



# VALIDATION REPORT FOR RETROACTIVE GOLD STANDARD REGISTRATION

CYY BIOPOWER WASTEWATER TREATMENT  
PLANT INCLUDING BIOGAS REUSE FOR  
THERMAL OIL REPLACEMENT AND ELECTRICITY  
GENERATION PROJECT, THAILAND

**Report No: 8000352987– 07/150GS**

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## Abbreviations

<b>CA</b>	<b>Corrective Action / Clarification Action</b>
<b>CAR</b>	<b>Corrective Action Request</b>
<b>CDM</b>	<b>Clean Development Mechanism</b>
<b>CO<sub>2</sub></b>	<b>Carbon dioxide</b>
<b>CO<sub>2eq</sub></b>	<b>Carbon dioxide equivalent</b>
<b>CL</b>	<b>Clarification Request</b>
<b>EIA</b>	<b>Environmental Impact Assessment</b>
<b>IEE</b>	<b>Initial Environmental Evaluation</b>
<b>ER</b>	<b>Emission Reduction</b>
<b>GHG</b>	<b>Greenhouse gas(es)</b>
<b>GS</b>	<b>Gold Standard Ver.01</b>
<b>GSD</b>	<b>Gold Standard Documentation</b>
<b>GSPDD</b>	<b>Project Design Document with Gold Standard Annex</b>
<b>ODA</b>	<b>Official Development Assistance</b>
<b>PP</b>	<b>Project Participant</b>
<b>QA/QC</b>	<b>Quality Assurance / Quality Control</b>
<b>SD</b>	<b>Sustainable Development</b>
<b>UNFCCC</b>	<b>United Nations Framework Convention on Climate Change</b>
<b>VAL</b>	<b>Validation Report</b>
<b>GSVVM</b>	<b>Gold Standard Validation and Verification Manual</b>

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## 1 INTRODUCTION

South Pole Carbon Asset Management Ltd. has commissioned the TÜV NORD JI/CDM Certification Program (CP) to carry out the validation for retroactive Gold Standard (GS) registration of the CDM project:

*“CYY Biopower Wastewater treatment plant including biogas reuse for thermal oil replacement and electricity generation Project, Thailand”.*

The purpose of this validation is to have an independent third party assess the project's compliance with the GS requirements as described in the additional PDD annexes provided by South Pole Carbon Asset Management Ltd.

The information included in the PDD, annexes to the PDD<sup>/PDD-GS/</sup> and supporting documents were reviewed against the requirements and criteria as set out in the Gold Standard Validation and Verification Manual for CDM Projects. Additionally results and recommendations of the GS Pre-feasibility Assessment were taken into account.

The GS validation of the project started in October 2007. It consisted of the following phases:

- A desk review of the additional annexes to the PDD for retroactive GS registration and supporting documents;
- Back ground investigation and follow-up interviews
- Reporting of draft validation findings in terms of Corrective Action Requests (CAR) and Clarification Requests (CLs).

Relevant Gold Standard criteria to be covered during this validation are:

- Eligibility of the project with relevant GS criteria
- Technological transfer
- Contribution to Sustainable Development
- Compliance with GS requirements w.r.t. the additionality screen
- Application of conservative assumptions
- Monitoring of sustainable development parameters
- Environmental Impacts
- Stakeholder consultation requirements

The documents that were considered during the validation process are referenced in section 4 in this report. The reference codes listed in tables 4-1 to 4-4 are used – as far as applicable – in the validation report.

The validation is based on the information made available to TÜV NORD JI/CDM CP and on the contract conditions. TÜV NORD JI/CDM CP can not be held liable by any entities for making its validation opinion based on any false or misleading information supplied to it during the course of validation.

## 2 VALIDATION TEAM

The Validation Team was led by:

- **Asim Kumar Jana**, TÜV Nord – Mumbai, India. Mr. Jana, M.Tech (Env Engg), Dipl in Industrial Safety, is a TÜV-CERT Lead auditor for ISO 9001/14001 and OHSAS 18001. He is Head – Energy and Carbon Services for TÜV Nord India operation and holds energy auditorship from Bureau of Energy Efficiency of India. He is an appointed assessor for JI/CDM certification program of TÜV Nord.

For this validation he was assisted by:

- **Pankaj Patel**, TÜV Nord -Baroda, India is TÜV-CERT auditor for ISO 9001/14001 and TS 16949. He has performed a number of CDM validation and verification functions of several projects. He is an appointed assessor for JI/CDM certification program of TÜV NORD.
- **Dr. Jochen Schubert**, TÜV NORD CERT GmbH. Mr. Schubert is an appointed JI/CDM Expert in the JI/CDM Certification Program of TÜV NORD.
- **Alexander Richter**, TÜV NORD CERT GmbH. Mr. Richter is an appointed JI/CDM Expert in the JI/CDM Certification Program of TÜV NORD.

The technical review is carried out by

- **Eric Krupp**. He is an expert in the field of environmental approval procedures as well as national and international Emission Trading. He worked in different projects in the framework of the German allocation procedure, the verification of the annual CO<sub>2</sub> emission reports and the validation/verification of several JI and CDM projects as a member of the validation/verification teams of TÜV NORD CERT GmbH respectively TÜV NORD JI/CDM CP. Mr. Krupp is an appointed JI/CDM Assessor.

The final validation report is approved by

- **Mr. Rainer Winter**. Mr. Winter works at TÜV NORD as ISO 9001/ 14001 Auditor and environmental verifier for EMAS. He is also an approved emission verifier within the European Emission Trading Scheme. Mr. Winter is an authorized JI/CDM senior assessor and is in charge of the JI/CDM Certification Program of TÜV NORD CERT GmbH.

### 3 GOLD STANDARD CRITERIA

#### 3.1 Project type eligibility screen

The project activity comprises wastewater treatment and reuse of associated biogas for the purpose of electricity and heat generation. The UNFCCC sectoral scope for this project activity is 13 - Waste handling and disposal. The total estimated reduction in GHG emissions during the total crediting period is 974,681 tCO<sub>2</sub>eq.

The project eligibility has been assessed by reviewing the documentation provided by the PP for validation. Moreover, the pre-feasibility assessment issued by the Gold Standard foundation has been taken into account during the validation of project's eligibility.

In respect of this TÜV NORD confirms that the pre-project scenario had been checked in the course of validation<sup>/VAL/</sup> and it can be concluded that no captive power generation is being displaced by the project activity. Moreover, the project's COD value is validated by on-site investigations and review of supporting documents<sup>/M-PROOF/</sup>. Thus, it is confirmed that the wastewater's COD concentration, i.e. 30kg/m<sup>3</sup> is representative and appropriate.

#### 3.2 Additionality screen

##### Public announcement check

The PP satisfactorily demonstrated that the project was considered as CDM project activity right from the beginning. It was at no time publicly announced as a non CDM project. Corresponding evidence has been provided to the validation team or has been received during interviews with PPs.

##### Additionality Tool Check

Additionally to the requirements set out in AM0022, Version 04 additionality of the project activity has been demonstrated in the GS Annex to the PDD in accordance with version 5 of the "Tool for demonstration and assessment of additionality" and confirmed in the course of the CDM validation by the validator. The individual arguments to justify the additionality were summarised in the table below. This table also includes the final assessment of the GS validation team after closure of all CARs / CLs raised during validation.

Step <sup>1)</sup>	Argument PP	Assessment of the validation team
1a	Possible alternatives for the project activity are: 1. Status quo: open anaerobic lagoon based wastewater treatment system 2. The project activity not	The alternatives given in step 1a are assessed as realistic and credible alternatives.  <input checked="" type="checkbox"/> step passed <input type="checkbox"/> step not passed <input type="checkbox"/> not applicable

Step <sup>1)</sup>	Argument PP	Assessment of the validation team	
	undertaken as a CDM project; 3. Aerobic waste water treatment; 4. direct discharge; 5. Methane recovery and flaring.		
1b	Alternative 4 cannot be considered as realistic alternative because it is not in compliance with national regulation. Thus, the remaining alternatives in compliance with national law are 1, 2, 3 and 5.	PP's evaluation w.r.t. selection of realistic baseline alternatives is deemed appropriate. Baseline selection and additionality demonstration according to AM0022 has been performed in a detailed manner in the course of validation <sup>VAL/</sup> .	
2a	<b>Not applied</b>	N/A	
2b	<b>Not applied</b>	N/A	
2c	<b>Not applied</b>	N/A	
2d	<b>Not applied</b>	N/A	<input type="checkbox"/> step passed <input type="checkbox"/> step not passed <input checked="" type="checkbox"/> not applicable (step 2 or 3 has to be passed)
3a	The PP identified the following barriers: 1. Technical barriers 2. Investment barriers 3. Social barriers 4. Prevailing practice barriers	The selection of barriers at that sub step is deemed adequate and applicable.	

Step <sup>1)</sup>	Argument PP	Assessment of the validation team
3b	<p>The PP demonstrated the project's additionality by description of technical barriers, investment barriers, social and common practice barriers.</p> <p><u>Alternative 1:</u> No technological barriers are associated in continuation with the current situation. No major additional investment is expected to run the project alternative and O&amp;M costs are deemed acceptable to achieve compliance with domestic effluent regulation.</p> <p><u>Alternative 2:</u> Description of technical barriers has been undertaken in a general manner, the investment barrier is more specific instead.</p> <p><u>Alternative 3:</u> Technological barriers are deemed irrelevant in the specific circumstances of this alternative.</p> <p><u>Alternative 5:</u> Technological barriers are deemed irrelevant in the specific circumstances of this alternative.</p>	<p><input checked="" type="checkbox"/> step passed  <input type="checkbox"/> step not passed  <input type="checkbox"/> not applicable  <small>(step 2 or 3 has to be passed)</small></p> <p><u>Alternative 1:</u> It is expected that no barriers are associated with the continuation of the current situation, i.e. to utilise open lagoon based wastewater treatment systems.</p> <p><u>Alternative 2:</u> It is recommended to elaborate technical and prevailing practice barriers in a more detailed manner in order to explain how these barriers would prevent the implementation of the project activity.</p> <p>Investment barrier needs further substantiation, particular w.r.t. difficulties in obtaining equity and dept for the investment. Taking into account clarification request 2.2 as part of the "GS pre-feasibility assessment summary table" w.r.t. additionality the PP shall demonstrate why the project activity was not viable from the PP's point of view at the time of investment decision, due to the high risk related to the high investment. Respective supporting documents (upfront payment and feasibility analysis) are pending. Please refer to CAR 2.1 and CL 2.1.</p> <p><u>Alternatives 3 &amp; 5:</u> Line of argumentation is deemed sufficient taking into account project and country specific circumstances. However, for alternative 3 transparent sources or documented evidence should be provided in the GS-PP or submitted for validation, respectively.</p>



Step <sup>1)</sup>	Argument PP	Assessment of the validation team	
4 a, b	Out of 85 starch factories 25 (29.4%) have installed an anaerobic digester, including the proposed project activity. All of them are applying for carbon credits except 1 which is already registered under the CDM. Sources for the statements made have been provided; however insufficiently.	<p>Further evaluation concerning the project's common practice demonstration shall be performed. For further clarification in this matter please refer to the summary table of the pre-feasibility assessment in the annex of this report. The information source for the common practice analysis is partially available and verified by the validation team. Please refer to CL 2.1. The line respective common practice evaluation is deemed to be correct. The underlying statistics show that the proposed project is not common practice in this region at the time of PDD preparation.</p> <p> <input type="checkbox"/> Argument not justified  <input type="checkbox"/> Argument not convincing  <input type="checkbox"/> Argument justified but not decisive  <input checked="" type="checkbox"/> Arguments justified / significant                 </p>	<p> <input checked="" type="checkbox"/> step passed  <input type="checkbox"/> step not passed  <input type="checkbox"/> not applicable                 </p>
<b>Assessment of the validation team</b>		<p> <input checked="" type="checkbox"/> <b>project is additional</b>  <input type="checkbox"/> <b>project is not additional</b> </p>	

ODA Additionality Screen

No ODA funds were used to finance the project activity. In order to demonstrate that no ODA funds are utilised for financing the project activity the PP submitted the Austrian LoA<sup>LOA-A/</sup>, which poses that

*“The public funding of the Republic of Austria involved in the purchase of Certified Emission Reductions (CERs) resulting from this project activity does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of the Republic of Austria.”*

Also, the PP improved the GS documentation by adding a table showing the finance means in accordance with the validation requirements. In order to assure that no ODA was utilised in regard to the project activity an ODA declaration has been submitted as well.

### Conservative approach

The selection of the baseline scenario as well as its conservativeness was verified in the course of CDM validation. As indicated in the CDM validation report, the most plausible scenario is the utilisation of lagoon based open anaerobic wastewater treatment systems. In this respect the methodological approach for the identification of the baseline and demonstration of additionality has been followed strictly. Moreover, in order to satisfy the Gold Standard requirements the CDM tool for the demonstration and assessment of additionality has been applied. Thus, the PP's performance in calculating the emission reductions is deemed appropriate, taking into account all methodological requirements as set out in AM0022. This has been verified in the course of the desk review and interviews with PPs.

TÜV NORD JI/CDM CP confirms that the baseline scenario has been established in a conservative manner and is in compliance with the applied version 04 of the methodology ACM0022.

Additionally, clarification has been provided to the issues determined in the Gold Standard pre-feasibility assessment. Please refer to section 5 of this report.

### Technology transfer and / or knowledge innovation

Sufficient evidence <sup>/TS- PRJ/</sup> has been provided to TÜV NORD JI/CDM CP that there are benefits for the project activity due to technology transfer as well as knowledge innovation. Benefits result from

- The technology transfer to a rural area.
- Intensive qualification and training of the local staff of the plant.
- Promotion of development in renewable energy sector.

### Early consideration of the CDM

Early consideration of the CDM is proved by provision of the management decision (as of 25<sup>th</sup> February 2006) to implement the project activity, being aware of the project's risks and the opportunity to alleviate the risks by sales of CERs. Furthermore, prior to the project starting date (04/08/2006) the CDM project development and transaction of CERs has been ordered and contracted with CDM Solutions on March 20<sup>th</sup>, 2006, following the proposal from Global Water Engineering (GWE) as of 1<sup>st</sup> February 2006. Corresponding supporting documents have been submitted for validation and were deemed adequate. Thus, the validation team is convinced that carbon credit financing was considered right from the beginning and was a decisive factor in the decision making process.

### 3.3 The Sustainable Development Screen

#### 3.3.1 Sustainable Development Assessment

The sustainable development indicators relevant for the project activity have been assessed using the Gold Standard Sustainable Development (SD) assessment matrix.

The scoring is reproducible and the justification considers existing information like results from the environmental impact assessment and the local stakeholder consultation in a sufficient manner. All considered changes are relative to the baseline situation. In the main consultation the scoring of the SD matrix has been discussed in detail with local stakeholders and NGOs. The results of this additional consultation confirm the positive impacts of the project in terms of sustainable development.

The total score is +11. There is no negative sub-total score and none of the single indicators are scored negative. Comprehensive information has been provided to TÜV NORD JI/CDM CP suitable to prove the data and statements.<sup>/IEE/, LSC/, /ISC/, SI/</sup>

Crucial indicators have been identified and included in the monitoring plan as provided in the Annex to the project design document section 5. These indicators are: “Water quality and quantity”, “Air quality”, “Employment (numbers)” and “Technological self-reliance”.<sup>/PDD-GS/</sup>

However, in conjunction with the pre-feasibility assessment issued by the Gold Standard foundation the following issues have been identified and successfully closed during final validation:

- lack of evidence to support the scoring of sustainable development indicators
- ambiguous scoring of crucial and sensitive indicators requires further elaboration
- insufficient description of monitoring plan, particular in terms of selection of indicators and monitoring measures

Please refer to section 5 for further details on the CARs / CLs raised and corresponding CA by the PP.

#### 3.3.2 Environmental Impact Assessment

There are no host party (Thailand) requirements for performing an EIA. Under the rules of the Thai DNA an initial environmental evaluation (IEE) has been conducted and which concludes that no negative environmental effects are expected from implementation of the project.

The initial environmental evaluation<sup>/IEE/</sup> has been conducted in compliance with host country regulations and fulfils the requirements of the CDM Executive Board as

verified during validation<sup>/VAL/</sup>. A copy of the original IEE and supporting documents has been provided to TÜV NORD JI/CDM CP.

The project is expected to contribute positively to the environment by reducing greenhouse gas emissions from methane and fossil fuels, by reducing wastewater pollution, and by reducing local odour pollution.

In the EIA the requirements for the project as listed in Appendix C of “The GS Validation & Verification Manual for CDM Projects” were considered. A synopsis of the main environmental aspects in this context has been provided. Results were addressed in the EIA study. Minutes of meetings, attendance lists etc. have been provided as additional proof. Environmental impacts in the phase of construction and at operating stage were assessed. No significant environmental impact was identified.<sup>/IEE/</sup>

After careful consideration of the provided information TÜV NORD JI/CDM CP comes to the conclusion that the project activity meets the GS EIA requirements.

### 3.3.3 Public Consultation Procedures

Local and international stakeholders were invited to comment on the project activity in the framework of a stakeholder meeting held on 26<sup>th</sup> July 2007. Thai government entities, NGOs, university representatives and others have been invited to attend the meeting. Nevertheless Gold Standard supporting NGOs, such as REEEP and Mercy Corps have not been informed. Moreover it was held prior to the issuance of the pre-feasibility assessment by the Gold Standard foundation.

According to the UNFCCC requirements, the PDD had been made publicly available on the DOE’s homepage for 30 days to comment on the project activity and validation requirements. The commenting period started on 2007-10-18 and ended on 2007-11-17. No comment was received.

Additional to the first physical meeting and the global commenting period on TÜV NORD’s homepage the PP initiated the invitation to another global stakeholder consultation on 5<sup>th</sup> September 2008.

Project participants organized several meetings with the local authority and institutional stakeholders to inform about the planned project and to discuss about environmental and socio-economic impacts. Internet and newspapers were used to announce the project. Moreover a survey was carried out, interviewing people in the vicinity of the planned project.

The initial physical stakeholder meeting has taken place in parallel to the validation for retroactive GS registration. Representatives of nearby communities as well as local and GS NGOs were actively invited to comment on the existing project design and impacts of the project activity either in written form, during participation at the meeting or in the course of interviews. The positive impacts of the project were pointed out by all participants. A summary of all activities and the comments received

are provided in the report of the Gold Standard Main Stakeholder Consultation. The corresponding evidences have been provided to TÜV NORD JI/CDM CP.

Though, the PP was not completely in line with the proposed GS project cycle the DoE accepted the public consultation procedures as the PP got the validity of the same confirmed from GS members, i.e. Ms. Denise Welch.

The validation team would like to mention that interviews with relevant local stakeholders have been held during site visits in March 2008 as well as May 2009. During these interviews, e.g. with employees (responsible for measurement or safety), the leader of the local community who was dealing mainly with agricultural matters as well as local villagers gave only positive feedback related to the project activity. Important positive matters which had been highlighted by the above mentioned stakeholders were creation of jobs in the (native) region and benefits due to watering of agricultural land. Stakeholders were surveyed to potential negative impacts in terms of water, soil, odour or other relevant issues and did reply again point out exclusively the latter mentioned positive aspects.

### **3.4 Monitoring Requirements and Monitoring Plan**

In addition to the monitoring plan of the registered PDD, the Gold Standard requirements call for monitoring of SD indicators, demonstrating the project's contribution to sustainable development over the crediting period.

Gold Standard requirements necessitate indication of those SD indicators with an asterisk and the transfer to the monitoring plan. Justification of selected parameters with transparent sources and/or documented evidences is part of the GS requirements just as an adequate description of the measures going to be undertaken for the monitoring. The revised monitoring plan is deemed appropriate considering the requirements mentioned above. In addition, the evidences submitted to the validation team were checked and are assessed to be acceptable in order to ensure adequate monitoring of the determined SD-indicators. Apart from monitoring the water & air quality / quantity, respectively which is monitored already as per the CDM monitoring plan adequate monitoring of the number of employees can be assured using payrolls and employment contracts. The validation team deemed the monitoring of the parameter technological self-reliance acceptable as training records do appropriately reflect the training efforts in order to operate the plant as per manufacturer requirements.

## 4 VALIDATION OPINION

South Pole Carbon Asset Management Ltd. has commissioned the TÜV NORD JI/CDM Certification Program (CP) to carry out the validation for retroactive Gold Standard (GS) registration of the CDM project:

*“CYY Biopower Wastewater treatment plant including biogas reuse for thermal oil replacement and electricity generation Project, Thailand”.*

In detail the conclusions can be summarised as follows:

- ✓ The project meets all eligibility criteria set by the GS foundation
- ✓ The project involves the adaption of a new technology
- ✓ The project does not result in negative social, environmental and/or economic impacts
- ✓ The project contribution to Sustainable Development is determined
- ✓ The project additionality is sufficiently justified in the PDD and GSD
- ✓ The project does not result in diversion of ODA
- ✓ Conservative assumptions were applied in the project description
- ✓ The monitoring plan of SD parameters is transparent and adequate
- ✓ The project meets the stakeholder consultation requirements
- ✓ The calculated emission reductions of 974,681 tCO<sub>2e</sub> are most likely to be achieved within the first crediting period of 10 years.

The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation.

Essen, 2010-01-19



Rainer Winter  
TÜV NORD JI/CDM Certification Program  
Validation Team Leader

Essen, 2010-01-19



Eric Krupp  
TÜV NORD JI/CDM Certification Program  
Senior Assessor

## 5 REFERENCES

**Table 4-1:** Documents provided by the project proponent

Reference	Document
/AR/	Extract of log of monitored data of the project activity: <ul style="list-style-type: none"> <li>- Annual report stating the quantity of dry starch production; HFO consumption</li> </ul>
/BL-ER/	Baseline and emission reduction estimation calculation spread sheets in accordance with the PDD. Spread sheet for CEF underlying value
/EC/	Employment Contracts of CYY Staff
/GSA/	Gold Standard Annex to the CDM PDD, version 1, dated 2008-08-01 Gold Standard Annex to the CDM PDD, version 2, dated 2009-10-20
/GSPFA/	Gold Standard Pre-Feasibility Assessment
/IEE/	Initial Environment Evaluation report
/ISC/	Invitation Letter to Stakeholder Consultation
/LEC/	List of Employees
/LOA-H/	Letter of Host Country Approval from DNA of Thailand
/LOA-A/	Letter of Annex-I Country Approval from DNAs of Switzerland and Austria
/LSC/	Proof of local stakeholder consultation process
/MD/	Management decision for with serious consideration of CDM
/ M-PROOF/	Methodology and project specific evidences: <ul style="list-style-type: none"> <li>- Proof of inlet wastewater chromatistics w.r.t type of sugar compounds ; COD; and sulphate</li> <li>- Water temperature within lagoon</li> <li>- Average depth of lagoon system and total pond surface area in hectare</li> <li>- Supporting documents for the chosen value of <math>E_{CH_4-NAWTF}</math> (Ref pg 5 of AM0022); <math>R_{NAWTF}</math> ( Ref pg 4 of AM0022 ; physical leakage of UASB reactor ( Ref pg 5 of AM0022); <math>f</math> ( Ref equation (7) of AM022)</li> <li>- Extract of testing of pre-project specific factors: <math>R_{lagoon}</math> (ref</li> </ul>

Reference	Document
	equation 5, APPENDIX 2 of AM 0022) ; $R_{\text{deposition}}$ (ref equation 6 and testing methodology under APPENDIX 3 of AM 0022) ; - Specific fuel consumption (HFO in energy unit/ dry starch quantity) - Combustion efficiency of burner (on HFO) for hot oil generator.
/MOC/	Modalities of Communication
/MM/	Minutes of Meeting of Stakeholder Consultation
/PDD-1/	Project Design Document entitled “CYY Biopower wastewater treatment plant including biogas reuse for thermal oil replacement and electricity generation project, Thailand” Version 2.0; 29/09/2007 (hosted for public comments during 18/10/07 to 07/11/07)
/PDD-2/	Project Design Document entitled “CYY Biopower wastewater treatment plant including biogas reuse for thermal oil replacement and electricity generation project, Thailand ” Version 2; 30/07/2008 and Version 3; 09/03/09 (due to effect of review comments)
/P-FLARE/	Proof associated with efficiency selection of the flare
/PO/	Purchase order of UASB
/ORG/	Organizational chart
/SC/	Proof of statutory clearances for the project plant
/SD/	Proof of starting date
/SDMF/	Filled SD-Matrix Forms during Stakeholder Consultation
/SI/	Safety Instructions
/TS- PRJ/	Technical data/ document related to the project plant: <ul style="list-style-type: none"> <li>- Site lay out plan</li> <li>- Single line diagram of electricity flow.</li> <li>- Technical data sheets specifying capacity and efficiency of UASB reactor (make: Global Water Engineering); Gas Engine; Hot Oil Heater (with co-firing provision);</li> <li>- Gas flow meter, Electricity meter, wastewater flow meter</li> <li>- Operation and Maintenance procedure of Bioreactor, Flare, Gas engine.</li> <li>- MOC and length of biogas pipeline (Pg 5 of AM022)</li> <li>- Leak detection procedure of biogas pipeline delivery system</li> </ul>



Reference	Document

**Table 4-2: Background investigation and assessment documents**

Reference	Document
<b>/AM0022/</b>	“Avoided Wastewater and On-site Energy Use Emissions in the Industrial Sector”, Version 4, released by EB 28.
<b>/AM0013/</b>	“Avoided methane emissions from organic wastewater treatment” , Version 4
<b>/AMSIH-H/</b>	“Methane recovery in waste water treatment”
<b>/FT/</b>	“Tool to determine project emissions from flaring gases containing methane”, released by EB 28.
<b>/CPM/</b>	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
<b>/GCP/</b>	UNFCCC: Guidelines for completing CDM-PDD and CDM-NM
<b>/GSM/</b>	The Gold Standard Validation & Verification Manual for CDM Projects, The Gold Standard, March 2007.
<b>/REF-CDM/</b>	UNFCCC registered CDM project entitled “Korat Waste to Energy” (Ref No 1040) using AM0022
<b>/IPCC-GP/</b>	IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, 2006
<b>/IPCC-RM/</b>	<ol style="list-style-type: none"> <li>1. Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual</li> <li>2. IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, 2006</li> </ol>
<b>/KP/</b>	Kyoto Protocol (1997)
<b>/MA/</b>	Decision 17/CP. 7 (Marrakesh – Accords and Annex to decision 17/CP.7)
<b>/VVM/</b>	IETA, PCF Validation and Verification Manual (V. 4)

**Table 4-3: Websites used**

Reference	Link	Organisation
/dna-t/	www.onep.go.th/CDM/	Climate Change Coordination Unit serving as Thai DNA
/GS/	www.cdmgoldstandard.org	The Gold Standard Foundation
/GSR/	http://goldstandard.apx.com/	Gold Standard Registry
/tgo/	www.tgo.or.th	Thailand Greenhouse Gas Management Organisation
/ipcc/	www.ipcc-nggip.iges.or.jp	IPCC publications
/unfccc/	http://cdm.unfccc.int	UNFCCC
/ieta/	www.ieta.org/	Website of International Emission trading Association (IETA)
/ghg/	www.ghgprotocol.org/templates/GHG5/layout.asp?MenuID=849	World Business Council for Sustainable Development
/papop/	www.papop.com	Web site of the technology supplier and project operator.

**Table 4-4: List of interviewed persons**

Reference	Mol <sup>1</sup>		Name	Organisation / Function
/IM01/	V	<input type="checkbox"/> Mr. <input checked="" type="checkbox"/> Ms.	Tonapon Yuenyong	CYY Bio Power Co Ltd., Owner
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Partik Burgi	South Pole carbon Assest Management Ltd., Switzerland
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Harshpreet Singh	South Pole carbon Assest Management
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Pathathai Tonsuwonnont	South Pole carbon Assest Management
/IM02/	V	<input type="checkbox"/> Mr. <input checked="" type="checkbox"/> Ms.	Anchalee Jitsuk	Bio Plant Operator

Reference	Mol <sup>1</sup>		Name	Organisation / Function
/IM03/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Monach Malikow	Major of local administrative.
/IM03/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Montree Jingsuntia	CYY Bio Power Co Ltd., Safety officer
/IM03/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Surachai Aonkumpha	CYY Bio Power Co Ltd., WWT Operator
/IM03/	V	<input type="checkbox"/> Mr. <input checked="" type="checkbox"/> Ms.	Yupin Amwan	CYY Bio Power Co Ltd., QAQC leader
/IM03/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Rodpadung	local community leader

<sup>1)</sup> Means of Interview: (Telephone, E-Mail, Visit)

# ANNEX

## 6 GOLD STANDARD VALIDATION FINDINGS

The summary below discusses areas of the Gold Standard Documentation (GSD) for which further elaboration was required. This was to be undertaken as initial statements were insufficient, unclear or not transparent enough to establish whether a requirement is met. In order to resolve the findings a Clarification Request (CL) was expressed.

Additionally, a Corrective Action Request was established if:

- mistakes have been made in assumptions or the project documentation which directly will influence the project results,
- the requirements deemed relevant for validation of the project with certain characteristics have not been met or
- there is a risk that the project would not be registered under the UNFCCC or that emission reductions cannot be verified and certified.

All erroneous demonstrations identified in the course of validation<sup>VAL</sup> are discussed taking into account the results and conclusions provided by the Gold Standard Foundation within the pre-feasibility assessment. The following tables address the areas where additional information is necessary for the project to be in line with the Gold Standard requirements.

	<b>CAR 0 General Aspects</b>
Findings	Submission of revised documents is requested, taking into account the guidance provided through the pre-feasibility assessment in order to re-publish relevant documentation on TÜV NORD homepage and to upload it into the GS-registry.
Proposed Corrective Action / PP Response	The revised GS Annex and the summary table of the responses to the Gold Standard's pre-feasibility assessment for the CYY Biopower project (GS560) are being submitted to TÜV NORD along with responds to GS validation findings. It has been confirmed in email communication with the GS staff that there is no need to re-publish documentation on TUV NORD's webpage. Once the documents are checked and validated by the DOE, they can be uploaded again into the GS-registry.
Validation Team comment	Revised set of documents, satisfying all relevant requirements, has been submitted for validation. The validation of the same resulted in a positive validation opinion as all CARs / CL could be closed.
Conclusion	<input type="checkbox"/> To be checked during next periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input type="checkbox"/> GSD was corrected correspondingly <input type="checkbox"/> Appropriate was action not taken <input checked="" type="checkbox"/> The project complies with the requirements

<b>CAR 1.1 Eligibility</b>	
Findings	A financial / business plan is requested showing that no ODA funding is being used for the purchase of VERs.
Proposed Corrective Action / PP Response	A financial plan is now included in the GS annex. In addition, an ODA declaration letter is attached as a confirmation of this.
Validation Team comment	The revised GSD has been cross checked with supporting documents provided by the PP and according to the same the validation team is convinced that no ODA was utilised in order to implement the project activity.
Conclusion	<input type="checkbox"/> To be checked during next periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input type="checkbox"/> GSD was corrected correspondingly <input type="checkbox"/> Appropriate was action not taken <input checked="" type="checkbox"/> The project complies with the requirements

<b>CAR 1.2 Eligibility</b>	
Findings	GS Annex to the PDD does not clearly mention the amount of biogas utilised in relation to the total available amount of biogas. The section project eligibility type screen of the GS Annex shall contain a confirmation that at least 65% of recovered biogas is used to deliver energy services.
Proposed Corrective Action / PP Response	All generated biogas is expected to be utilised in a hot oil boiler (4.07MW <sub>th</sub> ) and two power generators (with total capacity of 2.72 MW <sub>el</sub> ). Only in the case of emergency (e.g. stoppage of engines) will biogas be sent to the flare system. For reference, a calculation has been made to demonstrate that biogas requirement for energy service delivery amounts to 14,609,808 Nm <sup>3</sup> per year, whereas the biogas generation potential at the plant only amounts to 9,648,990 NM <sup>3</sup> per year. Therefore the standard operating intent is that the project will use all the generated biogas to deliver energy services (i.e. electricity and heat) and it is reasonable to expect no problem in meeting the minimum utilisation threshold. The GS Annex has been modified to include this information.
Validation Team comment	The project documentation has been revised accordingly. The same has been validated with relevant supporting documents available to the validation team. The revised GSD is deemed correct.



<b>CAR 1.2 Eligibility</b>	
<b>Conclusion</b>	<input type="checkbox"/> To be checked during next periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input type="checkbox"/> GSD was corrected correspondingly <input type="checkbox"/> Appropriate was action not taken <input checked="" type="checkbox"/> The project complies with the requirements

<b>CAR 2.1 Additionality</b>	
<b>Findings</b>	<p>An analysis of why the project activity is not viable from the PP's point of view at the time of investment decision, due to the high risk related to the high investment has not yet been provided.</p> <p>Submission of following documents is requested:</p> <ul style="list-style-type: none"> <li>• Analysis proving the project's non-viability at the time of investment decision.</li> <li>• Contract between CDM Solutions and CYY Biopower Co. Ltd. as of March 20th, 2006 for providing the service of CDM project development and transaction of CERs</li> <li>• Purchase contract for equipment utilised in the project activity.</li> </ul>
<b>Proposed Corrective Action / PP Response</b>	<ul style="list-style-type: none"> <li>• In addition to section B5 of the PDD, an analysis on the viability of the project was conducted as per the "Tool for the assessment and demonstration of additionality. This is exhibited in the GS annex with the conclusion being that the technical-, investment-, social- and prevailing practice barriers would contribute to the non-implementation of the project at the time of investment decision. This is also documented in a decision by the board of CYY Industries Co., Ltd. In addition, prior to project start date, a CDM service agreement for CDM project development and transaction of CERS was signed between CDM Solutions and CYY Biopower Co., Ltd., and as well, there will be upfront CDM payment of EUR 720,000 provided by Kommunalkredit GmbH on behalf of the Austrian government. All of these actions demonstrate that CDM was seriously considered in the decision to proceed with the project.</li> </ul> <p>The mentioned documents were also checked by the DOE and the UNFCCC in the process of CDM validation and registration. Nonetheless, they are again included in the pack being submitted to the DOE for GS validation.</p>

<b>CAR 2.1 Additionality</b>	
Validation Team comment	The requested set of documents has been submitted to the validation team. The review of these documents as well as the revised GS project documentation resulted in the acceptance of the stated additionality demonstration. The validation team is convinced that the PP faced significant barriers, i.e. mainly of technical and financial nature, in the project implementation, which would have led to non-implementation of the project activity in the absence of carbon credit financing. Since the additionality demonstration is in line with the Tool for the latest demonstration and assessment of additionality (version 05) and the PP could doubtlessly demonstrate that the project activity is additional to what would have happened in the absence of the project activity the validation team considers the raised CAR to be closed.
Conclusion	<input type="checkbox"/> To be checked during next periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input type="checkbox"/> GSD was corrected correspondingly <input type="checkbox"/> Appropriate was action not taken <input checked="" type="checkbox"/> The project complies with the requirements

<b>CAR 3.1 Emission Reduction Calculation</b>	
Findings	ER-calculations shall be provided in excel format.
Proposed Corrective Action / PP Response	The ER calculation sheet used for validation and registration of the project under CDM is available under the following link at the UNFCCC webpage: <a href="http://cdm.unfccc.int/Projects/DB/RWTUV1218617500.62/view">http://cdm.unfccc.int/Projects/DB/RWTUV1218617500.62/view</a>
Validation Team comment	Calculations excel format are uploaded by the DoE into the public section of the UNFCCC homepage.
Conclusion	<input type="checkbox"/> To be checked during next periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input type="checkbox"/> GSD was corrected correspondingly <input type="checkbox"/> Appropriate was action not taken <input checked="" type="checkbox"/> The project complies with the requirements

<b>CAR 4.1 Sustainable Development</b>	
Findings	The PP is requested to support the scoring of sustainable development indicators with sufficient evidences.



<b>CAR 4.1 Sustainable Development</b>	
<b>Proposed Corrective Action / PP Response</b>	The scoring of the SD indicators has been supported with more evidence and additional references in the GS Annex, and all 12 indicators have a justification (“rationale”) paragraph and reference sources.
<b>Validation Team comment</b>	The modifications in GSD have been cross checked with stated sources or evidences submitted to the validation team. The DoE deems the GSD appropriate as the set of documents is now improved in order to demonstrate the project’s impact on environmental, social, economic & technological in an adequate manner. The adequacy of parameter’s scoring is confirmed on the basis of document review as well as stakeholder interviews on site. Moreover, the DoE is convinced that the scoring has been conservatively executed so that the SD Matrix reliably reflects the project’s contribution to Thailand’s sustainable development.
<b>Conclusion</b>	<input type="checkbox"/> To be checked during next periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input type="checkbox"/> GSD was corrected correspondingly <input type="checkbox"/> Appropriate was action not taken <input checked="" type="checkbox"/> The project complies with the requirements

<b>CAR 4.2 Sustainable Development</b>	
<b>Findings</b>	It is requested to indicate all crucial and sensitive sustainability indicators in the sustainable development assessment matrix with an asterisk. Monitoring of all crucial and sensitive SD indicators shall be performed and the monitoring report shall be modified.
<b>Proposed Corrective Action / PP Response</b>	Sensitive and crucial SD indicators have been identified with an asterisk (*) in the SD Matrix and included in the monitoring plan.
<b>Validation Team comment</b>	The GSD has been improved in order to resolve the identified finding and satisfy GS requirements. The SD-Matrix is now designed in a fashion that adequately reflects the project’s contribution to Thailand’s sustainable development on a project level. Also, monitoring section has been checked and the DoE deems the comprehensiveness and detail adequate in order to enable monitoring in line with relevant UNFCCC and GS requirements. Thus, CAR 4.2 has been resolved and is closed.
<b>Conclusion</b>	<input type="checkbox"/> To be checked during next periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input type="checkbox"/> GSD was corrected correspondingly <input type="checkbox"/> Appropriate was action not taken <input checked="" type="checkbox"/> The project complies with the requirements



<b>CAR 4.3 Sustainable Development</b>	
<b>Findings</b>	<p>In respect of monitoring SD indicators the following is requested:</p> <ul style="list-style-type: none"> <li>• Reference to relevant parameter ID within the PDD shall be made for the monitoring parameter “water quality / quantity”.</li> <li>• Further elaboration of and justification for improvements in soil condition is requested.</li> <li>• Explanation to how the project is likely to create higher incomes for employees, better skilled jobs, safer working conditions than the average in the Nakhorn Ratchasima Province</li> <li>• Further elaboration on how locals are benefiting from electricity generated</li> <li>• Clarification on contradictory information or respective modification of documentation is solicited</li> <li>• Sufficient justification for +2 scoring of SD indicators balance of payments and technological self reliance needs to be performed</li> </ul>

<b>CAR 4.3 Sustainable Development</b>	
Proposed Corrective Action / PP Response	<ul style="list-style-type: none"> <li>• The parameter “water quality / quantity” was included in the monitoring plan of the GS Annex. However, only the impact from water quality would be crucial for an overall positive impact of sustainable development, hence its inclusion in the monitoring plan.</li> <li>• Justification and a reference were provided to support the original positive score for assessment of the soil condition indicator. Since it is still arguable that there is no significant difference relative to the baseline scenario, a neutral score is now given to be conservative.</li> <li>• The Employment’s score under ‘Social Sustainability and Development’ has been modified to +1. An explanation has been provided to clarify how the project activity leads to better skilled jobs and safer working conditions than current seen in the region.</li> <li>• An explanation was added to the GS Annex, to explain how this indicator was improved as a result of the project activity.</li> <li>• Excluding the managing director (MD) as well as her advisor (whose roles may be deemed as not directly attributable to the project), the project has created 11 full-time jobs for the operation and maintenance of the biogas plant. The GS Annex has now been revised to reflect the current employment situation and the same can be substantiated by the organisation chart provided as Attachment 5, as well as by the sample employment contracts attached along with this respond. The discrepancy between information provided in GS Annex and supporting document submitted during GS site visit can be explained by the fact that number of employment has increased since the time of CDM validation i.e. when the first version of GS Annex was developed. By the time GS site visit took place, number of employment has increased from 10 to 11 people (as shown in the submitted document); it should also be noted that the project owner plans to increase number of employment in the future.</li> <li>• After careful consideration, the positive impact on the balance of payments cannot be recognized as crucial to an overall positive score (hence a scoring of +1 is now given); monitoring of this parameter is therefore not mandatory. The indicator ‘technological self-reliance’ is now justified and now included in the GS monitoring plan.</li> </ul>
Validation Team comment	The monitoring section has been further improved according to the findings provided in the pre-feasibility assessment and the GS-DVR. The monitoring section is sufficiently informative, correctly elaborated and satisfies relevant UNFCCC and GS requirements.



<b>CAR 4.3 Sustainable Development</b>	
<b>Conclusion</b>	<input type="checkbox"/> To be checked during next periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> GSD was corrected correspondingly <input type="checkbox"/> Appropriate was action not taken <input checked="" type="checkbox"/> The project complies with the requirements

<b>CAR 5 Stakeholder Consultation</b>	
<b>Findings</b>	In order to perform a second round stakeholder consultation in accordance with the GS requirements modification of GS-documentation is requested. Based on the revised documents, including clarification requests by the GS / DOE relevant GS supporting (local and international) NGOs shall be invited to discuss the project activity in the meeting / during the site visit. Finally, the final stakeholder consultation report shall be submitted after occurrence of the second stakeholder feedback round. This document shall be in accordance with the GS requirements, particular concerning traceability of stakeholder invitations, attendees and there comments to the project's contribution to SD.
<b>Proposed Corrective Action / PP Response</b>	The issue has been clarified in written communication with the GS. The conclusion was that there is no need for an additional physical consultation meeting, but interviews by the DOE during site visits must be well documented in the final validation report.
<b>Validation Team comment</b>	OK, the corresponding E-Mail communication between Ms. Denise Welch and Mr. Patrick Bürgi has been forwarded to the validation team. Thus, CAR 5 has been closed and requested assessments to stakeholder consultation procedures and stakeholder opinions to the project activity are given in section 2.3.3 of this report.
<b>Conclusion</b>	<input type="checkbox"/> To be checked during next periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input type="checkbox"/> GSD was corrected correspondingly <input type="checkbox"/> Appropriate was action not taken <input checked="" type="checkbox"/> The project complies with the requirements

<b>CAR 6 Monitoring</b>	
<b>Findings</b>	Monitoring of the identified SD indicators shall be performed and the monitoring report shall be modified accordingly. Monitoring methods shall be described precisely, particular w.r.t. equipment / evidences going to be utilised, frequency of monitoring and quality assurance measures.

<b>CAR 6 Monitoring</b>	
Proposed Corrective Action / PP Response	Follow-up to this finding has been provided in the revised GS Annex.
Validation Team comment	The monitoring section has been further improved according to the findings provided in the pre-feasibility assessment and the GS-DVR. The monitoring section is sufficiently informative, correctly elaborated and satisfies relevant UNFCCC and GS requirements.
Conclusion	<input type="checkbox"/> To be checked during next periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> GSD was corrected correspondingly <input type="checkbox"/> Appropriate was action not taken <input checked="" type="checkbox"/> The project complies with the requirements

<b>CAR 7.1 Other</b>	
Findings	Submission of Initial Environmental Evaluation is requested.
Proposed Corrective Action / PP Response	An executive summary of the Initial Environmental Evaluation has been drafted and uploaded into the Registry. The full version in Thai was provided to the DOE during the site visit.
Validation Team comment	The Initial Environmental Evaluation as well as the corresponding summary document has been checked by the validation team. According to the same the DoE deems the elaboration furnished in the GSD correct and sufficiently conservative in order to describe the project's contribution to SD.
Conclusion	<input type="checkbox"/> To be checked during next periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input type="checkbox"/> GSD was corrected correspondingly <input type="checkbox"/> Appropriate was action not taken <input checked="" type="checkbox"/> The project complies with the requirements

<b>CAR 7.1 Other</b>	
Findings	PP's statements w.r.t. the entities involved in the project activity are imprecise. The GS-Annex to the PDD shall be modified in order to clarify the roles of the entities CDM Solutions, South Pole and AEP.

<b>CAR 7.1 Other</b>	
Proposed Corrective Action / PP Response	<p>The development of the baseline and monitoring methodology was transferred from CDM Solutions to South Pole Carbon Asset Management on 14 March 2007. For reference, CDM Solutions is a predecessor company by one of the South Pole founders in Thailand, prior to establishment of a formal South Pole presence in the country. The transfer is documented as per the emission reduction purchase agreement signed between CYY and South Pole Carbon Asset Management. The role of South Pole is the overall development of the CDM project and GS application as well as to purchase carbon credits from the project on behalf of a third party. AEP is a Thai CDM service provider who was sub-contracted by South Pole to conduct the stakeholder consultation process, Initial Environmental Evaluation and prepare the Letter of Approval documentation for the Thai DNA. CDM Solutions has no further involvement in the project.</p> <p>The summary tables clarifying all the project participants can be seen in section A.3 and Annex 1 of the registered CDM-PDD.</p>
Validation Team comment	OK, sufficient clarity has been provided. No impacts on project's eligibility or additionality are detected.
Conclusion	<input type="checkbox"/> To be checked during next periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input type="checkbox"/> GSD was corrected correspondingly <input type="checkbox"/> Appropriate was action not taken <input checked="" type="checkbox"/> The project complies with the requirements

<b>CL 2.1 Clarification on additionality</b>	
Findings	Lack of evidences for facts and figures listed in the common practice analysis has been identified. GS-Annex to the PDD, sources 4 and 5 are insufficient in terms of its traceability. Provision of traceable sources and/or documentary evidence is requested.
Proposed Corrective Action / PP Response	Additional evidence has been provided in the common practice analysis, and sources 4 and 5 have been equally substantiated.
Validation Team comment	The revised project documentation has been cross checked with the sources stated as well as further information collected on site and during the desk review. The validation team is convinced that the information is correct and that the project activity is not common practice in the region in question.
Conclusion	<input type="checkbox"/> To be checked during next periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input type="checkbox"/> GSD was corrected correspondingly <input type="checkbox"/> Appropriate was action not taken <input checked="" type="checkbox"/> The project complies with the requirements

<b>CL 3.1 Baseline, project, and leakage emissions &amp; emission reduction calculation</b>	
Findings	Substantial evidence and transparent explanation for justifying the application of the combined margin approach rather than the approach of calculating weighted average emissions of the current generation mix shall be provided.
Proposed Corrective Action / PP Response	At the time of Validation of the CDM project, the GEF was calculated based on an approach comprising of Operating Margin and Build Margin as per "Tool to calculate emission factor for an electrical grid". As per the calculations and estimations based on publically available data (excel sheet provided to DOE) the emission factor for electricity grid is observed to have increased from 2005 (0.522tCO <sub>2</sub> /MWh) to 2006 (0.546tCO <sub>2</sub> /MWh). The current generation mix of the grid, would have given a higher Carbon emission factor than project activity. Thereby the approach selected was conservative. Please note that details on the calculation of GEF are made available in Annex 3 of the PDD (registered version). The document can be retrieved from the following link: <a href="http://cdm.unfccc.int/Projects/DB/RWTUV1218617500.62/view">http://cdm.unfccc.int/Projects/DB/RWTUV1218617500.62/view</a> .
Validation Team comment	The GEF has been validated on the basis of the PDD. The project is successfully registered under the CDM.
Conclusion	<input type="checkbox"/> To be checked during next periodic verification <input type="checkbox"/> Appropriate action was taken <input type="checkbox"/> GSD was corrected correspondingly <input type="checkbox"/> Appropriate was action not taken <input checked="" type="checkbox"/> The project complies with the requirements

<b>CL 3.1 Baseline, project, and leakage emissions &amp; emission reduction calculation</b>	
Findings	The PP is requested to confirm that the use of normal or standard conditions (0°C and 1,013 bar) is consistent for both the density of methane applied and the biogas amounts.
Proposed Corrective Action / PP Response	As per the estimation sheet, the methane density used for estimation is at STP conditions. This is in line with the source i.e. Tool for estimating flaring emissions. The tool refers these conditions as normal conditions which is essentially the same as standard conditions. Therefore, the volume of gas and the density of methane used are consistent with each other for the emission reduction calculations.
Validation Team comment	The meter for "amount of biogas" provides the cumulative reading in Nm <sup>3</sup> and has inbuilt normaliser which converts gas quantity at field conditions to normal conditions. The default value for density of methane is going to be utilised. Thus, CL is closed.



<b>CL 3.1 Baseline, project, and leakage emissions &amp; emission reduction calculation</b>	
<b>Conclusion</b>	<input type="checkbox"/> To be checked during next periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input type="checkbox"/> GSD was corrected correspondingly <input type="checkbox"/> Appropriate was action not taken <input checked="" type="checkbox"/> The project complies with the requirements