline emission

Parameter Title	Final Value	Description	Means of Verification	Comment	
<b>BE<sub>thermal,y</sub></b>	6,238 tCO <sub>2</sub> /yr	Baseline emissions from steam/heat displaced by the project activity during the year y	Calculated value $BE_{thermal,y} = CC_{y,displaced} * NCV_{coal} * EF_{CO_2}$	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes
<b>CC<sub>y,displaced</sub></b>	2,250 ton	The amount of coal that would be used in the baseline	We confirmed that the average coal consumption is 2,947 ton/year and caloric value of coal is 4,800kcal/kg or 5,100kcal/kg from three years monthly record(2005~2007) that is actual purchased data demonstrated by purchase receipts every month provided by coal provider such as Guangdong Lanyue Energy Development Limited & Zhaoqing Shenyu Trading Limited. For the caloric value of coal, PP applied average 5,000kcal/kg caloric value as purchased coal considering each caloric value of coal purchased and amount of purchased coal respectively. Therefore, amount of coal displaced could be estimated as 2,105 ton/year by converting the Chinese national standard net caloric value of coal (7,000kcal/kg). * This coal type	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes

\* <http://www.sndrc.gov.cn/view.jsp?ID=4078>

Parameter Title	Final Value	Description	Means of Verification	Comment	
			<p>conversion is also applied to the coal price adoption by this context.</p> <p>The amount of coal displaced applied in FSR (2,250 ton/year) is higher than the estimated coal amount based on actually consumed record(2,105 ton/year). The validation team confirmed that the amount of coal displaced applied in FSR (2,250 ton/year) is estimated reflecting the gap between current annual production capacity (54~58 tons/day) and maximum production capacity(60 tons/day) as a conservative manner. Thus, we can conclude that the amount of coal displaced in financial analysis is not underestimated and valid at the time of the investment decision.</p>		
NCV <sub>coal</sub>	0.0293076 TJ/tonne	Net calorific value of coal that is consumed in the year y	Verified the net calorific value of coal by 7,000kcal/kg standard coal NCV and conversion factor for 1Gkcal equals to 0.0041868 TJ according to IEA: CO2 Emission from fuel combustion(2006) Edition,P.I.11	Data Checklist	Yes/No
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes

Parameter Title	Final Value	Description	Means of Verification	Comment	
				Data Checklist	Yes/No
EF <sub>CO2</sub>	94.6 tCO <sub>2</sub> /TJ	CO <sub>2</sub> emission factor per unit of energy of fossil fuel(coal) that would have been used in the baseline unit	IPCC 2006 default value applied	Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes

KFQ validated and concluded through the checked with the methodology AMS III.H (Version 16), AMS I.C (Version 19), FSR, historical records and other references in PDD, that the PDD had been correctly calculated based on the methodology using appropriate data, and of which result was also correctly applied to the BE<sub>y</sub> calculation.

Thus, the validation team confirmed that the application, discussion and determination of the chosen baseline methodology are transparent and reasonable. The baseline for this project activity is reasonably determined by validating the key assumption, calculations and rationales used in the PDD by checking the documents and sources referred to in the PDD.

## (2) Project emission

The calculation of the project emissions followed the procedures described in the methodologies AMS-III.H, version 16 and AMS-I.C, Version 19. Emission reductions within the impact of proposed project activity are divided into two components:

- Component 1 : Methane recovery component
- Component 2 : Heat utilization component

The project emissions are therefore divided into two components:

### Component 1

The project emission of methane recovery component is estimated using the following equation.

$$PE_{bio,y} = PE_{power,y} + PE_{ww,treatment,y} + PE_{s,treatment,y} + PE_{ww,discharge,y} + PE_{s,final,y} + PE_{fugitive,y} + PE_{biomass,y} + PE_{flaring,y}$$

Where,

- Methane emissions from sludge treatment systems affected by the project activity, and not equipped with biogas recovery, in year y ( $PE_{s,treatment,y}$ ). The validation team found there is no sludge treatment system in the project activity therefore this item is taken as zero.
- Since the sludge in the project activity is used for soil application in aerobic conditions, methane emissions from anaerobic decay of the final sludge produced in year y ( $PE_{s,final,y}$ ) is neglected, and the sludge treatment and final disposal shall be monitored during the crediting period.
- For the proposed project there is no biomass stored under anaerobic conditions, therefore Methane emissions from biomass stored under anaerobic condition ( $PE_{biomass,y}$ ) is regarded as zero.
- Methane emission due to incomplete flaring in year y as per the “Tool to determine project emissions from flaring gases containing methane”(tCO<sub>2</sub>e). There is no flaring system installed for the residual gas stream after the furnace for heating the hot air in the proposed project activity. The methane generated from the wastewater in UASB which emits to the air during the maintenance period of the starch plant is deducted from the baseline emissions. Therefore methane emission due to incomplete flaring in year y as per the “Tool to determine project emissions from flaring gases containing methane”(PE<sub>flaring,y</sub>) is regarded as zero.

Thus, this part of project emissions is fully in accordance with AMS III. H (version 16). The equation and parameters for baseline emission is follows in Table 5.

[Table 5] Equation and parameters for project emission

Parameter Title	Final Value	Description	Means of Verification	Comment	
<b>PE<sub>power,y</sub></b>	318 tCO <sub>2</sub> /yr	Emissions from electricity or fuel consumption in the year y	Calculated value $PE_{power,y} = EC_{PJ,y} * EF_{grid,CM,y} * (1+TDL_y)$	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes
<b>EC<sub>PJ,y</sub></b>	379 MWh/yr	The net quantity of heat supplied by the project activity during the year y	Investigated the electrical equipments such as capacity and operation hour that are used in project scenario.	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes
<b>EF<sub>grid,CM,y</sub></b>	0.7880 tCO <sub>2</sub> /MWh	Combined margin emission factor of the grid system	Investigated CO <sub>2</sub> emission factor of identified grid for the project activity, for the proposed project, the identified grid is China Southern Power Grid. And average technical transmission and distribution losses for providing electricity from grid in the project activity which is the most updated data resource from the China Southern Power Grid.	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes



Parameter Title	Final Value	Description	Means of Verification	Comment	
<b>TDL<sub>y</sub></b>	6.22%	Average technical transmission and distribution losses for providing electricity from grid in the project activity	Investigated China Electric Power Yearbook 2009	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes
<b>PE<sub>ww,treatment,y</sub></b>	646 tCO <sub>2</sub> /yr	Methane emissions from wastewater treatment systems affected by the project activity, and not equipped with biogas recovery, in year y	Calculated value $PE_{ww,treatment,y} = Q_{ww,y} * COD_{removed,PJ,k,y} * MCF_{ww,treatment,PJ,k} * Bo_{ww} * UF_{PJ} * GWP_{CH4}$	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes
<b>Q<sub>ww,y</sub></b>	509,543 m <sup>3</sup> /year	Volume of wastewater treated in baseline wastewater treatment system i in year y	Volume of wastewater was an average value of 10 days' measurement record(16/07/2010 ~25/07/2010). It was verified by checking the measurement record. 300 days applied for operation per year by confirming FSR.	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes
<b>COD<sub>removed, PJ,k,y</sub></b>	0.000725 tons/m <sup>3</sup>	COD removed by project wastewater treatment system k in year y	Calculated by inflow COD of project wastewater treatment system k in year y minus outflow COD of project wastewater treatment system k in year y. The COD data is used the measured	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes

Parameter Title	Final Value	Description	Means of Verification	Comment	
			data from 10 days' continuous measurement record(02/03/2009 ~ 30/03/2009).	Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes
<b>MCF<sub>ww,treatment,PJ,k</sub></b>	0.3	Methane correction factor for project wastewater treatment system <i>k</i>	AMS III.H default value applied It is verified that the aerobic treatment in the project activity is poorly managed through on-site check.	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes
<b>Bo<sub>ww</sub></b>	0.25 ton CH <sub>4</sub> /ton COD	Methane producing capacity of the wastewater	IPCC 2006 lower value applied	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes
<b>UF<sub>PJ</sub></b>	1.12	Model correction factor to account for model uncertainties	AMS III.H default value applied	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes

Parameter Title	Final Value	Description	Means of Verification	Comment	
<b>GWP<sub>CH4</sub></b>	21 ton CO <sub>2e</sub> /ton CH <sub>4</sub>	Global Warming Potential for methane	CO2 emission factor of the fossil fuel type used in the boiler for heat generation in the absence of the project activity	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes
<b>PE<sub>ww,discharge,y</sub></b>	23 tCO <sub>2</sub> /yr	Methane emissions from degradable organic carbon in treated wastewater in year y	Calculated value $PE_{ww,discharge,y} = Q_{ww,y} * GWP_{CH4} * B_{o,ww} * UF_{PJ} * COD_{ww,discharge,y} * MCF_{ww,final}$	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes
<b>MCF<sub>ww,final</sub></b>	0.1	Methane correction factor based on type of treatment and discharge pathway of the wastewater	AMS III.H default value applied	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes
<b>PE<sub>fugitive,y</sub></b>	4,575 tCO <sub>2</sub> /yr	Methane emissions from biogas release in capture systems in year y	Calculated value $PE_{fugitive,y} = (1 - CFE_{ww}) * MEP_{y,ww,treatment} * GWP_{CH4}$	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes

Parameter Title	Final Value	Description	Means of Verification	Comment	
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes
<b>MEP<sub>y,ww,treatment</sub></b>	2,178 ton CH <sub>4</sub> /yr	Methane emission potential of wastewater treatment systems equipped with biogas recovery system in year y	Calculated value $MEP_{ww,treatment,y} = Q_{ww,y} * B_{o,ww} * UF_{PJ} * \sum (COD_{removed,j,y} * MCF_{ww,j})$	Data Checklist	Yes/No
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes
<b>COD<sub>removed,j,y</sub></b>	0.019275264 tons/m <sup>3</sup>	The chemical oxygen demand removed by the treatment system j of the project activity equipped with methane recovery in the year y	Calculated by COD of wastewater flow into UASB reactor minus COD of wastewater discharged from UASB reactor. The COD data is used the measured data from 10 days' continuous measurement record(02/03/2009 ~ 30/03/2009) and UASB removal efficiency(96%) is confirmed by its specification and FSR.	Data Checklist	Yes/No
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes

**Component 2:**

This part of emission is counted according to the “Tool to calculate project or leakage CO<sub>2</sub> emissions from fossil fuel combustion (Ver. 2)”. The project emission from the fossil consumption is for keeping temperature of UASB digester in winter time.

The formulae for project emissions for component 2 is :

$$PE_{thermal,y} = C_{UASB,y} * NCV_{coal} * EF_{CO2}$$

The equation and parameters for project emission is follows in Table 6.

[Table 6] Equation and parameters for project emission

Parameter Title	Final Value	Description	Means of Verification	Comment	
<b>PE<sub>thermal,y</sub></b>	602 tCO <sub>2</sub> /yr	Quantity of coal which is used to keep temperature for wastewater in UASB digester in winter time in the year y	Calculated value $PE_{thermal,y} = C_{UASB,y} * NCV_{coal} * EF_{CO2}$	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes
<b>C<sub>UASB,y</sub></b>	217 ton/yr	Quantity of coal which is used to keep temperature for wastewater in UASB digester in winter time in the year y	Investigated UASB heating energy(0.053TJ/d) through UASB manual and 4 month(max.) required for heating process in a conservative manner. Thus, energy consumed per year for the heating is $0.053 * 120 = 6.36TJ/yr$ Coal NCV is found as 0.0293076 TJ/ton . Thus, coal consumption for heating is 217 ton/yr	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes
<b>NCV<sub>coal</sub></b>	0.0293076 TJ/ton	Net calorific value of coal that is consumed in the year y	Chinese national standard net caloric value of coal (7,000kcal/kg) applied  <a href="http://www.sndrc.gov.cn/view.jsp?ID=4078">http://www.sndrc.gov.cn/view.jsp?ID=4078</a>	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes
<b>EF<sub>CO2</sub></b>	94.6 tCO <sub>2</sub> /TJ	CO <sub>2</sub> emission factor per unit of energy of fossil fuel(coal)	IPCC 2006 default value applied	<b>Data Checklist</b>	<b>Yes/No</b>
				Title in line with methodology?	Yes
				Data unit correctly expressed?	Yes

Parameter Title	Final Value	Description	Means of Verification	Comment	
				Appropriate Description of parameter?	Yes
				Source clearly referenced?	Yes
				Correct value provided	Yes
				Has this value been verified?	Yes
				Choice of data correctly justified?	Yes
				Measurement method correctly described?	Yes

KFQ validated and concluded through the checked with the methodology AMS III.H (Version 16), AMS I.C (Version 19), Tool to calculate project or leakage CO<sub>2</sub> emissions from fossil fuel combustion (Version 2), FSR, historical records and other references in PDD, that the PDD had been correctly calculated based on the methodology using appropriate data, and of which result was also correctly applied to the PE<sub>y</sub> calculation.

### **(3) Leakage**

According to the methodology, no leakage emissions have been identified for the Project.

### **(4) Conclusion**

The validation team concluded that the GHG calculation is transparent and the amount of estimated baseline emission, project emission and leakage is reasonable. Also validation team confirmed that all the assumptions and data used by PP are considered reasonable and the methodology has been applied correctly to calculate baseline emission and emission reduction.

Further to this, all estimates of the baseline emissions, project emissions and accordingly emission reductions can be replicated using data and parameter values provided in the PDD.

Nevertheless, CAR 3 and CAR 4 were raised in the course of the validation and were successfully closed (ref Annex: Validation Protocol- Table 3).

## **3.4 Additionality**

The additionality of the project has been established in the PDD using the “Combined tool to identify the baseline scenario and demonstrate additionality” (Version 3.0).

Through our thorough investigation and analysis, we can state that the identification of alternatives to the project activity is complete under relevant national and/or sectoral policies and circumstances and the “Combined tool to identify the baseline scenario and demonstrate additionality” (Version 3.0) is correctly applied. And, the validation team concludes the proposed project activity is additional as it would not have happened in the absence of CDM.

### **Prior consideration and continued action to secure CDM status**

As starting date of the project activity (6 June 2008) is before 2 August 2008, the validation team had assessed the evidence that the incentive from the CDM was seriously considered in the decision to proceed with the project activity or at the starting date of the project activity.

The proofs for the prior consideration of applying for CDM to support project activity have been demonstrated by the project participants and verified by KFQ. In line with the guidance of EB 49 Annex 22 ‘Guidelines on the demonstration and assessment of prior consideration of the CDM (version 3)’, the evidences requested from the project participants were evaluated by KFQ. A summary of these evidences is provided in the following paragraphs.

The validation team was able to verify all the relevant documents which demonstrate that benefits from CDM had been seriously considered before the starting of the project activity and its CDM continuation.

On 5 July 2007, board members of PP made a basic concept of CDM for the project and on 28 April 2008, a board meeting regarding the project investment including the financial return of the project activity and CDM implementation was conducted. The project owner at that time was aware of CDM development in China and it was decided to implement the project with CDM considering implementation of the project activity without CDM is poor financial return.

Thus, KFQ confirmed that the project owner was aware of the CDM prior to the starting date of the project through checking the board meeting minute, and that the benefits of the CDM were as decisive factor in the decision to proceed with the project activity.

To proceed with the application, the project owner made consulting contract with Guangzhou Kaisheng Environmental Protection Tec. Co., Ltd. on 8 May 2008 and LOI was made 20 May 2008 with Sumitomo in order to develop the CDM, but they eventually failed to agree on ERPA in the end of 2008. And the Baraka Global Advisory who is trading and development for the project from end of 2008, introduced the project to HANWHA Europe GmbH in early 2009.

In the meantime, PP made a construction contract with Hainan Zhenyuan Environmental Technical Limited on 6 June 2008 and made a contract with ITP for consulting service on 2 September 2009. And PP made the ERPA with HANWHA Europe GmbH on 26 August 2009. Subsequently, HANWHA Europe GmbH made contract with KFQ for validation service on 18 February 2010 and PP got a LoA from China DNA in 13 July 2010 and Germany DNA in 9 June 2011 respectively.

Project participants have demonstrated through evidences and official documents that the sequence of the events is coherent and reliable which shows the continued action to secure CDM status further demonstrating the additionality of the project

Thus, validation team could conclude that Yun’An County Gaoli Starch Factory was aware of CDM development in China and it was decided to apply for CDM financing to implement the project activity considering poor financial return without CDM. And the project activity complies with the requirements of the Guidelines on the demonstration and assessment of prior



consideration of the CDM (ver.3). Also the project participants have demonstrated through evidences and official documents that the sequence of the events is coherent and reliable which shows the continued action to secure CDM status further demonstrating the additionality of the project.

### **Investment analysis**

#### **▪ Choice of approach**

The benchmark analysis option has been adopted for the project activity as the project activity generates financial return other than CDM income and heat generation using coal in a furnace and the existing anaerobic wastewater treatment system without methane recovery such as a current status is the only alternative except the project activity without CDM. To determine the project shall be implemented or not, the internal return rate (IRR) of total investment is identified as the financial indicator.

Thus a benchmark analysis (option III) is justified for conducting the investment analysis

#### **▪ Benchmark selection**

The evaluation of the project's financial viability is based on the internal rate on return (IRR). The PP selected the benchmark rate, as 12% according to the 'Economic Evaluation Measurements and Parameters of Constructive Projects(version 3)' issued by National Development and Reform Commission and Ministry of Construction of the People's Republic of China in 2006. The benchmark of 12% is therefore appropriate for this project.

Furthermore, KFQ was able to confirm this is suitable and reasonable as followings:

- a) This benchmark, 12% is in line with the 'Economic Evaluation Measurements and Parameters of Constructive Projects(version 3)' issued by National Development and Reform Commission and Ministry of Construction of the People's Republic of China in 2006. The benchmarks provided in this publication are the result of expert investigation and industry review, and can be considered as an authoritative, credible and reliable data source for benchmarks. This publication sets the benchmark for all industries in China and classifies them into 100 industrial sectors. There is no separate sector for 'starch production' and there is also no other sector more appropriate other than organic chemistry and intermediates production as starch production. Thus, organic chemistry and intermediates production(12%) has been chosen as the most relevant and appropriate sector benchmark for the project type.

And the publication is widely applied in China for assessing the financial viability of various types of project.

b) The validation team also checked any previous investment decision by the PP, Yun'An County Gaoli Starch Factory, involved and found that this proposed project activity is the first investment project which is not related to the increasing productivity or compliance of law, implemented by PP.

c) The benchmark rate, 12% is seen from other similar projects\* in China, recently registered under CDM and many of them referring to this rule.

Hence, the validation team concluded that this benchmark, 12% is appropriate for the project.

▪ **Input values**

The input values used in the investment analysis are taken from the FSR which has been the basis of the decision to proceed with the investment in the project. And consistency of input values applied in the investment analysis and associated spreadsheet are checked by the validation team.

This FSR was developed by 3<sup>rd</sup> party design company, Hainan Construction Project Planning Design Research Institute in September 2007. Subsequently the investment decision was made in Board meeting on 28 April 2008. The validation team was able to confirm that the input values during the time gap between the completion of the FSR (September 2007) and the investment decision (28 April 2008) was not materially changed. Also there was no any changing for the project design and plan until the project start date (6 June 2009). KFQ was able to confirm it through interview with PP and relevant documents.

Thus validation team can conclude that input values unlikely have materially changed and assumed that the parameters from the FSR have been the basis of the decision to proceed with the investment in the project in the frame of the project activity. Hence the input values taken from the FSR are applicable at the time of investment decision for the investment analysis.

Further to this, KFQ cross-checked the applied values when possible with actual contracts and references, then compared them with KFQ's internal statistic results of the evaluation of similar projects. The validation team selected the eight similar projects considering below two conditions for project selection.

- 1) Project status: registered CDM as Methane recovery in wastewater treatment projects (AMS III.H) including AMS I.C. or AMS I.D,
- 2) Physical boundary: China

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\* Methane Recovery Project of Fuyu Huihai Alcohol Co., Ltd  
Methane Recovery Project of Linqu Qinchu Biological Co., Ltd  
Methane Recovery Project of Meihekou City Fukang Alcohol Co., Ltd  
Tianjin TEDA Sewage Methane Recovery Project

The details on assessment for validity and applicability of each input values are as follows:

**Amount of coal displaced: 2,250 ton/year**

Amount of coal displaced has been adopted from the FSR. For more investigation for amount of coal displaced, the validation team checked annual coal consumption and its caloric value of coal through purchasing receipts.

The installed capacity of the production line is 60tons/day, and current production has reached 54~58 tons/day. In a very long-term, PP will try to keep the production stable at 58~60 tons/day thus the amount of coal displaced will not significantly exceed historical consumption record and we could regard the amount of coal displaced limited to the maximum production capacity.

In addition, it can be crosschecked that the baseline emissions from heat displaced by the project activity(BE<sub>thermal</sub>) is followed by the converted caloric value from the amount of coal displaced.

We confirmed that the average coal consumption is 2,947 ton/year and caloric value of coal is 4,800kcal/kg or 5,100kcal/kg from three years monthly record(2005~2007) that is actual purchased data demonstrated by purchase receipts every month provided by coal provider such as Guangdong Lanyue Energy Development Limited & Zhaoqing Shenyu Trading Limited. For the caloric value of coal, PP applied average 5,000kcal/kg caloric value as purchased coal considering each caloric value of coal purchased and amount of purchased coal respectively.

Therefore, amount of coal displaced could be estimated as 2,105 ton/year by converting to the Chinese national standard net caloric value of coal (7,000kcal/kg).<sup>†</sup>

The amount of coal displaced applied in FSR (2,250 ton/year) is higher than the estimated coal amount based on actually consumed record(2,105 ton/year). The validation team confirmed that the amount of coal displaced applied in FSR (2,250 ton/year) is estimated reflecting the gap between current annual starch production capacity (54~58 tons/day) and maximum production capacity(60 tons/day) as a conservative manner.

**Total investment cost: 7,280,000RMB**

Total investment cost has been adopted from the FSR. At first, the validation team compared the proposed project activity with other eight similar projects, implemented in China in order to check the validity of total investment cost. The average of the investment per ER (ktCO<sub>2e</sub>)

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<sup>†</sup> <http://www.sndrc.gov.cn/view.jsp?ID=4078>

of eight similar projects is 312.6 RMB/ktCO<sub>2e</sub> (max.:874.8, min.:99.0) while that of the Project is 178.4 RMB/ ktCO<sub>2e</sub> which is less than the average.

Furthermore, the audit team reviewed the actual expenditure for the proposed project activity. The amount of construction contract (6 June 2008) is 6,830,000RMB and additional contract (17 June 2008) is 450,000RMB. Thus, the validation team confirmed 100% of total investment cost (7,280,000 RMB) actually incurred through checking the payment receipt for contract.

Based on the above assessment, KFQ can conclude that the total static investment cost in financial analysis is not overestimated and valid at the time of the investment decision.

### **Annual O&M cost: 637,000 RMB**

Annual O&M cost is taken from the FSR. The O&M cost of this proposed project activity is 8.8% of the total investment cost. This cost consists of electricity cost, salary & welfare, chemical cost, equipment repair cost.

Salary & welfare, electricity cost and the chemical cost had the greater part of the O&M cost. Therefore, KFQ checked the detail of the salary & welfare, electricity cost and the chemical cost by the evidences and the document.

#### **Salary & welfare**

Salary & welfare cost was taken from the FSR. The validation team checked a salary book of Yun'An County Gaoli Starch Factory, expensed in May 2010 for the 8 staffs related in CDM and found annual salary & welfare was 191,006 RMB(23,876 RMB/person) which is higher than FSR estimation and PDD indication respectively. (23,375RMB/person)

#### **Electricity consumption**

The electricity consumption in FSR estimated as 300,000KWh by calculating project activity consumption minus baseline electricity consumption. The validation team investigated every installed capacity of electric equipment both baseline and project activity through the nameplate of each equipment and found the installed capacity for baseline scenario is 11KW and 52.7KW for project activity. Because PP does not have the record of load factor for installed electric equipments, KFQ tested IRR by estimating the load factor as 85% which is recommended by Research and Calculation Handbook for Energy saving and the IRR(7.5%) is still below than benchmark.

Thus, the annual electricity consumption for baseline and project activity was calculated 79,200KWh and 379,440KWh respectively and KFQ found the electricity consumption is reasonable to apply.

#### **Electricity Price**

This price is adapted from FSR. The electricity price, 0.5998 RMB/kWh excluding VAT (0.701 RMB/kWh including VAT) is based on the Instruction of the electricity price by Guangdong electricity grid company, Yunfu City, Yun'An County office.

In addition to the above Instruction, the validation team found that the actual purchased electricity tariff excluding VAT is 0.5998 RMB/kWh based on the electricity purchase bill issued by the Grid on 14 March 2007 just before the completion of the FSR.

Furthermore, KFQ investigated the electricity price with one similar project in Guangdong province and found that electricity price of proposed project activity(0.5998 RMB/kWh excluding VAT) is higher than similar project (0.5 RMB/kWh excluding VAT). However, even if 0.5 RMB/kWh excluding VAT is adopted, the IRR of the project is lower than the benchmark of 12%.

Thus KFQ concluded that the application of the electricity price, 0.5998 RMB/kWh is valid for the project at the time of investment decision.

### **Chemical cost**

The chemical cost was taken from the FSR. The validation investigated actually paid for chemical cost during January 2010 ~ December 2010 and found incurred chemical cost was 222,150 RMB/year which is higher than the price which was estimated on FSR (212,000 RMB/year). Thus the chemical cost applied on investment analysis is valid and applicable.

To check validity of O&M cost, the validation team reviewed it with eight similar projects in China and found that O&M cost of the total investment cost for this proposed project activity(8.8%) is within a range of O&M cost of other similar projects (6.2~55.9%, average : 19.9%) and less than the eight similar projects' average.

Through our comprehensive and thorough analysis, the validation team conclude the applied O&M cost is not overestimated and is valid.

### **TAX**

The validation team confirms that the Value added tax(17%) rates is properly applied in accordance with China regulation, "The People's Republic of China State Council Decree No. 538" published on 1 November 2008. Furthermore, this rate is compared with rates used in other wastewater treatment project in China and we confirmed the VAT is applied correctly.

### **Coal price: 650 RMB/ton**

The 650 RMB/ton is based on the coal price index in China and FSR.

As there was no national universal coal price index in China in year 2007. the FSR applied the most representative coal price index in China which is Qinhuangdao Harbor coal trading

price. Qinhuangdao Harbor coal market is more than 41% of Chinese coal trading market, and the trading price of Qinhuangdao Harbor coal market has been basis for financial analysis and decision making of most Chinese domestic energy and related industries\*.

According to this coal price index, the average trading price (exactly is Free On Board price) of 5,000kcal/kg<sup>†</sup> coal for year 2005, 2006 and 2007 is around 395.2 RMB/ton. Converting to standard coal(NCV of 7000kcal/kg) is 553.3 RMB/ton. Considering the project is located in Guangdong Province, the coal price should be a CIF price (cost, insurance and freight), so the calculation has taken transportation fee of 65 RMB/ton and insurance fee of 0.7 RMB/ton into consideration which is  $553.3+65+0.7=619$  RMB/ton.

We tested IRR in case applying the coal price before converting the 7000kcal/kg NCV coal. The coal NCV in Qinhuangdao Harbor coal market is 5000kcal/kg and the average price is 460.9 RMB/ton ( $395.2+65+0.7$ ). We found the resulted IRR(7.7%) is less than the IRR after converting the standard coal NCV(7000kcal/kg).

\* Transportation fee : According to the average transportation fee from Qinhuangdao Harbor to Guangzhou Harbor for the last week<sup>‡</sup>, recent average transportation fee level is provided(As of 4<sup>th</sup> November 2011). The average transportation fee from Qinhuangdao Harbor to Guangzhou Harbor for the last week is below table.

Ship type (Dead weight ton)	Unit Price (RMB/ton)
10000 ~ 15000	67
15000 ~ 20000	66
20000 ~ 30000	65

The current average transportation fee of all ship types is 66 RMB/ton. Considering the transportation cost has been continuously increased for the past years within the price increase rate in China and we confirmed the 65 RMB/ton transportation fee in the estimation of coal price in FSR by using recent average transportation fee level is reasonable.

\* Insurance fee : According to the integrated import/export customs information, consulting and services platform supported by the General Administration of Customs of P. R. China<sup>§</sup>, the insurance fee decided as

- Insurance fee = Cargo value \* Insurance rate(0.1%<sup>\*\*</sup>)

- Cargo value = CIF \* 110% = 619 RMB/ton \* 110%

\* <http://www.chinacoal.org.cn/coaljyxx/265/25163.aspx>

† <http://www.shenhua.com.cn/xwzx/xyzx/mtzs/2011/09/171790.shtml>

‡ <http://ghd.cqcoal.com/Trade/Price/>

§ <http://www.e-to-china.com.cn/tgzn/hwys/cjw/2009/1012/63340.html>

\*\* <http://www.nnzsy.com/shop/pinpaidiannao/130257416325.html>

We confirmed the insurance fee is  $680.9 \text{ RMB/ton} \times 0.001 = 0.7 \text{ RMB/ton}$  is reasonable.

Thus, the coal price 650RMB/ton is in the FSR instead of 619 RMB/ton since the annual increasing trend of coal price(4.49%, 2002~2008) is considered and a relatively high IRR is also helpful for PP to get governmental approval for the project activity. In doing so, 650 RMB/ton is a valid and applicable for financial analysis.

KFQ conclude that the adjusted coal price is valid and appropriate for investment analysis by cross-checking with other reference and the FSR adopted this price as well.

### **Residual Value: 5%**

The residual value for this project activity is 5% of fixed asset is from the FSR. The FSR estimated the residual value in accordance with GuoShuiFa[2003]70 issued by the National Taxation Bureau that indicates residual value set to 5% for the equipments since 18 June 2003. Furthermore, KFQ investigated the residual value with eight similar projects in China and found that average of residual value of similar projects(6.7%) is higher than the proposed project, however, even though applying the highest residual value of similar projects(12.4%), the IRR is still below the benchmark(7.2%).

Through the above assessment, KFQ can confirm that the selection of the residual value, 5% at the time of the investment decision is reasonable and applicable.

### **Annual operation day : 300 day**

Annual operation day is taken from FSR and the validation team checked that the historical two year operation records (2007 and 2008) and found the records show that the plant operated 300 days and 298 days in 2007 and 2008 respectively. Because the starch production facility got two months' maintenance period every year, the annual operational day is around 300 days. Also we found the other similar projects applied 300 days for annual operation day. Thus we confirmed annual operation day applied to the proposed project activity is valid and appropriate for this project.

### **Operational lifetime: 20 years**

Operational lifetime is taken from FSR. The validation team checked the remaining lifetime of main project equipments such as UASB (20 years, newly installed) and furnace (22 years, existing equipment) covers crediting period through the certificate from the equipment supplier and remaining lifetime assessment report from engineer of equipment supplier respectively\*. Thus, we confirm that the lifetime applied to the proposed project activity is valid and appropriate for this project according to the tool to determine the remaining lifetime of equipment(ver. 01).

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\* UASB : Equipments' lifetime assessment report, Hainan Zhenyuan Environmental Technical Limited.

Furnace : Equipments' remaining lifetime assessment report, engineer of equipment supplier, named Liu Hui Ming

## ▪ **Calculation and conclusion**

The validation team has checked all sources of the IRR calculation, as presented in Step 3 in the PDD. Furthermore the calculation spreadsheet was checked and the consistency of the used figures with the same stated in the PDD verified.

The validation team found that PP made a calculation error on the IRR spreadsheet for investment analysis(ver.01) and applied on GSC PDD(-1.9%). Thus PP corrected the IRR.

The project IRR without CDM revenues is 9.5% which confirms that the project in the absence of CDM benefits and compared to the benchmark of 12% is not financially attractive. With CDM revenue, the project IRR increases to 37.7% which is higher than benchmark.

Thus, KFQ is able to confirm that the input values in PP's evaluation are valid and through above thorough assessment, KFQ is able to confirm that the input values in PP's evaluation are valid and appropriate representing the economic situation of the project at the time of investment decision and they have been applied consistently.

## ▪ **Sensitivity analysis**

A sensitivity analysis has been carried out for parameter contributing more than 20% to revenues or costs which are static total investment cost, annual O&M cost, and coal price. A variation of  $\pm 10\%$  has been considered in the critical assumptions by consideration of circumstance of each parameter.

### **1) Investment cost**

In order to reach 12% benchmark, total Static Investment cost shall decrease by 25.8%. According to the China statistical Year Book, the price of industry products has risen by 2.3% annually in 2001~2007 and the price of investment in fixed assets have risen by average 3.8% annually in 2006~2007. Further to this, PP already made construction contract on 6 June 2008 and 17 June 2008 which are 100% of total investment cost. Thus, -25.8% in investment cost is not likely to occur.

### **2) O&M Cost**

In order to reach 12% benchmark, the operational cost of the proposed project shall decrease by 37%. According to the China statistical Year Book, the prices of raw materials fuels & power have risen by average 2.38% during 2001~2008 and the price of total wage bill of staff and workers has risen by average 15.2% during 2001~2008. Thus, -37% in annual operating cost is not likely to occur.

### **3) Coal price**

The coal price at which the IRR of the project activity could reach the benchmark would need to be 718 RMB/ton which is 10.5% above the coal price used in the PDD.



Statistical data on coal industry for Guangdong Province published by National Bureau of Statistics of China shows that the coal price annual average increasing rate is 4.49% from 2002 to 2008.

Thus, 10.5% increase of the coal price, which is necessary to make the IRR of the proposed project is unrealistic.

These results show that even under very favorable circumstances the Project IRR is still lower than the 12% benchmark. As a result, we can conclude that the Project overall was also not financially attractive.

Thus, KFQ conclude that the applied parameters and variation ranges for sensitivity analysis are completed and suitable for the proposed project and the sensitivity result supports that the project is financially unattractive without CER revenues and considered additional.

To conclude the additionality assessment, we can state that, according to all the documents we have reviewed, the additionality of the project based on the available information is fulfilled.

Nevertheless, CAR 5, CAR 6 and CL 3 were raised in the course of the validation and were successfully closed (ref Annex: Validation Protocol- Table 3).

### **3.5 Monitoring Plan**

The project activity have applied the indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories Type III.H-Methane recovery in wastewater treatment (Version 16) and categories Type I.C-Thermal energy production with or without electricity (Version 19). It includes all the parameters to arrive at the estimation of the baseline emissions and thereby emission reductions. The selected monitoring methodology is deemed to be the most applicable for this project. The application of the monitoring methodology is transparent.

According to the AMS I.C and AMS III.H, monitoring of parameters for both baseline and project emission calculation are required. Leakage emissions do not need to be considered.

Parameters that are not available ex-ante require estimation. These were estimated and validated as per the description provided in section 3.3 of this report. And the monitoring parameters requiring ex-post monitoring are confirmed as below table 6.

Thus, we could confirm that the parameters for achieving emission reduction calculation by the prescribed equations for baseline emissions, project emission and emission reductions in B.6 of the PDD have been listed in B.7.1 of the PDD in a complete manner. The meter installation,

monitoring frequency, recording frequency, accuracy class and QA/QA procedure have been prescribed for each parameter in compliance with relevant national standards.

[Table 6] Monitoring Parameters Requiring Ex-post Monitoring

Parameter Title	Description	Unit	Comment	
<b>Q<sub>ww,i,y</sub></b>	Volume of wastewater treated in wastewater treatment system in the year y	m <sup>3</sup>	<b>Data Checklist</b>	<b>Yes/No</b>
			Data unit correctly expressed?	Yes
			Appropriate Description of parameter?	Yes
			Source clearly referenced?	Yes
			Correct value provided for estimation?	Yes
			Has this value been verified?	Yes
			Measurement method correctly described?	Yes
			Correct reference to standards?	Yes
			Indication of accuracy provided?	Yes
			QA/QC procedures described?	Yes
			QA/QC procedures appropriate?	Yes
<b>COD<sub>ww,untreated,y</sub></b>	COD of the wastewater entering the UASB with methane capture in project activity	tonnes/ m <sup>3</sup>	<b>Data Checklist</b>	<b>Yes/No</b>
			Data unit correctly expressed?	Yes
			Appropriate Description of parameter?	Yes
			Source clearly referenced?	Yes
			Correct value provided for estimation?	Yes
			Has this value been verified?	Yes
			Measurement method correctly described?	Yes
			Correct reference to standards?	Yes
			Indication of accuracy provided?	Yes
			QA/QC procedures described?	Yes
			QA/QC procedures appropriate?	Yes
<b>COD<sub>ww,treated,y</sub></b>	COD of the wastewater out flowing from the UASB with methane capture in project activity	tonnes/ m <sup>3</sup>	<b>Data Checklist</b>	<b>Yes/No</b>
			Data unit correctly expressed?	Yes
			Appropriate Description of parameter?	Yes
			Source clearly referenced?	Yes
			Correct value provided for estimation?	Yes
			Has this value been verified?	Yes
			Measurement method correctly described?	Yes
			Correct reference to standards?	Yes
			Indication of accuracy provided?	Yes
			QA/QC procedures described?	Yes
			QA/QC procedures appropriate?	Yes
<b>Q<sub>fueled,y</sub></b>	Amount of biogas recovered and fueled by the project activity in the year y	m <sup>3</sup>	<b>Data Checklist</b>	<b>Yes/No</b>
			Data unit correctly expressed?	Yes
			Appropriate Description of parameter?	Yes
			Source clearly referenced?	Yes
			Correct value provided for estimation?	Yes
			Has this value been verified?	Yes
			Measurement method correctly described?	Yes
			Correct reference to standards?	Yes
			Indication of accuracy provided?	Yes
			QA/QC procedures described?	Yes
			QA/QC procedures appropriate?	Yes

Parameter Title	Description	Unit	Comment	
<b>P<sub>fueled,y</sub></b>	Pressure of recovered and fueled biogas	Pa	<b>Data Checklist</b>	<b>Yes/No</b>
			Data unit correctly expressed?	Yes
			Appropriate Description of parameter?	Yes
			Source clearly referenced?	Yes
			Correct value provided for estimation?	N/A
			Has this value been verified?	N/A
			Measurement method correctly described?	Yes
			Correct reference to standards?	Yes
			Indication of accuracy provided?	Yes
			QA/QC procedures described?	Yes
			QA/QC procedures appropriate?	Yes
<b>T<sub>fueled,y</sub></b>	Temperature of recovered and fueled biogas	℃	<b>Data Checklist</b>	<b>Yes/No</b>
			Data unit correctly expressed?	Yes
			Appropriate Description of parameter?	Yes
			Source clearly referenced?	Yes
			Correct value provided for estimation?	N/A
			Has this value been verified?	N/A
			Measurement method correctly described?	Yes
			Correct reference to standards?	Yes
			Indication of accuracy provided?	Yes
			QA/QC procedures described?	Yes
			QA/QC procedures appropriate?	Yes
<b>W<sub>CH4</sub></b>	Methane content in biogas in the year y	%	<b>Data Checklist</b>	<b>Yes/No</b>
			Data unit correctly expressed?	Yes
			Appropriate Description of parameter?	Yes
			Source clearly referenced?	Yes
			Correct value provided for estimation?	N/A
			Has this value been verified?	N/A
			Measurement method correctly described?	Yes
			Correct reference to standards?	Yes
			Indication of accuracy provided?	Yes
			QA/QC procedures described?	Yes
			QA/QC procedures appropriate?	Yes
<b>Q<sub>hot-air</sub></b>	The quantity of hot air supplied by the project activity during the year y	Nm <sup>3</sup> /hr	<b>Data Checklist</b>	<b>Yes/No</b>
			Data unit correctly expressed?	Yes
			Appropriate Description of parameter?	Yes
			Source clearly referenced?	Yes
			Correct value provided for estimation?	N/A
			Has this value been verified?	N/A
			Measurement method correctly described?	Yes
			Correct reference to standards?	Yes
			Indication of accuracy provided?	Yes
			QA/QC procedures described?	Yes
			QA/QC procedures appropriate?	Yes

Parameter Title	Description	Unit	Comment	
<b>T<sub>hot-air,y</sub></b>	Temperature of hot air supplied by project activity	℃	<b>Data Checklist</b>	<b>Yes/No</b>
			Data unit correctly expressed?	Yes
			Appropriate Description of parameter?	Yes
			Source clearly referenced?	Yes
			Correct value provided for estimation?	N/A
			Has this value been verified?	N/A
			Measurement method correctly described?	Yes
			Correct reference to standards?	Yes
			Indication of accuracy provided?	Yes
			QA/QC procedures described?	Yes
			QA/QC procedures appropriate?	Yes
<b>T<sub>air,y</sub></b>	Temperature of air to be heated by project activity(℃)		<b>Data Checklist</b>	<b>Yes/No</b>
			Data unit correctly expressed?	Yes
			Appropriate Description of parameter?	Yes
			Source clearly referenced?	Yes
			Correct value provided for estimation?	N/A
			Has this value been verified?	N/A
			Measurement method correctly described?	Yes
			Correct reference to standards?	Yes
			Indication of accuracy provided?	Yes
			QA/QC procedures described?	Yes
			QA/QC procedures appropriate?	Yes
<b>P<sub>hot-air,y</sub></b>	Pressure of heated hot air by the project activity(Pa)		<b>Data Checklist</b>	<b>Yes/No</b>
			Data unit correctly expressed?	Yes
			Appropriate Description of parameter?	Yes
			Source clearly referenced?	Yes
			Correct value provided for estimation?	N/A
			Has this value been verified?	N/A
			Measurement method correctly described?	Yes
			Correct reference to standards?	Yes
			Indication of accuracy provided?	Yes
			QA/QC procedures described?	Yes
			QA/QC procedures appropriate?	Yes
<b>P<sub>air,y</sub></b>	Pressure of air to be heated by the project activity(Pa)		<b>Data Checklist</b>	<b>Yes/No</b>
			Data unit correctly expressed?	Yes
			Appropriate Description of parameter?	Yes
			Source clearly referenced?	Yes
			Correct value provided for estimation?	N/A
			Has this value been verified?	N/A
			Measurement method correctly described?	Yes
			Correct reference to standards?	Yes
			Indication of accuracy provided?	Yes
			QA/QC procedures described?	Yes
			QA/QC procedures appropriate?	Yes

Parameter Title	Description	Unit	Comment	
<b>C<sub>co-fired,y</sub></b>	Quantity of co-fired coal consumed by the furnace installed in the project activity during the year y	Ton	<b>Data Checklist</b>	<b>Yes/No</b>
			Data unit correctly expressed?	Yes
			Appropriate Description of parameter?	Yes
			Source clearly referenced?	Yes
			Correct value provided for estimation?	N/A
			Has this value been verified?	N/A
			Measurement method correctly described?	Yes
			Correct reference to standards?	Yes
			Indication of accuracy provided?	Yes
			QA/QC procedures described?	Yes
			QA/QC procedures appropriate?	Yes
<b>C<sub>UASB,y</sub></b>	Quantity of coal consumed for keeping temperature of wastewater in UASB for project activity in winter time during the year y	Ton	<b>Data Checklist</b>	<b>Yes/No</b>
			Data unit correctly expressed?	Yes
			Appropriate Description of parameter?	Yes
			Source clearly referenced?	Yes
			Correct value provided for estimation?	Yes
			Has this value been verified?	Yes
			Measurement method correctly described?	Yes
			Correct reference to standards?	Yes
			Indication of accuracy provided?	Yes
			QA/QC procedures described?	Yes
			QA/QC procedures appropriate?	Yes
<b>End use of final sludge</b>	End use of the final sludge	N/A	<b>Data Checklist</b>	<b>Yes/No</b>
			Data unit correctly expressed?	N/A
			Appropriate Description of parameter?	Yes
			Source clearly referenced?	N/A
			Correct value provided for estimation?	N/A
			Has this value been verified?	N/A
			Measurement method correctly described?	Yes
			Correct reference to standards?	N/A
			Indication of accuracy provided?	N/A
			QA/QC procedures described?	N/A
			QA/QC procedures appropriate?	N/A
<b>TDL</b>	Average technical transmission and distribution losses for providing electricity from China Southern Power Grid in year y	%	<b>Data Checklist</b>	<b>Yes/No</b>
			Data unit correctly expressed?	Yes
			Appropriate Description of parameter?	Yes
			Source clearly referenced?	Yes
			Correct value provided for estimation?	Yes
			Has this value been verified?	Yes
			Measurement method correctly described?	N/A
			Correct reference to standards?	Yes
			Indication of accuracy provided?	N/A
			QA/QC procedures described?	N/A
			QA/QC procedures appropriate?	N/A
<b>EC<sub>PJ,y</sub></b>	Annual Electricity used by equipments installed in waste water treatment facility in year y	MWh/y	<b>Data Checklist</b>	<b>Yes/No</b>
			Data unit correctly expressed?	Yes
			Appropriate Description of parameter?	Yes
			Source clearly referenced?	Yes
			Correct value provided for estimation?	Yes
			Has this value been verified?	Yes
			Measurement method correctly described?	Yes
			Correct reference to standards?	Yes
			Indication of accuracy provided?	Yes
			QA/QC procedures described?	Yes
			QA/QC procedures appropriate?	Yes
<b>NCV<sub>coal,y</sub></b>	Net calorific value of coal that is consumed in the year y	TJ/ton	<b>Data Checklist</b>	<b>Yes/No</b>
			Data unit correctly expressed?	Yes

Parameter Title	Description	Unit	Comment	
			Appropriate Description of parameter?	Yes
			Source clearly referenced?	Yes
			Correct value provided for estimation?	Yes
			Has this value been verified?	Yes
			Measurement method correctly described?	Yes
			Correct reference to standards?	Yes
			Indication of accuracy provided?	N/A
			QA/QC procedures described?	Yes
			QA/QC procedures appropriate?	Yes

The project owner such as Yun'An County Gaoli Starch Factory has the overall authority and responsibility for the monitoring implementation. Monitoring manager has responsibilities for instruction and training of CDM monitoring staff while receiving necessary support from third party which is consulting company and instruct technical matters such as how to use, maintain and calibrate monitoring equipment, procedure for error detection, data processing for calculation of emission reductions, data entry method, data archiving system and preparation of internal monitoring report.

The project activity will have staffs involved in the CDM project monitoring in place by the time of its operation. A CDM project management office will be set up and the office will be composed of the CDM monitoring manager and CDM monitoring staff. The staff concerned will undertake the monitoring tasks including data collection, maintenance and calibration of meters, data recording and archiving, and preparation of monitoring report. Therefore, the staffs will receive training on monitoring to ensure that staff is capable to perform their designated tasks on operation of wastewater treatment biogas recovery system and monitoring system. The training will be carried out once a year during project operation period and records on training will be kept.

By document review, physical inspection and interview with the project owner, it is confirmed by the validation team that the monitoring arrangements described in the monitoring plan are feasible and the means of implementation of the monitoring plan are sufficient to ensure verifiable emission reductions.

We confirmed that this monitoring plan is in accordance with AMS III.H. and AMS I.C. All monitoring parameters for the project is contained in the monitoring plan and the project participants have ability to implement the monitoring plan described in the PDD.

Nevertheless, CAR 10 and CAR 12 were raised in the course of the validation and were successfully closed (ref Annex: Validation Protocol- Table 3).

### 3.6 Calculation of GHG Emissions

According to AMS III.H. (Version 16) and AMS I.C.(Version 19), emission reduction is calculated as following equation:

$$ER_{y,exante} = BE_{y, exante} - (PE_{y, exante} + LE_{y, exante})$$

- $ER_{y,exante}$  (t CO<sub>2</sub>e/yr): *ex-ante* calculated emission reduction in the year y
- $BE_{y, exante}$  (t CO<sub>2</sub>/yr): *ex-ante* calculated baseline emission in the year y
- $PE_{y, exante}$  (t CO<sub>2</sub>/yr): *ex-ante* calculated project emission in the year y
- $LE_{y, exante}$  (t CO<sub>2</sub>/yr): *ex-ante* calculated leakage emission in the year y

The ex-ante baseline emission is calculated as :

$$\begin{aligned} BE_y &= BE_{bio,y} + BE_{thermal,y} = BE_{power,y} + BE_{ww,treatment,y} + BE_{ww,discharge,y} + BE_{thermal,y} \\ &= 44,042 \text{ tCO}_2\text{e/yr} \end{aligned}$$

The ex-ante project emission is calculated as :

$$\begin{aligned} PE_y &= PE_{bio,y} + PE_{thermal,y} = PE_{power,y} + PE_{ww,treatment,y} + PE_{ww,discharge,y} + PE_{fugitive,ww,y} + PE_{thermal,y} \\ &= 6,163 \text{ tCO}_2\text{e/yr} \end{aligned}$$

KFQ confirmed that the PP estimated appropriately leakage associated with the project activity as zero according to AMS III.H. and AMS I.C, since the equipment for the proposed project was new facility and would not be transferred from another activity.

The ex-ante emission reduction is calculated as :

$$\begin{aligned} ER_{y,exante} &= BE_{y,exante} - (PE_{y,exante} + LE_{y,exante}) \\ &= 44,042 - (6,163 + 0) = 37,880 \text{ tCO}_2\text{e/yr} \end{aligned}$$

In the PDD, the parameters to be determined ex-ante are applicable to the proposed project activity. All parameters have been validated and are in compliance with methodology AMS III.H. and AMS I.C. as presented in Section 3.3,

All data and parameters listed in the PDD B.6.2 do not need to be monitored and will remain fixed throughout the crediting period. According to assessment in Section 3.3, the application of these values will result in a conservative estimate of emissions reductions.

Emission reduction by this project activity is estimated to be 37,880 tCO<sub>2</sub>e per year and 378,800 tCO<sub>2</sub>e over the 10 years crediting period. The validation team concluded that the GHG calculation is transparent and the amount of estimated emission reduction is reasonable. Also validation team confirmed that all the assumptions and data used by PP are considered reasonable and the methodologies have been applied correctly to calculate baseline emission, project emission and emission reduction.



### **3.7 Environmental Impacts**

Through document review and interview with PP and local stakeholders, the validation team confirmed the PP has undertaken environmental impact assessment (EIA) by Guangzhou EP Environmental Engineering Ltd and approved by Environment Protection Bureau of Yun'An County, Guangdong Province on 20 April 2008 in accordance with relevant Chinese laws and regulations.

The EIA report referred to anticipated environmental impacts by the project activity with suggestions of mitigation would measure against pollution of waste air, wastewater, solid waste and noise etc. No significant ecological impact on the local area was anticipated.

The validation team concluded that the potential environmental impacts have been sufficiently identified in the PDD and no major adverse effects have been expected from the project activity.

### **3.8 Comments by Local Stakeholders**

Regarding to this proposed project activity, a survey of local residents was carried out to invite comments from local stakeholders in May 2008. Sixty-one (61) copies were distributed to local stakeholders, and 100% feedback was received. No negative comments for impact on the local economy, development and environment have been received.

KFQ has checked all the questionnaires received and interviewed with local government. The survey shows that the proposed project receives strong support from the local people and comments received have been taken into consideration during construction and operation to achieve environmental and social benefits. Also validation team interviewed with local government and found that the proposed project keeps the environmental regulation and also very supportive and looking for growth of local economy.

The validation team confirmed that all relevant local stakeholders have been invited to consultation via appropriate media, the summary of comments received as provided in the PDD are appropriate, and due accounts was taken properly and described in the PDD well.

Nevertheless, CL 1 was raised in the course of the validation and was successfully closed (ref Annex: Validation Protocol- Table 3).

## **4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS**

Korean Foundation for Quality published the project documents on <http://cdm.unfccc.int/Projects/Validation>. Starting date of the global stakeholder consultation

process is 26 March 2010 and invited comments by Parties, stakeholders and non-governmental organizations during a period of 30 days.

No comment was received.

## 5 VALIDATION OPINION

*Korean Foundation for Quality (KFQ) has performed a validation of the ‘Yun’An County Gaoli Starch Factory Wastewater Treatment and Biogas Recovery Project’ in China. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host country criteria, 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 subsequent decision by the CDM Executive Board.*

*The validation is based on the information made available to us and the engagement conditions detailed in this report. The only purpose of this report is its use during the registration process as part of the CDM project cycle. Hence, KFQ can not be held liable by any party for decisions made or not made based on the validation opinion, which will go beyond that purpose. And it has provided KFQ with sufficient evidence to determine the fulfillment of stated criteria. The validation consisted of the following 3 phases : i) a desk review of the project design, the baseline and monitoring plan, ii) follow-up interviews with project stakeholders and iii) the Resolution of outstanding issues and the issuance of the final validation report and opinion.*

*The host country is the People’s Republic of China and the Annex I country is Germany. Both countries fulfill the participation criteria and have approved the project and authorized the project participants. The China DNA confirmed that the project assists in achieving sustainable development.*

*The validation did not reveal any information that indicated that the project can be seen as a diversion of official development assistance (ODA) funding towards China.*

*By wastewater treatment and biogas recovery, the project results in reductions of CO<sub>2</sub> emissions that are real, measurable and give long-term benefits to the mitigation of climate change. An analysis of the investment demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.*

*Given that the project is implemented as designed, the project is likely to achieve the estimated amount of emission reductions. Additionally the assessment team reviewed the estimation of the projected emission reductions.*

*We can confirm that the indicated amount of emission reductions of 378,800 ton CO<sub>2</sub> over the 10 years credit period, resulting in a calculated annual average of 37,880 ton CO<sub>2</sub>, represents a reasonable estimation using the assumptions given by the project documents.*

*The responsibilities and authorities of monitoring and maintenance are clearly defined and a detailed monitoring plan has been developed.*

*In our opinion, the 'Yun'An County Gaoli Starch Factory Wastewater Treatment and Biogas Recovery Project', as described in the revised PDD of 4 November 2011 (version 1.6), meets relevant UNFCCC requirements for the CDM and relevant host country criteria and correctly applies the baseline and monitoring methodology AMS III.H. version 16 and AMS I.C. Version 19. Thus the 'Yun'An County Gaoli Starch Factory Wastewater Treatment and Biogas Recovery Project' will hence be recommended by KFQ for requesting for registration as a CDM project to UNFCCC.*

**Signed on behalf of the Korean Foundation for Quality**

Signature : 

Name : Byung Yong LEE

Date : 08 November 2011

## 6 REFERENCES

Reference No.	Documentation and/or website	Remarks
1	Project Design Document for CDM project ‘Yun'An County Gaoli Starch Factory Wastewater Treatment and Biogas Recovery Project’ - Version 1.1: 8 March 2010 - Version 1.2: 7 September 2010 - Version 1.3: 9 December 2010 - Version 1.4: 14 February 2011 - Version 1.5: 4 July 2011 - Version 1.6: 4 November 2011	PDD
2	Supporting Excel Spreadsheet on Investment Analysis Report - Version 01: 1 April 2010 - Version 1.4 : 22 March 2011 - Version 1.5 : 13 July 2011 - Version 1.6: 4 November 2011	Spreadsheet : Investment Analysis
3	Supporting Excel Spreadsheet on ER - Version 01: 1 April 2010 - Version 1.4: 25 March 2011 - Version 1.5 : 13 July 2011 - Version 1.6: 4 November 2011	Spreadsheet : Emission Reduction
4	AMS III H : Methane recovery in wastewater treatment” (Version 16) AMS I C : Thermal energy production with or without electricity (Version 19) Guidelines for Completing the Project Design Document (CDM- SSC-PDD), and the form for Proposed New Small Scale Methodologies (CDM-SSC-NM, Ver.05) Combined tool to identify the baseline scenario and demonstrate additionality (Version 3.0) Tool for the demonstration and assessment of additionality (Version 5.2) Glossary of CDM terms (Ver. 05) Guidance on the Demonstration and Assessment of Prior consideration of the CDM (Ver.03) General Guideline to SSC CDM methodologies (Ver. 15). Guidelines on the Assessment of Investment Analysis (Ver. 03.1) Tool to calculate the emission factor for an electricity system” (ver. 02.2) Tool to calculate baseline, project and/or leakage emissions from electricity consumption” (ver. 01) Tool to determine project emissions from flaring gases containing methane Tool to calculate project or leakage CO2 emissions from fossil fuel combustion” (ver. 02)	EB guidelines/Tool and Methodology

	Tool to determine the remaining lifetime of equipment(ver. 01) Clean Development Mechanism Validation and Verification Manual (Ver. 01.2)	
5	LoA of Host country DNA: 13 July 2010. <a href="http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File2473.pdf">http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File2473.pdf</a>	LoA
6	FSR : Hainan Construction Project Planning Design Research Institute, September 2007	FSR
7	EIA: Guangzhou EP Environmental Engineering Ltd., March 2008 EIA Approval: Environment Protection Bureau of Yun'An County, Guangdong Province, 20 April 2008	EIA
8	Meeting minute for basic concept of CDM for the project by board, 5 July 2007 Board decision, Yun'An County Gaoli Starch Factory, 28 April 2008	BoD meeting
9	Construction contract including equipments purchasing, Yun'An County Gaoli Starch Factory and Hainan Zhenyuan Environmental Technical Limited. 6 June 2008 Supplementary construction contract, Yun'An County Gaoli Starch Factory and Hainan Zhenyuan Environmental Technical Limited. 17 June 2008	Project Starting date and other /Construction Contract
10	LOI, Sumitomo, 20 May 2008	Project continuation LOI
11	Consulting contact, ITP, 2 September 2009	Project continuation Consulting contact
12	ERPA, HANWHA Europe GmbH, 26 August 2009	Project continuation ERPA
13	Future production plan, 17 January 2005	Baseline determination
14	Economic Evaluation Measurements and Parameters of Constructive Projects(version 3), National Development and Reform Commission and Ministry of Construction of the People's Republic of China, 2006	Benchmark selection
15	Receipt of construction fee payment (initial), Hainan Zhenyuan Environmental Technical Limited., 11 June 2008	Input value Total investment cost
16	Equipments' lifetime assessment report(UASB), Hainan Zhenyuan Environmental Technical Limited. Equipments' remaining lifetime assessment report(Furnace), engineer of equipment supplier, named Liu Hui Ming	Input value Operational lifetime
17	Salary book, May 2010	Input value O&M cost
18	Research and Calculation Handbook for Energy saving	Input value O&M cost
19	Instruction of the electricity price by Guangdong electricity grid company, Yunfu City, Yun'An County office Electricity purchase bill, 14 March 2007	Input value O&M cost
20	Chemical purchase record, January 2010 ~ December 2010 Chemical purchase receipts January 2010 ~ December 2010	Input value O&M cost
21	The People's Republic of China State Council Decree No. 538, 1 November 2008	Input value TAX

22	Monthly coal purchase record(2005~2007)	Input value Amount of coal displaced
23	Coal purchase receipts, Guangdong Lanyue Energy Development Limited & Zhaoqing Shenyu Trading Limited	Input value Amount of coal displaced
24	GuoShuiFa[2003]70, National Taxation Bureau	Input value Residual Value
25	Electricity purchase bill, Guangdong electricity grid company, March 2007	Input value O&M cost
26	Annual operating log, 2007, 2008	Input value Annual operation day
27	China statistical Year Book, 2001~2008	Sensitivity analysis
28	Statistical data on coal industry for Guangdong Province, National Bureau of Statistics of China	Sensitivity analysis
29	IPCC Guideline 2006	Emission reduction calculation
30	Coal NCV, China DNA <a href="http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File2332.doc">http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File2332.doc</a>	Emission reduction calculation
31	China Electric Power Yearbook 2006 ~ 2008	Emission reduction calculation : EF
32	China Electric Power Yearbook 2009	Emission reduction calculation : TDL
33	Clarification of heating wastewater inflow to UASB, 12 July 2010	Emission reduction calculation
34	Clarification of treatment of sludge from UASB, 25 Jun 2010	Emission reduction calculation
35	Electrical equipment list	Emission reduction calculation
36	LoI of sludge treatment between PO and local farmers, 19 March 2009	Emission reduction calculation
37	Starch sales record, 2006~2010	Emission reduction calculation
38	Starch production record, 2006~2010	Emission reduction calculation
39	Demonstration of representative of measurement campaign condition, 24 September 2010	Emission reduction calculation

40	Long term sludge treatment contract, 28 May 2010	Emission reduction calculation
41	Statistical temperature record issued by the Guangdong province	Emission reduction calculation
42	<a href="http://www.biogas.gov.cn/Z_Show.asp?ArticleID=109">http://www.biogas.gov.cn/Z_Show.asp?ArticleID=109</a> )	Emission reduction calculation
43	Wastewater testing report, Yun'An County environment supervision bureau, 28 July 2010.	Wastewater testing report : wastewater volume
44	Wastewater testing report, Yun'An County environment supervision bureau, 31 May 2009	Wastewater testing report : COD
45	Wastewater testing report, Yun'An County environment supervision bureau, 7 March 2008, 20 March 2007	Wastewater testing report : COD
46	China national standard GB17167-2006 China national standard JJG 677-2006 The Technical Management Rules of Electrical Energy Measurement Devices, DL/T448-2000	Monitoring parameter
47	Training plan during monitoring period, 14 June 2010	Training plan
48	Copies of survey of local residents, May 2008	Stakeholder survey
49	Company regulation, Yun'An County Gaoli Starch Factory, December 2006	
50	UASB Manual, Hainan Zhenyuan Environmental Technical Limited, 2008	UASB Manual
51	Furnace specification, 29 March 2011	Furnace specification
52	Starch plant construction contract, 20 October 2003	Plant capacity
53	<a href="http://www.chinacoal.org.cn/coaljjyx/265/25163.aspx">http://www.chinacoal.org.cn/coaljjyx/265/25163.aspx</a> <a href="http://www.shenhuagroup.com.cn/xwzx/xyzx/mtzs/2011/09/171790.shtml">http://www.shenhuagroup.com.cn/xwzx/xyzx/mtzs/2011/09/171790.shtml</a>	Qinhuangdao Harbor coal trading price
54	<a href="http://www.sndrc.gov.cn/view.jsp?ID=4078">http://www.sndrc.gov.cn/view.jsp?ID=4078</a>	NCV of standard coal
55	<a href="http://qhd.cqcoal.com/Trade/Price/">http://qhd.cqcoal.com/Trade/Price/</a>	Transportation fee from Qinhuangdao Harbor to Guangzhou Harbor
56	<a href="http://www.e-to-china.com.cn/tgzn/hwys/cjwt/2009/1012/63340.html">http://www.e-to-china.com.cn/tgzn/hwys/cjwt/2009/1012/63340.html</a> <a href="http://www.nnzsy.com/shop/pinpaidiannao/130257416325.html">http://www.nnzsy.com/shop/pinpaidiannao/130257416325.html</a>	Coal transportation insurance fee
57	<a href="http://www.hndrc.gov.cn/html/fagaiweizhuanlan/diaochayanjiu/2011/0601/3169.html">http://www.hndrc.gov.cn/html/fagaiweizhuanlan/diaochayanjiu/2011/0601/3169.html</a>	Coal price trend



	Research report on Coal price trend, Chinese Academy of Science Center for Econometric Analysis and Forecasting Science Research Center Northeast Branch, 6 December 2007	
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## Appendix A

### Validation protocol for CDM project activities

**Table 1: Requirements and Means of Validation for Clean Development Mechanism Project Activity**

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

Question	Ref.	Criteria	Comments	Draft. Concl.	Final Concl.
<b>A. General Description of Project Activity</b>					
<b>A.1 Title of the project activity</b>					
A.1 1 Does the used project title clearly enable to identify the unique CDM activity?	EB 41	Annex 12	The project title is Fuel Switching of Yun'An County Gaoli Starch Factory Wastewater Treatment and Biogas Recovery Project. The project titled with the name of the project location and the energy source of the project. Hence, it can be clearly identified.	<b>OK</b>	<b>OK</b>
A.1 2 Are there any indication concerning the revision number and the date of the revision?	EB 41	Annex 12	The available GSC PDD is indicated as version 1.1 dated 8 March 2010, GSC started on 26 March 2010.	<b>OK</b>	<b>OK</b>
<b>A.2 Project Design Document</b>					
A.2.1 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 website.	VVM	55	PDD has followed the structure and guidance in the latest relevant PDD template (CDM-PDD, Ver. 03).	<b>OK</b>	<b>OK</b>
A.2.1.1 Is the PDD in accordance with the applicable CDM requirements for completing PDDs?	VVM	56	Yes, The PDD was completed according to the 'Guidelines for Completing the Project Design Document (CDM-PDD), and the 'Guidelines for Completing the Project Design Document (CDM- SSC-PDD), and the form for Proposed New Small Scale Methodologies (CDM-SSC-NM, Ver.05) for Small-Scale CDM project.	<b>OK</b>	<b>OK</b>
A.2.2 The validation report shall contain a statement regarding the compliance of the PDD with relevant forms and guidance.	VVM	57	Yes. The validation report contains a statement regarding the compliance with relevant forms and guidance.	<b>OK</b>	<b>OK</b>

<b>A.3 Description of the project activity</b>					
A.3.1 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.	VVM	58	<p>Yes. The information provides the reader with a clear understanding of the proposed CDM project activity.</p> <p>The project activity is a methane recovery project from wastewater treatment and biogas utilization for heat generation.</p> <p>The overview of the project is transparently provided in section A.2 and A.4 of the PDD. During the on-site audit, the project activities described in the PDD have been proven by the audit team technical aspects of its implementation.</p> <p>Thus, the validation team concludes the project description contained in PDD is completed and accurate.</p>	<b>OK</b>	<b>OK</b>
A.3.1.1 Does the description and information in the PDD sufficiently cover all relevant elements, is accurate and provide the reader with a clear understanding of the proposed CDM activity ?	VVM	59	<p>Yes. The information provides the reader with a clear understanding of the proposed CDM project activity.</p> <p>Please refer A.3.1.1</p>	<b>OK</b>	<b>OK</b>
<p>A.3.1.2 Is the proposed project activity in existing or utilizing existing equipments? If so, does the description in the PDD reflect the project activity for the following types of CDM project activities unless other means are specified in the methodology?</p> <p>(a) Large scale projects</p> <p>(b) Non-bundled SSC</p> <p>(c) Bundled SSC</p>	VVM	60	<p>Yes. The project activity is a methane recovery project from wastewater treatment and biogas utilization for heat generation through installing new equipment(UASB) and utilizing existing equipments(furnace). The validation team confirmed the proposed project is a non-bundling small scale project with emission reductions exceeding 60,000 tonnes CO<sub>2</sub>, per year applied by the methodology AMS III H “Methane recovery in wastewater treatment”(Version 16) and AMS I C “Thermal energy production with or without electricity” (Version 19) through physical site inspection.</p>	<b>OK</b>	<b>OK</b>
A.3.1.3 For other individual proposed small scale CDM project activities with emission reductions not exceeding 15,000 tonnes per year, was a physical site visit conducted as appropriate?	VVM	61	Please refer A.3.1.2	<b>OK</b>	<b>OK</b>

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A.3.1.4 For all other proposed CDM project activities not referred to in paragraphs A.3.1.1~A.3.1.3, Was the validation undertaken by reviewing available designs and feasibility studies, and comparison analysis to equivalent projects, as appropriate. Was the physical site visit conducted? If not, justify the reason.	VVM	62	N/A	<b>OK</b>	<b>OK</b>
A.3.1.5 If the proposed project activity involve the alteration of an existing installation or process, was the project description clearly stated the differences resulting from the project activity compared to the pre-project situation	VVM	63	The project activity is a methane recovery project from wastewater treatment and biogas utilization for heat generation through utilizing existing equipment(furnace) and the project description clearly stated in PDD. Beside methane recovery project from wastewater treatment and biogas utilization for heat generation, the proposed project activity involves no alteration of an existing installation or process.	<b>OK</b>	<b>OK</b>
A.3.1.6 Is all information presented consistent with details provided by further chapters of the PDD, especially section A.4, A.4.3and B.3?	EB 41	Annex 12	Yes. It is verified that the description in the PDD is accurate and complete. All information provided is consistent with details provided in further chapters of the PDD.	<b>OK</b>	<b>OK</b>
A.3.1.7 Is the brief explanation how the project will reduce greenhouse gas emission transparent and suitable?	EB 41	Annex 12	Because the project activity is composed of methane recovery and biogas utilization, which will be reduced methane gas emission and switched from coal using to recovered methane gas.  Doubtless, the Project will reduce greenhouse gas (GHG) emissions through avoidance of methane emissions to the atmosphere from wastewater treatment and reduction of coal consumption for hot air generation.	<b>OK</b>	<b>OK</b>
A.3.1.8 Will the project create other environmental or social benefits than GHG emission reductions?	EB 41	Annex 12	Yes, as biogas utilization for heat generation project and reducing coal consumption, results in the reduction of other air pollutants such as SO <sub>x</sub> , PM. And reducing health damage and danger from biogas diffusion, such as odor and danger of explosion of methane. Also it contributes to the local sustainable development and creating new job opportunities of the local people.	<b>OK</b>	<b>OK</b>

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A.3.1.9 What proofs are available demonstrating that the project description is in compliance with the actual situation or planning?	EB 41	Annex 12	<p>During the on-site assessment, numerous proofs for the described project activity were evidenced.</p> <p>The following data deliver evidences for the actual situation of the project activity:</p> <ul style="list-style-type: none"> <li>- FSR completion (September 2007)</li> <li>- Made a basic concept of CDM for the project by board (5 July 2007)</li> <li>- Investment decision (28 April 2008)</li> <li>- Construction contract including equipments purchasing (6 June 2008)</li> <li>- Construction commencement(11 June 2008)</li> <li>- Operation start(June 2009)</li> </ul>	<b>OK</b>	<b>OK</b>
<p>A. 3.2 The validation report shall:</p> <p>(a) Describe the process undertaken to validate the accuracy and completeness of the project description;</p> <p>(b) Contain the DOE.s opinion on the accuracy and completeness of the project description.</p>	VVM	64	Yes. The validation team reported the process undertaken to validate the accuracy and completeness of the project description in the PDD and stated DOE's opinion on the accuracy and completeness of the project description.	<b>OK</b>	<b>OK</b>
<b>A.4 Participation requirements/Approval</b>					
A.4.1 All parties involved have approved the project activity and CDM project activities shall assist Parties not included in Annex I to the Convention in achieving sustainable development.	VVM	44, 125	No. LoA of the host Party and Annex-I Party have not been submitted.	<b>CAR 1</b>	<b>OK</b>
<p>A.4 1.1 Has the DNA of the Host Party involved in the proposed CDM project activity in section A.3 of the PDD provided a written letter of approval which confirms?</p> <ul style="list-style-type: none"> <li>- The country is a Party to the Kyoto Protocol</li> <li>- Participation is Voluntary</li> <li>- The Host Party confirming that the proposed CDM project activity contributes to sustainable development of the country</li> <li>- It refers to the precise proposed CDM project activity title in the PDD being submitted for registration.</li> </ul> <p>Please indicate whether the letter is provided from the PP or the DNA</p>	VVM	45, 53 126	No. LoA of the host party has not been submitted.	<b>CAR 1</b>	<b>OK</b>

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A.4.1.2 Has the letter of approval been issued by the respective host party's DNA and valid for the CDM project activity under validation?	VVM	47	Please refer A.4.1.1	<b>CAR 1</b>	<b>OK</b>
<p>A.4.1.3 Has the DNA of the Annex I country involved in the proposed CDM project activity in section A.3 of the PDD provided a written letter of approval which confirms?</p> <ul style="list-style-type: none"> <li>- The country is a Party to the Kyoto Protocol</li> <li>- Participation is Voluntary</li> <li>- It refers to the precise proposed CDM project activity title in the PDD being submitted for registration</li> </ul> <p>Please indicate whether the letter is provided from the PP or the DNA</p>	VVM	45,53	CAR 1 was raised requesting the PP to provide the LoA from Germany.	<b>CAR 1</b>	<b>OK</b>
A.4.1.4 Has the letter of approval been issued by the respective Annex-I party's DNA and valid for the CDM project activity under validation?	VVM	47	Please refer A.4.1.3	<b>CAR 1</b>	<b>OK</b>
A.4.1.5 Is the letter(s) of approval authentic? Please describe the means of assessment.	VVM	48, 53	Please refer A.4.1.	<b>CAR 1</b>	<b>OK</b>
A.4.1.6 Is the letter(s) of approval unconditional?	VVM	46	Please refer A.4.1.	<b>CAR 1</b>	<b>OK</b>
A.4.2 All project participants have been listed in a consistent manner in the project documentation and their participation in the project activity has been approved by a party to the Kyoto Protocol.	VVM	51	Yes. The information provided is consistent with details provided in Annex I of the PDD. Through documents review and interview with the project owner, it has been confirmed that there are no entities other than those approved as project participants included in Section A.3 and Annex I of the PDD.	<b>OK</b>	<b>OK</b>
A.4.2.1 Is the table required for the indication of project participants correctly applied?	EB 41 VVM	Annex 12, 52	<p>Yes. The table in A.3 of the PDD is correctly applied.</p> <p>The host party involved in the project is China and the Annex –I participating Party is Germany.</p> <p>Yun'An County Gaoli Starch Factory is the project participant from the Host Party. And HANWHA Europe GmbH is the project participant from Annex-I party.</p>	<b>OK</b>	<b>OK</b>

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A.4.2.2 Is all information in participants/ Parties provided in consistent with details provided by further chapters of the PDD (in particular Annex I)?	EB 41 VVM	Annex 12 52	Yes. Please refer A.4.2.1.	<b>OK</b>	<b>OK</b>
A.4.2.3 Has the project participation of each project participant been approved by at least one Party involved, either in a letter of approval or in a separate letter specifically to approve participation?	VVM	52	Yes. The host party involved in this project is China and the Annex I participating party is Germany. However LoAs from China and Germany have not been submitted to DOE.	<b>CAR 1</b>	<b>OK</b>
A.4.2.4 Are there any other entities than those approved as project participants included in section A.3. of the PDD?	VVM	52	No. There are no other entities than those approved as project participants indicated in section A.3. of the PDD.  - Participant from Annex I Party: HANWHA Europe GmbH - Participant from host party: Yun'An County Gaoli Starch Factory	<b>OK</b>	<b>OK</b>
A.4.3 If letters of approval contain additional specification of the project activity, such as the PDD version number, please follow VVM paragraph 50	VVM	50	Please refer A.4.1.	<b>CAR 1</b>	<b>OK</b>
A.4.4 The validation report shall, for each Party involved:  (a) Indicate whether a letter of approval has been received, with clearly referencing the letter itself and any supporting documentation; (b) Indicate whether the DOE received this letter from the project participants or directly from the DNA; (c) Indicate the means of validation employed to assess the authenticity if VVM paragraph 48 applies; (d) Contain a clear statement regarding whether the DOE considers the letters are in accordance with VVM paragraphs 45.48.	VVM	49	Please refer A.4.1.1	<b>CAR 1</b>	<b>OK</b>
A.4.5 The validation report shall state whether the host Party.s DNA confirmed the contribution of the project to the sustainable development of the host Party. This may be reported together with the DOE.s assessment of the validity of the host Party.s approval (refer to VVM paragraphs 49 and 50).	VVM	127	Please refer A.4.1.1	<b>CAR 1</b>	<b>OK</b>



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A.4.6 The validation report shall, for each project participant:					
(a) Indicate whether the participation has been approved by a Party to the Kyoto Protocol; (b) Describe the means of validation employed to draw this conclusion.	VVM	54	Please refer A.4.1.1 and 4.1.5	<b>CAR 1</b>	<b>OK</b>
<b>A.5. Technological description of project activity</b>					
<b>A.5.1 Location of the project activity</b>					
A.5.1.1 Does the information provided on the location of the project activity allow for a clear identification of the site?	EB 41	Annex 12	Yes. The project location could be clearly identified according to the PDD. The project is located on Gaocun Town, Yun'An County, Guangdong Province, People's Republic of China (PRC).  The coordinates of the plant is: Longitude: 111° 53 '20''E Latitude: 22 ° 55 '54''N	<b>OK</b>	<b>OK</b>
A.5.1.2 How is it ensured and/or demonstrated, that the project proponents can implement the project at this site (Ownership, Licenses, Contracts etc.)?	VVM	62	During on-site assessment, a construction contract including equipments purchasing on 6 June 2008 was provided. This contract can demonstrate that project proponent can implement the project at the site. Also the operation has been started since June 2009.	<b>OK</b>	<b>OK</b>
<b>A.5.2 Categories of the project activity</b>					
A.5.2.1 To which category (ies) does the project activity belong to? Is the category correctly identified and indicated?	EB 41	Annex 12	Yes. The proposed project is composed of methane recovery and biogas utilization. Hence this project activity belongs to sectoral scope 1: Energy Industries (renewable – non-renewable sources) and sectoral scope 13 : Waste handling and disposal. The category is correctly identified and indicated in A.4.2 of the PDD.	<b>OK</b>	<b>OK</b>
<b>A.5.3 Technology to be employed by the small-scale project activity</b>					

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A.5.3.1. Is the technology implemented by the Project activity environmentally safe?	VVM	62	Yes. The project activity will reduce emissions of SOx, and PMs. By biogas utilization for heat generation project and reducing coal consumption, results in the reduction of other air pollutants such as SOx, PM. And as a combustion characteristic methane gas, SOx emissions will be reduced comparing to the baseline scenario. It is also expected that emissions of PMs will be reduced by project activity.	<b>OK</b>	<b>OK</b>
A.5.3.2 Does the description of technology to be applied provide sufficient and transparent input/information to evaluate its impact on the GHG balance?	EB 41	Annex 12	Yes. The project would avoid GHG emissions by biogas recovery and biogas utilization for heat generation in order to use recovered methane gas which is cleaner than coal to generate heat.  Therefore, avoidance of methane emissions to the atmosphere from wastewater treatment and reduction of coal consumption for heat generation by using recovered methane as fuel will be used to calculate emission reduction by this project activity.	<b>OK</b>	<b>OK</b>
A.5.3.3 Does the implementation of the project activity require any technology transfer from Annex-I-countries to the host country(ies)?	EB 41	Annex 12	No. The facility(UASB) is used by manufactured by China. Thus it can not be expected there is technology transfer from Annex-I country to the host country.	<b>OK</b>	<b>OK</b>
A.5.3.4. Is the information provided in compliance with actual situation or planning?	VVM	62	Yes. The information is complied with actual situation. Refer A.3.1.9 of this protocol.	<b>OK</b>	<b>OK</b>
A.5.3.5 Does the project require extensive initial training and maintenance efforts in order to be carried out as scheduled during the project period?	-	-	Yes the project does require extensive initial training but the PP has the necessary expertise to perform the necessary actions during the project period.	<b>OK</b>	<b>OK</b>
A.5.3.6 Does the project make provisions for meeting training and maintenance needs?	-	-	The staff concerned will undertake the monitoring tasks. Training for operation and maintenance for the project will be provided from third party who is consulting company. Training is conducted on site to ensure that staff is capable to perform their designated tasks on operation of wastewater treatment biogas recovery system and monitoring system. This will also include CDM specific training to warrant that they understand the importance of complete and accurate data and records for CDM monitoring.	<b>OK</b>	<b>OK</b>

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			The training will be carried out once a year during project operation period and records on training will be kept.		
<b>A.5.4 Estimated amount of emission reductions over the chosen crediting period</b>					
A.5.4.1 Is the form required for the indication of projected emission reductions correctly?	EB 41	Annex 12	Yes. The table used for the indication of projected emission reduction is correctly applied.	<b>OK</b>	<b>OK</b>
A.5.4.2 Are the figures provided consistent with other data presented in the PDD?	EB 41	Annex 12	Yes. The yearly emission reduction is estimated to be 37,880 t CO <sub>2</sub> which is the result of the emission reductions were calculated by deducting the project emission from the baseline emission. The same figure is quoted in the entire PDD.	<b>OK</b>	<b>OK</b>
<b>A.5.5 Public funding of the project activity</b>					
A.5.5.1 Public funding for the project from parties in Annex I shall not be a diversion of official development assistance.	EB 41	Annex 12	Yes. The validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards China. Project owner's equity capital was invested to this project.	<b>OK</b>	<b>OK</b>
<b>A.5.6 Confirmation that the small-scale project activity is not a de-bundled component of a large scale project activity</b>					
A.5.6.1 Does the proposed small-scale project activity meet the requirements of the simplified modalities and procedures for small-scale CDM project activities?	VVM	135	Yes. The project activity is a methane recovery project from wastewater treatment and biogas utilization for heat generation. The validation team confirmed the proposed project is a small scale project applied AMS III H "Methane recovery in wastewater treatment" (Version 16) and AMS I C "Thermal energy production with or without electricity" (Version 19) through physical site inspection.	<b>OK</b>	<b>OK</b>
A.5.6.2 Does the project activity qualifies within the thresholds of the three possible types of small scale project activities? [Type (i) project activities: renewable energy project activities with a maximum output capacity equivalent to up to 15 megawatts;	VVM	136	The proposed project is fuel switching project activity. But PP could not demonstrate the amount of emission reduction, less than 60k ton CO <sub>2</sub> eq, required by methodology AMS III H (Version 16).	<b>CAR 3</b>	<b>OK</b>

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Type (ii) project activities: energy efficiency improvement project activities which reduce energy consumption, on the supply and/or demand side, by up to the equivalent of 60 Giga watt hours per year; Type (iii) project activities: other project activities that both reduce anthropogenic emissions by sources and directly emit less than 60 kilo tones of carbon dioxide equivalent annually.]					
A.5.6.3 Does the project activity conform to one of the approved small-scale categories?	VVM	136	Yes. The proposed project applied for the methodology, AMS III H “Methane recovery in wastewater treatment” (Version 16) and AMS I C “Thermal energy production with or without electricity” (Version 19)	<b>OK</b>	<b>OK</b>
A.5.6.4 Does the project activity apply the relevant tool and methodology?	VVM	134	Yes. Besides the methodology, AMS III. H. and AMS I . C. , the proposed project applied the relevant tool and methodology as follows. - General Guideline to SSC CDM methodologies (Ver. 15). - Combined tool to identify the baseline scenario and demonstrate additionality (ver.3.0) - Tool to calculate the emission factor for an electricity system” (ver. 02.2) - Tool to calculate baseline, project and/or leakage emissions from electricity consumption” (ver. 01) - Tool to calculate project or leakage CO2 emissions from fossil fuel combustion” (ver. 02)	<b>OK</b>	<b>OK</b>
A.5.6.5 Are the small-scale methodologies applied in conjunction with the general guidance to the methodologies, which provides guidance on equipment capacity, equipment performance, sampling and other monitoring-related issues?	VVM	136	Yes. Please refer A.5.6.1 and A.5.6.4	<b>OK</b>	<b>OK</b>
A.5.6. Is the project activity not a de-bundled component of a large-scale project, i.e., is there a registered small scale. CDM project activity or an application to register another CDM project activity: (a) with the same project participants; (b) in the same project category and technology/measure; and (c) registered within the previous 2 years; and	VVM  Gener al guidel ine to SSC	136	The following criteria were checked to confirm that the proposed project activity is not a debundled component of a large scale project activity. - The same project participants? : No - In the same project category and technology/measure? : No - Registered within previous two years? Or in registration process? : No - Whose boundary is within 1 km of the project boundary of the small scale project activity under consideration? : No	<b>OK</b>	<b>OK</b>

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(d) whose project boundary is within 1 km of the proposed boundary of the proposed small-scale activity at the closest point?			Thus, the validation team made a conclusion the project activity is not a debundled component of a larger project.		
A.5.6.7 Does the project activity apply specific requirements on demonstration of additionality for SSC together with Chapter V, section E, subsection 6 in VVM and the 'Non-binding best practice examples to demonstrate additionality for SSC project activity?	VVM	137	<p>The project activity is required specific requirements on demonstration of additionality for SSC such as Annual emission reduction is less than the 60,000 t CO<sub>2</sub>e stipulated as threshold for this project category.</p> <p>However, PP could not demonstrate the amount of emission reduction in project activity less than 60k ton/year.</p>	CAR 3	OK
<b>B. Application of a baseline and monitoring methodology</b>					
<b>B.1 Title and reference of the approved baseline and monitoring methodology applied to the project activity.</b>					
B.1.1 The DOE shall validate that the selected baseline and monitoring methodologies selected by the project participants comply with the methodologies previously approved by the CDM EB is applicable to the project activity, including that the used version is valid. The DOE shall apply specific guidance provided by the CDM EB in respect to any approved methodology.	VVM	65, 66, 68, 69	<p>Yes. The methodologies, AMS III. H. (Version 16) is valid from 10 December 2010 onwards and AMS I.C. (Version 19) is valid from 17 June 2011 onwards. The validation team cross-checked the web-site:  <a href="http://cdm.unfccc.int/methodologies/DB/4ND00PCGC7WXR3L0LOJTS6SVZP4NSU">http://cdm.unfccc.int/methodologies/DB/4ND00PCGC7WXR3L0LOJTS6SVZP4NSU</a>  <a href="http://cdm.unfccc.int/methodologies/DB/6EL4AG49US2S1DNH55Y4S7GDQFA2JF">http://cdm.unfccc.int/methodologies/DB/6EL4AG49US2S1DNH55Y4S7GDQFA2JF</a>  respectively.</p> <p>Also, the proposed project applied specific guidance such as :</p> <ul style="list-style-type: none"> <li>- General Guideline to SSC CDM methodologies (Ver. 15).</li> <li>- Combined tool to identify the baseline scenario and demonstrate additionality (ver.3.0)</li> <li>- Tool to calculate the emission factor for an electricity system” (ver. 02.2)</li> <li>- Tool to calculate baseline, project and/or leakage emissions from electricity consumption” (ver. 01)</li> <li>- Tool to calculate project or leakage CO<sub>2</sub> emissions from fossil fuel combustion” (ver. 02)</li> </ul>	OK	OK
B.1.2 Are reference number, version number, and title of the baseline and monitoring methodology clearly quoted? Is the applied version the most recent one and/or this version still applicable? Is there specific guidance or tool used in this project	EB 41 VVM	Annex 12 70	Yes. Please refer to B.1.1	OK	OK

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activity in respect to the approved methodology?					
B.1.3 Are the applicability criteria in the baseline methodology all fulfilled and described in the PDD? (List up the applicability criteria)	VVM	71	<p>Methodology III.H is applicable to this project as below:</p> <ul style="list-style-type: none"> <li>- The project introduces a sequential stage of wastewater treatment by using an anaerobic reactor(UASB) with methane recovery in order to replace the open anaerobic lagoons without methane recovery.</li> <li>- The depth of lagoon in baseline system is greater than two meters confirmed by direct measurement.</li> <li>- The monthly average ambient temperature in baseline system is above 15°C during most of the year confirmed by statistical temperature record at the Guangdong province.</li> <li>- The sludge removal event in baseline system was not conducted since starting the wastewater inflow to the lagoon. Thus the sludge removal events in baseline system are greater than 30 days.</li> <li>- The recovered biogas from the above measures was utilized directly for thermal energy generation instead of combustion/flaring.</li> <li>- The approved baseline and monitoring methodology AMS I.C. is used for the heat generation component of the project activity.</li> <li>- The project is not a Greenfield project and the project activity does not involve a change of equipment resulting in a capacity addition of the wastewater or sludge treatment system.</li> <li>- The location of the wastewater treatment plant as well as the source generating the wastewater was defined uniquely in the PDD.</li> </ul> <p>Methodology I.C is fully applicable to this project as below:</p> <ul style="list-style-type: none"> <li>- The proposed project uses biogas which is recovered from the wastewater treatment system in order to displace fossil fuel to produce heat. This thermal energy is used in the starch production process.</li> <li>- The total installed thermal energy generation capacity of the furnace (co-fired systems, both fossil and renewable fuel) in the proposed project is 1.4MW which is less than 45MW thermal.</li> <li>- The project activities is not seek to retrofit or modify an existing facility for renewable energy generation.</li> </ul> <p>However, PP should clearly demonstrate that the project is less than 60,000ton CO<sub>2</sub>eq annually.</p>	CAR 3	OK

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B.1.4 Is the project activity not expected to result in emissions other than those allowed by the methodology?	VVM	71	The project activity not expected to result in emissions other than those allowed by the methodology AMS III. H. version 16 and AMS I.C. version 19.	<b>OK</b>	<b>OK</b>
B.1.5 Is there request for clarification of, revision to or deviation from a methodology? If so, please describe the process and results.	VVM	72,73, 74,75	No. There is no- clarification, revision or deviation for the project activity. KFQ confirmed it through the document review and interview with the PP.	<b>OK</b>	<b>OK</b>
B.1.6 For each applicability condition listed in the approved methodology selected, the DOE shall clearly describe in the validation report the steps taken to assess the relevant information contained in the PDD against these criteria. The validation report shall include an unambiguous validation opinion regarding the applicability of the selected methodology to the proposed CDM project activity.	VVM	76	Yes. The validation report describes that this proposed project activity met each applicability condition listed in the AMS III. H.(version 16) and AMS I.C. (Version 19) in section 3.3. of the validation report.	<b>OK</b>	<b>OK</b>
B.1.7 The validation report shall contain information regarding greenhouse gas emissions occurring within the proposed CDM project activity boundary as a result of the implementation of the proposed CDM project activity which are expected to contribute more than 1% of the overall expected average annual emissions reductions, which are not addressed by the applied methodology.	VVM	77	KFQ confirmed that the chosen baseline and monitoring methodologies are applicable to the project activity and also emission sources, which are not addressed by the applied methodology, and are expected to contribute more than 1% of the overall expected annual average emission reductions, have not been identified.	<b>OK</b>	<b>OK</b>
<b>B.2 Project Boundary and Description of the source and gases included in the project boundary</b>					
B.2.1. 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.	VVM	67,78	<p>Yes, the spatial and technological boundaries as verified onsite comply with the discussion provided by the PDD.</p> <p>As per the baseline methodology, the project boundary is the physical, geographical site where the biogas recovery and biogas utilization for heat generation measure occurs. Therefore, the project boundary encompasses the wastewater treatment process and heat generation process in the project's site.</p> <p>The physical project boundary is described on PDD B.3 correctly.</p>	<b>OK</b>	<b>OK</b>

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B.2.2 Does the project boundary include the physical delineation of the proposed CDM project activity?	VVM	79	The project boundary includes the physical delineation of the proposed CDM project activity. The spatial extent of the proposed project boundary includes the proposed project.	<b>OK</b>	<b>OK</b>
B.2.3 Are all emission sources and gases related to the baseline scenario and leakage clearly identified and described in a complete and transparent manner?	EB 41 VVM	Annex 12, 79	PP estimated appropriately leakage associated with the project activity as zero according to AMS III.H. and AMS I.C, since the equipment for the proposed project was new facility and would not be transferred from another activity.  However, the summary of gases and sources included/excluded in the project boundary is omitted in the PDD.	<b>CAR 4</b>	<b>OK</b>
B.2.4 If the methodology allows the PPs to choose whether a source or gas is to be included within the project boundary. If so, Have the PPs justified that choice and is the justification provided reasonable?	VVM	79	Pease refer to B.2.3	<b>CAR 4</b>	<b>OK</b>
B.2.5 Is a flow diagram of the project boundary, physically delineating the project activity presented based on the descriptions provided in section “A.4.3. Technology to be employed by the project activity”?	EB 41	Annex 12	Yes. A flow diagram of the project boundary is indicated in the PDD. The spatial extent of the project boundary includes project site. The project site includes UASB and furnace.	<b>OK</b>	<b>OK</b>
B.2.6 In the validation report, the DOE shall describe how the validation of the project boundary has been performed, by detailing the documentation assessed (e.g. a commissioning report) and by describing its observations during any site visit undertaken in accordance with VVM paragraphs 59.62 (i.e. observations of the physical site or equipment used in the process). The DOE shall provide a statement whether the identified boundary and the selected sources and gases are justified for the project activity. Should the DOE identify emission sources that will be affected by the project activity and are not	VVM	80	The validation team confirmed the project boundary via observation of the physical site on 12 ~ 13 April 2010. Also the validation team assessed documentation such as FSR, interview and site-inspection to identify the project site and boundary of the project activity. The validation report describes how DOE assessed project boundary and emission resources that affected by the project activity. Also it indicates that DOE does not need to request clarification of, revision to or deviation from the methodology.	<b>OK</b>	<b>OK</b>



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addressed by the selected approved methodology, the DOE shall request clarification of, revision to or deviation from the methodology, as appropriate, as described in VVM paragraph 73.					
<b>B.3 Description of how the baseline scenario is identified and description of the identified baseline scenario</b>					
B.3.1 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.	VVM	81	<p>According to AMS III . H and I.C, the baseline scenario has been defined as continuance of the existing lagoons to treat wastewater with biogas released to the atmosphere directly, and continuance of the existing coal fired boilers without any retrofit to provide heat for production.</p> <p>The baseline scenario was reasonably represented in the PDD.</p>	OK	OK
B.3.2 Have any procedure contained in the methodology to identify the most reasonable baseline scenario, been correctly applied?	VVM	82	<p>As methodology AMS III H and I.C prescribes the baseline scenario and no further analysis required, therefore, there is no need to take steps to identify the baseline scenarios.</p> <p>Because proposed project is small-scale CDM project, the alternative baseline scenarios dose not need to be considered according to “Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities” However, PP to identified alternative scenario to demonstrate additionality</p> <p>Refer section B.4 of this protocol.</p>	OK	OK
B.3.3 Does the selected methodology require use of tools (such as “Tool for the demonstration of additionality” and the “Combined tool to identify the baseline scenarion and demonstrate additionality”) to establish the baseline scenario?	VVM	82	<p>Yes. PP selected “Combined tool to identify the baseline scenario and demonstrate additionality” to establish the baseline scenario.</p>	OK	OK
B.3.4 If, yes, was the methodology consulted on the application of these tools ?(in such cases, the guidance in the methodology shall supersede the tool)	VVM	82	<p>Yes. PP followed instruction in the Tools applied to the project activity and where applicable the guidance in the methodology supersedes the guidance provided in the tools.</p>	OK	OK
B.3.5 Does the methodology require several alternative scenarios to be considered in the identification of the most reasonable baseline scenario?	VVM	83	<p>Yes. Please refer to B.4.3</p>	OK	OK

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B.3.6 If, yes, are all scenarios that are considered by the project participants and are supplementary to those required by the methodology reasonable in the context of the proposed CDM project activity?	VVM	83	Yes. All scenarios considered by the PP in the PDD are reasonable in the context of the CDM project activity. For a full validation of the baseline scenario analysis, please see B.4.3 of this protocol.	<b>OK</b>	<b>OK</b>
B.3.7 Is the baseline scenario identified reasonable by validating assumptions, calculations and rations used, as described in the PDD? And is all the documents and sources referred to in the PDD used for establishing the baseline scenario and correctly quoted and interpreted?	VVM	84	Yes. All the assumptions and data used by PP including reference and sources are provided in the PDD. And all the documentation is used for establishing the baseline scenario and correctly quoted and interpreted in the PDD.	<b>OK</b>	<b>OK</b>
B.3.8 Was the information provided in the PDD cross checked with other credible and credible sources, such as local expert opinion, if available ?(identify the sources)	VVM	84	Yes. The validation team cross-checked the information provided in the PDD with other credible source to confirm its validity and applicability. All the references that we have used in validation are listed in the section 6, Reference of this Report.	<b>OK</b>	<b>OK</b>
B.3.9 Have all applicable CDM requirements been taken into account in the identification of the baseline scenario for the proposed CDM project activity?	VVM	85	Yes. All applicable CDM requirements have been taken into account in the identification of the baseline scenario for the proposed project activity and it is well described in the PDD.	<b>OK</b>	<b>OK</b>
B.3.10 Have all relevant policies and circumstances been identified and correctly considered in the PDD, in accordance with the guidance by the CDM EB?	VVM	85	Yes. All relevant policies and circumstances were identified and correctly considered in the PDD in accordance with the guidance by the CDM EB.	<b>OK</b>	<b>OK</b>
B.3.11 Does the PDD 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?	VVM	86	Yes. It is identified in the PDD B.4 that: the baseline scenario, according to methodology AMS III H and I.C, is the following:  As described in the methodology, the emission baseline is the current emissions of the facility. In the absence of the Project activity, Yun'An County Gaoli Starch Factory would continue the existing lagoons to treat wastewater with biogas released to the atmosphere directly, and would continue of the existing coal fired boilers which is the current situation. Under the current regulations, it is allowed to release biogas on and there are no regulations that require the use of recovered methane gas.	<b>OK</b>	<b>OK</b>

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<p>B.3.12 The DOE shall clearly describe in the validation report the steps taken to assess the requirement given in VVM paragraphs 81 and 82 and shall provide an opinion as to whether:</p> <ul style="list-style-type: none"> <li>(a) All the assumptions and data used by the project participants are listed in the PDD, including their references and sources;</li> <li>(b) All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;</li> <li>(c) Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable;</li> <li>(d) Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD;</li> <li>(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.</li> </ul>	VVM	87	<p>Yes. KFQ confirms that all steps have been taken to assess requirements required by VVM paras. 81 and 82. Please refer section 3.3 of the validation report for full validation of these points.</p>	OK	OK
<p>B.3.13 The validation report shall clearly describe other steps taken, and sources of information used, by the DOE to cross check the information contained in the PDD on this matter.</p>	VVM	88	<p>Please refer section 3.3 of the validation report for full comments on this point.</p>	OK	OK
<p><b>B.4 Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity (assessment and demonstration of additionality)</b></p>					
<p>B.4.1 CDM benefit shall be considered necessary in the decision to undertake the project as a proposed CDM project activity.</p>	VVM	98/103	<p>As starting date of the project activity (6 June 2008) is before 2 August 2008, the validation team had assessed the evidence that the incentive from the CDM was seriously considered in the decision to proceed with the project activity or at the starting date of the project activity.</p> <p>The proofs for the prior consideration of applying for CDM to support project activity have been demonstrated by the project participants and verified by KFQ. In line with the guidance of EB 49 Annex 22 ‘Guidelines on the demonstration and assessment of prior consideration of the CDM (version 3)’, the evidences requested from the project participants were evaluated by KFQ. A summary of these evidences is provided in the</p>	OK	OK

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			<p>following paragraphs.</p> <p>Validation team was able to verify all the relevant documents which demonstrate that benefits from CDM had been seriously considered before the starting of the project activity and its CDM continuation.</p> <p>On 5 July 2007, board members of PP made a basic concept of CDM for the project and on 28 April 2008, a board meeting regarding the project investment including the financial return of the project activity and CDM implementation was conducted. The project owner at that time was aware of CDM development in China and it was decided to implement the project with CDM as implementation of the project activity without CDM is poor financial return.</p> <p>Thus, KFQ confirmed that the project owner was aware of the CDM prior to the starting date of the project, and that the benefits of the CDM were as decisive factor in the decision to proceed with the project activity.</p>		
B.4.1.1 Is the start date of the project activity in accordance with the “Glossary of CDM terms”?	VVM	99	<p>The starting date of the project has been validated by KFQ as 6 June 2008 which represents the date of construction contract including equipments purchasing between PP and Hainan Zhenyuan Environmental Technical Limited. KFQ confirmed that this starting date is the earliest date at which either the implementation or construction or real action of a project activity begins after reviewing the documents below.</p> <p>To confirm this date, validation team examined following dates:</p> <ul style="list-style-type: none"> <li>- Construction contract including equipments purchasing : 6 June 2008</li> <li>- Construction commencement: 11 June 2008</li> <li>- Operation start : June 2009</li> </ul> <p>Thus, KFQ regarded ‘construction contract including equipments purchasing’ as an official implementation to proceed with the project activity and accepted it as the starting date because it is the earliest date at which either the implementation or construction or real action of a project activity begins. And also project owner was committed to expenditures related to the implementation or related construction of the project activity.</p>	<b>OK</b>	<b>OK</b>

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B.4.1.2 Is it a new project activity (project activities with start date on or after 02 Aug 2008) or an existing project activity (project activities with a start date before 02 Aug 2008)?	VVM	100	The proposed project is an existing project as the starting date of the project activity is before 02 August 2008.	<b>OK</b>	<b>OK</b>
B.4.1.3 For a new project, for which PDD has not been published for global stakeholder consultation or a new methodology proposed to the EB before the project activity start date, had the PP 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?	VVM	101	N/A	<b>OK</b>	<b>OK</b>
B.4.1.4 For an existing project activity, for which the start date is prior to the date of publication of the PDD for global stakeholder consultation, are the following evidences provided?	VVM	102	Please refer B.4.1.	<b>OK</b>	<b>OK</b>
B.4.1.5 Evidence that must indicate that awareness of the CDM prior to the project activity start date, and that the benefits of the CDM were a decisive factor in the decision to proceed with the project, including, 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?	VVM	102	Please refer B.4.1.	<b>OK</b>	<b>OK</b>
B.4.1.6 Reliable evidence from project participant that must indicate that continuing and real actions were taken to secure status for the project in parallel with its implementation including, inter alia : <ul style="list-style-type: none"> <li>- Contract with consultants for CDM/PDD/methodology services</li> <li>- ERPA or other documentation related to the sale of the potential CERs</li> <li>- Evidence of agreements or negotiation with a DOE for validation service</li> <li>- Submission of a new methodology to the CDM EB</li> <li>- Publication in newspaper</li> </ul>	VVM	102	<p>PP indicated that continuing and real actions were taken to secure status for the project with reliable evidence.</p> <p>To proceed with the application, the project owner made consulting contract with Guangzhou Kaisheng Environmental Protection Tec. Co., Ltd. on 8 May 2008 and LOI was made 20 May 2008 with Sumitomo in order to develop the CDM, but they eventually failed to agree on ERPA by end of 2008. And the Baraka Global Advisory who is trading and development for the project from end of 2008, introduced the project to HANWHA Europe GmbH in early 2009.</p> <p>In the meantime, PP made a construction contract with Hainan Zhenyuan Environmental Technical Limited on 6 June 2008 and made a contract with</p>	<b>OK</b>	<b>OK</b>

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<ul style="list-style-type: none"> <li>- Interview with DNA</li> <li>- Earlier correspondence on the project with the DNA or the UNFCCC secretariat</li> </ul>			<p>ITP for consulting service on 2 September 2009. And PP made the ERPA with HANWHA Europe GmbH on 26 August 2009. Subsequently, HANWHA Europe GmbH made contract with KFQ for validation service on 18 February 2010 and PP got a LoA from China DNA in 13 July 2010.</p> <p>Project participants have demonstrated through evidences and official documents that the sequence of the events is coherent and reliable which shows the continued action to secure CDM status further demonstrating the additionality of the project</p>		
B.4.2 The PDD shall describe how a proposed CDM project activity is additional.	VVM	94	Yes, The PDD provided description that how a proposed CDM project activity is additional in section B.5 of the PDD.	<b>OK</b>	<b>OK</b>
B.4.2.1 Does the PDD describe how a proposed CDM project activity is additional? Are the reliability and credibility of all data, rationales, assumptions, justifications and documentation provided by project participants to support the demonstration of additionality assessed and verified?	VVM	95	Yes. PP analyzed investment barrier of this proposed project activity and it is well described in section B.5 of the PDD. The analysis conforms to the “Combined tool to identify the baseline scenario and demonstrate additionality”. (Version 3.0)	<b>OK</b>	<b>OK</b>
B.4.2.2 Does the PDD state the latest version of the additionality tool and documents being used?	VVM	96	Yes. The approved “Combined tool to identify the baseline scenario and demonstrate additionality” version 3.0 is used. The validation team cross-checked the web site: <a href="http://cdm.unfccc.int/Reference/tools/index.html">http://cdm.unfccc.int/Reference/tools/index.html</a> .	<b>OK</b>	<b>OK</b>
B.4.3 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 prescribe the baseline scenario and hence no further analysis is required?	VVM	105	<p>For the heat generation component, according to paragraph 16 of AMS I.C, the simplified baseline is the fuel consumption of the technologies that would have been used in the absence of the project activity times an emission factor for the fossil fuel displaced. For the proposed project, the fossil fuel displaced is coal.</p> <p>Therefore, the baseline scenarios for the heat generation that are available to the project participant can be listed as follows:</p> <ul style="list-style-type: none"> <li>• Scenario H1: Heat generation using co-fuel (coal and biogas) in a furnace (the proposed project activity undertaken without being registered as a CDM project activity);</li> <li>• Scenario H2: Heat generation using coal in a furnace (correspond with the baseline scenario of AMS I.C. stipulated in paragraph 16).</li> </ul>	<b>OK</b>	<b>OK</b>

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			<p>Alternative scenarios for wastewater treatment (W) that are available to the project participant include:</p> <ul style="list-style-type: none"> <li>• Scenario W1: Anaerobic digester with methane recovery (the proposed project activity undertaken without being registered as a CDM project activity);</li> <li>• Scenario W2: The untreated wastewater being discharged into sea, river, lake, stagnant sewer or flowing sewer and</li> <li>• Scenario W3: The (existing) anaerobic wastewater treatment system without methane recovery.</li> </ul> <p>Thus, possible and reasonable combinations of each scenario are described as follows;</p> <ul style="list-style-type: none"> <li>• Combination 1: H1 and W1</li> <li>• Combination 2: H2 and W2</li> <li>• Combination 3: H2 and W3</li> </ul> <p>According to the “Discharge limits of water pollutants(DB44/26-2001, 20 August 2001)” of Guangdong province, the wastewater which is discharged into the sea, river, lake, stagnant sewer or flowing sewer, has to be reduced of COD in wastewater lower than 100 mg/l. Because the wastewater from the starch production line before wastewater treatment will contain as much as about 22,560mg/l of COD, alternative Scenario W2, untreated wastewater being discharged into sea, river, lake, stagnant sewer or flowing sewer, does not comply with the mandatory applicable laws and regulations and thus Scenario W2 eliminated from the alternative scenarios.</p> <p>Therefore, the Combinations 1 and 3 remain as baseline scenarios for the proposed CDM project activity. Regard to the combination 1, the validation team described its financial unfeasibility to the next Investment analysis section in the report. Thus, Combination 3 remains as baseline scenario.</p>		
<p>B.4.3.1 Does the list of alternatives given in the PDD ensure that:</p> <p>(a) the list of alternatives includes as one of the options that the project activity is undertaken without being registered as a proposed CDM project activity</p> <p>(b) the list contains all plausible alternatives that the DOE, on basis of its local and sectoral knowledge, considers to</p>	VVM	106	<p>(a) Yes.</p> <p>(b) Yes. The list contains all plausible alternatives. In addition, the alternatives are defined by the selected methodology and KFQ confirms that there are no further alternatives that require consideration in the context of the project activity.</p> <p>(c) All alternatives comply with applicable and enforced legislation</p>	OK	OK

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be viable means of supplying the outputs or services that are to be supplied by the proposed CDM project activity (c) the alternatives comply with all applicable and enforced legislation.			governing the project area.		
B. 4.3.2 Have realistic and credible alternatives been identified providing comparable outputs or services? (step 1a)	VVM	106(b)	As mentioned above, KFQ confirms that all credible alternatives have been identified.	<b>OK</b>	<b>OK</b>
B. 4.3.3 Is the project activity without CDM included in these alternatives? (Step 1a)	VVM	106(a)	Yes. The proposed project activity without CDM is included as one of alternative scenarios.	<b>OK</b>	<b>OK</b>
B.4.3.4 Is a discussion provided for all identified alternatives concerning the compliance with applicable laws and regulations? (step 1b)	VVM	106(c)	KFQ confirms that a discussion of compliance with all applicable laws and regulations is provided in the context of all identified alternatives.	<b>OK</b>	<b>OK</b>
B.4.3.5 In case the PDD argues that specific laws are not enforced in the country or region Is evidence available concerning that statement? (step 1b)	VVM	106(c)	All the laws quoted in the PDD are enforced in this project: hence, this section is not applicable.	<b>OK</b>	<b>OK</b>
B.4.4 If investment analysis has been used to demonstrate the additionality of the proposed CDM project activity, the PDD provide evidence that the proposed project activity would not be the most economically or financially attractive alternative or economically or financially feasible, without the revenue from the sale of CERs  (In case of applying step 2: investment analysis of the additionality tool: Is the analysis method identified appropriately (step 2a)? which option is selected and why).	VVM	108	Yes. The proposed activity would be not economically or financially feasible, without the revenue from the sale of CERs. Three analysis methods are provided according to the Guidelines on the Assessment of Investment Analysis (Version 03.1). Because the proposed project generates economic benefits through the coal saving other than CDM revenue, therefore, the Option I (simple cost analysis) can't be taken. Moreover, Option II (investment comparison analysis) can't be adopted either as there are no similar investment project in alternatives identified. Thus, Option III (benchmark analysis) is the only applicable one to this project activity.	<b>OK</b>	<b>OK</b>



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<p>B.4.4.1 Was this shown by one of the following approaches?</p> <ul style="list-style-type: none"> <li>- 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;</li> <li>- The proposed CDM project activity is less economically or financially attractive than at least one other credible and realistic alternative;</li> <li>- The financial returns of the proposed CDM project activity would be insufficient to justify the required investment.</li> </ul>	VVM	109	<p>Yes. The financial returns of the proposed CDM project activity would be insufficient to justify the required investment was selected to show the proposed project activity would not be the most economically or financially attractive or economically or financially feasible without the revenue from the sale of CERs.</p>	<b>OK</b>	<b>OK</b>
<p>B.4.4.2 Does the investment analysis comply with the latest version of the “Guidance on the Assessment of investment analysis” and with other relevant guidance including the latest guidelines on plant load factors .guidelines for the reporting and validation of plant load factors?</p>	VVM	110	<p>Yes. The latest version of the approved “Guidance on the Assessment of Investment Analysis (Version 03.1)” is used. The validation team cross-checked the web site:  <a href="http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid03.pdf">http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid03.pdf</a>.</p>	<b>OK</b>	<b>OK</b>
<p>B.4.4.3 Is the period of assessment limited to the proposed crediting period of the CDM project activity?</p>	EB 51	Ann 58	<p>The operational lifetime of the project is stated as 20 years from the FSR and it is longer than the crediting period of the proposed project and the period of assessment is limited to the proposed crediting period of the CDM project activity.</p> <p>However, PP did not demonstrate the remaining lifetime of the equipments with objective evidence for assuring that remaining lifetime is longer than the crediting period and operational lifetime of the proposed project</p>	<b>CAR 2</b>	<b>OK</b>
<p>B.4.4.4 Does the project IRR or Equity IRR calculations reflect the period of expected operation of the underlying project activity(technical lifetime), or if a shorter period is chosen – include the fair value of the project activity assets at the end of the assessment period?</p>	EB 51	Ann 58	<p>Yes. The IRR is the most suitable financial indicator. A benchmark analysis in which the Internal Rate of Return (IRR) of the project is calculated and compared to a benchmark stated in the ‘Economic Evaluation Measurements and Parameters of Constructive Projects(version 3)’ issued by National Development and Reform Commission and Ministry of Construction of the People’s Republic of China in 2006. This publication provides 12% IRR benchmark as a guideline for this kind of project activity.</p>	<b>OK</b>	<b>OK</b>

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			<p>Furthermore, KFQ was able to confirm this is suitable and reasonable as followings:</p> <p>a) This benchmark, 12% is in line with the ‘Economic Evaluation Measurements and Parameters of Constructive Projects(version 3)’ issued by National Development and Reform Commission and Ministry of Construction of the People’s Republic of China in 2006. The benchmarks provided in this publication are the result of expert investigation and industry review, and can be considered as an authoritative, credible and reliable data source for benchmarks. This publication sets the benchmark for all industries in China and classifies them into 100 industrial sectors. There is no separate sector for ‘starch production’ and there is also no other sector more appropriate other than organic chemistry and intermediates production as starch production. Thus, organic chemistry and intermediates production(12%) has been chosen as the most relevant and appropriate sector benchmark for the project type. And the publication is widely applied in China for assessing the financial viability of various types of project.</p> <p>b) The validation team also checked any previous investment decision by the PP, Yun’An County Gaoli Starch Factory, involved and found that this proposed project activity is the first investment project implemented by PP.</p> <p>c) The benchmark rate, 12% is seen from other similar projects in China, recently registered under CDM and many of them referring to this rule.</p> <p>Hence, the validation team concluded that this benchmark, 12% is appropriate for the project.</p> <p>The fair value of the project activity assets is 5% which is in line with the relevant national tax regulation, GuoShuiFa[2003]70 issued by the National Tax Bureau since 18 June 2003.</p>		
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B.4.4.5 Is the most suitable financial indicator clearly identified (IRR, NPV, Cost benefit ratio, or (levelized) unit cost)?	EB 51	Ann 58	<p>Yes. The evaluation of the project's financial viability is based on the internal rate on return (IRR)</p> <p>However, IRR calculation on IRR spreadsheet for investment analysis(ver.01) is not correct.</p> <p>- IRR value (without CDM) : -1.8% - IRR value (with CDM) :41.3%</p>	<b>CL 3</b>	<b>OK</b>
B.4.4.6 Are Input values used valid and applicable at the time of the investment decision taken by the project participant?	EB 41	Ann 58	<p>The input values used in the investment analysis are taken from the FSR which has been the basis of the decision to proceed with the investment in the project. And consistency of input values applied in the investment analysis and associated spreadsheet are checked by the validation team.</p> <p>This FSR was developed by 3<sup>rd</sup> party design company, Hainan Construction Project Planning Design Research Institute in September 2007. Subsequently the investment decision was made in Board meeting on 28 April 2008. The validation team was able to confirm that the input values during the time gap between the completion of the FSR (September 2007) and the investment decision (28 April 2008) was not materially changed. Also there was no any changing for the project design &amp; plan till the project start date (6 June 2009). KFQ was able to confirm it through interview with PP and relevant documents.</p>	<b>OK</b>	<b>OK</b>
<p>B.4.4.7 In the case, does the project participants rely on values form FSR that are approved by national authorities for proposed project activities?</p> <p>(a) The FSR has been the basis of the decision to proceed with the investment in the project, i.e. that the period of time between the finalization of the FSR and the investment decision is 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;</p> <p>(b) The values used in the PDD and associated annexes are fully consistent with the FSR, and where inconsistencies occur the DOE should validate the appropriateness of the values;</p> <p>(c) On the basis of its specific local and sectoral expertise,</p>	VVM	113	<p>Yes. All the input value were identified and assessed through the FSR which has been used as the basis of the decision to proceed with the investment.</p> <p>The key parameters used for IRR analysis has been presented in Table B.4.1 of PDD. The spreadsheet and related documents have been verified by the validation team.</p> <p>Since input parameters impact the NPV analysis, the actual figures quoted from other official documents issued by the 3rd organizations are used for double check.</p> <p>However, input values which are applied in investment analysis are not clearly demonstrated.</p> <p>- Validity of investment cost - Validity of O&amp;M cost</p>	<b>CAR 5</b>	<b>OK</b>

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confirmation is 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.			<ul style="list-style-type: none"> <li>- Validity of coal price</li> <li>- Validity of residual value(5%)</li> <li>- etc.</li> </ul>		
B.4.4.8 Was a thorough assessment of all parameters and assumptions used in calculating the relevant financial indication and determine the accuracy and suitability of these parameters using the available evidence and expertise in relevant accounting practices conducted?	VVM	111	<p>All the input value were identified and assessed through the FSR that was basis of decision to proceed with this project activity as a CDM project. The key parameters used for IRR calculation has been presented in section B.5 of PDD and are consistent with the FSR. The spreadsheet and related documents have been verified by the validation team.</p> <p>Since input parameters impact the IRR results, the actual figures quoted from other official documents issued by the 3rd organizations are used for double check.</p> <p>However, input values which are applied in investment analysis are not clearly demonstrated.</p>	CAR 5	OK
B.4.4.9 Were the parameters cross-checked against third-party or publicly available sources, such as invoices or price indices?	VVM	111	Please refer to B.4.4.8.	CAR 5	OK
B.4.4.10 Were feasibility reports, public announcements and annual financial reports related to the proposed CDM project activity and the project participants reviewed?	VVM	111	Yes. All feasibility reports, business plans, public stakeholder announcements, and annual financial reports related to the proposed CDM project activity were reviewed.	OK	OK
B.4.4.11 Was the correctness of computations carried out and documented by the project participants assessed?	VVM	111	Yes. KFQ checked the correctness of computations documented by the project participants. KFQ went through all spreadsheet IRR calculations and checked for inconsistencies. None were found.	OK	OK
B.4.4.12 Was the sensitivity analysis by the project participants to determine under what conditions variations in the result would occur, and the likelihood of these conditions?	VVM	111	<p>Sensitive analysis is not analyzed in appropriate manner.</p> <ul style="list-style-type: none"> <li>- It is not clear to get annual increase rate of coal price(8.3%) and the statistical data is not derived from the project region</li> <li>- The price index for fuel and power in sensitivity analysis for investment cost was not related in investment cost</li> </ul>	CAR 6	OK

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<p>B.4.4.13 Is any benchmark applied in the investment analysis suitable?</p> <ul style="list-style-type: none"> <li>- Determine whether the type of benchmark applied is suitable for the type of financial indicator presented.</li> <li>- Ensure that any risk premiums applied in determining the benchmark reflect the risks associated with the project type or activity.</li> <li>- Determine whether it is reasonable to assume that no investment would be made at a rate of return lower than the benchmark by, for example, assessing previous investment decisions by the project participants involved and determining whether the same benchmark has been applied or if there are verifiable circumstances that have led to a change in the benchmark.</li> </ul>	VVM	112	<p>The evaluation of the project's financial viability is based on the IRR. The PP selected the benchmark rate, as 12% according to the 'Economic Evaluation Measurements and Parameters of Constructive Projects(version 3)' issued by National Development and Reform Commission and Ministry of Construction of the People's Republic of China in 2006. The benchmark of 12% is therefore appropriate for this project.</p>	<b>OK</b>	<b>OK</b>
<p>B.4.5 Barrier analysis has been used to demonstrate the additionality of the proposed CDM project activity? If so, please follow VVM 115~118</p>	VVM	115	<p>No. The PP used investment analysis for demonstrating the additionality for the proposed project activity instead of barrier analysis.</p>	<b>OK</b>	<b>OK</b>
<p>B.4.6 Are project participants able to demonstrate to a designated operational entity that the project activity would otherwise not be implemented due to the existence of one or more barrier(s) listed in attachment A of Appendix B of 4/CMP.1 Annex II ?</p>	General Guide line to SSC	5, 7	<p>Barrier analysis is not applied.</p>	<b>OK</b>	<b>OK</b>
<p>B.4.7 For proposed large-scale CDM project activities, common practice analysis shall be carried out</p>	VVM	119	<p>No. The proposed project is small-scale CDM project, thus common practice analysis is not carried out.</p>	<b>OK</b>	<b>OK</b>
<p>B.4.7.1 If yes, was common practice analysis carried out as a credibility check of the other available evidence used by the project participants to demonstrate additionality?</p>	VVM	119	<p>N/A</p>	<b>OK</b>	<b>OK</b>

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B.4.7.2 Is the geographical scope (e.g. the defined region) of the common practice analysis appropriate for the assessment of common practice related to the project activity's technology or industry type? (For certain technologies the relevant region for assessment will be local and for others it may be transnational/global)	VVM	120(a)	N/A	<b>OK</b>	<b>OK</b>
B.4.7.3 Was a region other than the entire host country is chosen. If yes, was the explanation why this region is more appropriate assessed?	VVM	120(a)	N/A	<b>OK</b>	<b>OK</b>
B.4.7.4 Using official sources and local and industry expertise was it determined to what extent similar and operational projects (e.g., using similar technology or practice), other than CDM project activities, have been undertaken in the defined region?	VVM	120(b)	N/A	<b>OK</b>	<b>OK</b>
B.4.7.5 Are similar and operational projects, other than CDM project activities, are already “widely observed and commonly carried out” in the defined region? What is the evidence?	VVM	120(c)	N/A	<b>OK</b>	<b>OK</b>
B.4.7.6 If, yes, was it assessed whether there is essential distinctions between the proposed CDM project activity and the other similar activities?	VVM	120(c)	N/A	<b>OK</b>	<b>OK</b>
B.4.8 The validation report shall clearly describe all steps taken, and sources of information used, by the DOE to cross-check the information contained in the PDD on this matter. The validation report shall contain information regarding how the DOE has determined that the documentation assessed is authentic, where appropriate.	VVM	97	Yes. The validation report describes all the steps taken and sources of information used by DOE to cross-check the information contained in the PDD. Also the validation team determined that the documentation assessed is authentic and the entire source used for appropriate.	<b>OK</b>	<b>OK</b>

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<p>B.4.9 The validation report shall:</p> <p>(a) Describe the DOE.s validation of the project activity start date provided in the PDD;</p> <p>(b) Describe the evidence for prior consideration of the CDM (if necessary) that was assessed;</p> <p>(c) Provide a clear validation opinion regarding whether the proposed CDM project activity complies with the requirements of the latest version of the Guidance on prior consideration of CDM.</p>	VVM	104	<p>Please refer B.4.1.1 for (a) and B.4.1 for (b).</p> <p>In the course of assessing B.4.1 and B.4.1.1, the validation team can confirm that proposed CDM project activity complies with the requirements of the latest version of the Guidance on Prior consideration of CDM.</p>	<b>OK</b>	<b>OK</b>
<p>B.4.10 The validation report shall describe whether the DOE considers the listed alternatives to be credible and complete.</p>	VVM	107	<p>Yes. Validation report describes that KFQ considered the listed alternatives to identify baseline scenario are credible and complete.</p>	<b>OK</b>	<b>OK</b>
<p>B.4.11 The validation report shall:</p> <p>(a) Describe in detail how the parameters used in any financial calculations have been validated;</p> <p>(b) Describe how the suitability of any benchmark applied has been assessed;</p> <p>(c) Confirm whether the underlying assumptions are appropriate and the financial calculations are correct.</p>	VVM	114	<p>Please refer B.4.4.7 and B.4.4.13.</p> <p>The validation team confirmed that underlying assumptions employed are appropriate and calculation in investment analysis is correctly performed and it is well indicated in section 3.4 of the validation report.</p>	<b>OK</b>	<b>OK</b>
<p>B.4.12 The validation report shall:</p> <p>(a) Provide an assessment of each barrier listed in the PDD, which describes how the DOE has undertaken validation of the barrier;</p> <p>(b) Provide an overall determination of the credibility of the barrier analysis performed.</p>	VVM	118	<p>To demonstrate additionality of the proposed project activity, PP conducted investment analysis. Therefore step 3, Barrier analysis is skipped.</p>	<b>OK</b>	<b>OK</b>
<p>B.4.13 The validation report shall provide details regarding:</p> <p>(a) How the geographical scope of the common practice analysis has been validated;</p> <p>(b) How the DOE has undertaken an assessment of the existence of similar projects;</p> <p>(c) How the DOE has assessed the essential distinctions between the proposed CDM project activity and any similar projects that are widely observed and commonly carried out;</p>	VVM	121	<p>N/A. The proposed project is Small-Scale CDM project, thus the common practice analysis is not required.</p>	<b>OK</b>	<b>OK</b>

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(d) Confirmation by the DOE that the proposed CDM project activity is not common practice.					
<b>B.5 Emission Reductions</b>					
<b>B.5.1. Algorithms and/or formulae used to determine emission reductions</b>					
B.5.1.1 The steps taken and equations applied to calculate project emissions, baseline emissions, leakage and emission reductions shall comply with the requirements of the selected methodology?	VVM	89	Yes. According to the AMS III.H (Version 16) and AMS I.C (Version 19), all the steps and equations were applied to calculate project emissions, baseline emissions, leakage and emission reductions for the proposed project activity.	OK	OK
B.5.1.2 Have the equations and parameters in the PDD been correctly applied with the respect those on the selected approved methodology?	VVM	90	The equations applied are consistent with the AMS III.H (Version 16) and AMS I.C (Version 19).	OK	OK
B.5.1.3 Are all Parameters included completely? - Title in line with methodology? - Data unit correctly expressed? - Appropriate description? - Source clearly referenced? - Correct value provided? - Has this value been verified? - Choice of data correctly justified? - Measurement method correctly described?	VVM	90	Yes. All listed parameters are properly described.	OK	OK
B.5.1.4. Does the methodology provide for selection between different options for equations or parameters?	VVM	90	No different options were selected for equations or parameters with the methodology AMS III.H (Version 16) and AMS I.C (Version 19).	OK	OK
B.5.1.5. If, yes, has adequate justification been provided (based on the choice of the baseline scenario, context of the proposed CDM project activity and other evidence provided)?	VVM	90	N/A	OK	OK



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B.5.1.6. Will data and parameters monitored throughout the crediting period of the proposed CDM project activity?	VVM	91	The data and parameters monitored throughout the crediting period. See section 3.5 of validation report “Monitoring Plan”	<b>OK</b>	<b>OK</b>
<p>B.5.1.7. If, no, and these data and parameters will remain fixed through the crediting period, are all data sources and assumptions</p> <ul style="list-style-type: none"> <li>- Appropriate and correct?</li> <li>- Applicable to the proposed CDM project activity?</li> <li>- Resulting in a conservative estimate of the emission reductions?</li> </ul>	VVM	91	<p>Yes. All parameters determined ex-ante are appropriate and correct, applicable to the proposed CDM project activity, and result in a conservative estimate of emission reductions in the opinion of KFQ.</p> <p>Following data and parameters are fixed through the crediting period.</p> <ul style="list-style-type: none"> <li>- Combined margin emission factor of the grid system</li> <li>- Methane correction factor for the anaerobic wastewater treatment system i</li> <li>- Methane producing capacity of the wastewater</li> <li>- Model correction factor to account for model uncertainty</li> <li>- Volume of waste water in UASB digester</li> <li>- Methane correction factor based on discharge pathway in the baseline situation (e.g., into sea, river or lake) of the wastewater</li> <li>- Efficiency of the boiler that would be used for heat generation in the absence of the project activity</li> <li>- CO2 emission factor</li> <li>- Net calorific value of methane</li> <li>- Methane conversion factor anaerobic digester</li> <li>- Net calorific value of coal that is consumed in the year y</li> </ul>	<b>OK</b>	<b>OK</b>
B.5.1.8 Will data and parameters be monitored on implementation and hence become available only after validation of the project activity?	VVM	91	<p>Yes. The following data and parameters will be monitored on implementation and these are available only after validation.</p> <ul style="list-style-type: none"> <li>- Volume of wastewater treated in wastewater treatment system in the year y</li> <li>- COD of the wastewater entering the UASB /out flowing from the UASB with methane capture in project activity</li> <li>- Amount of biogas recovered and fueled by the project activity in the year y</li> <li>- Temperature / Pressure of biogas captured</li> <li>- Methane content in biogas in the year y</li> <li>- The quantity of hot air supplied by the project activity during the year y</li> <li>- Temperature of hot air supplied / air to be heated by project activity</li> <li>- Pressure of heated hot air / air to be heated by the project activity</li> </ul>	<b>OK</b>	<b>OK</b>

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			<ul style="list-style-type: none"> <li>- Quantity of co-fired coal consumed by the furnace installed in the project activity during the year y</li> <li>- Quantity of coal consumed for keeping temperature of wastewater in UASB for project activity in winter time during the year y</li> <li>- End use of the final sludge in the year will be monitored during the crediting period</li> <li>- Average technical transmission and distribution losses for providing electricity from China Southern Power Grid in year y</li> <li>- Annual Electricity used by equipments installed in waste water treatment facility in year y</li> </ul>		
B.5.1.9 If yes, are the estimated provided in the PDD for these data and parameters reasonable?	VVM	91	<ul style="list-style-type: none"> <li>- Volume of the wastewater(Q<sub>ww,y</sub>) was not provided. According to the methodology AMS III H ver. 16, PP shall demonstrate that the operation conditions of 10 days measurement data instead of one year's measurement data.</li> <li>- The potential methane emission of the wastewater in the UASB digester during the maintenance period should be demonstrated.</li> <li>- It was not consistent between PP's assertion and PDD description on sludge treatment (Soil application of sludge from sedimentation pond and final sedimentation pond described in PDD)</li> <li>- Amount of coal consumption for UASB heating was omitted in PE power calculation.</li> <li>- Measured COD values in PDD B.6.2 were not described correctly</li> </ul>	<b>CAR 7</b> <b>CAR 9</b> <b>CAR 10</b> <b>CAR 11</b> <b>CL 2</b>	<b>OK</b>
<p>B.5.1.10 The DOE shall clearly describe in the validation report the steps taken to assess the requirement outlined in paragraph 89 above and shall provide an opinion as to whether:</p> <p>(a) All assumptions and data used by the project participants are listed in the PDD, including their references and sources;</p> <p>(b) All documentation used by project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD;</p> <p>(c) All values used in the PDD are considered reasonable in the context of the proposed CDM project activity;</p> <p>(d) The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions;</p>	VVM	92	<p>KFQ validates that:</p> <p>(a) All assumptions and data used by the project participants are listed in the PDD, including their references and sources;</p> <p>(b) All documentation used by project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD;</p> <p>(c) All values used in the PDD are considered reasonable in the context of the proposed CDM project activity;</p> <p>(d) The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions;</p> <p>(e) All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.</p> <p>Please refer to section 3.6 (calculation of GHG emissions) of the validation</p>	<b>OK</b>	<b>OK</b>

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(e) All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.			report.		
B.5.1.11 The validation report shall clearly describe how the DOE has verified the data and parameters used in the equations, including references to any other data sources used.	VVM	93	Please refer B.5 of this protocol.	OK	OK
<b>B.5.2. Data and parameters that are available at validation</b>					
B.5.2.1. Is the choice of ex-ante or ex-post vintage of OM and BM factors clearly specified in the PDD?	EB 41	Annex 12	For the calculation of the emission reductions, the ex-ante approach is chosen which is clearly stated in 2.1.1 of PDD. Since data for the China grid is not available to calculate emissions factor per the 'Tool to calculate the emission factor for an electricity system (Version 02.2)' the grid emissions factor was based on Executive Board (EB) guidance on this matter with respect to the application of the AMS-I.D and AM0005 methodologies for projects in PRC on 7 October 2005 in response to a request for deviation by DNV on this matter. The relevance of this EB guidance is also applicable to the 'Tool to calculate the emission factor for an electricity system (Version 02.2)	OK	OK
<b>B.5.3 Ex-ante calculation of emission reductions</b>					
B.5.3.1. Is the projection based on the same procedures as used for future monitoring?	EB 41	Annex 12	Yes, the ex-ante approach is adopted for calculation of the emissions and will not be changed during the crediting period.  However, PP shall demonstrate well managed treatment in aerobic system in order to assert PE ww,treatment,y (ex-ante) is zero.	CAR 8	OK
B.5.3.2. Are the GHG calculations documented in a complete and transparent manner?	EB 41	Annex 12	Yes. GHG calculation is documented in complete and transparent manner.	OK	OK
B.5.3.3. Is the form/table required for the indication of projected emission reductions correctly applied?	EB 41	Annex 12	Yes. Estimated emission reductions for the first crediting period is clearly indicated on PDD B.6.4 Annual emission reductions and emission reduction for crediting period are as follows.	OK	OK

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			<ul style="list-style-type: none"> <li>- <math>BE_y = 46,909 \text{ tCO}_2/\text{year}</math></li> <li>- <math>PE_y = 6,116 \text{ tCO}_2/\text{year}</math></li> <li>- <math>LE_y = 0 \text{ tCO}_2/\text{year}</math></li> <li>- <math>ER_y = BE_y - (PE_y + LE_y) = 37,880 \text{ tCO}_2/\text{year}</math></li> <li>- ER for crediting period = 378,800 tCO<sub>2</sub></li> </ul>		
B.5.3.4. Is the projection in line with the envisioned time schedule for the project's implementation and the indicated crediting period?	EB 41	Annex 12	<p>Yes. The validation team found that construction process had been completed and the operation started on June 2009.</p> <p>The lifetime of this proposed project activity is expected to be 20 years and the fixed crediting period is chosen. Thus, projection of emission reduction for 10 years is in line with the project's time schedule and crediting period.</p>	<b>OK</b>	<b>OK</b>
B.5.3.5. Is the data provided in this section in consistency with data as presented in other chapters of the PDD?	-	-	Yes. The data is consistent throughout the whole PDD.	<b>OK</b>	<b>OK</b>
<b>B.6. Application of the monitoring methodology and description of the monitoring plan</b>					
<b>B.6.1. Data and parameters monitored</b>					
B.6.1.1. 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.	VVM	122	<p>The monitoring plan is included in the PDD B.7.</p> <p>The monitoring plan established based on approved methodology AMS III H (Version 16) and AMS I C (Version 19).</p> <p>The monitoring parameter has been included in table B.7.1 in the PDD.</p>	<b>OK</b>	<b>OK</b>
<p>B.6.1.2 Are all necessary parameters included properly?</p> <ul style="list-style-type: none"> <li>- Title in line with methodology?</li> <li>- Data unit correctly expressed?</li> <li>- Appropriate description of parameter?</li> <li>- Source clearly referenced?</li> <li>- Correct value provided for estimation?</li> <li>- Has this value been verified?</li> <li>- Measurement method correctly described?</li> <li>- Correct reference to standards?</li> <li>- Indication of accuracy provided?</li> <li>- QA/QC procedures described?</li> </ul>	VVM	123 (a)	<p>Following monitoring parameters were not clearly described in PDD</p> <ul style="list-style-type: none"> <li>- Type, location, calibration of measuring device which will be installed in monitoring point was not described in PDD</li> <li>- QA/QC</li> </ul>	<b>CAR 12</b>	<b>OK</b>

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- QA/QC procedures appropriate?					
<p>B.6.1.3 Has PP a monitoring plan for the emission reductions from the small-scale project activity as follows?</p> <p>(a) Electronically archive all data collected as part of monitoring for a period of two years from the end of the crediting period;</p> <p>(b) Data variables that are most directly related to the emission reductions should be measured continuously. Data elements that are generally constant and indirectly related to the emission should be measured or calculated at least once a year, unless detailed specifications are provided as part of the indicated methodology;</p> <p>(c) Measuring equipment should be certified to national or IEC standards and calibrated according to the national standards and reference points or IEC standards and recalibrated at appropriate intervals according to manufacturer specifications, but at least once in three years;</p> <p>(d) The measured data with high levels of uncertainty or without adequate calibration should be compared with location/national data and commercial data to ensure consistency;</p> <p>(e) Wherever a statistical sample is proposed for monitoring, the General guidelines for sampling and surveys for SSC project activities.</p>	General Guide line to SSC	17	<p>All data including calibration records will be kept for two years after the end of the total crediting period of the CDM project</p> <p>Data variables that are most directly related to the emission reductions such as Average technical transmission and distribution losses for providing electricity from China Southern Power Grid in year y is monitored by China Electric Power Yearbook which is the most updated data resource by China Southern Power Grid, published every year.</p> <p>All monitoring equipment will be maintained and calibrated in line with manufacturers' instruction or national standards. Calibration will be implemented at least once a year. These activities will assure that the equipment operates at the stated level of accuracy</p> <p>No statistical sampling method used in the proposed project activity</p>	OK	OK
<b>B.6.2. Implementation of the monitoring plan</b>					
B.6.2.1. Is the operational and management structure clearly described and in compliance with the envisioned situation?	VVM	123(b)	Yes. Operational and management structure of the project activity is clearly described in section B.7.2 of the PDD.	OK	OK

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B.6.2.2. Are responsibilities and institutional arrangements for data collection and archiving clearly provided?	VVM	123(b)	<p>Yes. The project activity will have staffs involved in the CDM project monitoring in place by the time of its operation. A CDM project management office will be set up and the office will be composed of the CDM monitoring manager and CDM monitoring staff. The staff concerned will undertake the monitoring tasks including data collection, maintenance and calibration of meters, data recording and archiving, and preparation of monitoring report.</p> <p>The responsibilities of staff for proposed CDM project activity are defined for the relevant staff involved in CDM monitoring.</p>	<b>OK</b>	<b>OK</b>
B.6.2.3. Does the monitoring plan provide current good monitoring practice?	VVM	123(b)	<p>Yes. The monitoring plan is clearly described in PDD.</p> <ul style="list-style-type: none"> <li>- Organization and responsibility</li> <li>- Monitoring equipments installation</li> <li>- Data collection and management</li> <li>- Meter calibration and quality control</li> <li>- Monitoring report</li> </ul> <p>However, training plan in monitoring plan was not described in PDD</p>	<b>CAR 12</b>	<b>OK</b>
B.6.2.4. Does project participant has ability to implement the monitoring plan?	VVM	123(b)	<p>Yes. The personnel involved in the proposed project operation processes will strictly implement the CDM manual to guarantee that emissions reductions achieved.</p> <p>The validation team could confirm that PP has ability to implement the monitoring plan for the proposed project activity via interviewing project manager on the project site.</p>	<b>OK</b>	<b>OK</b>
B.6.2.5. If applicable: Does annex 4 provide useful information enabling a better understanding of the envisioned monitoring provisions?	VVM	123(b)	No. The PP did not describe monitoring plan on Annex 4 in PDD.	<b>OK</b>	<b>OK</b>
<p>B.6.3 The validation report shall:</p> <p>(a) State the DOE.s opinion of the compliance of the monitoring plan with the requirements of the methodology;</p> <p>(b) Describe the steps undertaken to assess whether the monitoring arrangements described in the monitoring plan are feasible within the project design;</p> <p>(c) State the DOE.s opinion of the project participants</p>	VVM	124	<p>(a) The validation report describes the DOE's opinion of the compliance of the monitoring plan with the requirements of the methodology.</p> <p>(b) The validation Report also describes steps undertaken to assess the monitoring plan within the project design.</p> <p>(c) Lastly, the validation report expresses the DOE's opinion of the PP ability to implement the monitoring plan in section 3.5 of the validation report.</p>	<b>OK</b>	<b>OK</b>

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ability to implement the monitoring plan.					
<b>B.7. Date of completion of the application of the baseline study and monitoring methodology an the name of the responsible person(s)/entity(ies)</b>					
B.7.1. Is there any indication of a date when the baseline was determined?	EB 41	Annex 12	Yes. Date of completion of the application of the baseline is 4 July 2011 which is most recently version and it is well indicated in B.8 of the PDD.	<b>OK</b>	<b>OK</b>
B.7.2. Is this consistent with the time line of the PDD history?	-	-	Yes, The PDD version 1.6 was completed on 4 November 2011 which is also finally revised version.	<b>OK</b>	<b>OK</b>
B.7.3. Is the information on the person(s) / entity (ies) responsible for the application of the baseline and monitoring methodology provided consistent with the actual situation?	EB 41	Annex 12	Yes, The responsible person indicated in PDD are also the ones being interviewed for baseline verification during the on site assessment.	<b>OK</b>	<b>OK</b>
B.7.4. Is information provided whether this person/entity is also considered a project participant?	EB 41	Annex 12	Yes. The above mentioned person is not from project participant's company.	<b>OK</b>	<b>OK</b>
<b>C. Duration of the Project/ Crediting Period</b>					
C.1 Are the project's starting date and operational life time clearly defined and evidenced?	EB 41	Annex 12	Yes. The starting date of the project has been validated by KFQ as 6 June 2008 which represents the date of construction contract including equipments purchasing between PP and Hainan Zhenyuan Environmental Technical Limited. KFQ confirmed that this starting date is the earliest date at which either the implementation or construction or real action of a project activity according to CDM glossary (version 05).  The operational lifetime is expected to be 20 years.	<b>OK</b>	<b>OK</b>
<b>C.2. Choice of the crediting period and related information</b>					
C.2.1. Is the assumed crediting period clearly defined and reasonable (renewable crediting period of max 7 years with potential for 2 renewals or fixed crediting period of max.10 years)?	EB 41	Annex 12	Yes. 10 yeas fixed crediting period is chosen.	<b>OK</b>	<b>OK</b>

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C.2.2 Is the start of the crediting period clearly defined and reasonable?	EB 41	Annex 12	Yes. It's clearly defined in the PDD. Starting date of crediting period will start 1 July 2011 or date of registration, whichever is later.	<b>OK</b>	<b>OK</b>
<b>D. Environmental Impacts</b>					
<b>D.1. Documentation on the analysis of the environmental impacts, including transboundary impacts</b>					
D.1.1 Has an analysis of the environmental impacts of the project activity been sufficiently described?	EB 41	Annex 12	Yes. The validation team confirmed the PP has undertaken environmental impact assessment (EIA) by Guangzhou EP Environmental Engineering Ltd. The validation team concludes that the potential environmental impacts have been sufficiently identified in the PDD and no major adverse effects have been expected from the project activity.	<b>OK</b>	<b>OK</b>
D.1.2 Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	EB 41	Annex 12	Yes. EIA was approved by Environment Protection Bureau of Yun'An County, Guangdong Province on 20 April 2008 in accordance with relevant Chinese laws and regulations.	<b>OK</b>	<b>OK</b>
D.1.3 Will the project create any adverse environmental effects?	EB 41	Annex 12	No major adverse effects have been expected from the project activity.	<b>OK</b>	<b>OK</b>
D.1.4 Are transboundary environmental impacts considered in the analysis?	-	-	There is no trans-boundary environmental impact.	<b>OK</b>	<b>OK</b>
D.1.5 The validation report shall describe whether the project participants have undertaken an analysis of environmental impacts and, if required by the host Party, an environmental impact assessment in accordance with procedures as required by the host Party.	VVM	133	Yes. Please refer D.1~D.4	<b>OK</b>	<b>OK</b>



<b>D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Part</b>					
D.2.1 Have the project participants submitted documentation on the analysis of the environmental impacts of the project activity? Who undertaken the analysis?	VVM	131	Please refer D.1	OK	OK
D.2.2 Does the project comply with environmental legislation in the host country? When was the EIA approved?	VVM	132	Please refer D.1	OK	OK
<b>E. Stakeholder Comments</b>					
<b>E.1. Brief description how comments by local stakeholders have been invited and compiled</b>					
E.1.1 Local stakeholders shall be invited by the PPs to comment on the proposed CDM activity prior to the publication of the PDD on the UNFCCC website?	VVM	128	Yes. KFQ published the project documents on <a href="http://cdm.unfccc.int/Projects/Validation">http://cdm.unfccc.int/Projects/Validation</a> . Starting date of the global stakeholder consultation process is 26 March 2010 and invited comments by Parties, stakeholders and non-governmental organizations during a period of 30 days. No comment was received.	OK	OK
E.1.2 Have appropriate media been used to invite comments by local stakeholders?	EB 41 VVM	Annex 12 129	Yes. A survey of local residents was carried out to invite comments from local stakeholders in May 2008. Sixty-one (61) questionnaires were distributed to local stakeholders, and 100% feedback was received. No negative comments for impact on the local economy, development and environment have been received. KFQ has checked all the questionnaires received and interviewed with local government. The survey shows that the proposed project receives strong support from the local people and comments received have been taken into consideration during construction and operation to achieve environmental and social benefits.  However, the stakeholder's consultation meeting was not described in the PDD besides Stakeholders' survey.	CL 1	OK

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E.1.3 If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	EB 41	Annex 12	There are no regulations/laws in China for carrying out the stakeholder consultation process for this project activity.	<b>OK</b>	<b>OK</b>
E.1.4. Is the undertaken stakeholder process that was carried out described in a complete and transparent manner?	VVM	129	Yes. Please see E.1.1	<b>OK</b>	<b>OK</b>
E.1.5 The validation report shall: (a) Describe the steps taken to assess the adequacy of the local stakeholder consultation; (b) State the DOE.s opinion on the adequacy of the local stakeholder consultation.	VVM	130	Yes. Please refer E.1~E.5 And DOE stated opinion on the adequacy of the local stakeholder consultation in section 3.8 of the validation report.	<b>OK</b>	<b>OK</b>
<b>E.2. Summary of the comments received</b>					
E.2.1 Is a summary of the stakeholder comments received complete?	VVM	129	Yes. Stakeholder comments received is well explained in section E.2 of the PDD.	<b>OK</b>	<b>OK</b>
E.2.2 Has due account been taken of any stakeholder comments received? And have described this process in the PDD	VVM	129	The comments were generally positive to project activity  For our confirmation, and validation team can see their positive support through interviewing local government officers.	<b>OK</b>	<b>OK</b>
<b>F. Specific validation activities</b>					
F.1 Does the proposed small-scale project activity meet the requirements of the simplified modalities and procedures for small-scale CDM project activities?	VVM	134	Yes. The proposed project is a fuel switching project activity less than 60,000 ton CO <sub>2</sub> eq annually of the emission reduction and applied for the methodology, AMS III.H. version 16 and AMS I.C. Version 19.  But PP should demonstrate the amount of emission reduction in project activity less than 60,000 ton CO <sub>2</sub> eq annually in any possible circumstance for the proposed project activity.	<b>CAR 3</b>	<b>OK</b>
F.1.1 Does the project activity qualify within the thresholds of the three possible types of small scale project activities? [Type (i) project activities: renewable energy project	VVM	135/ 136	Yes. The proposed project is qualified within the type (iii); other project activities that both reduce anthropogenic emissions by sources and directly emit less than 60 kilo tones of carbon dioxide equivalent annually. The proposed project is for methane recovery from waste water treatment and	<b>CAR 3</b>	<b>OK</b>

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<p>activities with a maximum output capacity equivalent to up to 15 megawatts;</p> <p>Type (ii) project activities: energy efficiency improvement project activities which reduce energy consumption, on the supply and/or demand side, by up to the equivalent of 60 Giga watt hours per year;</p> <p>Type (iii) project activities: other project activities that both reduce anthropogenic emissions by sources and directly emit less than 60 kilo tones of carbon dioxide equivalent annually.</p>			<p>biogas utilization and heat generation project activity less than 60,000 ton CO<sub>2</sub>eq annually of the emission reduction.</p> <p>Please see F.1</p>		
F.1.2 Does the project activity conform to one of the approved small-scale categories?	VVM	135/ 136	Yes. The proposed project applied for the methodology, AMS III.H. version 16 and AMS I.C. Version 19.	<b>OK</b>	<b>OK</b>
F.1.3 Does the project activity apply the relevant tool and methodology?	VVM	135/ 136	Yes. “Combined tool to identify the baseline scenario and demonstrate additionality (Ver. 3.0)” was employed.	<b>OK</b>	<b>OK</b>
F.1.4 Are the small-scale methodologies applied in conjunction with the general guidance to the methodologies, which provides guidance on equipment capacity, equipment performance, sampling and other monitoring-related issues?	VVM	135/ 136	Yes. Please refer to F.1	<b>OK</b>	<b>OK</b>
F.1.5 Is the project activity a debundled component of a large-scale project, i.e., is there a registered small-scale CDM project activity or an application to register another CDM project activity: (a) with the same project participants; (b) in the same project category and technology/measure; and (c) registered within the previous 2 years; and (d) whose project boundary is within 1 km of the proposed boundary of the proposed small-scale activity at the closest point?	VVM	135/ 136	<p>The following criteria were checked to confirm that the proposed project activity is not a debundled component of a large scale project activity.</p> <ul style="list-style-type: none"> <li>- The same project participants? : No</li> <li>- In the same project category and technology/measure? : No</li> <li>- Registered within previous two years? Or in registration process? : No</li> <li>- Whose boundary is within 1 km of the project boundary of the small scale project activity under consideration? : No</li> </ul> <p>Thus, the validation team made a conclusion the project activity is not a debundled component of a larger project and comply with “Guidelines on assessment of de-bundling for SSC project activities (Ver. 03)”.</p>	<b>OK</b>	<b>OK</b>
F.1.6 The DOE shall refer to the specific requirements on demonstration of additionality for small scale project activities together with the guidance in chapter V, section E, subsection 6 and may refer to	VVM	137	The validation team checked the specific requirements and found that the proposed project is complied with “Attachment A to Appendix B of 4/CMP.1, annex II, Appendix B of the simplified modalities and procedures for small-scale CDM project activities, Indicative simplified	<b>OK</b>	<b>OK</b>

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the .Non-binding best practice examples to demonstrate additionality for SSC project activities. (e.g. “Attachment A to Appendix B of 4/CMP.1, annex II, Appendix B of the simplified modalities and procedures for small-scale CDM project activities, Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories”, “EB 54 Annex 15, Guidelines for demonstrating additionality of renewable energy projects =<5 MW and energy efficiency projects with energy savings <=20 GWh per year (version01)” and “EB 35 Annex 34, Non-binding best practice examples to demonstrate additionality for SSC project activities”)			baseline and monitoring methodologies for selected small-scale CDM project activity categories” and “EB 35 Annex 34, Non-binding best practice examples to demonstrate additionality for SSC project activities.		
<b>G. Annexes 1-4</b>					
<b>Annex 1: Contact Information</b>					
G.1.1 Is the information provided consistent with the one given under section A.3?	EB 41	Annex 12	Yes, the information provided is consistent with one given under section A.3.	<b>OK</b>	<b>OK</b>
G.1.2 Is the information on all private participants and directly involved Parties presented?	EB 41	Annex 12	Yes. The PDD-Annex 1 clearly mentions this information.	<b>OK</b>	<b>OK</b>
<b>Annex 2: Information regarding public funding</b>					
G.1.3 Is the information provided on the inclusion of public funding (if any) in consistency with the actual situation presented by the project participants?	EB 41	Annex 12	It is stated that the project does not receive any public funding from Annex I countries.	<b>OK</b>	<b>OK</b>
G.1.4. If necessary: Is an affirmation available that any such funding from Annex – countries does not result in a diversion of ODA?	EB 41	Annex 12	N/A	<b>OK</b>	<b>OK</b>

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<b>Annex 3: Baseline information</b>					
G.1.5. If additional background information on baseline data is provided: Is this information consistent with data presented by other section of the PDD?	EB 41	Annex 12	The calculation procedure and basic data of Combined margin emission factor( $EF_{grid,CM,y}$ ) of the grid system is presented on Annex 2 of PDD.	<b>OK</b>	<b>OK</b>
G.1.6.Is the data provided verifiable? Has sufficient evidence been provided to the validation team?	EB 41	Annex 12	Pls. see the 3.3 section of the report.	<b>OK</b>	<b>OK</b>
G.1.7.Does the additional information substantiate/support statements given in other section of the PDD?	EB 41	Annex 12	Please see G.1.5 of protocol.	<b>OK</b>	<b>OK</b>
<b>Annex 4: Monitoring information</b>					
G.1.8.If additional background information on monitoring is provided: Is this information consistent with data presented in other section of the PDD?	EB 41	Annex 12	Please see B.6 of protocol.	<b>OK</b>	<b>OK</b>
G.1.9.Is the information provided verifiable? Has sufficient evidence been provided to the validation team?	EB 41	Annex 12	Please see B.6 of protocol.	<b>OK</b>	<b>OK</b>
G.1.10.Do the additional information and/or documented procedures substantiate/support statements given in other section of the PDD?	EB 41	Annex 12	Please see B.6 of protocol.	<b>OK</b>	<b>OK</b>

**Table 2. Resolution of Corrective Action and Clarification Requests**

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1	Summary of project owner response and validation team	Validation team conclusion
<p><b>CAR 1:</b></p> <p>Please deliver the LoAs issued by host country and Annex-I country together with the MoC countersigned by project participants to the DOE</p>	<p>A.4.1 A.4.1.1 A.4.1.2 A.4.1.3 A.4.1.4 A.4.1.5 A.4.1.6 A.4.2.3 A.4.3 A.4.4 A.4.5 A.4.6</p>	<p>The Letter of Approval (LoA) from China was obtained on 13 July 2010 authorizing Yun'An County Gaoli Starch Factory and HANWHA Europe GmbH as a project participants. The LoA confirms the project's contribution to sustainable development of China. The approval letter was provided by PP and the validation team checked the China DNA website* to confirm the approval of the project.</p> <p>The DNA of Germany has also issued a LoA on 9 June 2011. This LoA authorizes HANWHA Europe GmbH as project participant. The validation team checked detail information of the LoA of Germany such as address, website, signature &amp; name on LoA and website† of Germany DNA as well. And we found that all information is consistent with the registered CDM projects approved by Germany and found the proposed project was on the website of Germany DNA correctly. Thus the validation team confirmed that there is no doubt on LoA of Germany provided from the PP.</p> <p>The validation team confirmed followings.</p> <ul style="list-style-type: none"> <li>- Title of project activity is correctly indicated in the LoAs.</li> <li>- China has ratified the Kyoto Protocol on 30 August 2002.</li> <li>- Germany has ratified the Kyoto Protocol on 31 May 2002.</li> <li>- Voluntary participant.</li> </ul> <p>The LoAs refers to the precise proposed CDM project activity title in the PDD being submitted for registration.</p>	<p>CAR 1 is closed.</p>
<p><b>CAR 2:</b></p> <p>According to SSC general guidance, PP did not demonstrate the objective evidence for assuring the lifetime of main equipments(furnace, UASB)</p>	<p>B.4.4.3</p>	<p>The 20 years operational lifetime comes from the FSR based on the remaining lifetime of main equipments such as furnace and UASB.</p> <p>Therefore, the validation team checked the statement for the furnace(SG-WYT-PU200) lifetime from the engineer of equipment supplier, named Liu Hui Ming. This statement indicated the remaining lifetime of furnace is over 22 years that the remaining lifetime of furnace could cover operational lifetime of the project activity. And we confirm that operational lifetime is reasonable based on this statement and our sectoral knowledge.</p>	<p>CAR 2 is closed.</p>

\* <http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File2473.pdf>

† <https://www.jicdm.dehst.de/promechg/pages/project1.aspx>

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		<p>Regard to the remaining lifetime of UASB, validation team checked the detail lifetime assessment report for the UASB(HNZY-UBT-SQVI-25) lifetime from the UASB system building company. The report indicated the remaining lifetime of UASB is over 22 years.</p> <p>The remaining lifetime of main project equipments(UASB, furnace) are demonstrated through statement for equipments(UASB, furnace) remaining lifetime from the equipment supplier according to Indicative Simplified Baseline and Monitoring Methodologies for Selected Small-Scale CDM Project Activity Categories(Ver. 13), EB54 Annex 14. Thus KFQ confirmed the remaining lifetime of installed equipments (22 years) cover the operation lifetime(20 years) and crediting period of the project activity as well.</p>														
<p><b>CAR 3:</b></p> <p>PP should demonstrate the amount of emission reduction in project activity less than 60k ton/year</p>	<p>A.5.6.2 B.1.3 F.1 F.1.1</p>	<p>In order to demonstrate the amount of emission reduction in project activity less than 60k ton/year, PP provided the production records during 2006 ~ 2009 and production plan.</p> <p>The emission reduction is affected by the amount of wastewater and the wastewater is linked with the amount of starch production.</p> <p>The production capability of the starch plant has been kept unchanged since the establishment of the factory and the production plan made in year September 2010 indicated "The current production line is proved to be most suitable and feasible design for the plant by pre-study and running result for the early months. The installed capacity of the production line is 60tons/day, and current production has reached 54~58 tons/day. In a very long-term, the plant will try to keep the production stable at 58~60 tons/day".</p> <p>Moreover, the validation team checked production record during 2006 ~ 2009 and found average daily production amount is 58.6tons/day, 58.8 tons/day, 58.4 tons/day and 58.6 tons/day in every year from 2006 to 2009. The annual/daily production is very stable with keeping below 60 tons/day.</p> <p>Based on the above future production plan and production records, KFQ concluded the emission reduction in project activity is less than 60k ton/year.</p>	<p>CAR 3 is closed.</p>													
<p><b>CAR 4:</b></p> <p>The summary of gases and sources included/excluded in the project boundary is omitted in the PDD</p>	<p>B.2.3 B.2.4</p>	<p>The “Summary of the sources and gases included in the project boundary” was added in the PDD B.3. as follows.</p> <table><tr><td></td><td>Source</td><td>Gas</td><td>Included?</td><td>Justification/explanation</td></tr><tr><td rowspan="2">Baseline</td><td rowspan="2">Wastewater treatment processes or sludge disposal</td><td>CO<sub>2</sub></td><td>excluded</td><td>Excluded for simplification.</td></tr><tr><td>CH<sub>4</sub></td><td>included</td><td>The major source of emissions in the baseline from open</td></tr></table>		Source	Gas	Included?	Justification/explanation	Baseline	Wastewater treatment processes or sludge disposal	CO <sub>2</sub>	excluded	Excluded for simplification.	CH <sub>4</sub>	included	The major source of emissions in the baseline from open	<p>CAR 4 is closed.</p>
	Source	Gas	Included?	Justification/explanation												
Baseline	Wastewater treatment processes or sludge disposal	CO <sub>2</sub>	excluded	Excluded for simplification.												
		CH <sub>4</sub>	included	The major source of emissions in the baseline from open												

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		<table><tr><td rowspan="17">Project activity</td><td rowspan="4">Electricity consumption/generation</td><td></td><td></td><td>lagoons</td></tr><tr><td>N<sub>2</sub>O</td><td>excluded</td><td>Excluded for simplification.</td></tr><tr><td>CO<sub>2</sub></td><td>included</td><td>There is a pump used in the baseline scenario.</td></tr><tr><td>CH<sub>4</sub></td><td>excluded</td><td>Excluded for simplification.</td></tr><tr><td rowspan="4">Thermal energy generation</td><td>N<sub>2</sub>O</td><td>excluded</td><td>Excluded for simplification.</td></tr><tr><td>CO<sub>2</sub></td><td>included</td><td>On-site thermal energy generation is displaced by the biogas from an anaerobic digester under the project activity.</td></tr><tr><td>CH<sub>4</sub></td><td>excluded</td><td>Excluded for simplification.</td></tr><tr><td>N<sub>2</sub>O</td><td>excluded</td><td>Excluded for simplification.</td></tr><tr><td rowspan="9">Wastewater treatment processes or sludge treatment disposal</td><td>CO<sub>2</sub></td><td>excluded</td><td>Excluded for simplification.</td></tr><tr><td>CH<sub>4</sub></td><td>included</td><td>Emissions due to wastewater treatment</td></tr><tr><td>N<sub>2</sub>O</td><td>excluded</td><td>Excluded for simplification.</td></tr><tr><td rowspan="3">On- site electricity use</td><td>CO<sub>2</sub></td><td>included</td><td>emission due to electricity consumption</td></tr><tr><td>CH<sub>4</sub></td><td>excluded</td><td>Excluded for simplification.</td></tr><tr><td>N<sub>2</sub>O</td><td>excluded</td><td>Excluded for simplification.</td></tr><tr><td rowspan="3">On-site fossil fuel consumption</td><td>CO<sub>2</sub></td><td>included</td><td>Emissions due to coal consumption for keeping temperature for anaerobic digester in winter.</td></tr><tr><td>CH<sub>4</sub></td><td>excluded</td><td>Excluded for simplification.</td></tr><tr><td>N<sub>2</sub>O</td><td>excluded</td><td>Excluded for simplification.</td></tr></table>	Project activity	Electricity consumption/generation			lagoons	N <sub>2</sub> O	excluded	Excluded for simplification.	CO <sub>2</sub>	included	There is a pump used in the baseline scenario.	CH <sub>4</sub>	excluded	Excluded for simplification.	Thermal energy generation	N <sub>2</sub> O	excluded	Excluded for simplification.	CO <sub>2</sub>	included	On-site thermal energy generation is displaced by the biogas from an anaerobic digester under the project activity.	CH <sub>4</sub>	excluded	Excluded for simplification.	N <sub>2</sub> O	excluded	Excluded for simplification.	Wastewater treatment processes or sludge treatment disposal	CO <sub>2</sub>	excluded	Excluded for simplification.	CH <sub>4</sub>	included	Emissions due to wastewater treatment	N <sub>2</sub> O	excluded	Excluded for simplification.	On- site electricity use	CO <sub>2</sub>	included	emission due to electricity consumption	CH <sub>4</sub>	excluded	Excluded for simplification.	N <sub>2</sub> O	excluded	Excluded for simplification.	On-site fossil fuel consumption	CO <sub>2</sub>	included	Emissions due to coal consumption for keeping temperature for anaerobic digester in winter.	CH <sub>4</sub>	excluded	Excluded for simplification.	N <sub>2</sub> O	excluded	Excluded for simplification.	
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		<p>The validation team confirmed the summary of the sources and gases included in the project boundary investigated correctly and it was added in PDD.</p>																																																										
<p><b>CAR 5:</b></p> <p>Input values which are applied in investment analysis are not clearly demonstrated.</p> <ul style="list-style-type: none"><li>- Validity of Amount of coal displaced</li><li>- Validity of investment cost</li><li>- Validity of O&amp;M cost</li><li>- Validity of coal price</li></ul>	<p>B.4.4.7 B.4.4.8 B.4.4.9 B.4.4.10</p>	<p>Input values which are applied in investment analysis were demonstrated as follows.</p> <p><b>Amount of coal displaced: 2,250 ton/year</b></p> <p>Amount of coal displaced has been adopted from the FSR. For more investigation for amount of coal displaced, the validation team checked annual coal consumption and its caloric value of coal through purchasing receipts.</p> <p>The installed capacity of the production line is 60tons/day, and current production has reached 54~58 tons/day. In a very long-term, PP will try to keep the production stable at</p>	<p>CAR 5 is closed.</p>																																																									



## APPENDIX B. QUALIFICATION OF VALIDATION TEAM

<ul style="list-style-type: none"> <li>- Validity of residual value(5%)</li> <li>- etc.</li> </ul>		<p>58~60 tons/day thus the amount of coal displaced will not significantly exceed historical consumption record and we could regard the amount of coal displaced limited to the maximum production capacity.</p> <p>In addition, it can be crosschecked that the baseline emissions from heat displaced by the project activity(BE<sub>thermal</sub>) is followed by the converted caloric value from the amount of coal displaced.</p> <p>We confirmed that the average coal consumption is 2,947 ton/year and caloric value of coal is 4,800kcal/kg or 5,100kcal/kg from three years monthly record(2005~2007) that is actual purchased data demonstrated by purchase receipts every month provided by coal provider such as Guangdong Lanyue Energy Development Limited &amp; Zhaoqing Shenyu Trading Limited. For the caloric value of coal, PP applied average 5,000kcal/kg caloric value as purchased coal considering each caloric value of coal purchased and amount of purchased coal respectively.</p> <p>Therefore, amount of coal displaced could be estimated as 2,105 ton/year by converting to the Chinese national standard net caloric value of coal (7,000kcal/kg).</p> <p>The amount of coal displaced applied in FSR (2,250 ton/year) is higher than the estimated coal amount based on actually consumed record(2,105 ton/year). The validation team confirmed that the amount of coal displaced applied in FSR (2,250 ton/year) is estimated reflecting the gap between current annual starch production capacity (54~58 tons/day) and maximum production capacity(60 tons/day) as a conservative manner.</p> <p><b>Total investment cost: 7,280,000RMB</b></p> <p>Total investment cost has been adopted from the FSR. At first, the validation team compared the proposed project activity with other eight similar projects, implemented in China in order to check the validity of total investment cost. The average of the investment per ER (ktCO<sub>2e</sub>) of eight similar projects is 312.6 RMB/ktCO<sub>2e</sub> (max.:874.8, min.:99.0) while that of the Project is 178.4 RMB/ ktCO<sub>2e</sub> which is less than the average.</p> <p>Furthermore, the audit team reviewed the actual expenditure for the proposed project activity. The amount of construction contract (6 June 2008) is 6,830,000RMB and additional contract (17 June 2008) is 450,000RMB. Thus, the validation team confirmed 100% of total investment cost (7,280,000 RMB) actually incurred through checking the payment receipt for contract.</p> <p>Based on the above assessment, KFQ can conclude that the total static investment cost in financial analysis is not overestimated and valid at the time of the investment decision.</p> <p><b>Annual O&amp;M cost: 637,000 RMB</b></p>	
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		<p>Annual O&amp;M cost is taken from the FSR. The O&amp;M cost of this proposed project activity is 8.8% of the total investment cost. This cost consists of electricity cost, salary &amp; welfare, chemical cost, equipment repair cost.</p> <p>Salary &amp; welfare, electricity cost and the chemical cost had the greater part of the O&amp;M cost. Therefore, KFQ checked the detail of the salary &amp; welfare, electricity cost and the chemical cost by the evidences and the document.</p> <p><b><u>Salary &amp; welfare</u></b></p> <p>Salary &amp; welfare cost was taken from the FSR. The validation team checked a salary book of Yun'An County Gaoli Starch Factory, expensed in May 2010 for the 8 staffs related in CDM and found annual salary &amp; welfare was 191,006 RMB which is higher than FSR estimation.</p> <p><b><u>Electricity consumption</u></b></p> <p>The electricity consumption in FSR estimated as 300,000KWh by calculating project activity consumption minus baseline electricity consumption. The validation team investigated every installed capacity of electric equipment both baseline and project activity through the nameplate of each equipment and found the installed capacity for baseline scenario is 11KW and 52.7KW for project activity. Because PP does not have the record of load factor for installed electric equipments, KFQ tested IRR by estimating the load factor as 85% which is recommended by Research and Calculation Handbook for Energy saving and the IRR(7.5%) is still below than benchmark.</p> <p>Thus, the annual electricity consumption for baseline and project activity was calculated 79,200KWh and 379,440KWh respectively and KFQ found the electricity consumption is reasonable to apply.</p> <p><b><u>Electricity Price</u></b></p> <p>This price is adapted from FSR. The electricity price, 0.5998 RMB/kWh excluding VAT (0.701 RMB/kWh including VAT) is based on the Instruction of the electricity price by Guangdong electricity grid company, Yunfu City, Yun'An County office. In addition to the above Instruction, the validation team found that the actual purchased electricity tariff excluding VAT is 0.5998 RMB/kWh based on the electricity purchase bill issued by the Grid on 14 March 2007 just before the completion of the FSR.</p> <p>Furthermore, KFQ investigated the electricity price with eight similar projects in China and found that electricity price of proposed project activity(0.5998 RMB/kWh excluding VAT) is within a range of electricity price of other similar projects (0.5~0.6 RMB/kWh excluding VAT, average: 0.55 RMB/kWh excluding VAT) and found the average price of similar projects are less than that used in PDD. However, even if 0.55</p>	
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		<p>RMB/kWh excluding VAT (0.643 including VAT) is adopted, the IRR of the project is lower than the benchmark of 12%.</p> <p>Thus KFQ concluded that the application of the electricity price, 0.5998 RMB/kWh is valid for the project at the time of investment decision.</p> <p><b><u>Chemical cost</u></b></p> <p>The chemical cost was taken from the FSR. The validation investigated actually paid for chemical cost during October 2009 ~ September 2010 and found incurred chemical cost was 222,150 RMB/year which is higher than the price which was estimated on FSR (212,000 RMB/year). Thus the chemical cost applied on investment analysis is valid and applicable.</p> <p>To check validity of O&amp;M cost, the validation team reviewed it with eight similar projects in China and found that O&amp;M cost of the total investment cost for this proposed project activity(8.8%) is within a range of O&amp;M cost of other similar projects (6.2~55.9%, average : 15.6%) of the total investment cost and less than the average. Furthermore, The average of the O&amp;M cost per ER (ktCO<sub>2</sub>e) of eight similar projects is 41.7 RMB/ktCO<sub>2</sub>e while that of the Project is 15.6RMB/ ktCO<sub>2</sub>e which is less than the average.</p> <p>Through our comprehensive and thorough analysis, the validation team conclude the applied value is not overestimated and is valid.</p> <p><b>TAX</b></p> <p>The validation team confirms that the Value added tax(17%) rates is properly applied in accordance with China regulation, "The People's Republic of China State Council Decree No. 538" published on 1 November 2008. Furthermore, this rate is compared with rates used in other wastewater treatment project in China and we confirmed the VAT is applied correctly.</p> <p><b>Coal price: 650 RMB/ton</b></p> <p>The 650 RMB/ton is based on the coal price index in China and FSR.</p> <p>As there was no national universal coal price index in China in year 2007. the FSR applied the most representative coal price index in China which is Qinhuangdao Harbor coal trading price. Qinhuangdao Harbor coal market is more than 41% of Chinese coal trading market, and the trading price of Qinhuangdao Harbor coal market has been basis for financial analysis and decision making of most Chinese domestic energy and related industries<sup>†</sup>.</p> <p>According to this coal price index, the average trading price (exactly is Free On Board</p>	
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		<p>price) of 5,000kcal/kg<sup>‡</sup> coal for year 2005, 2006 and 2007 is around 395.2 RMB/ton. Converting to standard coal(NCV of 7000kcal/kg) is 553.3 RMB/ton. Considering the project is located in Guangdong Province, the coal price should be a CIF price (cost, insurance and freight), so the calculation has taken transportation fee of 65 RMB/ton and insurance fee of 0.7 RMB/ton into consideration which is 553.3+65+0.7=619 RMB/ton.</p> <p>We tested IRR in case applying the coal price before converting the 7000kcal/kg NCV coal. The coal NCV in Qinhuangdao Harbor coal market is 5000kcal/kg and the average price is 460.9 RMB/ton (395.2+65+0.7). We found the resulted IRR(7.7%) is less than the IRR after converting the standard coal NCV(7000kcal/kg).</p> <p>* Transportation fee : According to the average transportation fee from Qinhuangdao Harbor to Guangzhou Harbor for the last week<sup>§</sup>, recent average transportation fee level is provided(As of 4<sup>th</sup> November 2011). The average transportation fee from Qinhuangdao Harbor to Guangzhou Harbor for the last week is below table.</p> <table border="1"> <tr> <th>Ship type (Dead weight ton)</th> <th>Unit Price (RMB/ton)</th> </tr> <tr> <td>10000 ~ 15000</td> <td>67</td> </tr> <tr> <td>15000 ~ 20000</td> <td>66</td> </tr> <tr> <td>20000 ~ 30000</td> <td>65</td> </tr> </table> <p>The current average transportation fee of all ship types is 66 RMB/ton. Considering the transportation cost has been continuously increased for the past years within the price increase rate in China and we confirmed the 65 RMB/ton transportation fee in the estimation of coal price in FSR by using recent average transportation fee level is reasonable.</p> <p>* Insurance fee : According to the integrated import/export customs information, consulting and services platform supported by the General Administration of Customs of P. R. China<sup>**</sup>, the insurance fee decided as</p> <p>- Insurance fee = Cargo value * Insurance rate(0.1%)</p> <p>- Cargo value = CIF * 110% = 619 RMB/ton * 110%</p> <p>We confirmed the insurance fee is 680.9 RMB/ton * 0.001 = 0.7 RMB/ton is reasonable.</p> <p>Thus, the coal price 650RMB/ton is in the FSR instead of 619 RMB/ton since the annual increasing trend of coal price(4.49%, 2002~2008) is considered and a relatively</p>	Ship type (Dead weight ton)	Unit Price (RMB/ton)	10000 ~ 15000	67	15000 ~ 20000	66	20000 ~ 30000	65	
Ship type (Dead weight ton)	Unit Price (RMB/ton)										
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		<p>high IRR is also helpful for PP to get governmental approval for the project activity. In doing so, 650 RMB/ton is a valid and applicable for financial analysis.</p> <p>KFQ conclude that the adjusted coal price is valid and appropriate for investment analysis by cross-checking with other reference and the FSR adopted this price as well.</p> <p><b>Residual Value: 5%</b>  The residual value for this project activity is 5% of fixed asset is from the FSR. The FSR estimated the residual value in accordance with GuoShuiFa[2003]70 issued by the National Taxation Bureau that indicates residual value set to 5% for the equipments since 18 June 2003.  Furthermore, KFQ investigated the residual value with eight similar projects in China and found that average of residual value of similar projects(6.7%) is higher than the proposed project, however, even though applying the highest residual value of similar projects(12.4%), the IRR is still below the benchmark(7.2%).  Through the above assessment, KFQ can confirm that the selection of the residual value, 5% at the time of the investment decision is reasonable and applicable.</p> <p><b>Annual operation day : 300 day</b>  Annual operation day is taken from FSR and the validation team checked that the historical two year operation records (2007 and 2008) and found the records show that the plant operated 300 days and 298 days in 2007 and 2008 respectively because the starch production facility got two months' maintenance period every year. Also we found the other similar projects applied 300 days for annual operation day. Thus we confirmed annual operation day applied to the proposed project activity is valid and appropriate for this project.</p> <p><b>Operational lifetime: 20 years</b>  Operational lifetime is taken from FSR. The validation team checked the remaining lifetime of main project equipments such as UASB (20 years, newly installed) and furnace (22 years, existing equipment) covers crediting period through the certificate from the equipment supplier and remaining lifetime assessment report from engineer of equipment supplier respectively. Thus, we confirm that the lifetime applied to the proposed project activity is valid and appropriate for this project according to the tool to determine the remaining lifetime of equipment(ver. 01)</p> <p>Thus, KFQ is able to confirm that the input values in PP's evaluation are valid and through above thorough assessment, KFQ is able to confirm that the input values in PP's evaluation are valid and appropriate representing the economic situation of the project at the time of investment decision and they have been applied consistently.</p>	
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<p><b>CAR 6:</b></p> <p>Sensitive analysis is not analyzed in appropriate manner.</p> <ul style="list-style-type: none"> <li>- It is not clear to get annual increase rate of coal price(8.3%) and the statistical data is not derived from the project region</li> <li>- The price index for fuel and power in sensitivity analysis for investment cost was not related in investment cost</li> </ul>	<p>B.4.4.12</p>	<p>PP investigated increase rate of coal price from the Statistical data on coal industry for Guangdong Province published by National Bureau of Statistics of China. It shows that the coal price annual average increasing rate is 4.49% from 2002 to 2008. And also PP used price index for investment analysis according to the China statistical Year Book, the price of industry products has risen by 2.3% annually in 2001~2007 and the price of investment in fixed assets have risen by average 3.8% annually in 2006~2007. Thus, the validation team confirmed the references which was used for sensitivity analysis were appropriate.</p> <p>Sensitivity analysis was validated as follows.</p> <p>A sensitivity analysis has been carried out for parameter contributing more than 20% to revenues or costs which are static total investment cost, annual O&amp;M cost, and coal price. A variation of <math>\pm 10\%</math> has been considered in the critical assumptions by consideration of circumstance of each parameter.</p> <p><b>1) Investment cost</b></p> <p>In order to reach 12% benchmark, total Static Investment cost shall decrease by 25.8%. According to the China statistical Year Book, the price of industry products has risen by 2.3% annually in 2001~2007 and the price of investment in fixed assets have risen by average 3.8% annually in 2006~2007. Further to this, PP already made construction contract on 6 June 2008 and 17 June 2008 which are 100% of total investment cost. Thus, -25.8% in investment cost is not likely to occur.</p> <p><b>2) O&amp;M Cost</b></p> <p>In order to reach 12% benchmark, the operational cost of the proposed project shall decrease by 37%. According to the China statistical Year Book, the prices of raw materials fuels &amp; power have risen by average 2.38% during 2001~2008 and the price of total wage bill of staff and workers has risen by average 15.2% during 2001~2008. Thus, -37% in annual operating cost is not likely to occur.</p> <p><b>3) Coal price</b></p> <p>The coal price at which the IRR of the project activity could reach the benchmark would need to be 718 RMB/ton which is 10.5% above the coal price used in the PDD.</p> <p>Statistical data on coal industry for Guangdong Province published by National Bureau of Statistics of China shows that the coal price annual average increasing rate is 4.49% from 2002 to 2008.</p> <p>Thus, 10.5% increase of the coal price, which is necessary to make the IRR of the proposed project is unrealistic.</p>	<p>CAR 6 is closed.</p>
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		<p>These results show that even under very favorable circumstances the Project IRR is still lower than the 12% benchmark. As a result, we can conclude that the Project overall was also not financially attractive.</p> <p>Thus, KFQ conclude that the applied parameters and variation ranges for sensitivity analysis are completed and suitable for the proposed project and the sensitivity result supports that the project is financially unattractive without CER revenues and considered additional.</p>	
<p><b>CAR 7:</b></p> <p>The source for BE calculation is not clearly defined</p> <ul style="list-style-type: none"> <li>- Volume of the wastewater(<math>Q_{ww,y}</math>) was not provided</li> <li>- According to the methodology AMS III H ver. 16, PP shall demonstrate that the operation conditions of 10 days measurement data instead of one year's measurement data.</li> </ul> <p>※ Methodology AMS III H ver. 16, 27 (b)</p> <p>The measurements should be undertaken during a period that is representative for the typical operation conditions of the systems and ambient conditions of the site.</p>	B.5.1.9	<p>The volume of the wastewater (<math>Q_{ww,y}</math>) applies the value from the measurement record of wastewater for ex-ante calculation and will be monitored in the project activity. PP provided the measurement for volume of wastewater. It was conducted for 10 days from 16 July 2010 to 25 July 2010.</p> <p>The validation team confirmed the measured volume of the wastewater is applicable for the forecasted wastewater generation volume by reviewing the starch production rate in test period(10 days) and past daily production rate.</p> <p>PP provided the COD test report which contains 10 days(2 March ~ 30 March 2009) measurement information of <math>COD_{inflow}</math> and <math>COD_{discharge}</math>. In order to demonstrate this measurement represents the typical operation conditions of the systems and ambient conditions of the site, PP demonstrated the 10 days measurement record is under typical operation conditions of the systems and ambient conditions of the site by the document "Demonstration of representative of measurement campaign condition" dated on 24 September 2010. This document made by PP including the opinion of local environment monitoring team.</p> <p>The document indicated as follows.</p> <ul style="list-style-type: none"> <li>- Starch production of the plant has been stable during the measurement period: During 2 March ~ 30 March in 2009 daily average starch production is 58.52ton/d, and daily average starch production for whole year 2009 is 58.43ton/d. And daily average starch productions for March in other year are 58.42 ton/d in 2006, 58.45ton/d in 2007, 58.58ton/d in 2008 and 58.45ton/d in 2010. Therefore, during the measurement period, the starch production were stable as other operating periods, which means the measuring period was during a typical plant operating period. The validation team also the crosschecked this document and actual starch production records as well.</li> <li>- Typical ambient environment according to local temperature data: During 2 March ~ 30 March in 2009 average temperature was 18°C and average for the whole year 2009 was 22°C. And average temperatures for March in other year were 18°C ton/d in 2006, 18°C in 2007, 20°C in 2008 and 19°C in 2010.</li> </ul>	CAR 7 is closed.

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		<p>4°C different between the measuring period and 2009 annual average. The local environment monitoring team made their opinion that this difference makes no affect on the COD value.</p> <p>The validation team concluded the 10 day COD measurement is representative for the typical operation conditions of the systems and ambient conditions of the site through the provided document and our sectoral expertise.</p>	
<p><b>CAR 8:</b></p> <p>PP shall demonstrate well managed treatment in aerobic system in order to assert <math>PE_{ww,treatment,y}</math> is zero</p>	B.5.3.1	<p>The aerobic treatment system in the project activity is taken as poorly managed and therefore the <math>PE_{ww,treatment,y}</math> is not zero in emission reduction calculation. PP revised the PDD and ER spreadsheet accordingly.</p> <p><math>PE_{ww,treatment,y}</math> for project emission (Ex-ante) in the year y is estimated as follow.</p> <p>Methane emissions from wastewater treatment systems affected by the project activity, and not equipped with biogas recovery, in year y (<math>tCO_{2e}</math>). For the proposed project, it is the emission from the poorly managed aerobic treatment system and the final sedimentation pond which is not equipped with biogas recovery. <math>PE_{ww,treatment,y}</math> calculated by using the volume of wastewater treated in project wastewater treatment system k in year y (<math>Q_{ww,k,y}</math>) and <math>COD_{removed}</math> by project wastewater treatment system k in year y, measured as the difference between inflow COD and the outflow COD in system k (<math>COD_{removed,PJ,k,y}</math>). And Methane correction factor for project wastewater treatment system k (<math>MCF_{ww,treatment,PJ,k}</math>). The aerobic treatment in the project activity is poorly managed, therefore MCF value is 0.3 as per methodology. Methane producing capacity of the wastewater (<math>B_{o,ww}</math>, 0.25), Model correction factor to account for model uncertainties (<math>UF_{PJ}</math>, 1.12), Global Warming Potential for methane (<math>GWP_{CH_4}</math>, 21) were also applied for <math>PE_{ww,treatment,y}</math> calculation.</p> <p>Thus, the value of <math>PE_{ww,treatment,y}</math> is calculated to 646 <math>tCO_{2e}/year</math> and the validation team concluded this value is appropriate.</p>	CAR 8 is closed.
<p><b>CAR 9:</b></p> <p>For BE calculation, PP should demonstrate the potential methane emission of the wastewater in the UASB digester during the maintenance period</p>	B.5.1.9	<p>Recovered <math>CH_4</math> is converted to heat generation except two months' maintenance period every year. Potential methane emission of the wastewater in the UASB digester during the maintenance period is deducted from baseline emission. To be conservative in BE calculation, PP deducted this amount of methane in two components such as methane recovery component and heat generation component.</p> <p>Volume of methane deducted from baseline because of maintenance period in year y is calculated as,</p> <p>Volume of waste water in UASB digester * COD of wastewater flow into wastewater treatment system * Methane correction factor for the anaerobic wastewater treatment system i * Methane producing capacity of the wastewater * Model correction factor to</p>	CAR 9 is closed.



## APPENDIX B. QUALIFICATION OF VALIDATION TEAM

		<p>account for model uncertainty = 18 ton CH<sub>4</sub>/yr</p> <p>The validation team confirmed the applied potential methane emission of the wastewater in the UASB digester during the maintenance period is valid.</p>	
<p><b>CAR 10:</b></p> <p>It was not consistent between PP's assertion and PDD description on sludge treatment</p> <ul style="list-style-type: none"> <li>- Soil application of sludge from sedimentation pond and final sedimentation pond described in PDD</li> </ul>	B.5.1.9	<p>PP provided the "Letter of Intention for Purchase of Sludge from Starch Plant" between PP and local residents dated on 19 March 2009 for one year's free trial of offering the sludge to local community for soil application and "Long-term sludge treatment contract" between PP and local residents dated on 28 May 2010.</p> <p>In this contract, the local community is satisfied with using the sludge as organic fertilizer and is willing to continue the practice. Considering the poor living condition of local community and limited production quantity of sludge, PP agrees to provide sludge to local community for soil application without any charge in long term.</p> <p>The contract also defines the responsibility of each party:</p> <p>For PP, they shall inform local community in time after they produce the sludge, and provide full quantity of generated sludge to the community</p> <p>For local community, they are responsible for picking up sludge from the plant and transportation within 3 days after they receive PP's notice, and they are also required to use sludge only as organic fertilizer for soil application, not in other disposal ways.</p> <p>Therefore, the validation team confirmed that the produced final sludge is used for soil application so, BE<sub>s,final,y</sub> is estimated as zero.</p>	CAR 10 is closed.
<p><b>CAR 11:</b></p> <p>PE power calculation was not clearly demonstrated</p> <ul style="list-style-type: none"> <li>- Amount of coal consumption for UASB heating was omitted in PE power calculation</li> </ul>	B.5.1.9	<p>PP add the quantity of coal(C<sub>UASB,y</sub>) which is used to keep temperature for wastewater in UASB digester in winter time for project emission (PE<sub>thermal,y</sub>)</p> <p>According to the manual of UASB provided by the equipment supplier, the energy required for heating system is 0.053TJ/d. There are average 4 months require heating process, therefore energy consumed per year for the heating system is 0.053 TJ/d * 120 day = 6.36TJ/yr.</p> <p>NCV<sub>coal</sub> is 0.0293076TJ/tonne from Chinese standard and IEA: CO<sub>2</sub> Emission from fuel combustion(2006) Edition, so annual coal consumption for heating system is calculated as 6.36TJ/yr / 0.0293076TJ/tonne=217 tonne. PP input 217 tonne/yr in PDD and ER calculation sheet.</p> <p>Therefore, the validation team confirmed that the quantity of coal(C<sub>UASB,y</sub>) which is used to keep temperature for wastewater in UASB digester in winter time for project emission is estimated correctly.</p>	CAR 11 is closed.

## APPENDIX B. QUALIFICATION OF VALIDATION TEAM

<b>CAR 12:</b>  Monitoring plan was not clearly described in PDD - Type, location, calibration of measuring device which will be installed in monitoring point was not described in PDD - QA/QC - Training plan was not described in PDD	B.6.1.2 B.6.2.3	<p>The project activity have applied the indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories Type III.H-Methane recovery in wastewater treatment (Version 16) and categories Type I.C-Thermal energy production with or without electricity (Version 19).</p> <p>KFQ confirmed that the data and parameters used in the calculations were sourced from appropriate documents and correctly interpreted and applied through cross-checks with comparison of the data from the applicable website as well. And also KFQ confirmed the description of calibration frequency requirements, type, location of measuring device monitoring method, QA/QC, training plan and data management system are explained correctly on PDD.</p>	CAR 12 is closed.
<b>CL 1:</b>  Please describe conducted the stakeholder's consultation in the PDD besides Stakeholders' survey.	E.1.3	<p>PP added the stakeholders' survey with stakeholder's consultation on PDD correctly. Regarding to this proposed project activity, a survey of local residents was carried out to invite comments from local stakeholders in May 2008. Sixty-one (61) questionnaires were distributed to local stakeholders, and 100% feedback was received. No negative comments for impact on the local economy, development and environment have been received. KFQ has checked all the questionnaires received and interviewed with local government. The survey shows that the proposed project receives strong support from the local people and comments received have been taken into consideration during construction and operation to achieve environmental and social benefits. Also validation team interviewed with local government and found that the proposed project keeps the environmental regulation and also very supportive and looking for growth of local economy.</p> <p>The validation team confirmed that all relevant local stakeholders have been invited to consultation via appropriate media, the summary of comments received as provided in the PDD are appropriate, and due accounts was taken properly and described in the PDD well.</p>	CL 1 is closed.
<b>CL 2:</b>  COD values in PDD B.6.2 were not described correctly. - COD <sub>removed,i,y</sub> - COD <sub>ww, discharge,BL,y</sub> - COD <sub>removed,PJ,k,y</sub> - COD <sub>ww, discharge,PJ,y</sub> - COD <sub>ww, discharge,PJ,y</sub>	B.5.1.9	<p>PP revised the COD value correctly in PDD and ER spreadsheet as follows.</p> <ul style="list-style-type: none"> <li>- COD<sub>ww,removed,i,y</sub> : 0.02 tonnes/m<sup>3</sup></li> <li>- COD<sub>ww,discharge,BL,i</sub> : 0.000078 tonnes /m<sup>3</sup></li> <li>- COD<sub>removed, PJ,k,y</sub> : 0.00725 tonnes /m<sup>3</sup></li> <li>- COD<sub>ww,discharge,PJ,y</sub> : 0.000078 tonnes /m<sup>3</sup></li> <li>- COD<sub>ww,removed,PJ,y</sub> : 0.019275264 tonnes /m<sup>3</sup></li> </ul>	CL 2 is closed

## APPENDIX B. QUALIFICATION OF VALIDATION TEAM

		The validation team confirmed.	
<b>CL 3:</b>  IRR calculation on IRR spreadsheet for investment analysis(ver.01) is not correct.  - IRR value (without CDM) : -1.8% - IRR value (with CDM) :41.3%	B.4.4.5	PP made a mistake on IRR spreadsheet for investment analysis, thus it revised correctly. The result of IRRs are  - IRR value (without CDM) : 9.5% - IRR value (with CDM) : 37.7%  The validation team confirmed.	CL 3 is closed

Appendix B  
Qualification of Validation Team



## CERTIFICATE OF COMPETENCE

**Name:** Nam Hoon KIM

**Qualification:**

	Validation	Verification
-Lead auditor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-Auditor	<input type="checkbox"/>	<input type="checkbox"/>
-Technical Expert	<input type="checkbox"/>	<input type="checkbox"/>
-Local Expert	<input type="checkbox"/>	<input type="checkbox"/>

**Scopes of Expertise:**

**Technical Area (TA)**

1.2 Energy generation from renewable energy sources

Approved by qualified person for Auditors Qualification of KFQ on 28 February 2011

Sustainability Management Institute  
Byung Yong LEE

A handwritten signature in black ink, appearing to read 'B Y Lee', is written over the printed name.



## CERTIFICATE OF COMPETENCE

**Name:** Sung Han YOON

**Qualification:**

	Validation	Verification
-Lead auditor	<input checked="" type="checkbox"/>	<input type="checkbox"/>
-Auditor	<input type="checkbox"/>	<input type="checkbox"/>
-Technical Expert	<input type="checkbox"/>	<input type="checkbox"/>
-Local Expert	<input type="checkbox"/>	<input type="checkbox"/>

**Scopes of Expertise:**

**Technical Area (TA)**

- 1.1 Thermal energy generation from fossil fuels and biomass including thermal electricity from sol
- 1.2 Energy generation from renewable energy sources
- 11.2 GHG capture and destruction.
- 13.1 Waste handling and disposal

Approved by qualified person for Auditors Qualification of KFQ on 28 February 2011

Sustainability Management Institute  
Byung Yong LEE

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## CERTIFICATE OF COMPETENCE

**Name:** Pyung-Hee JANG

**Qualification:**

	Validation	Verification
-Lead auditor	<input type="checkbox"/>	<input type="checkbox"/>
-Auditor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-Technical Expert	<input type="checkbox"/>	<input type="checkbox"/>
-Local Expert	<input type="checkbox"/>	<input type="checkbox"/>

**Scopes of Expertise:**

**Technical Area (TA)**

1.2 Energy generation from renewable energy sources

Approved by qualified person for Auditors Qualification of KFQ on 28 February 2011

Sustainability Management Institute  
Byung Yong LEE

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Appendix C  
Qualification of Technical Reviewer





## CERTIFICATE OF COMPETENCE

**Name:** Jong Mun PARK

**Qualification:**

	Validation	Verification
-Lead auditor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-Auditor	<input type="checkbox"/>	<input type="checkbox"/>
-Technical Expert	<input type="checkbox"/>	<input type="checkbox"/>
-Local Expert	<input type="checkbox"/>	<input type="checkbox"/>

**Scopes of Expertise:**

**Technical Area (TA)**

- 1.1 Thermal energy generation from fossil fuels and biomass including thermal electricity from solar
- 5.1 Chemical process industries

Approved by qualified person for Auditors Qualification of KFQ on 28 February 2011

Sustainability Management Institute  
Byung Yong LEE

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## CERTIFICATE OF COMPETENCE

**Name:** Ji Young SONG

**Qualification:**

	Validation	Verification
-Lead auditor	<input type="checkbox"/>	<input type="checkbox"/>
-Auditor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-Technical Expert	<input type="checkbox"/>	<input type="checkbox"/>
-Local Expert	<input type="checkbox"/>	<input type="checkbox"/>

**Scopes of Expertise:**

**Technical Area (TA)**

13.1 Waste handling and disposal

Approved by qualified person for Auditors Qualification of KFQ on 28 February 2011

Sustainability Management Institute  
Byung Yong LEE

A handwritten signature in black ink, appearing to read 'B Y Lee'.