
VALIDATION REPORT (rev.1.2)

**"Biogas Recovery and Utilization Project in Tay Ninh
Province, Vietnam"**

REPORT No. : 2012-01

KSA KOREAN
STANDARDS
ASSOCIATION

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ABBREVIATIONS

BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CL	Clarification Request
CM	Combined Margin
CO₂	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
GHG	Greenhouse Gas
GWP	Global Warming Potential
KSA	Korean Standards Association
FAR	Forward Action Request
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of Approval
MP	Monitoring Plan
MoV	Means of Validation
ODA	Official Development Assistance
OM	Operational Margin
PDD	Project Design Document
PP	Project Participant
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard

0. VALIDATION OPINION

Korean Standards Association (KSA) has carried out validation of the "Biogas Recovery and Utilization Project in Tay Ninh Province, Vietnam". The validation has been performed on the basis of UNFCCC criteria for the Clean Development Mechanism and the host country criteria.

The validation has been performed by document review based on the project design document, follow-up resolution of outstanding issues and the issuance of the validation report.

Total emission reductions from the project are estimated to be on the 23,985 tCO₂-eq per a year over the selected 10 year crediting period without renewal. The emission reduction forecast has been checked and is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

Validation team also confirmed that monitoring and maintenance plans are clearly defined and adequate.

In KSA's opinion, the project activity meets all relevant UNFCCC requirements for CDM, is eligible as category I and III small-scale CDM project activity, and correctly applies the approved simplified baseline and monitoring methodologies AMS-I.C. (ver.19), AMS-III.H. (ver.16) and AMS-III.I (ver.08). Hence, KSA requests the registration of the project "Biogas Recovery and Utilization Project in Tay Ninh Province, Vietnam" as a CDM project activity.

Dec 23rd, 2012



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Mr. SeungKeun Choi

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1. INTRODUCTION

Miwon Vietnam Co., Ltd. (hereafter, the PP), project participant, has contracted Korean Standards Association (hereafter, KSA) to carry out a validation of the proposed project "Biogas Recovery and Utilization Project in Tay Ninh Province, Vietnam" in Korea (hereafter, the project). This report summarizes the findings over the validation process that has been performed on the validation requirements of the Clean Development Mechanism (CDM).

1.1 Objective

The purpose of validation is to ensure a thorough, independent assessment of proposed project activities submitted for registration as a proposed CDM project activity against the applicable CDM requirements. In particular, the project's baseline, the monitoring plan and the project's compliance with relevant UNFCCC and host Party 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. The validation is seen as necessary to provide assurance to stakeholders of the quality of the project activity and its intended generation of certified emission reduction (CERs).

1.2 Scope

The scope of the validation is defined as an independent and objective review of the project design document (PDD) and the relevant documents. The information in these documents is reviewed against the criteria stated in Article 12 of Kyoto Protocol (decision 17/CP.7), the CDM modalities and procedures as agreed in the Marrakech Accords, the simplified modalities and procedures for small-scale CDM project activities and the relevant decisions of the COP/MOP and the CDM Executive Board including the approved baseline and monitoring methodologies AMS-I.C. (ver.19), AMS-III.H. (ver.16) and AMS-III.I (ver.08). The KSA validation team followed a risk-based approach in the validation focusing on the identification of significant risks for project implementation and generation of certified emission reductions (CERs). Validation is no meant to provide any consulting toward the project participant. However, the corrective action requests (CARs) and clarifications (CL) may have provided input for improvement of the project design.

1.3 Validation Team

The validation has been performed by the following personnel;

<i>Role/Qualification</i>	<i>Name</i>	<i>Document Review</i>	<i>Site Visit</i>	<i>Follow-up Actions</i>	<i>Reporting</i>	<i>Technical Review</i>
Team Leader CDM Validator	Mr. SeungKeun Choi	✓	✓	✓	✓	
Team Member CDM Validator	Mr. Kyoo-II Sohn	✓	✓	✓		

Team Member Technical Expert	Mr. Young-Nam Lee	✓	✓	✓
Team Member Local Expert	Ms. Nguyen Houng	✓	✓	✓
Technical Reviewer CDM Validator	Mr. Seong-Yong Park			✓
Technical Reviewer Technical Expert	Mr. Ju-Dong Yeo			✓
Technical Reviewer Technical Expert	Mr. Seok Kim			✓

For the qualification of individual team members, see appendix B

2. METHODOLOGY

To assess the correctness of the information provided by the project participant, the validation consists of the following three phases;

I . Review of Documents, including;

- Review of data and information to verify the correctness, credibility and interpretation of presented information;
- Cross check between information provided in the PDD and information from sources other than that used, if available, and if necessary independent background investigations.

II. Follow-up actions, including;

- Interview with relevant stakeholders in the host country, personnel with knowledge of the project design and implementation;
- Cross-check of information provided by interviewed personnel to ensure that no relevant information has been omitted the validation

III. Reference to available information relating to projects or technologies similar to the proposed project activity under validation

IV. Review, based on the approved methodology being applied, of the appropriateness of formulae and accuracy of calculations.

V . The resolution of outstanding issues and the issuance of the final validation report and opinion.

Validation Protocol Table 1: Requirement checklist				
Checklist Question	Reference	Means of Verification (MoV)	Comment	Draft and/or Final Conclusion
The various requirements in Table 1 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.	Gives reference to documents where the answer to the checklist question or item is found.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	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.	This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) due to noncompliance with the checklist question (See below). Clarification Request (CL) is used when the validation team has identified a need for further clarification.

Validation Protocol Table 2: Resolution of Corrective Action and Clarification Requests			
Draft report clarifications and corrective action requests	Ref. to checklist question in table 1	Summary of project owner response	Validation conclusion
If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	Reference to the checklist question number in Table 1 where the Corrective Action Request or Clarification Request is explained.	The responses given by the Client or other project participants during the communications with the validation team should be summarized in this section.	This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 1, under "Final Conclusion".

Figure 1 Validation Protocol Tables

2.1 Review of Documents

The validation is performed by KSA primarily based on the review of the PDD and the other supporting documents. The PDD version 01, dated 19/04/2012, was initially reviewed and KSA requested the project participant to present the supporting information and documents the related with the project design. Such additional information and documents were also reviewed by KSA. Through the validation process, the PDD and the relevant documents were evaluated to confirm the actions taken by the project participant to the CARs and CLs issued by KSA.

2.2 Follow-up Interviews

Follow-up interviews with the stakeholders and site visits were conducted on 24/05/2012. The schedule for on-site assessment and interviewed personnel are as follows;

Site Name	Location (Address)
Miwon Vietnam Tay Ninh Factory	B2 Hamlet, Phuoc Minh Commune, Duong Minh Chau Dist., Vietnam (GPS Coordinate: 11.3272° N, 106.3194° E)

Interviewee	Roles & Responsibility	Interview Topics
Mr. Song Ho Baek	Miwon Vietnam	- Document related to the project's physical features
Mr. Tae-Hyung Lee	LIG system, Consultant	- Construction contract
Mr. Won-Tak Bae	LIG system, Consultant	- Records about stakeholder consultation
Mr. N'GUYEN CHANH TUAN	Local Resident	- Baseline scenario - Environmental Regulations

2.3 Resolution of clarification and corrective action requests

As an outcomes of the validation process, the validation team can raise Corrective Action Requests (CAR) and Clarifications (CLs) in order to confirm that the proposed project activity meets the CDM requirements and can achieve credible emission reductions. CARs and CLs require the project participant to modify the project design, to rectify the PDD or to provide adequate additional explanations or evidence. Criteria for CARs and CLs are as follows and are based on the "Clean Development Mechanism Validation and Verification Standard (version 3.0, EB 70)" /2-1/

- Corrective Action Request (CAR) shall be raised if one of the followings occurs;
 - a) The project participant has made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;
 - b) The applicable CDM requirements have not been met;
 - c) There is a risk that emission reduction cannot be monitored or calculated.
- Clarification (CL) Request shall be raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

The validation team by KSA has identified 21 CARs and 6 CLs. The resolution of CARs and CLs raised by KSA is to be reflected in the revised PDD and submitted to KSA for validation conclusion.

2.4 Internal Quality Control

The final validation report underwent a technical review by a qualified independent review team before requesting registration of the project activity. The technical review was performed by a technical review team (Mr. Seong-Yong Park, Mr. Ju-Dong Yeo and Mr. Seok Kim) qualified in accordance with KSA's qualification scheme for CDM validation and verification that meets the criteria of EB guidelines for qualification.

3. VALIDATION FINDINGS

In the following sections the findings of the validation are stated. The validation requirements, the means of validation and the results from validating the identified criteria are documented in more detail in the validation protocols given in Appendix A.

3.1 Global Stakeholder Consultation

The Project Design Document for this project was made available on the UNFCCC website and was open for comments from Parties, stakeholders and NGOs from 03/05/2012 until 01/06/2012. No comments were received.

3.2 Approval

The only one Party, Vietnam, has been involved in the project activity as a host Party. The Letter of Approval issued by DNA of the host country has been received on 04/10/2012 and verified by the validation team. According to the LoA /1-4/, validation team confirms that;

- Vietnam is a Party to the Kyoto Protocol.
- Participation is voluntary.
- The proposed CDM project activity contributes to the sustainable development of the host Party.
- It refers to the precise proposed CDM project activity title in the PDD being submitted for registration.

And the letter is unconditional with respect to item (a) to (d) as per paragraph 39 of VVS.

Validation team received this letter of approval from the PP and checked it by calling DNA of host party. It does not doubts its authenticity.

This proposed project activity is developed as unilateral CDM, and no Annex I Party has been identified.

3.3 Authorization

The project participant has been authorized by the corresponding Party, which is confirmed by the issued LoA /1-4/. According to the LoA, validation team confirms that;

- Project participant : Miwon Vietnam Co., Ltd.
- Host Party : Vietnam

□ Project title : Biogas Recovery and Utilization Project in Tay Ninh Province, Vietnam

Validation team confirms that there is no other project participants than Miwon Vietnam Co., Ltd. approved by host party's DNA, and the information of the project participant listed in the table under section A.4 and Annex 1 of the PDD is exactly same in the LoA and is in consistency throughout the PDD.

3.4 Contribution to Sustainable Development

The LoA /1-4/ of the Host country, Vietnam, clearly presents a statement that this project activity contributes to the sustainable development in Vietnam.

3.5 Modalities of Communications

KSA validation team confirms that MoC /2-3/ has been stated in accordance with all relevant forms and requirements. Validation team also confirms that it has performed due diligence on the MoC statement in accordance with requirement established in the VVS. Additional assessment result is described in A.5, Table 1 of appendix A.

3.6 Project Design Document

PDD used is F-CDM-SSC-PDD (ver.4.1) /2-4/ which is the most recent format and complies with relevant form and guidance as provided by UNFCCC CDM EB. Completeness was assessed through the protocol included as Appendix A of this report.

3.7 Description of Project Activity

The information presented in the PDD on the technical design are consistent with the actual planning and implementation of the project activity as confirmed by;

- Review of following document provided by the PP:
 - PDD /1-1/
 - Install of methane recovery facilities at Tay Ninh factory (document no. VT-100305)" /1-5/
 - Revised draft for Install of methane recovery facilities at Tay Ninh factory (document no. VT-100319)" /1-6/
 - 1st and 2nd Feasibility Study Report /1-7,-8/

- Cross Section Diagram of Anaerobic Lagoon /1-9/

- On-site assessment has been performed and interviewed people who related to the project activities.
- Cross-check with information in the similar projects registered as CDM project activity in Vietnam.

In the view of the above, KSA confirms that the project description as included in the PDD is sufficiently accurate and complete in order to comply with the requirements of the CDM

3.7.1 General Information

Tay Ninh factory of Miwon Vietnam Co., Ltd. produces starch and starch syrup, so heat is used into the production process and a lot of organic waste water is produced. Before the proposed project, waste water has been treated in open lagoons without discharge, so methane was directly emitted into atmosphere by anaerobic digest in the lagoons. In addition, steam was generated by two B-C boilers, and two dryers using cashew nut oil.

The proposed project activity is to change waste water treatment system and source of heat from fossil fuel to biogas. By the project activity, new anaerobic digester (defined as stage 1) is constructed, then discharged water from the digester is supplied to aerobic waste water treatment system (defined as stage 2). So, methane is avoided by aerobic treatment system at stage 2. Treated water at stage 2 is discharged. So, methane generated by anaerobic digest at stage 1 is recovered, then utilized by dryers and newly built co-fired boilers (defined as stage 3). In baseline situation, dryers used cashew nut oil which is biomass, so the amount of heat generated by dryers using biogas is not considered as emission reductions. The co-fired boilers can combust coal as back-up fuel, so it is considered as project emission source. In case recovered biogas is not needed in the production process or in emergency situation, the gas can be vented.

The PP has received proposals for the project activity from engineering companies, and comparison result was recorded on "Research for Biogas Recovery Project (17/11/2009)" /1-10/. Based on the document, CEO of Miwon vietnam approved the project by signing the draft "Install of methane recovery facilities at Tay Nihn factory" /1-5/ on 30/12/2009 (investment decision). After that, initial construction contract /1-11/ was made on 12/01/2010 (project start date). Then, feasibility study for CDM registration has been carried out two times by consulting firms, after investment decision.

Initial investment decision includes installation of two co-fired boilers - 5 ton/hr and 8 ton/hr.

However, the plan was changed to install two boilers with capacity of 5 ton/hr. Validation team confirmed this by review of the documented evidence "Review of coal boiler installation (15/05/2012)" /1-12/ that CEO signed on.

3.7.2 Public Funding

A.5 of the PDD demonstrates that no public funding is provided for the proposed project. To confirm this, validation team reviewed "Research for Biogas Recovery Project (17/11/2009)" /1-10/, prepared by the PP prior to the decision making. The document described that investment cost would be covered by the PP themselves. As a result, validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding toward the host party of the proposed project.

3.7.3 Eligibility as a Small-Scale Project

Capacity Threshold for SSC CDM project

The proposed project is combination of type III project (biogas recovery and avoidance) and type I project (heat generation from biogas). For heat generation, capacity of generator is 8 MWth, which is less than 45MWth (15MWe) of type I threshold defined in paragraph 81 (a) and 82 (c) of CDM Project Standard /2-2/.

For type III part, expected average annual emission reduction of the proposed project activity (including heat generation), is less than 60ktCO₂-e of threshold defined in paragraph 81 (c) of CDM Project Standard /2-2/.

Thus, the proposed project is eligible for small scale project activity.

De-bundling Issue

As per the paragraph 2 of "Guidelines on Assessment of Debundling for SSC Project Activities (ver.03)" /2-5/ defines that:

A proposed small-scale project activity shall be deemed to be a debundled component of a large project activity, if there is a registered SSC CDM project activity or an application to register another SSC CDM project activity (a) with the same PPs, (b) in the same project category and technology/measure, (c) registered within the previous 2 years, and (d) whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point.

After interviews with the PP and CDM webpage check, validation team confirmed that the PP

does not have any registered CDM project and has not proceed another CDM project in the host party. In this reason, validation team confirmed that the project is not a de-bundled component of a large scale CDM project activity.

Conclusion

In conclusion, validation team confirmed that the project is eligible as a small-scale project.

3.7.4 Choice of the Crediting Period

The crediting period for this project activity is considered as fixed crediting period of 10 years starting on start date of crediting period. The expected operational lifetime 25 years as defined in section C of the PDD. So, selection of the fixed crediting period of 10 years is also found acceptable.

3.8 Baseline and Monitoring Methodology

3.8.1 Applicability of selected methodology to the Project Activity

The proposed project activity consists of (i) methane recover from anaerobic waste water treatment system, (ii) methane avoidance by aerobic waste water treatment system, and (iii) heat production by recovered methane.

Section B.2 of the PDD demonstrates how the proposed project activity meets the applicability conditions. Validation team confirmed that the project meets applicability conditions in the applied methodologies by:

- *Review of following document*
 - PDD /1-1/
 - AMS-III.H. (ver.16) /1-13/, AMS-III.I. (ver.08) /1-14/, and AMS-I.C. (ver.19) /1-15/
 - Install of methane recovery facilities at Tay Nihn factory /1-5/
 - Revised draft for Install of methane recovery facilities at Tay Nihn factory /1-6/
 - Technical Explanation and Quotation /1-16/
 - 1st Feasibility Study Report /1-7/
 - 2nd Feasibility Study Report /1-8/
 - Specification of Co-fired Boiler /1-17/
 - Review of Coal Boiler Installation /1-12/
 - Cross Section Diagram of Anaerobic Lagoon /1-9/
 - Pipeline Allocation Drawings /1-18/

- Evidence for annual average temperature in Tay Ninh, Viet Nam /1-29/
- *On-site assessment including interviews people who related to the project activities.*

Additional assessment result is described in section B.1, table 1 of appendix A.

3.8.2 Project Boundary

Figure 1 in section B.3 of the PDD shows how the PP identified project boundary for the proposed project activity. To determine whether identified project boundary is appropriate, validation team reviewed following documents:

- PDD /1-1/
- Applied methodologies AMS-III.H. (ver.16), AMS-III.I. (ver.08), and AMS-I.C. (ver.19)
- Install of methane recovery facilities at Tay Nihn factory /1-5/
- Revised draft for Install of methane recovery facilities at Tay Nihn factory /1-6/
- 1st Feasibility Study Report /1-7/
- 2nd Feasibility Study Report /1-8/

After review of documents, validation team carried out on-site assessment. When the team visited the project site, most of the facilities have been installed, so was able to confirm the project would be implemented as designed. In conclusion, project boundary identified in the PDD includes all emission sources, and is in accordance with applied methodologies.

3.8.3 Baseline Identification

Baseline Scenario for Waste Water Treatment (Stage 1&2)

"General Guidelines for the SSC CDM Methodologies (ver.19)" requires to demonstrate eligibility of the baseline scenario for type III project activity by the steps provided. Section B.4 of the PDD describes how the PPs identified baseline scenario in accordance with the requirement.

step 1. Identifying alternatives

The PP identified four (4) alternatives including the project activity without CDM revenue. Validation team confirms that all identified alternatives are credible and complete, by cross-check with recently registered CDM projects:

- TV Daklak wastewater treatment and methane recovery project (reference 5347) /2-10/
- Methane Recovery and Use of the Biogas in Son Hai - Son Ha and Dong Xuan Tapioca

- Starch Making Plants of APFCO, Vietnam (reference 5438) /2-11/
- Project JBS S/A – Slaughterhouse Wastewater Aerobic Treatment – Barra do Garças Unit. (reference 2609) /2-12/

step 2. Compliance with local regulation

To assess this step, following local regulations have been taken into account

- QCVN 24:2009-BTNMT, National Technical Regulation on Industrial Wastewater /2-6/
- Circular: Providing Strategic Environmental Assessment, Environmental Impact Assessment and Environmental Protection Commitment (Circular 26.2011.TT.BTNMT) /2-7/
- Decree: Providing Strategic Environmental Assessment, Environmental Impact Assessment and Environmental Protection Commitment (government's decree No. 29/2011/ND-CP) /2-8/

By review of these documents, validation team found that local regulation requires that COD of discharged waste water should be less than 50 mg/L. Validation team reviewed 1st feasibility study report /1-7/ and confirmed that COD of waste water which is not treated is approximately 10,000 mg/L. So, exclusion of alternative 2 is acceptable.

step 3. Barrier Test

According to the "General Guidelines for SSC CDM Methodologies (ver.19)" /2-9/, barrier test is applied as specified in "Guidelines on the Demonstration of Additionality of Small-scale Project Activities" /2-13/.

Alternative 3 has been eliminated at this stage, because it is not financially feasible. Refer to the assessment of investment analysis in 'section 3.8.5 Additionality' below, validation team confirmed that the project activity without CDM registration is not profitable.

Alternative 4 has also been eliminated at this stage, because investment cost is much bigger than alternative 3, but saving benefit is similar. To verify this, validation team reviewed investment cost analysis of Gunsan factory /1-33/, and confirmed.

As the outcome of the step 3, it is unveiled that alternative 1 is the only alternative that remains.

Step 4.

The only remaining alternative 1 is not the project activity without CDM revenue, but corresponds to the baseline scenario. In conclusion, validation team confirmed that alternative 1 is most plausible and eligible baseline scenario, and is in accordance with applied methodologies AMS-III.H.

(ver.16) and AMS-III.I. (ver.08).

Baseline Scenario for Heat Generation (Stage 3)

In accordance with paragraph 16 of AMS-I.C. (ver.19), baseline scenario 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, B-C used to boilers is correctly defined as baseline fossil fuel in the PDD.

Conclusion

As defined in the applied baseline methodologies, the PP identified baseline scenario in accordance with applied methodologies and correctly reflected it in the PDD. KSA confirms that all related CDM requirements, including relevant and/or sectoral policies and circumstances, have been correctly identified taken into account in the definition of the baseline scenario. A verifiable description of the baseline scenario has been included in the PDD, KSA confirms that:

- All the assumptions and data used by the project participant are listed in the PDD, including their references and sources;
- All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;
- Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable;
- Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD;
- 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

3.8.4 Algorithms and/or Formulae used to determine emission reductions

The validation team conducted assessment of baseline emissions, project emissions, leakage emission, and emission reductions. The parameters and equations presented in the PDD, as well as other applicable documents, have been compared with the information and requirements specified in the applied methodologies and respective tools as listed below:

In summary of the assessment belows, the validation team hereby confirms that:

- (a) All assumptions and data used by the project participant are listed in the PDD, including

their references and sources;

- (b) All documentation used by project participant as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD;
- (c) All values used in the PDD are considered reasonable in the context of the proposed CDM project activity;
- (d) The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage emissions and emission reductions;
- (e) All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.

Stage 1, Anaerobic Treatment (AMS-III.H.)

Paragraph 18 of AMS-III.H. (ver.16) provides options baseline emission sources. Among them, the PP defined option (ii) Methane emissions from baseline wastewater treatment systems is applied. Therefore, the PP selected equations (2) defined in paragraph 20 of the methodology. Before the propose project, wastewater was treated under anaerobic condition in open lagoons without discharge. During on-site assessment, validation team could look at the open lagoons, then concluded that the selection is appropriate.

Paragraph 29 of AMS-III.H. (ver.16) provides list of project emission sources, and the PP's identification is appropriately justified as belows:

- Option (i) is identified as emission source. The project facilities including stage 2 and 3 use electricity to be operated and the project includes biogas capture system, so selection of option (i) is appropriate. Especially, the PP considered option (i) for whole project activity. Validation team also confirms that there is no other project emission sources by:
 - (i) *Review of 1st and 2nd Feasibility Study Reports /1-7,-8/*
 - (ii) *Cross check with registered CDM project "Methane Recovery and Use of the Biogas in Son Hai- Son Ha and Dong Xuan Tapioca Starch Making Plant of APFCO, Vietnam (ref# 5438)" /2-11/. The project site produces starch in vietnam, which is same to the proposed project activity.*
- Option (ii) is not considered. There is no other wastewater treatment system affected by project activity, so it is appropriate.
- Option (iii) is not considered. Sludge is not treated in stage 1, so it is appropriate.
- Option (iv) is not considered. Wastewater treated in stage 1 is supplied to stage 2, and treated again in aerobic treated system. So, methane from degradable organic carbon is not generated.
- Option (v) is not considered. Sludge is not treated in stage 1, so it is appropriate.
- Option (vi) is appropriately considered as project emission source.

- Option (vii) is not considered. There is no flaring by the project activity.
- Option (viii) is not considered. There is no biogas storage equipment.

Equation (10) in B.6.1 of PDD defined the amount of vent gas as project emission source, although applied methodology does not define it. Project diagram described in the decision making record /1-5,-6/ shows that recovered biogas can be vented into atmosphere, so identification of emission source is appropriate. However, by on-site interview, validation team found that vent had not been happened until the time of on-site assessment, and venting equipment is designed for emergency situation. PDD also described that the amount of vent gas would be considered if it happens. So, validation team concluded that the PP's identification is appropriate.

No leakage emission source is identified in accordance with methodology.

Parameters and ex-ante values applied to calculate emissions and emission reductions in stage 1 are validated as follows:

Parameter	Value Applied	Source	Assessment Result
$Q_{ww,y,stage1}$	729,600 m ³ /yr	Design value	Validation team reviewed "Technical Explanation" /1-16/, and found that 2,400 m ³ /day is design capacity. 304 working days/year is assumed by the PP, and validation team confirms that it is reasonable. In conclusion, 729,600 m ³ /yr is appropriate.
$COD_{inflow,anaerobic}$	0.009863 t/m ³	Historical COD analysis data /1-19/	The PP provided 2 year historical data. Methodology requires 3 year data, but only 2 year was available. Validation team accepted in that variation of historical value is constant. Average value is correctly applied. In addition, the value is almost same with design value of anaerobic treatment system.
$COD_{outflow,y,stage1}$	0.002138 t/m ³	Calculated by $COD_{inflow,y,stage1} \times (1 - \eta_{COD,BL})$	Validation team confirms that the value is appropriately calculated in excel spreadsheet.
$\eta_{COD,BL}$	0.78	0.88 of designed removal efficiency multiplied by 0.89 of uncertainty provided in the methodology	Validation team reviewed "Technical Explanation" /1-16/ for designed COD removal efficiency and confirmed the value of 0.88. 0.89 of uncertainty is correctly multiplied in accordance with applied methodology.
$MCF_{ww,treatment,BL}$	0.8	Fixed value in the	Cross section Diagram of anaerobic

		applied methodology, in case anaerobic deep lagoon (depth more than 2 meters)	lagoon /1-9/ shows that depth is more than 2 meters, so 0.8 is correct.
$B_{o,ww}$	0.25 kgCH ₄ /kgCOD	Fixed value in the methodology	Validation team confirmed that the value is provided in the methodology.
$UF_{BL,stage1}$	0.89	Fixed value in the methodology	Validation team confirmed that the value is provided in the methodology.
GWP_{CH_4}	21	IPCC default value	Validation team confirmed that the value is provided in the methodology.
$EC_{consumption,y}$	1,866 MWh	Equipment specifications /1-16/, nameplate of facilities /1-30/ and assumption of operating hours	"Technical Explanation" /1-16/, "Specification of co-fired Boiler" /1-17/ and nameplates of facilities /1-30/ provide design capacity of electricity consumption, and the PP assumed 304 working days. 1,866 MWh is calculated by electric capacity, 304 working days, and 24 hour/day. Validation team confirmed that the calculation is appropriate.
$EF_{grid,y}$	0.5764 tCO ₂ /MWh	Provided by host party's DNA	DNA of Vietnam provided emission factor for electricity consumption /1-20/. Validation team also cross checked recently registered CDM projects in Vietnam, and confirmed that same emission factor is consistently applied.
CFE_{ww}	0.9	Fixed value in the methodology	Validation team confirmed that the value is provided in the methodology.
$UF_{PJ,Stage1}$	1.12	Fixed value in the methodology	Validation team confirmed that the value is provided in the methodology.
$COD_{removed,y,stage1}$	0.007725 t/m ³	Calculated by the differenced between $COD_{inflow,y,stage1}$ and $COD_{outflow,y,stage1}$	Validation team confirms that it is appropriately calculated in excel spreadsheet.
$MCF_{ww,treatment,PJ}$	0.8	Fixed value in the applied methodology, in case anaerobic deep lagoon (depth more than 2 meters)	Cross section Diagram of anaerobic lagoon /1-9/ shows that depth is more than 2 meters, so 0.8 is correct.
D_{CH_4}	0.716 kg/m ³	Project Emissions from Flaring (ver.2.0, EB68)	OK. Correct value in the tool is applied.
FE	100%	Default value provided in the methodology.	OK. Methodology provides 100% of efficiency in case biogas is fed to engine.

Stage 2, Aerobic Treatment (AMS-III.I.)

Paragraph 4 of AMS-III.H. (ver.08) provides options baseline emission sources. Among them, the PP defined option (a) Methane produced in the anaerobic baseline wastewater treatment system that is being replaced with the biological aerobic system is applied. Therefore, the PP selected equations (2) defined in paragraph 7 of the methodology. Stage 2 of the propose project activity is to install aerobic wastewater treatment system, where wastewater was treated under anaerobic condition in open lagoons. So, validation team concluded that the selection is appropriate.

Paragraph 13 of AMS-III.H. (ver.08) provides list of project emission sources, and the PP's identification is appropriately justified as belows:

- Option (i) is already considered in stage 1, so excluded in stage 2.
- Option (ii) shall be considered as project emission source, but $MCF_{aerobic,k}$ in equation (9) is 0 in case of well managed aerobic treatment as defined in table III.I of the applied methodology. Validation team concluded that stage 2 facilities are newly installed, so can be regarded as well managed system. It results in 0 tCO₂-e as outcome of calculation, so excluded.
- Option (iii) is considered as project emission source.
- Option (iv) and (v) are not considered. Sludge is mostly deposited under anaerobic lagoon at stage 1, and anaerobic lagoon is covered and sealed to recover methane, so sludge treatment will not happen in normal operating condition. In addition, "Technical explanation" /1-16/ describes that sludge is pumped into sludge tank, then basically return to the treatment process. The other sludge is dried and used for fertilizer. In this reason, validation team confirmed that emissions from sludge treatment is not considerable.

No leakage emission source is identified in accordance with methodology.

Parameters and ex-ante values applied to calculate emissions and emission reductions in stage 2 are validated as follows:

Parameter	Value Applied	Source	Assessment Result
$Q_{ww,y,stage2}$	729,600 m ³ /yr	Design value	Validation team reviewed "Technical Explanation" /1-16/, and found that 2,400 m ³ /day is design capacity. 304 working days/year is assumed by the PP, and validation team confirms that

			it is reasonable. In conclusion, 729,600 m ³ /yr is appropriate.
COD _{removed,y,stage2}	0.002089 t/m ³	Estimated by COD out from previous stage and historical COD at the end of baseline treatment system.	Validation team reviewed 2 year historical data of COD analysis, and confirmed that average COD value at the end of baseline treatment system is 49 mg/L, which is almost same with 50 mg/L of design value for stage 2. COD in is estimated as COD out of previous stage (stage 1). In conclusion, validation team confirms that the value is appropriately estimated.
MCF _{anaerobic,stage2}	0.8	Fixed value in the applied methodology, in case anaerobic deep lagoon (depth more than 2 meters)	"Cross section Diagram of anaerobic lagoon" /1-9/ shows that depth is more than 2 meters, so 0.8 is correct.
B ₀	0.21 kgCH ₄ /kgCOD	Fixed value in the methodology	Validation team confirmed that the value is provided in the methodology.
UF _{BL,stage2}	0.94	Fixed value in the methodology	Validation team confirmed that the value is provided in the methodology.
UF _{PJ,Stage2}	1.06	Fixed value in the methodology	Validation team confirmed that the value is provided in the methodology.
GWP _{CH4}	21	IPCC default value	Validation team confirmed that the value is provided in the methodology.
COD _{outflow,aerobic}	0.000049 t/m ³	Historical COD analysis data /1-19/	The PP provided 2 year historical data. Methodology requires 3 year data, but only 2 year was available. Validation team accepted in that variation of historical value is constant. Average value is correctly applied. In addition, the value is almost same with design value of anaerobic treatment system.
MCF _{ww,discharge}	0.1	Fixed value in the methodology	Validation team confirmed that the value is provided in the methodology.

Stage 3, Heat Generation (AMS-I.C.)

The proposed project is to generate heat by utilizing recovered methane from stage 1, therefore, for baseline emission calculation, equation (2) defined in paragraph 22 of AMS-I.C. (ver.19) is appropriately applied in the PDD.

Newly installed co-fired boilers are designed to combust coal as backup fuel, so emissions from coal is identified as project emission source. To calculate ex-ante emissions by coal, the PP analyzed 2 year (2008,2009) historical fuel consumption data /1-21/. Paragraph 23 of AMS-I.C.

(ver.19) requires most recent historical records at least three year, but only two year records were available. Validation team concluded that 2 year records are acceptable and reasonable in that variation of consumption is not considerable amount.

To estimate amount of coal consumption, the PP calculated annual amount of heat utilized by boilers and dryers from fuel consumption record. By the way, dryers in baseline scenario already utilized cashewnut oil, which is biomass. In this reason, even if amount of heat generated in baseline situation is produced by biogas recovered by stage 1 project activity, emission reductions do not happen. To consider this situation, the PP assumed that recovered biogas at stage 1 would be used in dryers first, then the remainder would be used in co-fired boilers. Validation team confirms this assumption because recovered biogas is the only fuel available to dryers.

Finally, differences between the amount of heat generated by B-C boilers and heat can be produced by remaining biogas would be the amount of heat that should be supplied by coal. Calculation procedure is provided in excel spreadsheet, and validation team confirmed it.

Validation team confirmed that the approach to estimate project emission is complete and reasonable.

No leakage emission source is identified.

Parameters and ex-ante values applied to calculate emissions and emission reductions in stage 3 are validated as follows:

Parameter	Value Applied	Source	Assessment Result
$EG_{thermal,y}$	46.6 TJ	Historical B-C consumption data /1-21/ multiplied by NCV provided in IPCC 2006	See $EG_{thermal,boiler}$ below.
$\eta_{BL,thermal}$	100%	Default value in the methodology.	Conservative value provided in the methodology is correctly applied.
NCV	Coal 25.8 TJ/Gg Biogas 50.4 TJ/Gg B-C 40.4 TJ/Gg Cashewnut oil 27.4 TJ/Gg	IPCC 2006	Net calorific value for each fuel provided in IPCC 2006 is correctly applied.
$EF_{CO_2,B-C}$	77.4 tCO ₂ /TJ	IPCC 2006	Emission factor for other residual oil (B-C) is correctly applied.

EF _{CO₂,coal}	94.6 tCO ₂ /TJ	IPCC 2006	Emission factor for coal is correctly applied.
EG _{thermal,boiler}	46.6 TJ	Historical B-C consumption data /1-21/ multiplied by NCV provided in IPCC 2006	Validation team reviewed monthly records for B-C consumption /1-21/ and confirmed that 2 year (2008,2009) average consumption is 1,153 ton. NCV for B-C (40.4 TJ/Gg) provided in IPCC 2006 is correctly multiplied.
EG _{thermal,dryer}	18.8 TJ	Historical cashew nut oil consumption data /1-21/ multiplied by NCV provided in IPCC 2006	Validation team reviewed monthly records for cashewnut out consumption /1-21/ and confirmed that 2 year (2008,2009) average consumption is 684.5 ton. NCV for liquid biomass (27.4 TJ/Gg) provided in IPCC 2006 is correctly multiplied.
EG _{thermal,CH₄}	25.44 TJ	Calculated by equation (20) in the PDD.	Validation team reviewed excel spreadsheet and confirmed that calculation is correct.
FC _{coal,y}	819.31 ton	Calculated by equation (19) in the PDD.	Validation team reviewed excel spreadsheet and confirmed that calculation is correct.

3.8.5 Additionality of a Project Activity

To demonstrate additionality, the PP selected to demonstrate investment barrier. So, validation team performed assessment by following "Guidelines on the Assessment of Investment Analysis (ver.05)" /2-14/. Usually, values applied to the investment analysis is based on feasibility study report, but for the proposed project activity, feasibility studies have been made after investment decision, to analyze feasibility for CDM registration. By the way, paragraph 6 of "Guidelines on the Assessment of Investment Analysis (ver.05)" requires that input values used in all investment analysis should be valid and applicable at the time of the investment decision taken by the project participant. In accordance with this requirement, values in the feasibility study reports are not used. Instead, values at the time of investment decision - "Install of methane recovery facilities at Tay Nihn factory (30/12/2009)" /1-5/ - are applied. The documents have been signed of the PP, so can be regarded as decision making records.

Prior to the investment decision, the PP has conducted research to compare proposals from engineering companies, and the result has been reported to the management /1-10/. The input values in the investment analysis are cross-checked with the document "Research for biogas recovery project (17/11/2009)" /1-10/.

Applied Benchmark

To compare with the project IRR, the PP applied 13.25% of benchmark, 3 year (2007-2009) average lending rate of State Bank of Viet Nam. Investment decision was made on 30/12/2009, so selection of 2007-2009 benchmark is appropriate. Validation team also visited website of State Bank of Viet Nam, and confirmed that average basic interest rate was 8.84% for three years, and lending rate is 150% of basic interest rate, so 13.25% is accurate, as described in the PDD.

To assess the suitability of applied benchmark, validation team also conducted cross-check with similar projects which have recently been registered, and found that:

- 21% of benchmark is applied to "Methane Recovery and Use of the Biogas in Son Hai- Son Ha and Dong Xuan Tapioca Starch Making Plant of APFCO, Vietnam (ref# 5438)" /2-11/
- 11.8% of benchmark is applied to "TV Daklak Wastewater Treatment and Methane Recovery Project (ref# 5347)" /2-10/

So, validation team confirmed the benchmark is appropriate and can be regarded as standard in the market as required by paragraph 18 of "Guidelines on the Assessment of Investment Analysis (ver.05)" /2-14/.

Underlying Assumptions

The proposed project activity consists of three major stages, and has many kinds of facilities. However, operational lifetime of the whole project is not clearly defined in any internal documents such as decision making record and feasibility study report. So, the PP assumed that 25 year in terms of boilers in accordance with "Tool to determine remaining lifetime of equipment (ver.01)" /2-15/. This value is consistently applied throughout PDD.

Parameters used

- Investment cost : 53,000 million VND (hereafter mVND) was initially planned at the time of decision making, and it is cross-checked by "Research for biogas recovery project (17/11/2009)" /1-10/, which has been prepared prior to the investment decision on 30/12/2009. However, expected cost for boilers was decreased because capacity of spare boiler had been reduced. In this reason, validation team requested the PP to reflect actual cost for boiler-related parameters.

- Boilers : 13,248 mVND is applied based on actual contracts /1-22,-23,-24/. The values can be broken down as belows:

- Main boiler : 4,187 mVND /1-22/.

- Spare boiler : 7,235 mVND /1-23/.
- Construction : 1,826 mVND /1-24/.
- Biogas Recovery system : 8,000 mVND is consistently applied based on decision making record /1-5,-6/.
- Aerobic waste water treatment system: 30,000 mVND is consistently applied based on decision making record /1-5,-6/.
- Totally, 51,248 mVND is correctly applied as investment cost. Compare to 53,000 mVND of the initially expected value in the decision making record /1-5,-6/, it is acceptable and conservative.
- O&M Cost : 4,090 mVND/year is correctly applied from the value available at the time of investment decision /1-5,-6/, and cross checked with "Research for biogas recovery project (17/11/2009)" /1-10/. The values were almost same.
- Benefit (energy cost savings) : 10,000 mVND/year is correctly applied from decision making record /1-5,-6/, and cross checked with "Research for biogas recovery project (17/11/2009)" /1-10/. The values were almost same.
- CER revenue : 12 euro/CER is applied based on decision making record /1-5,-6/, and exchange rate at the time of investment decision (30/12/2009) is correctly applied to the calculation.

Sensitivity Analysis

Paragraph 20 of "Guidelines on the Assessment of Investment Analysis (ver.05)" requires that variables that constitute more than 20% of either total project costs or revenue should be subjected to reasonable variation. So, the PP selected (i) construction cost, (ii) O&M cost, and (iii) energy saving revenue as variables to be analyzed.

Paragraph 21 of the guideline requires to cover at least +10% and -10% of range, and this requirement is reflected in the sensitivity analysis. But, the PP did not analyze with direction to decrease project revenue and increase project cost because it is not able to impact of the analysis result.

Table in B.5 of the PDD shows the summary of sensitivity analysis. None is higher than benchmark. Validation team confirmed that all calculation and the result in the worksheet is appropriate.

Conclusion

As a result of assessment, validation team confirmed that all assumptions, values, and calculations are correct. The outcome of investment analysis shows that IRR without CDM project is below the benchmark, while IRR with CDM revenue is over the benchmark. So, the project is additional.

3.8.6 Prior Consideration of the Project Activity

a) Starting Date of CDM project activity

According to "Glossary: CDM terms (ver.7.0, EB70 Annex07)" /2-16/, start date of project activity is the earliest date at which either the implementation or construction or real action of a CDM project activity begins. The PP defined start date of the proposed project as 12/01/2010, the date of equipment purchase, as described in B.5 of the PDD. Validation team reviewed the equipments purchase contracts, and found that the initial contract was to install biogas recovery facilities, and made on 12/01/2010, as described in the PDD.

According to "Install of methane recovery facilities at Tay Nihn factory (document no. VT-100305)" /1-5/, CEO of the PP initially approved the project to be implemented on 30/12/2009. Then, "Revised draft for Install of methane recovery facilities at Tay Nihn factory (document no. VT-100319)" /1-6/ has been signed on 06/01/2010.

Validation team also reviewed the other purchase contract, such as biogas boilers and aerobic treatment facilities, and confirmed that the dates are later than 12/01/2010. Initial contract for equipment purchase was made on 12/01/2010, right after revised plan had been approved on 06/01/2010. So, project start date defined by the PP is clear and appropriate.

b) Prior Consideration of the CDM

According to paragraph 7 of CDM Project Cycle Procedure /2-17/, for the project activity with start date on or after 2 August 2008, project participant shall notify the DNA of the host party and secretariat in writing of the commencement of the project activity and their intention to seek the CDM status within 180 days of the start date of the project activity.

The PP has informed DNA of Vietnam and UNFCCC secretariat of their consideration of CDM project activity on 28/06/2010, within 180 days of project start date (12/01/2010). Validation team reviewed prior consideration form submitted to secretariat /1-3/, checked UNFCCC CDM website and contacted DNA of Vietnam to verify it.

In summary, KSA has confirmed that the project activity meets the requirements related to prior consideration of CDM.

3.8.7 Monitoring Plan

As described below, by review of documents and on-site assessment, KSA confirmed that (i) monitoring plan described in the PDD is complete, (ii) proposed monitoring plan complies with applied monitoring methodologies, and (iii) the PP is able to implement the monitoring plan.

Identification of Monitoring Parameters

To identify parameters required to monitor, validation team analyzed following documents:

- Applied monitoring methodology AMS-III.H.(ver.16) /1-13/
- Applied monitoring methodology AMS-III.I. (ver.08) /1-14/
- Applied monitoring methodology AMS-I.C. (ver.19) /1-15/
- Methodological Tool "Tool to calculate project or leakage emissions from fossil fuel combustion (ver.2)" /2-18/
- General Guidelines for SSC CDM Methodologies (ver.19) /2-19/
- Monitoring plan described in the PDD
- Pipeline Allocation Drawings /1-18/

As the outcomes of the review, validation team identified monitoring parameters for the proposed project activity.

Compliance with Applied Methodologies

Validation team also carried out assessment of compliance of monitoring parameters defined in section B.7.1 of the PDD with applied monitoring methodologies and relevant requirements. Assessment result is as described below:

Stage 1, Anaerobic Treatment (AMS-III.H.)

No	Parameter in the methodology	Parameter in the PDD	Assessment
1	$Q_{ww,i,y}$	$Q_{ww,y,stage1}$	OK. Parameter is correctly defined. Monitoring point described in table B-11, B.7.3 of the PDD is correct. Also, requirement described in table III.H.2 is appropriately reflected.
2	$COD_{inflow,y}$	$COD_{inflow,anaerobic}$	OK. Parameter is correctly defined. Monitoring point described in table B-11, B.7.3 of the PDD is correct. Also, requirement described in table III.H.2 is

			appropriately reflected.
3	$\eta_{\text{COD,BL},i}$	$\eta_{\text{COD,BL}}$ $\text{COD}_{\text{outflow,anaerobic}}$	OK. COD removal efficiency cannot be directly measured, so COD outflow is additionally defined. So, removal efficiency can be appropriately calculated.
4	$\text{PE}_{\text{power},y}$	$\text{EC}_{\text{consumption},y}$	OK. The amount of electricity consumption is not able to be measured at the site. In this reason, the PP defined this parameter would be calculated by electricity capacity of facilities and operating hours. Validation team confirms that the PP already identified maximum capacity of facilities and operating hours can be conservatively applied.
5	$\text{COD}_{\text{removed,PJ},k,y}$	$\text{COD}_{\text{removed},y,\text{stage1}}$	OK. This parameter can be calculated by difference between $\text{COD}_{\text{inflow,anaerobic}}$ and $\text{COD}_{\text{outflow,anaerobic}}$, defined above. So, it is appropriate.
6	$\text{BG}_{\text{burnt},y}$	$\text{BG}_{\text{burnt},y}$	OK. Parameter is correctly defined. Refer to monitoring point described in table B-11, B.7.3 of the PDD, methane content measurement is carried out close location in the system. In addition, normalized value will be recorded, so validation team confirms that requirement described in table III.H.2 is appropriately reflected.
7	$\text{W}_{\text{CH}_4,y}$	$\text{W}_{\text{CH}_4,y}$	OK. Parameter is correctly defined. Monitoring point described in table B-11, B.7.3 of the PDD is appropriate. So validation team confirms that requirement described in table III.H.2 is appropriately reflected.
8	Not Defined	$\text{PE}_{\text{vent},y} \text{ (tCO}_2\text{e)}$ $\text{BG}_{\text{vent},y} \text{ (m}^3\text{)}$	OK. As per the PDD, vent of recovered biogas is available, even if it happens only in emergency situation. In this reason, definition of this parameter is appropriate although AMS-III.H. does not identify it. Volume of vent gas will be correctly measured, and $\text{W}_{\text{CH}_4,y}$, D_{CH_4} , GWP_{CH_4} defined above will be multiplied to $\text{BG}_{\text{vent},y}$ to get $\text{PE}_{\text{vent},y}$.

Stage 2, Aerobic Treatment (AMS-III.I.)

No	Parameter in the methodology	Parameter in the PDD	Assessment
1	$\text{Q}_{\text{ww},m,y}$	$\text{Q}_{\text{ww},y,\text{stage2}}$	OK. B.7.1 of the PDD defined that volume of wastewater treated in aerobic system (stage 2) is directly and continuously measured. Monitoring diagram in B.7.3 shows that monitoring point is appropriate.
2	$\text{COD}_{\text{removed},i,m,y}$	$\text{COD}_{\text{removed},y,\text{stage2}}$	OK. COD removal cannot be directly measured, so it

			should be calculated by the difference between COD inflow and outflow. Outflow wastewater from stage 1 is directly supplied to stage 2, so the parameter $COD_{outflow,anaerobic}$, defined in stage 1, is appropriate to be used for COD inflow. For COD outflow, $COD_{outflow,aerobic}$ (#4 below) is appropriately defined in B.7.1 of PDD. Monitoring diagram described in B.7.3 of PDD shows that monitoring points for these two parameters are complete.
3	$Q_{ww,y}$	$Q_{ww,y,stage2}$	OK. This parameter (volume of wastewater discharged in year y) is not separately defined in the PDD. The same value with #1 above is applied. Validation team confirms that it is appropriate.
4	$COD_{ww,discharge,y}$	$COD_{outflow,aerobic}$	OK. Parameter is correctly defined in B.7.1 of PDD. Monitoring point described in table B-11, B.7.3 of the PDD is correct.

Stage 3, Heat Generation (AMS-I.C.)

No	Parameter in the methodology	Parameter in the PDD	Assessment
1	$EG_{thermal,y}$	$BG_{boiler,y}$ $FC_{coal,y}$	OK. Monitoring parameter required in the methodology is the net quantity of heat generated by the project activity. However, the PP is not able to directly measure the value, so planned to measure amount of fuel consumption, then converted the value into heat by multiplying NCV provided in IPCC 2006. Validation team confirmed this approach in that it is conservative with 100% of default efficiency, which means same amount of calorific value would be supplied to the process from the boilers. $BG_{boiler,y}$ is correctly defined. Refer to monitoring point described in table B-11, B.7.3 of the PDD, methane content measurement is carried out close location in the system. In addition, normalized value will be recorded, so validation team confirms that requirement described in table III.H.2 of AMS-III.H. is appropriately reflected. See below for $FC_{coal,y}$
2	$FC_{i,j,y}$	$FC_{coal,y}$	OK. Coal can be used as back-up fuel in case recovered methane is not enough. Validation team confirms that definition, measurement point, measurement/recording frequency and QA/QC procedure is in accordance with applied methodology and methodological tool.

Management System

Section B.7.3 of the PDD describes monitoring system for the project activity including:

- Monitoring Organization
- Monitoring Points
- Data management procedure
- Emergency procedure (error handling and corrective action)
- Training procedure

During on-site assessment, validation team interviewed representative of the project site and operating personnel, then confirmed that they already has knowledge about monitoring requirements defined in the PDD. In addition, LIG system (CDM consulting firm) has contracted /1-32/ with PP to support monitoring and verification processes. In this reason, validation team concluded that monitoring system of the proposed project activity is eligible.

3.9 Environmental Impacts

Regulations in Vietnam does not require EIA for the industrial waste water treatment project. To confirm this, validation team reviewed following local regulations:

- QCVN 24:2009-BTNMT, National Technical Regulation on Industrial Wastewater /2-6/
- Circular: Providing Strategic Environmental Assessment, Environmental Impact Assessment and Environmental Protection Commitment (Circular 26.2011.TT.BTNMT) /2-7/
- Government's Decree: Providing Strategic Environmental Assessment, Environmental Impact Assessment and Environmental Protection Commitment (No. 29/2011/ND-CP) /2-8/

Instead of EIA, local regulation requires "Environmental Protection Commitment", and validation team has been provided "Approval of Environmental Protection Commitment" /1-25/, issued by People's Committee of Duong Minh Chau District.

In conclusion, validation team confirms that the proposed project activity does not require to carry out environmental impact analysis, and no adverse environmental impacts as well as trans-boundary impacts have been expected from the project activity.

3.10 Local Stakeholder Consultation

As described in section E of the PDD, the PP has held local residents' meeting on 18/12/2009. To confirm this validation team reviewed following documents:

1. Minutes of the meeting /1-26/
2. List of participants with signatures /1-27/

According to the minute, the PP introduced information about the proposed project activity, and participants presented positive opinions, with expectation of decrease of bad smell from open lagoons.

After that, during on-site assessment, validation team interviewed one of the local residents, Mr. N'GUYEN CHAI TUAN, who has participated in the meeting. He confirmed the information in the minutes is correct and complete.

As a result of the assessment, validation team concluded that local stakeholder consultation process has been appropriate.

4. REFERENCES

Category 1 Documents: Documents provided by the Client that relate directly to the project.

- /1-1/ Project Design Document, initial version 01 (19/04/2012), final version 6.1 (28/12/2012)*
- /1-2/ Excel spreadsheet for emission reduction calculation & Investment analysis*
- /1-3/ Prior Consideration of the CDM Form, submitted to UNFCCC and DNA of Viet Nam*
- /1-4/ Letter of Approval, issued by DNA of Viet Nam (04/10/2012, doc.no. 80/2012/DMHCC-BCD)*
- /1-5/ Install of methane recovery facilities at Tay Ninh factory (document no. VT-100305) 30/12/2009*
- /1-6/ Revised draft for Install of methane recovery facilities at Tay Ninh factory (document no. VT-100319) on 06/01/2010.*
- /1-7/ 1st Feasibility Study Report, RCC Co., Ltd., July 2012*
- /1-8/ 2nd Feasibility Study Report, SunTech Energy Co., Ltd., Dec 2011*
- /1-9/ Cross Section Diagram of Anaerobic Lagoon*
- /1-10/ Research for Biogas Recovery Project (17/11/2009)*
- /1-11/ Contract for Biogas Recovery Facilities, 12/01/2010*
- /1-12/ Review of coal boiler installation (15/05/2012)*
- /1-13/ AMS-III.H. (ver.16)*
- /1-14/ AMS-III.I. (ver.08)*
- /1-15/ AMS-I.C. (ver.19)*
- /1-16/ Technical Explanation and Quotation, Centre for Environmental Technology, Jan 2012*
- /1-17/ Specification of Co-fired Boiler*
- /1-18/ Pipeline Allocation Drawings*
- /1-19/ Historical COD analysis records*
- /1-20/ Emission Factor for Electricity Consumption, provided by DNA of Viet Nam*
- /1-21/ Monthly Fuel Consumption for 2008~2010*
- /1-22/ Equipment Purchase Contract for main boiler*
- /1-23/ Equipment Purchase Contract for spare boiler, May 2012*
- /1-24/ Construction Contract, 15/01/2010*
- /1-25/ Approval of Environmental Protection Commitment*
- /1-26/ Minutes of the meeting*
- /1-27/ List of participants with signatures*
- /1-28/ Registered PDD for "Project JBS S/A – Slaughterhouse Wastewater Aerobic Treatment – Barra do Garças Unit. (reference 2609)"*
- /1-29/ <http://www.tayninh.gov.vn/gioithieu/pages/gioi-thieu-chung.aspx>*
- /1-30/ Photocopy of nameplates*
- /1-31/ Equipment Purchase Contract for Aerobic Treatment System, 17/03/2012*
- /1-32/ Consulting Contract for CDM registration and monitoring, LIG system*
- /1-33/ investment cost analysis for waste water treatment system at Gunsan factory*

Category 2 Documents: Background documents related to the design and/or methodologies employed in the design or other reference documents.

- /2-1/ CDM Validation and Verification Standard (ver.3.0, EB70)
- /2-2/ CDM Project Standard (ver.2.1, EB70)
- /2-3/ Modalities of Communications
- /2-4/ F-CDM-SSC-PDD (ver.4.1)
- /2-5/ Guidelines on Assessment of Debundling for SSC Project Activities (ver.03)
- /2-6/ QCVN 24:2009-BTNMT, National Technical Regulation on Industrial Wastewater
- /2-7/ Circular: Providing Strategic Environmental Assessment, Environmental Impact Assessment and Environmental Protection Commitment (Circular 26.2011.TT.BTNMT)
- /2-8/ Government Decree: Providing Strategic Environmental Assessment, Environmental Impact Assessment and Environmental Protection Commitment (decree No. 29/2011/ND-CP)
- /2-9/ General Guidelines for SSC CDM Methodologies (ver.19)
- /2-10/ Registered PDD and its validation report for "TV Daklak Wastewater Treatment and Methane Recovery Project (ref# 5347)"
- /2-11/ Registered PDD and its validation report for "Methane Recovery and Use of the Biogas in Son Hai- Son Ha and Dong Xuan Tapioca Starch Making Plant of APFCO, Vietnam (ref# 5438)"
- /2-12/ Registered PDD for "Project JBS S/A – Slaughterhouse Wastewater Aerobic Treatment – Barra do Garças Unit. (reference 2609)"
- /2-13/ Guidelines on the Demonstration of Additionality of Small-scale Project Activities
- /2-14/ Guidelines on the Assessment of Investment Analysis (ver.05)
- /2-15/ Tool to determine remaining lifetime of equipment (ver.01)
- /2-16/ Glossary: CDM terms (ver.7.0, EB70 Annex07)
- /2-17/ CDM Project Cycle Procedure (ver.3.1, EB70)
- /2-18/ Tool to calculate project or leakage emissions from fossil fuel combustion (ver.02, EB41 annex11)
- /2-19/ General Guidelines for SSC CDM Methodologies (ver.19)

APPENDIX A

VALIDATION PROTOCOL FOR SMALL-SCALE CDM ACTIVITIES

Table 1. Requirements Checklist

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
A. General Description of Project Activity					
A.1. Global stakeholder consultation					
A.1.1. Did receive any comment on the PDD of the proposed project activity during the Global stakeholder consultation?	/VVS/ 37	DR	No comments were received during global stakeholder consultation process.	OK	OK
A.1.2. If yes, report the details of the actions taken to take due account of the comments received during the validation process.	/VVS/ 38	DR	N/A	OK	OK
A.2. Approval					
A.2.1. Have all parties involved approved the project activity ?	/VVS/ 38	DR, I	OK. Viet Nam is the only party involved in the project. Validation team confirmed it by review of PDD and LoA, and interview with the PP.	PENDING	OK
A.2.2. Has the DNA of each Party indicated as being involved in the proposed CDM project activity in section A.4 of the PDD provided a written letter of approval ?	/VVS/ 38	DR	OK. The only party involved in the project is Viet Nam. Letter of Approval, document no. 80/2012/DMHCC-BCD, of the proposed project has been issued by DNA of Viet Nam.	PENDING	OK
A.2.3. Does each letter confirms that ; a) The party is a party to the Kyoto Protocol. b) Participation is voluntary. c) In the case of the host Party, the proposed CDM project activity contributes to the sustainable development of the country.	/VVS/ 39 /M&P 40(a)	DR	OK. LoA confirms all.	PENDING	OK

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d) It refers to the precise proposed CDM project activity title in the PDD being submitted for registration.					
A.2.4 Is the letter(s) of approval unconditional with respect to (a) to (d) above A.1.3 ?	/VVS/ 40	DR	Yes. The LoA is unconditional.	PENDING	OK
A.2.5 Has the letter(s) of approval been issued by the respective Party's DNA and valid for the proposed CDM project activity ?	/VVS/ 41	DR	OK. Letter of Approval has been issued by Ministry of Natural Resources and Environment of Viet Nam, which is identical organization with information in CDM website.	PENDING	OK
A.2.6 Has the letter(s) of approval been issued by the respective Party's DNA ? If in doubt, verify with the DNA that letter(s) of approval are valid for the proposed projects activity, project participants and authentic.	/VVS/ 42, 43	DR	OK. Letter of Approval has been issued by Ministry of Natural Resources and Environment of Viet Nam, which is identical organization with information in CDM website.	PENDING	OK
A.3 Authorization					
A.3.1 Has each project participant been approved by at least one Party involved in a letter of approval?	/VVS/ 45	DR	OK. The only party involved in the project is Viet Nam. Letter of Approval, document no. 80/2012/DMHCC-BCD, of the proposed project has been issued by DNA of Viet Nam.	PENDING	OK
A.3.2. Is the information the project participants listed in section A.4 and Annex 1 of the PDD internally consistent to each other and exactly the same as in the LoA from each Party involved	/VVS/ 46	DR	OK. The only participant Miwon Vietnam Co., LTD is accurately and consistently stated.	PENDING	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
A.3.3 Are there no entities other than those approved as project participants as project participants included in these sections of the PDD.	/VVS/ 47	DR	No other entities except Miwon Vietnam Co., LTD has been identified.	PENDING	OK
A.3.4 Has the approval of participation been issued for the relevant DNA and valid for the proposed CDM project participants?	/VVS/ 48	DR	OK. Participation of Miwon Vietnam Co., LTD is approved by DNA of host party.	PENDING	OK
A.4. Sustainable development					
A.4.1 Does the letter approval by the DNA of the host Party confirms the contribution of the proposed CDM project activity to the sustainable development of the host Party ?	/VVS/ 51	DR	OK. LoA issued by host party's DNA confirms that the project contributes to sustainable development.	PENDING	OK
A.5 Modalities of communications					
A.5.1 Has been validated the corporate identity of all project participants and focal points included in the Modalities of Communication (MoC) statement, as well as the personal identities, including specimen signatures and employment status, of their authorized signatories?	/VVS/ 53	DR, I	OK. List of project participant is identical with list in the PDD. Name, signature and employment status is confirmed by on-site interview with the person on the MoC.	PENDING	OK
A.5.2 Has been confirmed that ; (a) Directly checking evidence for corporate, personal identity and other relevant documentation;	/VVS/ 54	DR, I	OK. Validation team met the person on MoC (Mr. Song Ho Baek) during on-site assessment, and received his namecard. The person is the factory manager. Validation team also reviewed decision making document where Mr. Baek has signed.	PENDING	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
(b) Notarized documentation; or (c) Written confirmation from the project participant or the CME that submits to it the MoC statement that all corporate and personal details, including specimen signatures, are valid and accurate.					
A.5.3 Has been confirmed that the MoC statement is received from a PP with whom the DOE has a contractual relationship, in case of PoAs, from the CME?	/VVS/ 55	DR	OK. The only project participant - Miwon Vietnam - has contractual relationship with KSA.	OK	OK
A.5.4 Has been confirmed that the official who submits the MoC statement to the DOE and the official who signed the written confirmation (if a different person) is/are duly authorized to do so on behalf of the respective project participant or coordinating/managing entity?	/VVS/ 56	DR, I	OK. See A.5.2 above.	PENDING	OK
A.5.5 Has the MoC statement been confirmed that: (a) The latest version of the form "Modalities of Communication statement"(F-CDM-MOC) has been used; (b) The information required as per the F-CDM-MOC, including its annex 1, is correctly completed; (c) The project participant's authorized signatories	/VVS/ 59&60	DR	OK. (a) Latest version (2.1) has been used. (b) Information in the MoC is correct (c) The PP's authorized signatories correspond to the sign on annex 1.	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
signing the F-CDM-MOC correspond to the project participant's authorized signatories included in F-CDM-MOC, annex 1.					
A.6. Project Design Document					
A.6.1. Was the PDD prepared in accordance with the latest template from the EB ?	/VVS/ 62	DR	OK. Latest template under VVS track (F-CDM-SSC-PDD, ver.4.1) has been utilized.	OK	OK
A.6.2. Confirmed to state regarding the compliance of the PDD with the relevant forms and guidance ?	/VVS/ 63	DR	Geographical location of the proposed project is not consistently described in section A.2.4 of the PDD (ver.01) /CAR03/ OK. Revised PDD has prepared in accordance with "Guidelines for completing the simplified Project Design document (CDM-SSC-PDD) and the form for proposed new Small Scale Methodologies (CDM-SSC-NM)" (ver.1.0, EB66 Annex09).	CAR03	OK
A.7. Description of project activity					
A.7.1 Is the information in Section A of the PDD accurate and complete, and does provides an understanding of the proposed CDM project activity?	/VVS/ 64	DR, I PSI	Information and data in the PDD (ver.01) are not consistently described. For example, number of pumps, COD inflow/outflow, size and depth of lagoon are not consistent throughout the PDD. /CAR01/ In addition, the PP is required to clearly describe the differences between baseline situation and project scenario. /CAR02/ The PP divided the project into three component - (i) methane capture from anaerobic treatment, (ii) methane avoidance from aerobic treatment, and (iii) heat production from biogas. But,	CAR01 CAR02 CAR09	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
			<p>throughout the PDD (ver.01), description for each component is not consistent. /CAR09/</p> <p>The PDD (ver.01) includes references/links to not only other part of the description but also another documents, but some are not accurate. For example, in page 17 of PDD (ver.01), "paragraph 23 scenario (f) of AMS-III.H. version.16, but it is not exist. /CAR10/</p> <p>B.7.3 of the PDD (ver.01), diagram on page 46 of the PDD (ver.01) shows one boiler and two dryer will be installed, but it is not in accordance with actual project activity. /CAR18/</p> <p>C.1.2 of the PDD (ver.01) defined that operational lifetime of the project is 20 years, but no evidence has been provided. /CL04/</p> <p>OK. By review of documents and on-site inspection, validation team confirms that information in section A of revised PDD is clear, accurate and complete.</p>	<p>CAR10</p> <p>CAR18</p> <p>CL04</p>	
<p>A.7.2 Does conduct a physical site inspection for the proposed project activities?</p> <p>In case a site inspection has been concluded, does the description in PDD reflect the proposed CDM project activity?</p> <p>If a physical site inspection is not undertaken, how the project description was assessed for</p>	/VVS/ 65, 66	DR, I PSI	<p>OK. Physical site inspection has been conducted on May 24th 2012. Validation team confirmed that information and physical features of the proposed project is correctly described in the PDD.</p>	PENDING	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
appropriateness and what is the outcome?					
A.7.3 For not referred project activities to in para 65-66 in the VVS, undertake the validation of project description by reviewing available designs and feasibility studies and conduct comparison analysis with equivalent project?	/VVS/ 67	DR	N/A. On-site assessment has been carried out.	OK	OK
A.7.4 Does the proposed project activities involve alteration of an existing installation or process ? If yes, confirm that the project description states the differences resulting from the project activity compared to the pre-project situation.	/VVS/ 68	DR, PSI	YES, the proposed project is to replace existing anaerobic lagoons to single anaerobic lagoon with methane recovery facility, and replace B-C and cashew nut oil to recovered methane and coal, with new boilers. Project description in section A of the PDD appropriately demonstrated the difference.	PENDING	OK
A.7.5 Does the information on public funding provided conform to the actual situation or planning as presented by the project participant?	PDD A.5	DR, I	OK. The PP has made their own investment for the project activity. Validation team has interviewed plant manager and headquarter of the PP, and confirmed that no public funding is applied to the project.	PENDING	OK
A.8 Eligibility as a small-scale project					
A.8.1 Is the project activity a small scale project activity ? (If yes, assess the specific small-scale activity below)	/VVS/ 150	DR	YES. The proposed project is a small-scale project activity.	OK	OK
A.8.2 Does the project activity qualify within the thresholds of the three possible types of small scale project activities?	/VVS/ 152 (a)	DR, I, OSI	OK. Estimated emission reduction for type III part (methane recovery and avoidance) is less than 60ktCO ₂ /yr, and for type I part (heat generation by recovered methane) is less than 15MWe of output capacity.	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
A.9 Debundling for project activity					
A.9.1 Confirm that the proposed small-scale project activity is not a debundled component of a large-scale project activity in accordance with the "Guidelines on assessment of debundling for SSC project activities".	/VVS/ 154	DR, I, OSI	OK. Validation team checked CDM website and found that no other project has been proceeded by the same PP. In addition, the PP has another plant in Viet Nam, but distance is more than 60 km from the project site.	PENDING	OK
A.9.2 Is there a registered small-scale project activity or an application to register another small-scale project activity within 1 km of the project boundary? If applicable, does the proposed small-scale project activity to be a debundled component of a large-scale project activity?	/VVS/ 155	DR, I, OSI	OK. See A.9.1 above.	PENDING	OK
A.9.3 Confirm that the proposed small-scale project activity is not a debundled component taken into account specific debundling requirements for Type I project activities and small-scale transport project activities.	/VVS/ 156	DR, OSI	OK. See A.9.1 above.	PENDING	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
B. Baseline and monitoring methodology					
B.1 Applicability of selected methodology to the project activity.					
B.1.1 Is the selected baseline and monitoring methodology applicable to the project activity and that the selected version is valid at the time of submission of the proposed project activity for registration?	/VVS/ 73	DR, PSI	<p>OK. The PP selected following three methodologies:</p> <ol style="list-style-type: none"> 1. AMS-III.H. (ver.16) 2. AMS-III.I. (ver.08) 3. AMS-I.C. (ver.19) <p>All applied methodologies are latest version. Each part of the proposed project meets applicability conditions defined in each methodology.</p> <p>For stage 1 (AMS-III.H.), proposed project is to recover methane generated by anaerobic wastewater treatment.</p> <p>For stage 2 (AMS-III.I.), proposed project is to avoid methane generation by replace anaerobic lagoon to aerobic wastewater treatment system.</p> <p>Total estimated emission reduction for type III part is less than 60ktCO₂.</p> <p>For state 3, the proposed project activity is to install new co-fired boiler that utilize recovered methane from stage 1 and coal for shortage. Output capacity is 8MW_{th}, less than 45MW_{th}.</p>	PENDING	OK
B.1.2 Is the methodology correctly quoted with the actual text of the applicable version of the methodology and the choice of methodology justified ?	/VVS/ 74	DR	<p>OK.</p> <ol style="list-style-type: none"> 1. Applicability conditions <ul style="list-style-type: none"> - correctly quoted in PDD B.2 2. Project boundary 	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
			<ul style="list-style-type: none"> - correctly defined in accordance with methodologies <p>3. Baseline emissions and emission reduction calculation</p> <ul style="list-style-type: none"> - AMS-III.H. provides options of baseline emission sources, and the PP identified methane emissions from baseline waste water treatment system, paragraph 18(ii) in the methodology, as the baseline emission of the project. Electricity consumption and inefficiency of recover system were identified as project emission sources. - for AMS-III.I., paragraph 4(a) of methodology is defined as baseline emission source. Project emissions from electricity consumption is considered in stage 1. - for AMS-I.C., requirements for heat production have been applied. To consider coal usage, project emission is considered in accordance with co-fired system requirements. 		
B.1.3 Is the PDD of a proposed project activity is based on a previous version of a methodology and was published for global stakeholder consultation but was not submitted for registration within the grace period? If applicable, confirm to request the project participants to provide a revised PDD in accordance with the Project cycle procedure.	/VVS/ 75, EB50 An nex 48	DR	<p>N/A.</p> <p>No applied methodologies have been revised after global stakeholder consultation process.</p>	OK	OK
B.1.4 Confirm that the project activity meets each of the applicability conditions of the approved methodology or any tool or other methodology component referred to therein.	/VVS/ 76	DR, I, PSI	Section B.2 of the PDD (ver.01) describes how the proposed project meets eligibility conditions in the applied methodologies, but not all conditions are considered. /CAR04/	CAR04	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
			Section B.2 of the PDD (ver.01) demonstrates that the project meets the eligibility condition "the minimum interval between two consecutive sludge removal events shall be 30 days", but the description is not appropriate. /CAR05/	CAR05	
			As per paragraph 1 of AMS-III.I(ver.08), without the project activity, waste water would be treated under anaerobic condition. But, the project activity is to construct aerobic waste water treatment system after anaerobic treatment. Moreover, local regulation requires to decrease COD of discharged water under 50 ppm, while previous anaerobic treatment system only can decrease COD to 1,000 ppm. In this case, the PP shall demonstrate how applicability condition is satisfied by the proposed project activity. /CAR06/	CAR06	
			Section B.2 of the PDD (ver.01) describes that how applicability condition of AMS-I.C. is met by the project, but nature of the project is not fully considered, including cashew nut oil usage. /CAR07/	CAR07	
			In section B.2 of the PDD (ver.01), the PP described that average temperature in Tay Ninh Province is 27.4°C, but no evidence has been provided. /CL01/	CL01	
			OK. As per the revised PDD, project activity meets all applicability conditions defined in the applied methodologies. For AMS-III.H. (ver.16),		

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
			<ul style="list-style-type: none"> - Stage 1 of the project is to recover methane generated by anaerobic waste water treatment system, whose depth is 4.6m and sludge removal interval is 5 year. - Annual/monthly average temperature is over 15°C. - Recovered methane would be utilized in the factory to generate heat, type I project activity. - Estimated emission reduction is less than 60ktCO₂/yr. <p>For AMS-III.I. (ver.08),</p> <ul style="list-style-type: none"> - Stage 2 is to replace anaerobic lagoons to aerobic treatment system, and avoid methane emissions - Estimated emission reduction is less than 60ktCO₂/yr. <p>For AMS-I.C. (ver.19),</p> <ul style="list-style-type: none"> - Stage 3 is to utilize recovered methane from stage 1, and replace B-C consumption. - Output capacity of co-fired boiler is 8 MW_{th}, less than 45 MW_{th} of threshold. 		
B.1.5 Is comparable information available from other sources and cross check with the PDD in order to assess the applicability ?	/VVS/ 76	DR, I	OK. Validation team reviewed recently registered CDM projects in Vietnam and conducted on-site assessment, then confirmed no other emission sources were identified.	OK	OK
B.1.5 Is the project activity expected to result in emission other than those allowed by the methodology ?	/VVS/ 76	DR, I	No other emission sources have been identified.	PENDING	OK
B.1.5 Is the project activity a small scale project activity ? (If yes, assess the specific small-scale activity below)	/VVS/ 150	DR	YES. The proposed project activity is a small-scale CDM project activity.	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
B.1.6 Does the project activity qualify within the thresholds of the three possible types of small scale project activities?	/VVS/ 152 (a)	DR, I	OK. For type III part (stage 1,2), estimated emission reduction is less than 60ktCO ₂ , so eligible for small scale. For type I part (stage 3), output capacity of two boilers is 8MWth, less than 45MWth of threshold.	OK	OK
B.1.7 Does the project activity conforms to one or more of the approved small-scale methodologies applied in conjunction with the general guidelines to SSC CDM methodologies?	/VVS/ 152 (b)	DR	OK. The proposed project applies three approved methodologies AMS-III.H. (ver.16), AMS-III.I. (ver.08), and AMS-I.C. (ver.19).	OK	OK
B.1.8 Is the project activity not a debundled component of a large-scale project, in accordance with the rules defined in appendix C of the simplified modalities and procedures for small scale CDM project activities and the "Guidelines on assessment of de-bundling for SSC project activities"?	/VVS/ 152 (c)	DR, I	OK. Surfing CDM website, validation team confirmed no project activity has been registered or proceeding by same PP. In addition, another factory of the PP, is far from the proposed project site, more than 1 km.	OK	OK
B.2 Project Boundary					
B.2.1 State documented evidence and site inspection result which has been adopted for verifying project boundary.	/VVS/ 83	DR, OSI	Validation team reviewed "Install of methane recovery facilities at Tay Nihn factory (VT-100305)", "Revised draft for Install of methane recovery facilities at Tay Nihn factory (document no. VT-100319)", and 1st/2nd Feasibility Study Report. These documents have information and diagram for the proposed project activity. By on-site assessment, validation team confirmed baseline facilities, including lagoons, and project facilities for stage 1 and 3. Recovered methane have already been utilized at newly installed boilers.	PENDING	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
B.2.2 Is the delineation of the project boundary in the PDD correct and does it meet the requirements of the selected baseline methodology ?	/VVS/ 84	DR, I	Section B.3 of the PDD (ver.01) provides photos, but there is no description how project boundary is identified. /CAR08/ OK. Methane recovery facilities, aerobic waste water treatment system, co-fired biogas boilers have been aligned and described in accordance with applied methodologies.	CAR08	OK
B.2.3 Have all sources and GHG's required by the methodology been included within the project boundary ?	/VVS/ 84	DR	OK. Methane generated by anaerobic lagoons, carbon dioxide from electricity and coal consumption have been correctly and completely identified in the boundary.	OK	OK
B.2.4 Does the methodology allows project participants to choose whether a source or gas is to be included within the project boundary? If yes, confirm that the project participants have justified that choice with followings: - The justification shall be reasonable, based on an assessment of supporting documented evidence provided by the project participants - Corroborated by observations.	/VVS/ 84	DR, OSI	YES. Type III methodologies applied to the project provide options of emission sources. - AMS-III.H. provides options of baseline emission sources, and the PP identified methane emissions from baseline waste water treatment system, paragraph 18(ii) in the methodology, as the baseline emission of the project. Electricity consumption and inefficiency of recover system were identified as project emission sources. - for AMS-III.I., paragraph 4(a) of methodology is defined as baseline emission source. Project emission from discharged wastewater is identified. Project emissions from electricity consumption is already considered in stage 1. - for AMS-I.C., requirements for heat production have been applied. To consider coal usage, project emission is considered in accordance with co-fired system requirements.	OK	OK
B.3 Baseline scenario identification and description					
B.3.1 Has any procedure contained in the methodology	/VVS/	DR, I	OK.	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
to identify the most reasonable baseline scenario been correctly applied?	89		AMS-I.C. provide fixed baseline scenario. Other methodologies do not provide procedure to identify baseline scenario, but procedure for type III greenfield project activity defined in the "General Guidelines for SSC CDM methodologies (ver.19)" has been correctly applied.		
B.3.2 Does the selected methodology require use of tools to establish the baseline scenario?	/VVS/ 89	DR, I	OK. To calculate emissions from electricity consumption, applied methodologies requires to use "Tool to Calculate Emission Factor for an Electricity System (ver.2.2.1)". However, DNA of host party provides fixed value of emission factor, so the tool is not applied.	OK	OK
B.3.3 Does the methodology require several alternative scenarios to be considered in the identification of the most reasonable baseline scenario?	/VVS/ 90	DR, I	NO. Applied methodologies does not require several alternative scenarios. However, the PP applied steps to identify most reasonable baseline scenario in accordance with "General Guidelines for SSC CDM Methodologies".	OK	OK
B.3.4 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 project activity?	/VVS/ 90		N/A	OK	OK
B.3.5 Does PDD provide all the assumptions and data including reference and sources ?	/VVS/ 91&94(a)	DR, I	OK. The PDD provides following assumptions: At stage 1 - COD removal efficiency $\eta_{COD,BL}$ is not available, so this value is assumed based on COD in/out differences. Historical data have been applied for COD in, design value has been applied for COD out. - Quantity of waste water is assumed 2,400 m ³ /day based on design value.	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
			<ul style="list-style-type: none"> - Amount of electricity consumption by the project ($EC_{consumption,y}$) is assumed based on capacity multiplied by operation hours. - 304 working days/yr has been assumed. <p>At stage 2</p> <ul style="list-style-type: none"> - COD removed by aerobic treatment system is assumed. - COD in is assumed based on design value of COD out at stage 1. - COD out is applied from historical data. <p>Other data have been correctly applied in accordance with the applied methodologies.</p>		
B.3.6 Are all the documentation used for establishing the baseline scenario correctly quoted and interpreted in the PDD ?	/VVS/ 91&94(b)	DR, I	OK.	OK	OK
B.3.7 Are the information provided in the PDD cross-checked with other credible sources, such as local expert opinion, if available ?	/VVS/ 91		<p>OK. Recently registered CDM projects have been reviewed by validation team. The registered CDM projects also applied same baseline scenario.</p> <ul style="list-style-type: none"> - TV Daklak wastewater treatment and methane recovery project (reference 5347). - Methane Recovery and Use of the Biogas in Son Hai - Son Ha and Dong Xuan Tapioca Starch Making Plants of APFCO, Vietnam (reference 5438). - Project JBS S/A - Slaughterhouse Wastewater Aerobic Treatment - Barra do Garças Unit. (reference 2609) 	OK	OK
B.3.8 Are all the assumptions and data used by the	/VVM/	DR, I	OK. See B.3.5 above.	PENDING	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
project participants justified appropriately and supported by evidence ?. Are those deemed reasonable?	94(c)				
B.3.9 .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?	/VVS/ 92	DR, I	OK. Baseline scenario is clearly described in the PDD, and values applied to calculate baseline emission have been verified.	OK	OK
B.3.10 Have all applicable CDM requirements been taken into account in the identification of the baseline scenario for the proposed CDM project activity?	/VVS/ 93 /M&P/ 45	DR, I	OK. Steps provided in the "General Guidelines for SSC CDM Methodologies (ver.19)" has been applied to identify baseline scenario for type III part of the proposed project.	OK	OK
B.3.11 Have all relevant policies and circumstances been identified and correctly considered in the PDD, in accordance with the guidance by the CDM EB?	/VVS/ 93&94(d), /M&P/ 45, EB22 Annex3 para 6&7		OK. To determine most plausible baseline scenario, following local regulations have been taken into account - QCVN 24:2009-BTNMT, National Technical Regulation on Industrial Wastewater. - 29/2011/ND-CP, Decree Providing Strategic Environmental Assessment, Environmental Impact Assessment and Environmental Protection Commitment. - Circular 26/2011/TT-BTNMT, Detailing a number of articles of the Government's Decree No. 29/2011/ND-CP.	OK	OK
B.4 Algorithms and/or formulae used to determine emission reductions					
B.4.1 Have the equations and parameters in th PDD	/VVS/	DR	Algorithm/formula for baseline emission and emission reduction calculation are not correctly applied. For example, to calculate	GAR15	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
been correctly applied as required by the selected approved methodology ?	97 & EB41 Annex 12		COD removal efficiency $\eta_{COD,BL,i}$, methodology requires historical data, but validation team cannot find relevant description in the PDD (ver.01). Furthermore, equation (6) and (7) in page 30 of the PDD (ver.01) are applied to the project. /CAR15/ OK. All equations, parameters and fixed values in the methodologies have been correctly applied.		
B.4.2 In case the methodology provides the selection of different options for equations or parameters, has an adequate justification been provided and were the correct equations and parameter used in accordance with the methodology ?	/VVS/ 97, EB41 Annex12	DR	B.6 of the PDD (ver.01) describes methodological choice for the project, but there is no explanation how ex post calculation method has been chosen. /CAR14/ OK. Applied methodologies provides options for equations and parameters, so the PP applied followings: At stage 1, - Baseline emission is calculated only for methane emissions from baseline wastewater treatment system, paragraph 18(ii) of AMS-III.H. - 0.8 of MCF is applied, due to 4.6 m of lagoon depth. - For project emission, equations for emissions from electricity consumption and fugitive emissions from inefficiency in capture system have been applied. At stage 2, - Methane produced by anaerobic wastewater treatment system that would be replaced by project facilities, paragraph 4(a) in the AMS-III.I., is appropriately selected for baseline calculation.	CAR14	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
			At stage 3, - Paragraph 22 in AMS-I.C. is correctly selected to calculate baseline emissions.		
B.4.3 Is the choice of data and parameters used in the equations appropriate ?	/VVS/ 98	DR	B.6.2 of the PDD (ver.01) defined data and parameter fixed ex ante, but it is neither consistent to the applied methodologies, nor fully described. For example, the PP defined COD _{in} for fixed parameter, but it is monitoring parameter defined in the methodology. Moreover, some parameter such as B _{O,WW} and U _{F,BL} are not considered. /CAR16/ The PP applied 0.5764 tCO ₂ /MWh for electricity emission factor, but no evidence has been provided. /CL02/ OK. Appropriate values have been applied. See B.4.4 below.	CAR16 CL02	OK
B.4.4 In case of ex-ante data and parameters, are all data sources and assumptions appropriate ? And Are calculations correct, applicable to the proposed project activity ?	/VVS/ 98	DR, I	To calculate ex ante project emissions from electricity consumption, the PP applied 807.59 MWh/year, from the value of 2,656.56 kWh/day in the design document. However, validation team found that the value is auxiliary power consumption only for aerobic treatment system (stage 2). The PP is required to demonstrate how the value can ensure complete and accurate. /CAR20/ OK. Following ex ante data have been correctly applied: At stage 1, - Q _{ww,stage1} : 729,600 m ³ /yr, design value - COD _{inflow,anaerobic} : 0.009863t/m ³ , historical data - η _{COD,BL} : 0.78, 0.88 of designed efficiency multiplied by 0.89 of uncertainty provided in the methodology.	CAR20	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
			<ul style="list-style-type: none"> - $COD_{outflow,anaerobic}$: $0.002138t/m^3$, design value - $MCF_{ww,treatment,BL}$: 0.8 provided in the methodology - $B_{o,ww}$: 0.25 kgCH₄/kgCOD, provided in the methodology - UF_{BL} : 0.89, provided in the methodology - GWP_{CH_4} : 21 based on IPCC 2006 - $EC_{consumption,y}$: 1,866 MWh based on design value and operation time - $EF_{grid,y}$: 0.5764 tCO₂/MWh, provided by DNA - CFE_{ww} : 0.9, provided in the methodology - UF_{PJ} : 1.12, provided in the methodology - $COD_{removed,y,stage1}$: $0.007725t/m^3$, calculated from $COD_{inflow,anaerobic}$ and $\eta_{COD,BL}$ - $MCF_{ww,treatment,PJ}$: 0.89, provided in the methodology <p>At stage 2,</p> <ul style="list-style-type: none"> - $COD_{outflow,aerobic}$: $0.000049t/m^3$, historical data - $MCF_{anaerobic,i}$: 0.8, provided in methodology - B_o : 0.21 kgCH₄/kgCOD, provided in the methodology - UF_{BL} : 0.94, provided in the methodology - $MCF_{ww,discharge}$: 0.1, provided in the methodology - UF_{PJ} : 1.06, provided in the methodology <p>At stage 3,</p> <ul style="list-style-type: none"> - NCV for methane : 50.4 TJ/Gg, from IPCC2006 - NCV for coal : 25.8 TJ/Gg, from IPCC2006 - NCV for B-C : 40.4 TJ/Gg, from IPCC2006 - NCV for Cashew nut oil : 27.4 TJ/Gg, from IPCC2006 - B-C consumption for baseline scenario : 1,153 ton/yr, based on 		

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
			past two year average from historical data - Cashew nut oil consumption for baseline scenario :684.5 ton/year, based on past two year average from historical data - CO ₂ emission factor for B-C : 77.4 tCO ₂ /TJ, IPCC 2006 - CO ₂ emission factor for coal : 94.6 tCO ₂ /TJ, IPCC 2006		
B.4.5 In case of ex-post data and parameters, are the estimates provided in the PDD for these data and parameters reasonable ?	/VVS/ 98	DR, I	B.7.1 of the PDD defined that amount of coal consumption would be monitored based on purchase records. However, the PP is required to demonstrate how this approach can ensure accuracy or conservativeness. /CAR21/ OK. ex post data and parameters correctly defined in the PDD.	CAR21	OK
B.5 Additionality of a project activity					
B.5.1 Describe how the reliability and credibility of all data, rationales, assumptions, justifications and documentation provided by the project participant to support the demonstration of additionality is assessed and validated using local knowledge, sectoral and financial expertise and considering other sources of information for cross checks.	/VVS/ 102	DR, I	To demonstrate additionality of the project, the PP applied investment analysis. As per "Guidelines on the Assessment of Investment Analysis" (EB62), the input values of the analysis shall be at the time of decision making, but the PP applied the actual value after construction has been started. /CAR11/ In the investment analysis worksheet, the PP selected 15 year of analysis period, but other part of the PDD describes that operational lifetime of the major equipments are 20 years. In this reason, the PP is needed to demonstrate how 15 year of analysis is appropriate. /CAR12/ B.5 of the PDD (ver.01) demonstrates additionality of the project applying investment analysis, but there is no information for '2. Aerobic wastewater treatment system'. /CAR13/	CAR11 CAR12 CAR13	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
			<p>Evidences for following input values in the investment analysis are required to validate:</p> <ol style="list-style-type: none"> 1. historical data for fuel consumption 2. construction cost for anaerobic treatment system <p>/CL06/</p> <p>OK.</p> <p>As per the revised PP, to demonstrate additionality, the PP applied investment analysis. Input values and analysis conditions are correct.</p>	GL06	
B.5.2 Are any tools and documents provided by the EB to demonstrate the additionality of the proposed CDM project activities relevant and have they been correctly considered and applied ?	/VVS/ 103	DR	<p>See CAR11&12, on B.5.1 above.</p> <p>OK.</p> <p>"Guidelines on the Assessment of Investment Analysis (ver.05, EB62 Annex5)" is correctly applied.</p>	PENDING	OK
B.5.3 Are any specific complementary or alternative requirements included in the approved CDM methodology and have they been correctly considered and applied ?	/VVS/ 103	DR	N/A. No alternative requirements have been applied.	OK	OK
B.6 Prior Consideration of the Clean Development Mechanism					
B.6.1 Is the start date of the project activity, reported in the PDD, 'the earliest date at which either the implementation or construction or real action of a project activity begins'(Glossary of CDM	/VVS/ 106	DR	OK. As the project starting date, the PP identified the date of initial equipment purchase contract.	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
terms)?					
B.6.2 Is a start date of the project activity, (a) <i>on or after 02 Aug 2008</i> or (b) <i>before 02 Aug 2008</i> ?	/VVS/ 106	DR	After 02 Aug 2008.	OK	OK
B.6.3 In (a) case, for which PDD has not been published for global stakeholder consultation or a new methodology is proposed to the EB before the project activity start date, confirm by referring to the list of prior consideration notifications from the UNFCCC website and communication between the project proponent, the secretariat and the host Party DNA regarding the commencement of a new project activity within 180 days of project start date ?	/VVS/ 107 & EB 62 Annex 13	DR	After project start date 12/01/2010, the PP has submitted "Prior Consideration of the CDM Form" to UNFCCC and DNA of host country on 28/06.2010 (160 days after start date). Validation team checked CDM website and reviewed submitted document, and confirmed it.	OK	OK
B.6.4 In (b) case (project activities with start date before 02 Aug 2008) for which the start date is prior to the date of publication of the PDD for global stakeholder consultation, please verify through documents review that PP's prior consideration ;	/VVS/ 108	DR	N/A	OK	OK
(a) 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. Evidence to support this would include, inter alia,	/VVS/ 108 (a)	DR	N/A	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
minutes and/or notes related to the consideration of the decision by the Board of Directors, or equivalent, other project participant, to undertake the project as a proposed CDM project activity.					
(b) Reliable evidence from project participants that must indicate that continuing and real actions were taken to secure CDM status for the project in parallel with its implementation. Evidence to support this should include, inter alia, contracts with consultants for CDM/PDD/methodology services, Emission Reduction Purchase Agreements or other documentation related to the sale of the potential CERs (including correspondence with multilateral financial institutions or carbon funds), evidence of agreements or negotiations with a DOE for validation services, submission of a new methodology to the CDM Executive Board, publication in newspaper, interviews with DNA, earlier correspondence on the project with the DNA or the UNFCCC secretariat.	/VVS/ 108 (b)	DR	N/A	OK	OK
B.7 Identification of Alternatives					
B.7.1 Does the PDD identify credible alternatives to the	/VVS/ 113	DR	OK. In accordance with "General Guidelines for SSC CDM Methodologies (ver.19)", the PP has identified 4 alternatives to	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
project activity in order to determine the most realistic baseline scenario, unless the applied approved methodology prescribes the baseline scenario and no further analysis is required?			define baseline scenario, in section B.4 of PDD.		
B.7.2 Does the list of alternatives given in the PDD ensures that:	/VVS/ 114	DR	OK. See belows.		
(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?	/VVS/ 114 (a)	DR	OK. Alternative 3 is.	OK	OK
(b) The list contains all plausible alternatives which can be considered to be viable means of supplying the outputs or services that are to be supplied by the proposed CDM project activity?	/VVS/ 114 (b)	DR	OK. Identified alternatives include doing nothing, applying another technologies/measures, and proposed project without CDM revenue.	OK	OK
(c) The alternatives comply with all applicable and enforced legislation?	/VVS/ 114 (c)	DR	Alternative 2 does not comply with local regulation, so is eliminated at step 2.	OK	OK
B.8 Monitoring Plan					
B.8.1 Does the PDD include a monitoring plan ?	/VVS/ 131	DR	OK. B.7 of PDD provides monitoring plan for the project activity.	OK	OK
B.8.2 Does the monitoring plan comply with the approved methodology ?	/VVS/ 132	DR, I	OK. Monitoring requirements defined in the applied methodologies have been correctly reflected in the PDD.	OK	OK
- Has the list of parameters required by the selected approved methodology been identified?	/VVS/ 132 (a) (i)	DR, I	B.7 of the PDD (ver.01) defined monitoring parameters, but it is neither fully identified, nor completely described to validate. For example, definition for each parameter shall include	GAR47	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
			<p>monitoring/recording frequency and quality assurance procedure. Moreover, lists of the parameters are not complete for the project activity. /CAR17/</p> <p>Diagram and table described in B.7.3 of the PDD (ver.01) shows monitoring points for the project activity, but it is not consistent with monitoring parameters defined in B.7.1. /CAR19/</p> <p>OK. B.6.2 and B.7.1 of PDD completely listed parameters required by applied methodologies.</p>	CAR19	
- Does the monitoring plan contain all necessary parameters ?	/VVS/ 132 (a) (ii)	DR, I	OK. All monitoring parameters required by applied methodologies have been reflected in the monitoring plan.	OK	OK
- Does the means of monitoring described in the plan comply with the requirements of the methodology including applicable tool ?	/VVS/ 132 (a) (ii)	DR, I	OK. All monitoring parameters required by applied methodologies have been reflected in the monitoring plan.	OK	OK
<p>(b) Are the monitoring arrangements described in the monitoring plan feasible within the project design?</p> <p>- Are the means of implementation of the monitoring plan, including the data arrangement and quality assurance and quality control procedures, sufficient to ensure that the emission reductions achieved by requesting from the proposed CDM project can be reported ex post and verified ?</p>	/VVS/ 132 (b)	DR, I OSI	<p>B.7.3 of the PDD (ver.02) described that calibration would be implemented in accordance with monitoring manual, and national standards, industrial standards, or manufacturer's recommendations. However, there is no specific and concrete information in the description. The PP is required to provide monitoring manual and applied standards. /CL03/</p> <p>OK. Monitoring arrangement and QA/QC procedure described in the PDD is appropriate as follows:</p>	CL03	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
			<ul style="list-style-type: none"> - Monitoring plan is complete in accordance with applied methodologies - CDM consulting firm has been involved into the project not only at validation stage but also further monitoring/verification stages - Management and operators has knowledge about monitoring parameter and CDM requirements. 		
C. Environmental Impacts					
C.1 Has the PP conducted an analysis of environmental impacts of the project activity? Confirm whether those impacts are considered significant by the project participants or the host Party is an Environmental Impact Assessment (EIA) generated?	/VVS/ 134	DR, I	<p>NO.</p> <p>Regulations in Viet Nam does not require EIA for the industrial waste water treatment project. To confirm this, validation team reviewed following local regulations:</p> <ul style="list-style-type: none"> - QCVN 24:2009-BTNMT, National Technical Regulation on Industrial Wastewater. - 29/2011/ND-CP, Decree Providing Strategic Environmental Assessment, Environmental Impact Assessment and Environmental Protection Commitment. - Circular 26/2011/TT-BTNMT, Detailing a number of articles of the Government's Decree No. 29/2011/ND-CP. <p>Instead, local regulation requires "Environmental Protection Commitment", and validation team has been provided "Approval of Environmental Protection Commitment", issued by People's Committee of Duong Minh Chau District.</p>	OK	OK
C.2 Were transboundary environmental impacts identified in the analysis?	/VVS/ 134	DR, I	No transboundary impact has been identified.	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
C.3 Will the project create significant adverse environmental effects?	/VVS/ 134	DR, I	No significant adverse environmental effects have been expected.	OK	OK
C.4 Have the identified environmental impacts been addressed in the project design sufficiently?	/VVS/ 136	DR, I	OK. Identified impacts have been described in D.1 of PDD.	OK	OK
C.5 Does the project comply with environmental legislation in the host country?	/VVS/ 136	DR, I	OK. "Approval of Environmental Protection Commitment" has been issued in accordance with local regulations.	OK	OK
D. Local Stakeholder Consultation					
D.1 Have PPs conducted a local stakeholder consultation? Is it adequate enough stakeholder to be engaged?	/VVS/ 138	DR, I	OK. The PP invited local stakeholders to provide information about the proposed project activity, on 18/12/2009. Validation team interviewed one of the participant and confirmed it.	PENDING	OK
D.2 Were relevant stakeholders invited by the PP's to comment on the proposed CDM project activity? 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?	/VVS/ 138 & 139 (a)	DR	OK. Local residents and employees were invited. Local regulation does not require stakeholder consultation.	OK	OK
D.3 Have appropriate media been used to invite comments by local stakeholders?	/VVS/ 138	DR, I	OK. Hearings for the stakeholders were held. Validation team interviewed one of the participant, Mr. N'GUYEN CHAI TUAN, and confirmed it.	PENDING	OK
D.4 Is the summary of the received comments completed?	/VVS/ 139(b)	DR, I	E.2 fo the PDD (ver.01) stated that no negative opinion has been raised during local stakeholder consultation process, but validation team needs to check all opinions raised. /CL05/ The revised PDD described that no negative opinion has been	CL05	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
			raised. Interviewee Mr. N'GUYEN CHAI TUAN said residents expected reduced smell from lagoons.		
D.5 Have the PPs taken due account of any comments received and have they described this process in the PDD?	/VVS/ 139(c)	DR	No considerable opinion has been raised.	OK	OK

Table 2 Resolution of Corrective Action and Clarification Requests

No. of CAR/CL	Description of the CAR/CL	Ref.	Comments/Response from project proponent	Conclusions
CAR01	Some information in the PDD (ver.01) is not consistently described. ex) number of pumps, COD inflow/outflow, size and depth of the lagoon, etc.	Table 1 A.7.1 VVS 64	Mentioned information is rewritten in the revised PDD with consistency.	Resolved. Revised PDD has been consistently prepared.
CAR02	The PP is required to clearly describe difference between previous status and project activity.	Table 1 A.7.1 VVS 64	The description and figures are rewritten in the revised PDD to explain difference between previous status and project activity clearly, including electricity import.	Resolved. Revised PDD provide appropriate information.
CAR03	Geographical location of the project is not correctly described in section A.2.4 of the PDD (ver.01)	Table 1 A.6.2 VVS 62	Longitude and latitude of the project area is changed to correct data in the revised PDD.	Resolved.
CAR04	Section B.2 of the PDD (ver.01) describes how the project meets the eligibility conditions in the applied methodologies, but not all conditions are handled.	Table 1 B.1.4 VVS 76	All the eligibility conditions which were not included in the PDD (ver.01) is added in the revised PDD.	Resolved. All applicability conditions have been appropriately demonstrated in the revised PDD.
CAR05	Section B.2 of the PDD (ver.01) demonstrates that the project meets the eligibility condition "the minimum interval between two consecutive sludge removal events shall be 30 days", but the description is not appropriate.	Table 1 B.1.4 VVS 76	The description related to the sludge removal is rewritten in the revised PDD. In this project, the biogas recovery membrane cannot be removed between membrane replacement events. Therefore sludge will not be removed for 5 years, the lifetime of the membrane.	Resolved. Revised PDD correctly demonstrated it.

No. of CAR/CL	Description of the CAR/CL	Ref.	Comments/Response from project proponent	Conclusions
CAR06	As per paragraph 1 of AMS-III.I(ver.08), without the project activity, waste water would be treated under anaerobic condition. But, the project activity is to construct aerobic waste water treatment system after anaerobic treatment. Moreover, local regulation requires to decrease COD of discharged water under 50 ppm, while previous anaerobic treatment system only can decrease COD to 1,000 ppm. In this case, the PP shall demonstrate how applicability condition is satisfied by the proposed project activity.	Table 1 B.1.4 VVS 76	In the revised PDD, steps defined in the paragraph 22 of the “General Guidelines for SSC CDM methodologies (EB69 annex27)” has been applied to develop the baseline scenario.	Resolved. In accordance with EB69 annex 27, the PP identified baseline scenario of the proposed project activity, especially stage 2.
CAR07	Section B.2 of the PDD (ver.01) describes that how applicability condition of AMS-I.C. is met by the project, but nature of the project is not fully considered, including cashew nut oil usage.	Table 1 B.1.4 VVS 76	A condition of baseline is rewritten, including cashew nut oil which had been used, and the reason of not considering in baseline emission is added to the revised PDD.	Resolved. Appropriate description has been provided in the revised PDD.
CAR08	Section B.3 of the PDD (ver.01) provides photos, but there is no description how project boundary is identified.	Table 1 B.2.2 VVS 84	Information about project boundary is written and a description of the photos is also added to the revised PDD, including source of electricity consumption.	Resolved. Appropriate description has been provided in the revised PDD.
CAR09	The PP divided the project into three component - (i) methane capture from anaerobic treatment, (ii) methane avoidance from aerobic treatment, and (iii)	Table 1 A.7.1 VVS 64	Three stages of this project is written consistently throughout the revised PDD.	Resolved. Appropriate description has been provided in the

No. of CAR/CL	Description of the CAR/CL	Ref.	Comments/Response from project proponent	Conclusions
	heat production from biogas. But, throughout the PDD (ver.01), description for each component is not consistent.			revised PDD.
CAR10	The PDD (ver.01) includes references/links to not only other part of the description but also another documents, but some are not accurate. ex) in page 17, "paragraph 23 scenario (f) of AMS-III.H./version.16", but it is not exist.	Table 1 A.7.1 VVS 64	All the references/links which were not accurate in the PDD (ver.01) is changed correctly in the revised PDD.	Resolved. Appropriate description has been provided in the revised PDD.
CAR11	To demonstrate additionality of the project, the PP applied investment analysis. As per "Guidelines on the Assessment of Investment Analysis" (EB62), the input values of the analysis shall be at the time of decision making, but the PP applied the actual value after construction has been started.	Table 1 B.5.1 EB62 Annex 5 para. 6	All the input values of investment analysis are changed in the revised PDD to those at the time of decision making. For investment cost of the boilers, on the other hand, actual value from the contract is applied as the specifications of the boilers are changed from the time of decision making.	Resolved. Appropriate description has been provided in the revised PDD.
CAR12	In the investment analysis worksheet, the PP selected 15 year of analysis period, but other part of the PDD describes that operational lifetime of the major equipments are 20 years. In this reason, the PP is needed to demonstrate how 15 year of analysis is appropriate.	Table 1 B.5.1, EB62 Annex 5 para. 3	As the operational lifetime of the major equipments are 20 years, investment analysis was conducted again with 20 years and the result is applied to the revised PDD.	Resolved. Appropriate description has been provided in the revised PDD.
CAR13	B.5 of the PDD (ver.01) demonstrates additionality	Table 1	Investment cost of aerobic wastewater treatment	Resolved.

No. of CAR/CL	Description of the CAR/CL	Ref.	Comments/Response from project proponent	Conclusions
	of the project applying investment analysis, but there is no information for '2. Aerobic wastewater treatment system'	B.5.1, VVS 62	system is added in the revised PDD.	Appropriate description has been provided in the revised PDD.
CAR14	B.6 of the PDD (ver.01) describes methodological choice for the project, but there is no explanation how ex post calculation method has been chosen.	Table 1 B.4.2, VVS 97	Parameters and equations for ex-post calculation has been provided in the revised PDD.	Resolved. Appropriate description has been provided in the revised PDD.
CAR15	Algorithm/formula for baseline emission and emission reduction calculation are not correctly applied. For example, to calculate COD removal efficiency $\eta_{\text{COD,BL},i}$, methodology requires historical data, but validation team cannot find relevant description in the PDD (ver.01). Furthermore, equation (6) and (7) in page 30 of the PDD (ver.01) are applied to the project.	Table 1 B.4.1, VVS 96~98	Algorithm/formula for baseline emissions and emission reduction calculation are rewritten in the revised PDD without any missing or inappropriate informations.	Resolved. Appropriate description has been provided in the revised PDD.
CAR16	B.6.2 of the PDD (ver.01) defined data and parameter fixed ex ante, but it is neither consistent to the applied methodologies, nor fully described. For example, the PP defined COD _{in} for fixed parameter, but it is monitoring parameter defined in the methodology. Moreover, some parameter such as $B_{O,WW}$ and UF_{BL} are not considered.	Table 1 B.4.3, VVS 98	Monitoring parameters which were written in B.6.2. is displaced in B.7, and parameters not considered in previous PDD is added in the revised PDD.	Resolved. Appropriate description has been provided in the revised PDD.

No. of CAR/CL	Description of the CAR/CL	Ref.	Comments/Response from project proponent	Conclusions
CAR17	B.7 of the PDD (ver.01) defined monitoring parameters, but it is neither fully identified, nor completely described to validate. For example, definition for each parameter shall include monitoring/recording frequency and quality assurance procedure. Moreover, lists of the parameters are not complete for the project activity.	Table 1 B.8.2, VVS 132(a)&(b)	Missing monitoring parameters are added, and details of the monitoring and QA/QC plan are added for monitoring parameters in the revised PDD.	Resolved. Appropriate description has been provided in the revised PDD.
CAR18	B.7.3 of the PDD (ver.01), diagram on page 46 of the PDD (ver.01) shows one boiler and two dryer will be installed, but it is not in accordance with actual project activity.	Table 1 A.7.1 VVS 64	Actual project activity occurs in two boilers and two dryers, and the diagram is changed correctly in the revised PDD.	Resolved. Appropriate description has been provided in the revised PDD.
CAR19	Diagram and table described in B.7.3 of the PDD (ver.01) shows monitoring points for the project activity, but it is not consistent with monitoring parameters defined in B.7.1.	Table 1 B.8.2, VVS 132(a)	Diagram and table described in B.7.3 of the PDD is rewritten consistently with monitoring parameters defined in B.7.1 in the revised PDD.	Resolved. Appropriate description has been provided in the revised PDD.
CAR20	To calculate ex ante project emissions from electricity consumption, the PP applied 807.59 MWh/year, from the value of 2,656.56 kWh/day in the design document. However, validation team found that the value is auxiliary power consumption only for aerobic treatment system	Table 1 B.4.4, VVS 98	To calculate ex ante project emissions from electricity consumption, all the facilities relevant to the project activity was included in the revised PDD. Total electricity consumption for the project facilities is 1,866 MWh/year and related evidences were provided to the validation team.	Resolved. Appropriate description has been provided in the revised PDD.

No. of CAR/CL	Description of the CAR/CL	Ref.	Comments/Response from project proponent	Conclusions
	(stage 2). The PP is required to demonstrate how the value can ensure complete and accurate.			
CAR21	B.7.1 of the PDD defined that amount of coal consumption would be monitored based on purchase records. However, the PP is required to demonstrate how this approach can ensure accuracy or conservativeness.	Table 1 B.4.5, VVS 98	In the revised PDD, monitoring method for the amount of coal consumption is modified to direct measurement of coal supplied to the boilers.	Resolved. Appropriate description has been provided in the revised PDD.
CL01	Please provide evidence for 27.4°C of average temperature in Tay Ninh Province, described in section B.2 of the PDD (ver.01)	Table 1 B.1.4	The average temperature data of Tay Ninh Province is gathered in Tay Ninh Province homepage and captured image is submitted to DOE.	OK. Appropriate documents have been provided.
CL02	The PP applied 0.5764 tCO ₂ /MWh for electricity emission factor. Please provide how the value comes out.	Table 1 B.4.3	The PDF file which was written by Ministry of Natural Resources and Environment of Viet Nam is submitted to DOE.	OK. Appropriate documents have been provided.
CL03	Please provide following standards mentioned in B.7.3 of the PDD (ver.01) - Monitoring manual - National standards, industrial standards or manufacturer's recommendation for calibration and maintain procedure	Table 1 B.8.2 (b)	All the standards requested were provided to the validation team.	OK. Appropriate documents have been provided.
CL04	C.1.2 of the PDD (ver.01) defined that operational lifetime of the project is 20 years. Please provide documented evidence.	Table 1 A.7.1		OK. Appropriate documents have been provided.

No. of CAR/CL	Description of the CAR/CL	Ref.	Comments/Response from project proponent	Conclusions
CL05	E.2 fo the PDD (ver.01) stated that no negative opinion has been raised during local stakeholder consultation process, but please provide all opinion raised.	Table 1 D.4	All the opinions raised during local stakeholder consultation process are added in the revised PDD.	OK. Appropriate documents have been provided.
CL06	To demonstrate additionality, the PP applied investment analysis. Please provide objective evidences for following values: 1. historical data for fuel consumption 2. construction cost for anaerobic treatment system	Table 1 B.5.1	All the evidences requested were provided to the validation team.	OK. Appropriate documents have been provided.

APPENDIX B

CERTIFICATE OF COMPETENCE

KSA

CDM Validator/Verifier Certificate

Seung-Keun Choi

Certificate No. : CDM-015

Technical Area : -

Korean Standards Association hereby certifies that the above person is qualified by KSA's Qualification requirements as a technical expert for CDM validation and verification activities.

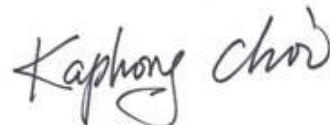
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2014.01.20

PRESIDENT OF KSA



KOREAN STANDARDS ASSOCIATION

13F, Ace High-end Tower 3, 371-50, Gasan-dong, Gwumcheon-gu, Seoul, Korea



GHG Validator/Verifier Certificate

Kyoo-Il Sohn

Certificate No. : CDM-001

Technical Area : 13.1

Korean Standards Association hereby certifies that the above person is qualified by KSA's Qualification requirements to conduct validation and verification for CDM and GHG project.

VALID FROM

2011.1.21

VALID UNTIL

2014.1.20

PRESIDENT OF KSA

A handwritten signature in black ink, appearing to read "Kaphong Choo", is written over a faint, larger version of the same signature.

KOREAN STANDARDS ASSOCIATION

13F, Ace High-end Tower 3, 371-50, Gasan-dong, Gwumcheon-gu, Seoul, Korea



Technical Expert Certificate

Young-Nam Lee

Certificate No. : CDM-020

Technical Area : 1.1, 1.2, 2.1, 2.2, 3.1

Korean Standards Association hereby certifies that the above person is qualified by KSA's Qualification requirements as a technical expert for CDM validation and verification activities.

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2012.03.20

VALID UNTIL

2015.03.19

PRESIDENT OF KSA

Chang Ryong Kim

KOREAN STANDARDS ASSOCIATION

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KSA

CDM Validator/Verifier Certificate

Seong-Yong Park

Certificate No. : CDM-014

Technical Area : -

Korean Standards Association hereby certifies that the above person is qualified by KSA's Qualification requirements as a technical expert for CDM validation and verification activities.

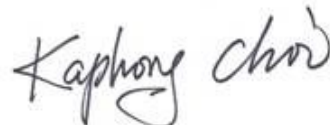
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GHG Validator/Verifier Certificate

Ju-Dong Yeo

Certificate No. : CDM-002

Technical Area : 13.1

Korean Standards Association hereby certifies that the above person is qualified by KSA's Qualification requirements to conduct validation and verification for CDM and GHG project.

VALID FROM

2011.1.21

VALID UNTIL

2014.1.20

PRESIDENT OF KSA

A handwritten signature in black ink, appearing to read "Kaphong Choo", is written over the printed name of the President of KSA.

KOREAN STANDARDS ASSOCIATION

13F, Ace High-end Tower 3, 371-50, Gasan-dong, Gwumcheon-gu, Seoul, Korea

KSA

Technical Expert Certificate

Seok Kim

Certificate No. : CDM-011

Technical Area : 1.1, 1.2, 2.1, 2.2, 3.1

Korean Standards Association hereby certifies that the above person is qualified by KSA's Qualification requirements as a technical expert for CDM validation and verification activities.

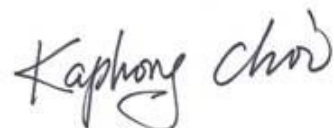
VALID FROM

2010.09.20

VALID UNTIL

2013.09.19

PRESIDENT OF KSA



KOREAN STANDARDS ASSOCIATION

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