



# VALIDATION REPORT

for the CDM Project Activity

## Grid-connected Biomass Power Plant at Takli District of Nakhon Sawan Province in Thailand In Thailand

Report No. 01 997 9105069848  
Version No. 01, 2012-12-30

Designated Operational Entity (DOE)

TÜV Rheinland (China) Ltd

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**I. Project description:**

Project title:	Grid-connected Biomass Power Plant at Takli District of Nakhon Sawan Province in Thailand		Report No.: 01 997 9105069848
Host Country:	Thailand		Current revision No.: 01
Methodology:	ACM0006Version 12.1.1	<input checked="" type="checkbox"/> Large Scale	Date of current revision: 30/12/2012
		<input type="checkbox"/> Small Scale	Date of first issue: 2012-08-20
Annual average emission reductions (estimate):			96,035tCO2e/yr
GHG reducing measure/technology:	The project involves installation of 60 MW Grid-connected Biomass Power Plant at the middle part of Thailand. The Proposed project activity will use bagasse as fuel to produce steam and electricity to be contributed to adjacent sugar factory and the surplus power supply 30 MW in average will be sold to the Electricity Generating Authority of Thailand (EGAT). So, the project displacing fossil fuel based grid power generation with renewable energy and thereby avoids CO2 emission associated with the fossil fuel based grid power generation		

Party	Project Participants	Party considered a project participant	Contract party
Thailand (Host)	Kaset Thai Bio Power Co., Ltd. (KTBP)	No	<input checked="" type="checkbox"/>

**II. Validation Team:**

Validation Team			Role									
Full name	Affiliation TÜV Rheinland	Appointed for Sectoral Scopes (Technical Areas)	Team leader	Acting Team Leader	Local Expert	Team Member (Auditor)	Technical Expert	Acting Tech. Expert	Trainee Auditor	Technical Reviewer	Expert to TR	Trainee TR
Mr. Shailendra Kewat	India	1.2, 13.1	X									
Mr. Chankeat Charoennitniyom	Thailand	13.1			X							
Mr. Ramachandra Nesari	India	1.1, 4.5, 5.1, 11.1, 12.1					X					
Mr. M P Kanal	India	1.2, 2.1				X						
Mr. R Murali	India	1.2, 3.1				X						
Dr. Lixin Li	China	1.1, 1.2, 2.1, 2.2, 3.1, 4.5								X		

(Adjust accordingly, i.e. provide one line per person)

**Validation Phases and Validation Status:**

☒ Desk Review
 ☒ Follow up interviews
 ☒ Resolution of outstanding issues  
☐ Corrective Actions / Clarifications Requested
 ☒ Full Approval and Submission for Registration
 ☐ Rejected

**III. Validation Report:**

Final approval	Released	Distribution
<input checked="" type="checkbox"/>	By: Mr. Praveen Urs	<input type="checkbox"/> No distribution without permission from the Client or responsible organizational unit
Date: 2012-12-30		<input checked="" type="checkbox"/> Unrestricted distribution

## Executive Summary – Validation Opinion

The validation team assigned by the DOE (TÜV Rheinland (China) Ltd.), here after called TRC, is been assigned by “M/s. Kaset Thai Bio Power Co., Ltd.” to perform the validation of their project “Grid-connected Biomass Power Plant at Takli District of Nakhon Sawan Province in Thailand”. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism. The scope of the validation is defined as an independent and objective review of the project design document, the project’s baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against CDM Validation and Verification Manual (Version 01.2), Kyoto Protocol requirements, CDM Executive Board/UNFCCC rules.

The report is based on the assessment of the project design document undertaken through stakeholder consultations, application of standard auditing techniques including but not limited to document reviews, site visit, stakeholder interviews, review of the applicable methodology and its underlying formulae and calculations.

### Validation methodology and process

The validation has been performed as described in the VVM version 01.2 and constitutes the following steps:

- Publication of the PDD on the UNFCCC website (29/04/2012 – 28/05/2012)
- Desk review of the PDD and the relevant documents
- On-site assessment (03/06/2012)
- Issuance of Validation Report

### Validation criteria

The following CDM requirements have been considered:

- Article 12 of the Kyoto Protocol,
- Modalities and procedures for CDM (Marrakech Accords)
- Subsequent decisions by the COP/MOP and CDM Executive Board
- Host country criteria
- Criteria given to provide for consistent project operations, monitoring and reporting.

The host part is Thailand and the party fulfil the participation criteria and have approved and authorized the project and the project participant. The DNA from Thailand confirms that the project assists in achieving sustainable development.

The project correctly applies the baseline and monitoring methodology ACM0006, version 12.1.1, Consolidated methodology for electricity and heat generation from biomass.

The project results in reductions of CO<sub>2</sub> emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards” Thailand”.

The monitoring plan provides for the monitoring of the project’s emission reductions. The monitoring arrangements described in the monitoring plan are feasible within the project design and it is TRC’s opinion that the project participants are able to implement the monitoring plan.

By installation and operation of 60 MW rate output turbine generators and thereby replacing the equivalent amount of grid electricity, the project activity will result in reductions of greenhouse gas (GHG) emissions that are real, measurable and give long-term benefits to the mitigation of climate change.

The total emission reductions from the project are estimated to be 960,350 t of CO<sub>2</sub>e over the 10 year fixed crediting period, averaging 96,035 t of CO<sub>2</sub>e annually. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given the underlying assumptions do not alter.

The validation protocol describes a total of 26 findings which include:

- 23 Corrective Action Requests (CARs);
- 3 Clarification Requests (CLs);

0 Forward Action Requests (FARs); and all findings have been closed satisfactorily.

TRC concludes that the CDM Project Activity “Grid-connected Biomass Power Plant at Takli District of Nakhon Sawan Province in Thailand” in Thailand, as described in the PDD (version 02, dated 30/12/2012), meets all relevant requirements of the UNFCCC for CDM project activities including article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakesh Accords) and the subsequent decisions by the COP/MOP and CDM Executive Board.

The selected baseline and monitoring methodologies (ACM0006, Version 12.1.1) are applicable to the project and correctly applied. The TRC therefore requests the registration of the project as a CDM project activity with UNFCCC.

Shailendra Kewat (Team Leader)



TÜV Rheinland (India) Pvt. Ltd  
Bangalore, 2012-12-30

Mr. Praveen Nagaraj Urs (DOE Manager)



TÜV Rheinland (China) Ltd.  
Beijing, 2012-12-30

**Abbreviations**

BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM EB	CDM Executive Board
CEA	Central Electricity Authority
CER	Certified Emission Reduction(s)
CH <sub>4</sub>	Methane
CL	Clarification request
CM	Combined Margin
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated operational entity
EIA	Environment Impact Assessment
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
LoA	Letter of approval
MAT	Minimum Alternative Tax
MoEF	Ministry of Environment & Forest
N <sub>2</sub> O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
OM	Operating Margin
PDD	Project Design Document
PLF	Plant Load Factor
PPA	Power Purchase Agreement
tCO <sub>2</sub> e	Tonnes of CO <sub>2</sub> equivalents
TRC	TÜV Rheinland (China) Ltd.
UNFCCC	United Nations Framework Convention on Climate Change
VVM	Validation and Verification Manual

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## 1. Introduction:

The organization “by Kaset Thai Bio Power Co., Ltd. (KTBP)” has commissioned the DOE TÜV Rheinland (China) Ltd. to perform a validation of the CDM Project Activity “Grid-connected Biomass Power Plant at Takli District of Nakhon Sawan Province in Thailand.” in Thailand (hereafter called “the project”). This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. The term “UNFCCC criteria” refers to Article 12 of the Kyoto Protocol, the CDM modalities and procedures or the simplified modalities and procedures for small-scale CDM project activities (as applicable) and the subsequent decisions by the CDM Executive Board.

### 1.1 Objective:

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, 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 identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

### 1.2 Scope:

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the relevant criteria (see above) and decisions by the CDM Executive Board, including the approved baseline and monitoring methodology. The validation team has, based on the recommendations in the Validation and Verification Manual employed (latest version) a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs. The validation is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

While carrying out the validation, TRC determines if the project activity complies with the requirements of Para 37 of the CDM M&P and also assess the claims and assumptions made in the PDD without limitation on the information provided by the project participants.

The scope of the validation is:

- To apply TRC's own quality management system integrated with the VVM standard along with the recent decisions and guidance provided by the UNFCCC board to determine if the project activity meets all applicable CDM requirements, including those specified in the relevant methodologies, tools and guidelines;
- Asses the accuracy, conservativeness, relevance, completeness, consistency and transparency of the information provided by the project participants;
- Determine whether information provided by the project participants are reliable and credible;
- Present information in the form of validation report in a factual, neutral, coherent manner and document all assumptions, provide references to the background material and identify changes made to the documentation;
- Base the findings and conclusions on objective evidence and conduct all validation in accordance with CDM rules and procedures;
- Apply consistent validation criteria in providing expert judgments to the requirements of applicable approved methodologies, tools and also cross check the same with projects of similar characteristics, technology, time period and region; and
- Safeguard the confidentiality of all information's obtained or created during validation.
- Where sampling is involved, the standard for sampling and surveys are applied.

## 2. Methodology:

The validation consists of the following four phases:

- I A desk review of the project design documents
  - Publication of PDD in UNFCCC for global stakeholder consultation;
  - A review of data and information;
  - Cross checking between information provided in PDD with all necessary means without limitations to the information provided by the project proponent;
- II On-site visit and follow-up interviews with project stakeholders
  - Interviews with relevant stakeholders in host country with personnel's having knowledge with the project development via telephone, email or direct on-site visits;
  - Cross checking between information provided by interviewed personnel with all necessary means without limitations to the information provided by the project proponent;
- III Reference to available information's relating to projects or technologies similar projects under validation and review based on the approved methodology being applied of the appropriateness of formulae and accuracy of calculations.
- IV The resolution of outstanding issues and the issuance of the final validation report and opinion.

### 2.1 Desk Review of the Project Design Documentation:

The following table outlines the documentation reviewed during the validation:

Ref no.	Reference Document
/P01/	Webhosted PDD [Grid-connected Biomass Power Plant at Takli District of Nakhon Sawan Province in Thailand], Version 01, Date :2012-03-01
/P02/	PDD [Grid-connected Biomass Power Plant at Takli District of Nakhon Sawan Province in Thailand], Version 02, Date : 2012-12-30
/P03/	Letter of Approval by Thailand DNA, Thailand Greenhouse Gas Management Organization to Kaset Thai Biopower Co. Ltd. Dated: 2012-10-19
/P04/	Modalities of Communication: date:2012-12-30
/P05/	Declaration for no ODA funding for the project activity by Kaset Thai Biopower Co. Ltd.
/P06/	Letter of Intention on CDM project sent to Thailand Greenhouse Gas Management Organization by Kaset Thai Biopower Co. Ltd. Dated: 2011-02-08
/P07/	Minutes of board meeting approving the CDM project activity by Kaset Thai Biopower Co. Ltd., Date: 2010-10-20
/P08/	Purchase order placed for turbine generator by Kaset Thai Biopower Co. Ltd. Dated: 2011-01-19
/P09/	Spread sheet for emission reduction calculations corresponding to /P01/ and /P02/
/P10/	Energy Purchase Agreement signed with EPC by Kaset Thai Biopower Co. Ltd. Dated: 2011-02-21 Water Purchase Agreement signed with EPC by Kaset Thai Biopower Co. Ltd. Dated: 2011-04-01
/P11/	Statuary Clearances <ol style="list-style-type: none"> <li>i. Approval for factory approval to Kaset Thai Biopower Co. Ltd. to run a business of raw sugar, white sugar and pure white sugar, Dated:1995-11-06</li> <li>ii. Approval from Tambon Administrative office of Tambon Nong Pho, Amphone Takli, Nakorn Sawan to allow KTBP to construct the bagasse power plant in the area of Tambon Nong Pho., Dated: 2011-05-02</li> <li>iii. EIA Approval to Kaset Thai Biopower Co. Ltd., dated:2011-08-24</li> <li>iv. Letter of Intention on CDM project to Thailand Greenhouse Gas Management Organization by Kaset Thai Biopower Co. Ltd. Dated: 2011-02-25</li> </ol>
/P12/	<ol style="list-style-type: none"> <li>i. Spread sheet for investment analysis and sensitivity analysis version 01corresponding to /P01/</li> <li>ii. Spread sheet for investment analysis and sensitivity analysis version 02corresponding to /P02/</li> </ol>



/P13/	<ol style="list-style-type: none"> <li>1. Offer letter from wangkanai sugar group to Kaset Thai Biopower Co. Ltd. for supply of bagasse, Dated: 2010-07-15</li> <li>2. Undertaking from Kaset Thai Biopower Co. Ltd. that technology of the project activity will not change during its entire crediting period, dated 2012-11-28</li> <li>3. Proof of boiler specification given by Environment Pulp and Paper Co., Ltd</li> </ol>
/P14/	<p>Related documents for the local stakeholder consultation process</p> <ol style="list-style-type: none"> <li>i. Minutes of interviews, group meeting and questionnaires related to stakeholder consultation meetings conducted on September 2011.</li> </ol>
/P15/	Certificate of Company's Registration for kaset Thai Industry Sugar Co., Ltd.
/P16/	Letter of statement from KTS Industry Co., Ltd to Kaset Thai Biopower Co. Ltd. certifying that the biomass power plant has a life expectancy of 20 years, dated 2012-04-02
/P17/	Letter of statement from KTS Industry Co., Ltd providing the geographical co-ordinates of the project activity.
/P18/	Feasibility Study Report made by KTS Industry Co., Ltd. for the project activity, dated 2010-07-31

Background investigation and other referred documents/websites:

Ref no.	Reference Document
/B1/	CDM Validation and Verification Manual (Version 1.2).
/B2/	Approved Baseline & Monitoring Methodology: ACM0006, version 12.1.1
/B3/	Tool to calculate the emission factor for an electricity system, version 02.2.1
/B4/	Tool for the demonstration and assessment of additionality, version 6.0.0
/B5/	<ol style="list-style-type: none"> <li>1. Glossary of CDM terms, version 07</li> <li>2. Relevant CDM and PoA specific requirements (CDM M &amp; P and decisions by the CMP and documents released by CDM EB) published on the UNFCCC CDM website</li> </ol>
/B6/	<p>As applicable: F-CDM-PDD – Project Design Document form, Version 03 <a href="http://cdm.unfccc.int/Reference/PDDs_Forms/PDDs/PDD_form04_v03_2.pdf">http://cdm.unfccc.int/Reference/PDDs_Forms/PDDs/PDD_form04_v03_2.pdf</a></p> <p>Guidelines for Project Design Document (CDM-PDD) and the Proposed new baseline and monitoring methodologies (CDM-NM), Version 07 1. <a href="http://cdm.unfccc.int/Reference/Guidclarif/pdd/PDD_guid04.pdf">http://cdm.unfccc.int/Reference/Guidclarif/pdd/PDD_guid04.pdf</a></p>
/B7/	Guidelines on the demonstration and assessment of prior consideration of the CDM, version 04
/B8/	Guidelines on the Assessment of Investment Analysis, version 05

## 2.2. Follow-up Interviews with Project Stakeholders:

TÜV Rheinland validation team carried out an on-site visit dated (2012-06-03) and performed interviews with the project representatives and stakeholders. The site visit was conducted to validate the accuracy and completeness of the project description as specified under webhosted PDD.

During the site visit, the validation team reviewed the available project activity designs, feasibility studies, documentation check and comparison analysis with equivalent projects as appropriate.

Prior to the interview salient points to be discussed were planned. Date of interview, interviewee and points discussed are given in the following table.

	Date	Name	Organization	Topic
/i/	03/06/2012	Mr. Santad Suwannarat	Senior Engineer, KTBP	-PP's background
/ii/	03/06/2012	Ms Nolinee Lhnung	Chemical Engineer, KTBP	-Investment decision

/iii/	03/06/2012	Mr. Wiroj	Senior Engineer, KTBP	-Baseline identification
/iv/	03/06/2012	Mr. Chalwat Tuntinalorulevl	Engineer and Executive Assistant, KTBP	-CDM consideration
/v/	03/06/2012	Mr. Wuttichai Pan-in	Mechanical Engineer, KTBP	-Public funding
/vi/	03/06/2012	Ms. Sirinitra Mahamai	Environmental Engineer, KTBP	-Additionality issues
				- Project design
				-Project implementation
				- Technical design
				-Monitoring provisions
/vii/	03/06/2012	Ms. Sureeporn Sringam	CDM Specialist, QCA	-Project design
/viii/	03/06/2012	Ms. Sarinthip	CDM Information Manager, QCA	-Baseline identification
				-ER calculation
/ix/	03/06/2012	Mr. Bundit	CDM Project coordinator, QCA	-Additionality issues
				-Monitoring plan

Validation Team considered the views obtained in these interviews while arriving at Validation Opinion.

### 2.3 Resolution of Outstanding Issues:

The objective of this phase of the validation is to resolve any outstanding issues which need be clarified prior to TÜV Rheinland's positive conclusion on the project design. In order to ensure transparency a validation protocol is customised for the project. The protocol shows in transparent manner criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

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

The validation protocol consists of three tables. The different columns in these tables are described in the figure below. The completed validation protocol for this project is enclosed in Appendix A to this report.

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

- Mistakes have been made with a direct influence the ability of the project activity to achieve on project results like real, measurable, verifiable and additional emission reductions;
- CDM and/or methodology specific requirements have not been met; or
- There is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

A request for clarification (CL) may be used where additional information is needed to fully clarify an issue.

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

<b>Validation Protocol Table 1: Validation requirements</b>				
<b>Checklist Question</b>	<b>Reference</b>	<b>Means of Validation (MoV)</b>	<b>Comment</b>	<b>Draft and/or Final Conclusion</b>
The various UNFCCC requirements as specified in the VVM are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the VVM.	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 validation 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 non-compliance with the checklist question (See below). A request for clarification (CL) is used when the validation team has identified a need for further clarification.

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

<b>Table 3: List of forward action requests (FARs)</b>			
<b>FAR number</b>	<b>Reference</b>	<b>Summary of project owner response</b>	<b>Validation team conclusion</b>
Forward action request (FAR) to be raised during validation to highlight issues related To project implementation that requires review during the first verification of the project activity. FARs Shall not relate to the CDM requirements for registration.	Reference to the checklist question number in Table 2 where the CAR or CL is explained.	The responses given by the project participants during the communications with the validation team should be summarised in this section.	This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".

**Figure 1. Validation protocol tables**

## 2.4 Internal Quality Control:

The final validation report underwent a technical review by a qualified independent reviewer before requesting registration of the project activity. The technical review was performed by a technical reviewer qualified in accordance with TÜV Rheinland's qualification scheme for CDM validation and verification that meets the criteria of EB guidelines for qualification.

## 2.5 Validation Team:

Before the assessment begins, members of the validation team are ensured to cover the technical area(s), sectoral scope(s) and relevant host country experience including local language ability for evaluating the CDM project activity. The qualification of the team is as per the criterias defined by the EB guidelines for qualification.

Validation Team			Type of Involvement						
Full name	Affiliation TÜV Rheinland	Appointed for Sectoral Scopes (Technical Areas)	Supervising the work	Desk review	Site Visit + Interview	Report and protocol Writing	Technical Expert Input	Reporting Support	Technical Reviewer
Mr. Shailendra Kewat	India	1.2, 13.1	X		X	X			
Mr. Chankeat Charoennitniyom	Thailand	13.1			X				
Mr. Ramachandra Nesari	India	1.1, 4.5, 5.1, 11.1, 12.1			X		X		
Mr. M P Kanai	India	1.2, 2.1						X	
Mr. R Murali	India	1.2, 3.1			X				
Dr. Lixin Li	China	1.1, 1.2, 2.1, 2.2, 3.1, 4.5							X

## 3. Validation Findings:

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

The final validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation.

### 3.1 Approval and Participation:

#### 3.1.1 Letter of Approval:

The below table summarizes the project participants and parties involved. The authenticity of the letters of approval has been validated by TÜV Rheinland validation team.

These LoA(s) are therefore regarded as valid and meeting the requirements.

Project participants	M/s. Kaset Thai Bio Power Co., Ltd. (KTBP)
Parties involved	Thailand
APPROVAL	
LoA received	Yes
Date of LoA	19/10/2012
Reference to document	No: BE2555(2012)
LoA received from	PP
Validation of authenticity	Validation of authenticity of the LoA has been done through web-research by referring to the official web-site of the host DNA.
Validity of LoA	Valid
PARTICIPATION	
Party is party to Kyoto Protocol	Yes, Thailand ratified the Kyoto protocol in August 2002.

	Statement 1 of LoA confirms the same.
Voluntary participation	Yes, statement 2 of LoA confirms the same
Diversion of official development aid towards host country	No, ODA is involved
Project contribution to SD	Yes, statement 3 of LoA confirms the same.

The validation team confirms that the information related to the letter of approval as mentioned in the above table is authentic. The validation team has confirmed the same through DNA website. The project participant listed in the tabular form of the PDD has obtained the letter of approval from the Thailand DNA.

### 3.1.2 Modalities of Communications:

Requirement of MOC	Criteria fulfilled	Determination by the validation team
Is the focal point identified	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Since M/s. Kaset Thai Bio Power Co., Ltd. (KTBP) is the only PP in this project, M/s. Kaset Thai Bio Power Co., Ltd. (KTBP) is considered as focal point.
Is the MOC signed by all project participant (including focal point identified entity/personal)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Please refer above comment
Is the written confirmation obtained by the PP's stating the authorization, specimen signatures and personal details, employment status are valid and accurate?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The MOC is signed by Mr. Apichart Noochprayoon of the company. The specimen signature of Mr. Apichart is checked by the written confirmation given by the PP
Is MOC received by the validation team from the PP with whom DOE has the contractual relationship?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The MOC is received from the M/s. Kaset Thai Bio Power Co., Ltd. and the DOE has contractual relationship with the same.

The validation team confirms that the applicable latest template is been employed by the project participant for the MOC. The MOC is been received from the DOE's contractual project participant. All the personal who have duly signed the MOC are been confirmed from the authorization letter from Notary agency of Government of Karnataka.

### 3.2 Project Design Document:

The Project Design Document is based on the currently valid PDD template "CDM-PDD - Project Design Document form, Version 03"/B6/ and is completed in accordance with the "Guidelines for Project Design Document (CDM-PDD) and the Proposed new baseline and monitoring methodologies (CDM-NM), Version 07"/B6/

### 3.3 Project Description:

The proposed project (KTBP) involves installation of the new bagasse based cogeneration power plant consist of one travelling grate stoker 60 MW rate output turbine generator with 240 tonnes/hr and one boiler delivering steam at 105 kg/cm<sup>2</sup> and 540 C° by Shin Nippon Machinery Co. LTD., which will burn bagasse from the nearby sugar factories to produce steam and electricity to be contributed to adjacent sugar factory of KTIS (roughly at 11.8% in crushing process, 23.5% in re-melting process and 2.5% in off-season) and other factories as EPPCO (on-season: 5.9% in, off-season: 4.2% in) and EPC (on-season: 3.5%, off-season: 2.5%). The surplus power supply 30 MW in average will be sold to the Electricity Generating Authority of Thailand (EGAT) under the non-firmed Small Power Producer (SPP) scheme. In the absence of the project activity the same power would have been generated from the fossil fuel based power plant in the grid which would have resulted in the emission of Greenhouse gas emissions into the atmosphere. Thus, the proposed project will reduce 96,035 tCO<sub>2</sub>e annually, as aim to promote a global level of greenhouse gases reduction and enhance a sustainable development of CDM project in Thailand in additional. The technology adopted by the project is the current industrial practices and are deemed environmentally safe. Also project owners employ trained technicians for

the operation and maintenance of the power plant and hence the assuring the proper operation and maintenance of the power plant.

The project is located in Tambon Nong Pho, Takli District, Nakhon Sawan Province at coordinates: 15.375684, 100.234859 (+15° 22' 32.46" N, +100° 14' 5.49"E).

The validation team has carried out on-site visit & interviews in order to assess the information included in the project documentation and to gain additional information regarding the compliance of the project with the relevant criteria applicable for CDM.

The operational lifetime of the project has been mentioned as 20 years which is recommended by the system supplier which is verified from the feasibility report.

The project participant has opted for a fixed crediting period of 10 years. The start date of the crediting period is mentioned as 01/01/2013 or the date of submission of request for registration to UNFCCC whichever is later.

The start date of project activity is considered as 29/10/2010 and has been verified to be the date of intent of Turbine Generator with the Shin Nippon Machinery Co. LTD in the project which is the first real action of the project activity.

TÜV Rheinland validation team considers the project description of the project contained in the PDD to be complete and accurate. The PDD complies with the relevant methodology, tools, forms and guidance at the time of PDD submission for registration.

Crediting period starting date of project	Expected project operational lifetime	Crediting period
01/01/2013	20 years 0 months	10 year (fixed)

Herewith, the Validation Team summarizes major changes between webhosted PDD and final version of PDD for submission as follows:

Subject	Webhosted PDD	Correction to webhosted PDD in the final PDD submission for registration with DOE assessment and reason of acceptance.
PDD ( project title / participants involved/ project location /project technology etc)	Not applicable as no changes made in this regard	Not applicable as no changes made in this regard
Methodologies and tools applied ( scope and version numbers)	Not applicable as no changes made in this regard	Not applicable as no changes made in this regard
CER calculations (formula applied/ amount of emission reduction)	Estimated emission reduction: 96,035 tCO <sub>2</sub> /year	Estimated emission reduction: 89,427 tCO <sub>2</sub> /year Please refer respective CARs & CLs
Additionality: (Benchmark / input values/analysis type/project start date/IRR or NPV values etc.)	Project IRR: 11.72% Benchmark : 21.58%	Project IRR: 14.72% Benchmark (WACC): 19.23%
Monitoring (parameters / frequency )	Not applicable as no changes made in this regard	Not applicable as no changes made in this regard
Crediting period ( type / start date)	The project start date: 29/10/2010	Project start date: 29/10/2010
Please refer to Appendix A of this report for details of each change between webhosted PDD and the final PDD		



for submission. The Validation Team has carried out the validation process based on the Webhosted PDD and raised CARs/CLs against the project by issuing the validation protocol. With the updated information and corrections done on final PDD, the PP has addressed all the CARs /CLs that were raised by the Validation Team. It is concluded that the Validation Team has reviewed the project in line with the VVM (version 01.2) and all the evidence, corrections, justifications and updating done on the final PDD with respect to CARs /CLs raised are accepted and closed by the Validation Team, issuing the positive validation opinion for project registration.

TÜV Rheinland validation team considers the project description of the project contained in the PDD to be complete and accurate. The PDD complies with the relevant methodology, tools, forms and guidance at the time of PDD submission for registration.

### 3.4 Baseline and Monitoring Methodology:

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

Approved baseline and monitoring methodology ACM0006 “Consolidated methodology for electricity and heat generation from biomass” (version 12.1.1) has been applied for the proposed project activity. At the time of GSP of the PDD (version 01, dated 01/03/2012) and methodology Consolidated methodology for electricity and heat generation from biomass (version 12.1.1) applied was the latest one.

The validation team determined the applicability of methodology ACM0006), (version 12.1.1) as follows:

Applicability criteria of the methodology (ACM0006), Version 12.1.1	Criteria fulfilled	Determination by the validation team
The methodology is applicable to project activities that operate biomass-residue (co-)fired power-and-heat plants.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	The project is a cogeneration biomass residues fired based plant, which the biomass residues derived from sugar cane crushing process. This project activity will supply power to nation grid and both power and heat to nearby sugar factory and 3 <sup>rd</sup> parties. This information has been confirmed by site visit.
The installation of new plants at a site where currently no power and heat generation occurs (greenfield project);	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	The project activity involved the installation of a new biomass based cogeneration which operated as independent power plant, the biomass residues supplied by biomass residues finding from an affiliate factories nearby or a market. This has been validated while onsite visit.
The installation of new plants at a site where currently power or heat generation occurs. The new plant replaces or is operated next to existing plants (capacity expansion projects);	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	The project activity is constructed at a site where currently no power or heat generation occurs. Thus, this is not applicable. This has been validated while onsite visit.
The improvement of energy efficiency of existing plants (energy efficiency improvement projects), which can also lead to a capacity expansion, e.g. by retrofitting the existing plant;	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	The project activity is a Greenfield plant. Thus, the applicability condition is not applicable. This has been validated while onsite visit.
The total or partial replacement of fossil fuels by biomass in existing plants or in new plants that would have been built in the absence of the project (fuel switch projects), e.g. by increasing the share of biomass use as compared to the baseline, by retrofitting an existing plant to use biomass, etc.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	The project does not involve replacement of fossil fuels by biomass. Thus, the applicability condition is not applicable for the project activity. This has been validated while onsite visit.
In addition, the project activity meets the consolidated	<input type="checkbox"/> Yes	The project will be used only bagasse as

condition as follows: 1. No biomass types other than biomass residues are used in the project plant	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	a biomass residues fuel. This has been validated while onsite visit.
2. Fossil fuels may be co-fired in the project plant. However, the amount of fossil fuels co-fired does not exceed 80% of the total fuel fired on an energy basis;	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	There will be no fossil fuel used in the project activity. This has been validated while onsite visit.
3. For projects that use biomass residues from a production process (e.g. production of sugar or wood panel boards), the implementation of the project does not result in an increase of the processing capacity of raw in put (e.g. sugar, rice, logs, etc.) or in other substantial changes (e.g. product change) in this process;	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	The implementation of the project activity does not result in an increase in the processing capacity of the raw input or other changes in the sugar manufacturing process since the sugar cane is an independent process based on sugar cane production and managed by separate entities. This has been validated while onsite visit.
4. The biomass residues used by the project facility are not stored for more than one year	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	The biomass residues used by the project facility will not be stored for more than one year. The rest small quantities of the biomass residues may be held over from one season to the next season and used as the start up fuel of the nearby plant. However, the length of this process is not longer than 6 months. This has been validated while onsite visit.
5. The biomass residues used by the project facility are not obtained from chemically processed biomass (e.g. through esterification, fermentation, hydrolysis, pyrolysis, bio- or chemical degradation, etc.) prior to combustion. Moreover, the preparation of biomass-derived fuel do not involve significant energy quantities, except from transportation or mechanical treatment so as not to cause significant GHG emissions;	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	The biomass residues used by the project facility are directly conveyed to the boilers, the bagasse is only transfer from storage yard to boiler without chemical treatment or involved significant energy quantities. This has been validated while onsite visit.
6. In the case of fuel switch project activities, the use of biomass or the increase in the use of biomass as compared to the baseline scenario is technically not possible at the project site without a capital investment in: a. The retrofit or replacement of existing heat generators/boilers; or b. The installation of new heat generators/boilers; or c. A new dedicated biomass residues supply chain established for the purpose of the project (e.g. collecting and cleaning contaminated new sources of biomass residues that could otherwise not be used for energy purposes); or d. Equipment for preparation and feeding of biomass.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	The project activity does not involve fuel switch majors. Thus , the applicability condition does not applies to the project. This has been validated while onsite visit.
7. In the case that biogas is used in power and/or heat generation, this methodology is applicable under the following conditions: a. The biogas is generated by anaerobic digestion of wastewaster (to be) registered	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	The project activity does not involve biogas used in power and heat generation. Thus, the applicability condition does not applies to the project activity. This has been validated while



<p>as a CDM project activity and the details of the registered CDM project activity must be included in the PDD. Any CERs from biogas energy generation should be claimed under the proposed project activity registered under this methodology;</p> <p>b. The biogas is generated by anaerobic digestion of wastewater that is not (and will not) be registered as a CDM project activity. The amount of biogas does not exceed 50% of the total fuel fired on an energy basis.</p>		onsite visit.
<p>8. In the case of biomass from dedicated plantations:</p> <p>(a) The cultivated land can be clearly identified and used only for dedicated energy biomass plantations;</p> <p>(b) The CDM project activity does not lead to a shift of pre-project activities outside the project boundary, i.e. the land under the proposed project activity can continue to provide at least the same amount of goods and services as in the absence of the project;</p> <p>(c) The plantations are established:</p> <p>(i) On land which was, at the start of the project implementation, classified as degraded or degrading; or</p> <p>(ii) On a land area that is included in the project boundary of one or several registered A/R CDM project activities;</p> <p>(d) The plantations are not established on organic soil (notably peatlands);</p> <p>(e) The land area of the dedicated plantations will be planted by direct planting and/or seeding;</p> <p>(f) After harvest, regeneration will occur either by direct planting, seeding or natural sprouting;</p> <p>(g) Grazing will not occur within the plantation;</p> <p>(h) No irrigation is undertaken for the biomass plantations;</p> <p>(i) The land area where the dedicated plantation will be established is, prior to project implementation, severely degraded and in absence of the CDM project activity would have not been used for any other agricultural or forestry activity;</p>	<p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p> <p><input checked="" type="checkbox"/> N/A</p>	<p>The project activity does not involve dedicated plantation. This has been validated while onsite visit.</p>

(j) Only perennial plantations are eligible. <sup>1</sup>		
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The assessment of the project's compliance with the applicability criteria of the methodology ACM0006, version 12.1.0 as documented in the PDD part B and annex 3, which are evaluated in detail under the validation protocol in Appendix A to this report based from the webhosted PDD.

### 3.4.2 Project Boundary:

The spatial extent of the project boundary encompasses:

- The power plant at the project site;
- All power plants connected physically to the electricity system that the CDM project power plant is connected to
- The means of transportation of biomass residues to the project site (trucks)
- The site where the biomass residues would have been left for decay or dumped.

Thus, the project site consists of KTBP and EPPCO, EPC & KTIS. So, the power plant installed at the EPPCO, EPC & KTIS is included in the project boundary.

The geographical and physical project boundary of the project activity was determined by the validation team during the on-site assessment. The coordinates were correctly documented in the PDD. The sources and sinks of greenhouse gas identified in the PDD are deemed to be appropriate. The coordinates were confirmed by the validation team through Google maps (<https://maps.google.co.in/maps?hl=en>)

	Source	Gas		Justification / Explanation
Baseline	Electricity generation	CO <sub>2</sub>	Included	Main emission source:
		CH <sub>4</sub>	Excluded	Excluded for simplification. This is conservative
		N <sub>2</sub> O	Excluded	Excluded for simplification. This is conservative
	Heat generation	CO <sub>2</sub>	Excluded	No emission reductions are claimed for heat generated by the project activity as the heat under baseline is derived from the biomass residues.
		CH <sub>4</sub>	Excluded	Excluded for simplification. This is conservative
		N <sub>2</sub> O	Excluded	Excluded for simplification. This is conservative
	Uncontrolled burning or decay of surplus biomass residues	CO <sub>2</sub>	Excluded	It is assumed that CO <sub>2</sub> emissions from surplus biomass residues do not lead to changes of carbon pools in the LULUCF sector.
		CH <sub>4</sub>	Excluded	Excluded for simplification. This is conservative.
		N <sub>2</sub> O	Excluded	Excluded for simplification. This is conservative. Note also that emissions from natural decay of biomass are not included in GHG inventories as anthropogenic sources.
Project Activity	On-site fossil fuel consumption	CO <sub>2</sub>	Included	May be an important emission source.
		CH <sub>4</sub>	Excluded	Excluded for simplification. This emission source is assumed to be very small.
		N <sub>2</sub> O	Excluded	Excluded for simplification. This emission source is assumed to be very small.
	Off-site transportation of biomass residues	CO <sub>2</sub>	Included	May be an important emission source.
		CH <sub>4</sub>	Excluded	Excluded for simplification. This emission source is assumed to be very small.
		N <sub>2</sub> O	Excluded	Excluded for simplification. This emission source is assumed to be very small.
	Combustion of biomass residues for electricity and heat	CO <sub>2</sub>	Excluded	It is assumed that CO <sub>2</sub> emissions from surplus biomass residues do not lead to changes of carbon pools in the LULUCF sector.
		CH <sub>4</sub>	Excluded	Exclude, because this emission source is excluded because CH <sub>4</sub> emissions from uncontrolled burning

<sup>1</sup> Project proponents can apply for revision of the methodology to include annual plantations, providing evidence that annual plantations would not result in depletion of the soil carbon.

				or decay of biomass residues in the baseline scenario are not occurred.
		N <sub>2</sub> O	Excluded	Excluded for simplification. This emission source is assumed to be very small.
	Storage of biomass residues	CO <sub>2</sub>	Excluded	It is assumed that CO <sub>2</sub> emissions from surplus biomass residues do not lead to changes of carbon pools in the LULUCF sector.
		CH <sub>4</sub>	Excluded	Excluded for simplification. Since biomass residues are stored not longer than one year, this emission source is assumed to be very small.
		N <sub>2</sub> O	Excluded	Excluded for simplification. This emission source is assumed to be very small.
	Wastewater from the treatment of biomass residues	CO <sub>2</sub>	Excluded	It is assumed that CO <sub>2</sub> emissions from surplus biomass residues do not lead to changes of carbon pools in the LULUCF sector.
		CH <sub>4</sub>	Excluded	This emission source shall be included in case where the waste water is treated (partly) under anaerobic condition.
		N <sub>2</sub> O	Excluded	Excluded for simplification. This emission source is assumed to be very small.

In summary, the project boundary was correctly identified in accordance with the methodology ACM0006 (version 12.1.1). All greenhouse gas emissions occurring within the proposed project activity boundary as a result of the implementation of the proposed CDM project activity have been appropriately addressed in the PDD.

The identified project boundary and selected sources of emissions are justified for the project activity. The validation of the project activity did not reveal other greenhouse gas emissions occurring within the proposed CDM project activity boundary as a result of the implementation of the proposed project activity which are expected to contribute more than 1% of the overall expected average annual emission reduction, with respect to the methodology applied.

### 3.4.3 Baseline Identification:

According to ACM0006 version 12.1.1, realistic and credible power generation alternatives include P1 to P7 in absence of the project activity. While site visit assessment, it has been confirmed by the team that proposed project activity is a green field project activity. This has also been confirmed FSR.

1. P1 The project activity not undertaken as a CDM project activity. P1 is a plausible scenario;
2. The scenario P2, P3 and P4 are excluded since proposed project activity is a greenfield, so these are not a credible scenario.
3. P5: The installation of new power plants at the project site different from those installed under the project activity; this is not a credible baseline, because the project is a green field project activity
4. P6: The generation of power in specific off-site plants, excluding the power grid; P6 is not a plausible scenario.
5. P7: The generation of power in the power grid: this is considered as a credible baseline.

Hence, P1, and P7 related to installation of new power plant at the project site are realistic and credible alternatives.

### The alternative scenarios for heat

Realistic and credible heat generation alternatives include H1 to H7 in absence of the project activity are.

1. H1 The project activity not undertaken as a CDM project activity. H1 is a plausible scenario;
2. The scenario H2, H3 and H4 are excluded since proposed project activity is a greenfield, so these are not a credible scenario.

3. H5: The installation of new power plants at the project site different from those installed under the project activity; this is a not credible baseline, because the project is greenfield project.
4. H6: The generation of power in specific off-site plants, excluding the power grid; P6 is not a plausible scenario.
5. H7: The generation of power in the power grid: this is considered as a credible baseline.

Therefore the plausible and credible baseline scenarios for heat generation are H1 and H5.

The considered **biomass** baseline scenarios are as follow;

1. B1: Excluded, because of the rest biomass residues from nearby sugar factory would be stored not longer than 6 months as previous mention. Moreover, the quantity of the biomass from the adjacent factory trend would be gradually increased in the future.
2. B2: Excluded, because of the biomass storage of the project activity is clearly dumped on the fields.
3. B3: Excluded, all of biomass in this project activity used for electricity generation and it was against the law of Thailand.
4. B4: Excluded, as per this remaining biomass are dumped and leaved on the field.
5. B5: Excluded, as the main part of biomass residue is the surplus from other power plant of sugar mill.
6. B6: Excluded, as per this remaining biomass are dumped and leaved on the field.
7. B7: Excluded, as per this remaining biomass are dumped and leaved on the field.
8. B8: Included, because of the main part of biomass residues derived from nearby sugar factory while the rest required biomass will purchase from market as prior mention.

Therefore the plausible and credible baseline scenario for use of biomass is B4

**Outcome of Step 1a:** From the above, the results can be summarized as follows:

- For power: P1, P7 is the plausible scenarios;
- For heat: H1 or H5 is the plausible scenario;
- For biomass: B4 is the plausible scenario.

Alternative combination	Power	Heat	Biomass	Descriptions
1	P1	H1	B4	The project activity not undertaken as CDM activity and biomass is used at the existing facility..
2	P7	H6	B4	In the absence of the proposed project activity, the equivalent power would have been supplied by the grid; the equivalent heat would be generated at KTIS existing bagasse based boiler or some other site; the biomass residues would have been dumped or left to decay mainly under aerobic conditions or burnt in an uncontrolled manner without utilizing it for energy purposes.

### ***Consistency with mandatory applicable laws and regulations***

All of the alternative combinations that pass Step 1a are in compliance with all Thailand government applicable laws and regulations. The proposed project activity not undertaken as a CDM project activity is not the only alternative among them.

### **Outcome of Step 1b:**

In conclusion, the list of alternative scenarios to the project activity that are in compliance with current laws and regulations in Thailand are:

- (a) **P1, H1 and B4 (the proposed project activity undertaken without CDM)**
- (b) **P7, H6 and B4**

The approved baseline methodology applicable to the project explicit criteria implicit criteria (e.g. available scenarios, applicability of formulas for BE/PE/LE calculations)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The selected ACM0006, Version 12.1.1 is demonstrated to be applicable to the project in the section 3.4.1 above
PDD includes all assumptions and data used by project participants	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The selected ACM0006, Version 12.1.1 is demonstrated to be applicable to the project in the section 3.4.1 above
All the references and documents used are relevant for establishing the baseline scenario	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The selected ACM0006, Version 12.1.1 is demonstrated to be applicable to the project in the section 3.4.1 above
All the references and documents used are correctly quoted and conservatively interpreted in the PDD	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The selected ACM0006, Version 12.1.1 is demonstrated to be applicable to the project in the section 3.4.1 above
All relevant policies / regulations considered are listed in the PDD	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The selected ACM0006, Version 12.1.1 is demonstrated to be applicable to the project in the section 3.4.1 above
Identified potential baseline scenarios reasonably represent what would/could occur in the absence of the proposed project activity	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The selected ACM0006, Version 12.1.1 is demonstrated to be applicable to the project in the section 3.4.1 above
The baseline scenario selection is appropriate and determined according to the methodology	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The selected ACM0006, Version 12.1.1 is demonstrated to be applicable to the project in the section 3.4.1 above
The approved methodology used is applicable to the identified baseline scenario	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The selected ACM0006, Version 12.1.1 is demonstrated to be applicable to the project in the section 3.4.1 above

The approved baseline methodology has been correctly applied to identify a realistic and credible baseline scenario, and the identified baseline scenario most reasonably represents what would occur in the absence of the proposed CDM project activity.

All the assumption and data used by the project participants are listed in the PDD and supporting documents. All documentation 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.

### 3.4.4 GHG Emission Reductions:

As the base line analysis of section B.4 of the PDD, the baseline scenario of the proposed project is the combination of P7, H1, B1 and B8. Thus, according to the methodology ACM0006 (Version 12.1.1), the emission reductions of this project during the year  $y$  will be calculated following:

$$ER_y = BE_y - PE_y - LE_y \quad (1)$$

Where:

$ER_y$	=	Emissions reductions in year $y$ (tCO <sub>2</sub> )
$BE_y$	=	Baseline emissions in year $y$ (tCO <sub>2</sub> )
$PE_y$	=	Project emissions in year $y$ (tCO <sub>2</sub> )
$LE_y$	=	Leakage emissions in year $y$ (tCO <sub>2</sub> )

#### Baseline Emissions

In the baseline scenario power would have been generated from the grid and heat would be generated in the existing bagasse based boiler of KTIS and the biomass residues would have been dumped or left to decay mainly under aerobic conditions or burnt in an uncontrolled manner without utilizing it for energy purposes. Based on conservative assumptions, baseline emissions are calculated as follows:

$$BE_y = EL_{BL,GR,y} \cdot EF_{EG,GR,y} + \sum_f FF_{BL,HG,y,f} \cdot EF_{FF,y,f} + EL_{BL,FF/GR,y} \cdot \min(EF_{EG,GR,y}, EF_{EG,FF,y}) + BE_{BR,y} \quad (2)$$

Where:

$BE_y$	= Baseline emissions in year y (tCO <sub>2</sub> )
$EL_{BL,GR,y}$	= Baseline minimum electricity generation in the grid in year y (MWh)
$EF_{EG,GR,y}$	= Grid emission factor in year y (tCO <sub>2</sub> /MWh)
$FF_{BL,HG,y,f}$	= Baseline fossil fuel demand for process heat in year y (GJ)
$EF_{FF,y,f}$	= CO <sub>2</sub> emission factor for fossil fuel type f in year y (tCO <sub>2</sub> /GJ)
$EL_{BL,FF/GR,y}$	= Baseline uncertain electricity generation in the grid or on-site in year y (MWh)
$EF_{EG,FF,y}$	= CO <sub>2</sub> emission factor for electricity generation with fossil fuels at the project site in the baseline in year y (tCO <sub>2</sub> /MWh)
$BE_{BR,y}$	= Baseline emissions due to disposal of biomass residues in year y (tCO <sub>2</sub> e)
y	= Year of the crediting period
f	= Fossil fuel type

### Step 1: Determine biomass availability, generation and capacity constraints, efficiencies and power emission factors;

#### Step 1.1: Determine total baseline process heat generation

In the absence of project activity the heat will be generated at the KTIS in the existing bagasse based boiler at the KTIS. HCBL<sub>y</sub> is determined as 17,81,950GJ.

#### Step 1.2: Baseline electricity generation

The amount of electricity that would be generated in the baseline in year y is calculated as follows:

$$EL_{BL,y} = EL_{PJ,gross,y} + EL_{PJ,imp,y} - EL_{PJ,aux,y} \quad (1)$$

Where:

$EL_{BL,y}$	=	Baseline electricity generation in year y (MWh)
$EL_{PJ,gross,y}$	=	Gross quantity of electricity generated in all power plants which are located at the project site and included in the project boundary in year y (MWh)
$EL_{PJ,imp,y}$	=	Project electricity imports from the grid in year y (MWh)
$EL_{PJ,aux,y}$	=	Total auxiliary electricity consumption required for the operation of the power plants at the project site in year y (MWh)
y	=	Year of the crediting period

According to the FSR,  $EL_{PJ,gross,y} = 263,700\text{MWh}$  and  $EL_{PJ,aux,y} = 26,370\text{MWh}$ .  $EL_{PJ,imp,y}$  is ex-ante estimated as zero and will be monitored in the crediting periods. Hence,  $EL_{BL,y} = 263,700 + 0 - 26,370 = 237,330\text{MWh}$

#### Step 1.3: Baseline capacity of electricity generation

equation below. The heat engines *i* and *j* should be obtained from the baseline scenario identified using the “Selection of the baseline scenario and demonstration of additionality” and the load factors should take into account seasonal operational constraints as well as other technical constraints in the system (e.g. availability of heat to drive heat engines).

$$CAP_{EG,total,y} = LOC_y \cdot \left[ \sum_i (CAP_{EG,CG,i} \cdot LFC_{EG,CG,i}) + \sum_j (CAP_{EG,PO,j} \cdot LFC_{EG,PO,j}) \right] \quad (2)$$

Where:

$CAP_{EG,total,y}$	=	Baseline electricity generation capacity in year y (MWh)
$CAP_{EG,CG,i}$	=	Baseline electricity generation capacity of heat engine <i>i</i> (MW)
$CAP_{EG,PO,j}$	=	Baseline electricity generation capacity of heat engine <i>j</i> (MW)
$LFC_{EG,CG,i}$	=	Baseline load factor of heat engine <i>i</i> (ratio)
$LFC_{EG,PO,j}$	=	Baseline load factor of heat engine <i>j</i> (ratio)
$LOC_y$	=	Length of the operational campaign in year y (hour)



- I = Cogeneration-type heat engine in the baseline scenario  
 j = Power-only-type heat engine in the baseline scenario  
 y = Year of the crediting period

#### Step 1.4: Baseline availability of biomass residues

Since, this project had only one type of the biomass residue. Then the fate of the biomass residue of the proposed project fall in to (b) B1; dumping, leaving to decay or burning that not leaved longer than one year. The KTIS and RP sugar mill, both mills will not leaved the biomass residue longer than one year. The KTIS could be supported 500,000 tons per year of the bagasse to the proposed project and raised 71,230 tons would be derived from RP sugar mill, which located in the same province. The distance takes approximately 60 kilometers from the proposed project.

Biomass residues category (k)	Biomass residues type	Biomass residues source	Biomass residues fate in the absence of the CDM project activity	Biomass residues use in project scenario	Biomass residues quantity (tonnes)
1	Bagasse	Off-site from an identified KTIS	Electricity generation on-site (Error! eference source not found.)	Electricity generation on-site (biomass-only boiler)	392,376
2	Bagasse	Off-site from an identified RPI	Electricity generation on-site (Error! eference source not found.)	Electricity generation on-site (biomass-only boiler)	45,384

#### Step 1.5: Determine efficiencies of heat generators, and efficiencies and heat-to-power ratio of heat engines.

For this project, Option 1- Default values will be chosen to calculate the efficiencies of heat generators, i.e. use Option F in the latest approved version of the “Tool to determine the baseline efficiency of thermal or electric energy generation systems”.

According to the tool option F, use 85% of new coal fired boiler for heat generators of this project activity in baseline scenario.

#### Step 1.6: Determine the emission factor of on-site electricity generation with fossil fuels

There is no fossil fuel based power generation was identified as the part of the baseline scenario, Thus, make  $EF_{EG,FF,y} = EF_{EG,GR,y}$ .

#### Step 1.7: Determine the emission factor of grid electricity generation

Determination of the emission factor of grid electricity generation as the “Tool to calculate the emission factor for an electricity system” version 02.2.1, this tool provides procedures to determine the following parameters:

Parameter	SI Unit	Description
$EF_{grid,CM,y}$	tCO <sub>2</sub> /MWh	Combined margin CO <sub>2</sub> emission factor for the project electricity system in year y

$EF_{grid,BM,y}$	$tCO_2/MWh$	Build margin $CO_2$ emission factor for the project electricity system in year y
$EF_{grid,OM,y}$	$tCO_2/MWh$	Operating margin $CO_2$ emission factor for the project electricity system in year y

However, the emission factor is calculated in a transparent and conservative manner by the Thailand Greenhouse Gas Management Organization (TGO), which is the Designed National Authority (DNA) for the Clean Development Mechanism of Thailand. TGO has set up a working group to study on the emission factor for an electricity system in Thailand in 2010 and published a report under a title of “The Study of emission factor for an electricity generation of Thailand in year 2010”. ([http://www.tgo.or.th/english/download/publication/GEF/2010/GEFReport\\_EN.pdf](http://www.tgo.or.th/english/download/publication/GEF/2010/GEFReport_EN.pdf)) using version 02.2.1 of the “Tool to calculate the emission factor for an electricity system” that was clarification in (Annex 3) of the PDD.

### Step 2: Determine the minimum baseline electricity generation in the grid;

In case of absence project, the electricity would be generated from grid only, then the minimum amount of electricity generation could be calculated from the following equation:

$$EL_{BL,GR,y} = \max(0, EL_{BL,y} - CAP_{EG,total,y}) \quad (13)$$

Where:

$EL_{BL,GR,y}$  = Baseline minimum electricity generation in the grid in year y (MWh)

$EL_{BL,y}$  = Baseline electricity generation in year y (MWh)

$CAPEG_{total,y}$  = Baseline electricity generation capacity in year y (MWh)

y = Year of the crediting period

As aforesaid, the baseline electricity generation capacity in year y  $CAP_{EG,total,y}$  is set to be zero, Hence  $EL_{BL,GR,y} = EL_{BL,y}$

### Step 3: Determine the baseline biomass-based heat and power generation;

#### Step 3.1: Determine the baseline biomass-based heat generation

It is assumed that the use of biomass residues for which scenario B.4: has been identified as the baseline scenario ( $BR_{B4,n,y}$ ) would be prioritized over the use of any fossil fuels in the baseline. From that assumption, the equivalent amount of heat that would be generated with biomass residues ( $HG_{BL,BR,y}$ ) is determined.

- Calculate the amount of heat generated with biomass residues based on the allocation rules established in the CDM-PDD using the following equations:

$$HG_{BL,BR,y} = \sum_h \sum_n (BR_{B4,n,h,y} \cdot NCV_{BR,n,y} \cdot \eta_{BL,HG,BR,h})$$

Subject to,

$$\sum_h \sum_n BR_{B4,n,h,y} = \sum_n BR_{B4,n,y}, \text{ i.e. the biomass residues used in each heat generator should not exceed the total amount of biomass residues available.}$$

$$\sum_n (BR_{B4,n,h,y} \cdot NCV_{BR,n,y} \cdot \eta_{BL,HG,BR,h}) \leq LOC_y \cdot CAP_{HG,h} \cdot LFC_{HG,h}, \text{ i.e. the heat generation in each heat generator should not exceed the total capacity of the heat generator;}$$

Where:

$HG_{BL,BR,y}$  = Baseline biomass-based heat generation in year y (GJ)

$BR_{B4,n,h,y}$  = Quantity of biomass residues of category n used in heat generator h in year y with baseline scenario B4 (tonne on dry-basis)

$NCV_{BR,n,y}$  = Net calorific value of biomass residue of category n in year y (GJ/tonne on dry-basis)



$\eta_{BL,HG,BR,h}$	=	Baseline biomass-based heat generation efficiency of heat generator $h$ (ratio)
$BR_{B4,n,y}$	=	Quantity of biomass residues of category $n$ used in the CDM project activity in year $y$ for which the baseline scenario is B4 (tonne on dry-basis)
$LOC_y$	=	Length of the operational campaign in year $y$ (hour)
$CAP_{HG,h}$	=	Baseline capacity of heat generator $h$ (GJ/h)
$LFC_{HG,h}$	=	Baseline load factor of heat generator $h$ (ratio)
$y$	=	Year of the crediting period
$h$	=	Heat generator in the baseline scenario

$$\sum_n (BR_{B4,n,h,y} \cdot NCV_{BR,n,y} \cdot \eta_{BL,HG,BR,h}) \leq LOC_y \cdot CAP_{HG,h} \cdot LFC_{HG,h}$$

**Step 3.2: Determine the baseline biomass-based cogeneration of process heat and electricity and heat extraction.**

- Calculate the amount of electricity and process heat generation based on the allocation above using the following equations:

$$EL_{BL,BR,CG,y} = \frac{1}{3.6} \cdot \sum_i \left( \frac{1}{(HPR_{BL,i} + 1 + GGL_{default})} \cdot HG_{BL,BR,CG,y,i} \right) \quad (3)$$

$$HC_{BL,BR,CG,y} = \sum_i \left( \frac{HPR_{BL,i}}{(HPR_{BL,i} + 1 + GGL_{default})} \cdot HG_{BL,BR,CG,y,i} \right) \quad (4)$$

Subject to,

$$\sum_i HG_{BL,BR,CG,y,i} \leq HG_{BL,BR,y}, \text{ i.e. the biomass-based heat used in cogeneration mode should not exceed the total biomass-based heat generated;}$$

The next step As indicated above, the cogeneration in Step 4.1 is not the project case and thus  $HG_{BL,BR,CG,y}=0$ .

Baseline process heat demand is totally met via direct heat extraction from biomass-fired boilers.

followed depends on the outcomes of the calculations above. Four cases are possible:

**Case 3.2.1:** If  $HG_{BL,BR,y} = \sum_i HG_{BL,BR,CG,y,i}$  and  $HC_{BL,y} = HC_{BL,BR,CG,y}$ , then all the heat that would be

generated using biomass residues in the baseline would be used in cogeneration-type heat engines and would suffice to serve all process heat demand. It is assumed then that the use of fossil fuels on-site in the baseline scenario would be uncertain (except for the amount required due to technical constraints) because it would depend on a number of factors that are not taken into account in this methodology, particularly on the relative prices of on-site electricity generation using fossil fuels and the electricity price in the grid. In order to estimate the baseline parameters that result project participants should:

- Define  $EL_{BL,FF/GR,y} = EL_{BL,y} - EL_{BL,GR,y} - EL_{BL,BR,CG,y}$ ,  $EL_{PJ,offset,y} = 0$ ,  $FF_{BL,HG,y,f} = 0$ , and,
- Thus,  $EL_{BL,FF/GR,y} = 0$
- Proceed to Step 5: Determine the baseline emissions due to uncontrolled burning or decay of biomass residues.

As the proposed project is the new travelling grate stoker type boiler 240 TPH 105 bars at Maximum Continuous Rating biomass based cogeneration power plant. There is no baseline biomass-based cogeneration, and then the amount of electricity and process heat generation calculation are not required.

#### Step 5: Determine the baseline emissions due to uncontrolled burning or decay of biomass residues;

The calculation of baseline emissions due to uncontrolled burning or decay of biomass residues is not included. Because, the biomass would be not burned as it against the nation regulation of Thailand and it would not leave to decay longer than one year.

#### Step 6: Calculate baseline emissions

The baseline emission of the proposed project is not included the emission from fossil fuel, burning and disposal of biomass residues. The emission baseline would be calculated from the electricity generated from grid only. The calculation based on equation (2) above and the results are show in the emission reduction calculation sheet.

#### Project Emissions

The emission of the proposed project activity would not include the emission from fossil fuel consumption, the CO<sub>2</sub> from grid-connected fossil fuel power plants in the electricity system as there are not any electricity that is imported from the grid to the project site;

The project emissions are calculated by the following formula:

$$PE_y = PE_{FF,y} + PE_{GR1,y} + PE_{GR2,y} + PE_{TR,y} + PE_{BR,y} + PE_{WW,y} + PE_{BG2,y} \quad (37)$$

Where:

PE<sub>y</sub> = Project emissions in year y (tCO<sub>2</sub>)

PEFF<sub>y</sub> = Emissions during the year y due to fossil fuel consumption at the project site (tCO<sub>2</sub>)

PEGR1<sub>y</sub> = Emissions during the year y due to grid electricity imports to the project site (tCO<sub>2</sub>)

PEGR2<sub>y</sub> = Emissions due to a reduction in electricity generation at the project site as compared to the baseline scenario in year y (tCO<sub>2</sub>)

PETR<sub>y</sub> = Emissions during the year y due to transport of the biomass residues to the project plant (tCO<sub>2</sub>)

PEBR<sub>y</sub> = Emissions from the combustion of biomass residues during the year y (tCO<sub>2</sub>e)

PEWW<sub>y</sub> = Emissions from wastewater generated from the treatment of biomass residues in year y (tCO<sub>2</sub>e)

PEBG2<sub>y</sub> = Emissions from the production of biogas in year y (tCO<sub>2</sub>e)

#### Determination of PEFF<sub>y</sub>

There are no emissions due to fossil fuel consumption at the project site, then **PEFF<sub>y</sub> = 0**

#### Determination of PEGR1<sub>y</sub>

As the proposed project is a new power plant which now not imported electricity from the grid to the project site, then this parameter will be set to zero in this stage (**PEGR1<sub>y</sub> = 0**). Anyway, if the power fluctuations occurred the proposed project would import from the grid. The calculation as follows:

$$PE_{GR1,y} = EF_{EG,GR,y} \cdot EL_{PJ,imp,y} \quad (38)$$

Where:

PEGR1<sub>y</sub> = Emissions during the year y due to grid electricity imports to the project site (tCO<sub>2</sub>)

EL<sub>PJ,imp,y</sub> = Project electricity imports from the grid in year y (MWh)

EF<sub>EG,GR,y</sub> = Grid emission factor in year y (tCO<sub>2</sub>/MWh)

#### Determination of PEGR2<sub>y</sub>

The amount of electricity generated on-site in the baseline not exceeds the amount of electricity generated in the project scenario, then the **PEGR2<sub>y</sub>** should be unaccounted as project emissions (as no electricity generated on-site in the baseline).

### Determination of $PE_{TR,y}$

The most part of biomass residues of this project are generated from nearby sugar factory, then it assumed no CO<sub>2</sub> emissions. However, the remained biomass need to transport from off-site source, the CO<sub>2</sub> emissions resulting from transportation of the biomass residues to the project plant are derived under “Project and leakage emissions from road transportation of freight” tool, version 01.0.0 (EB 63 Report Annex 10) with Option B. The equation is as follows:

$$\left. \begin{matrix} PE_{TR,m} \\ LE_{TR,m} \end{matrix} \right\} = \sum_f D_{f,m} \cdot FR_{f,m} \cdot EF_{CO_2,f} \cdot 10^{-6} \quad (40)$$

### Determination of $PE_{BR,y}$

The emissions from the combustion of biomass residues not to be included in the project scenario, then  $PE_{BR,y} = 0$ .

### Leakage

The emission from biomass residue transportations are already considered in the emission reduction of project activity already. Thus emissions due to leakage are zero ( $LE_y = 0$ ).

In summary, the calculation of emission reductions was correctly demonstrated by the PP according to the methodology ACM0006, version 12.1.1. The table below summaries validation team’s determination of emission reduction:

All assumptions made for estimating GHG are listed in the PDD	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	All the assumption made for the calculation of emission factor is listed in the Section B.4.
All data used by project participants are listed in the PDD	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	All the data used for the ex-ante emission reduction calculation by the project participants are listed in the section B.4, Section B.6.3 and Annex 3 of PDD
Their references and sources are also listed in the PDD	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The reference and sources are listed in the PDD
Formulas, parameters, values are complete, accurate, transparent and conservative	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	All formula and reference are correctly used and quoted.
All the references and documents used are correctly quoted and conservatively interpreted in the PDD	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	All formula and reference are correctly used and quoted.
Methodology has been applied correctly to calculate project emissions, baseline emissions, leakage emissions and emission reductions	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The methodology (i.e. ACM0006, version 12.1.1) has been correctly applied to calculate project emissions, baseline emissions, leakage emissions and emission reductions. Please also see above descriptions in this section
All the emissions of baseline emissions can be replicated using information provided in the PDD	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	All the emissions of baseline emissions can be replicated

Based on the calculations and results presented in the sections above the implementation of the project activity will result in an average ex-ante estimation of emission reduction conservatively calculated to be 96,035 tCO<sub>2</sub>e per year for the selected crediting period.

All assumptions and data used by the project participants are listed in the PDD and/or supporting documents, including their references and sources. All documentation used by the project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD. All values used in the PDD are considered reasonable and conservative in the context of the proposed CDM project activity. The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions. All estimates of the baseline, project and leakage emissions can be replicated using the data and parameter values provided in the PDD.

### 3.5 Additionality :

The project applies the “Tool for demonstration and assessment of additionality” version 06.0.0 to demonstrate additionality.

The data, rationales, assumptions, justifications and documentation provided by the project participants are reliable and credible to the demonstrated additionality.

The validation team was able to verify that CDM has been introduced and considered prior to the starting of the project

In conclusion, the assessment of the arguments presented in the PDD has been sufficient to demonstrate that the proposed project is not likely the baseline scenario and the emission reductions resulting from the project activity are additional

The following sections described how is the additionality of the project activity has been validated

#### 3.5.1 CDM consideration:

Starting date of project	Justification of and evidences (references) on the starting date of project	Date of CDM consideration
29/10/2010	The date of signed the letter of intent of Turbine Generator with the Shin Nippon Machinery Co. LTD., is the considered as the start date of the project activity.	09/02/2011 The date of intimation of the CDM consideration to UNFCCC & Host country DNA

In conclusion, the starting date of the project activity was after 02/08/2008 but before the date of publication of the PDD for global stakeholder process. The PP has intimated about their intention to seek CDM for this project to Thailand DNA and UNFCCC within 6 months of the start date of the project and hence it is inline with §2 of EB 62 annex 13. Hence, it is confirmed that the PP has seriously considered CDM benefit for the implementation of the project activity.

#### 3.5.2 Alternatives:

As prescribed in the methodology ACM0006/, the following alternatives are identified: The list of alternative scenarios to the project activity that are in compliance with current laws and regulations in Thailand are:

- For power generation: Scenario P7;
- For heat generation: Scenario H6;
- For biomass residue use: Scenario B4

The both the alternatives are consistent with mandatory laws and regulations of Thailand. There is no mandate to set up biomass based cogeneration projects nor is it a legal requirement.

TÜV Rheinland validation team considers the selected baseline is credible and complete.

#### 3.5.3 Investment analysis:

The Investment Analysis has been assessed for compliance with the latest version (ie., version 05) of the “Guidance on the Assessment of Investment Analysis”.

The investment analysis is done in accordance with the stepwise approach provided in the “Tool for the demonstration and assessment of additionality” version 06.0.0

##### 3.5.3.1 Choice of approach:

The “tool for the demonstration and assessment of additionality” (Version 06.0.0) recommends three analysis methods: simple cost analysis, investment comparison analysis and benchmark analysis. The proposed project produces economic benefits through the sales of electricity other than CDM related income; therefore, the simple cost analysis can not be taken. The investment comparison analysis is not applicable to the proposed project because the alternative of the proposed project is outside the direct control of the PP.

As per Annex 05 of EB 62, the benchmark approach is suited to circumstances where the baseline does not require investment or is outside the direct control of the project developer, i.e. cases where the choice of the developer is to invest or not to invest. In the project activity the baseline scenario is the generation of equivalent amount of electricity from the grid connected power plants.

The baseline scenario is outside the direct control of the PP. Hence, the benchmark analysis is chosen and the Post Tax Equity IRR is used as the financial indicator to assess the financial viability of the project activity.

### **Benchmark selection:**

The PP has calculated the Benchmark Required/Expected returns on equity using the standard, popular paradigm, the Capital Asset Pricing Model (CAPM). This model postulates a linear relationship between an asset's 'beta', a measure of systematic risk, and expected return.

Cost of Equity: The cost of equity has been determined based upon the Capital Asset Pricing Model (CAPM)

$$CoE = r_f + \beta(ERP)$$

Where:

CoE = cost of equity

$r_f$  = risk free rate

ERP = equity risk premium for the market

$\beta$  = Beta or systematic risk for this type of equity investment coefficient reflecting the volatility (risk) of the stock relative to the market

Yield to Maturity (YTM) is considered as the yield on the Thailand BMA Government Yield Curve for the period of 20 years corresponding to the time period of financial assessment. This works out 3.87% for the project activity as on 30/07/2010 at the time of investment decision<sup>2</sup>.

Capital Asset Pricing Model (CAPM) provides the framework for computing risk premium. Risk premium, or market risk premium as it is commonly known as is the difference between the market return and the risk free return (YTM on Government Securities). As required by CAPM, market Index representing a widely diversified portfolio which is SET 50 Total Return Index (Set 50 TRI) has been selected to compute the market return. The base value of SET 50 TRI index is considered as 1000 as on 02/01/2002. The return on SET 50 TRI index has been computed from 02/01/2002 till 30/07/2010 the at the time of investment decision date for the project activity. This return works out to 18.09% for the project activity.

Based on the market return arrived at as explained above and the risk free return, the market risk premium works out to be 14.22% for the project activity.

The risk of the project type has been computed using Beta. Beta has been computed by regressing the returns of the Industry Group and Sector Indices Resources which represent the Stocks in Energy Sector with the returns of the SET 50 TRI Index

The cost of equity is obtained by adding the risk premium reflecting the risk of the project type to the government bond rates which works out to 19.23%.

### **Calculation and comparison of financial indicators**

The calculation of the equity IRR is based on the project cash inflows from sale of electricity to grid and third party and steam to adjacent third party, the project cash outflows related to cost of operation and maintenance of the plant, fuel cost, etc., which minus any interest and debt repayments. All these costs are in line with industry standards. Detail and data parameters used for the analysis are given in table below

Assumption	Value	Unit	DOE Assessment
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<sup>2</sup> <http://www.thaibma.or.th/yieldcurve/YieldTTM.aspx>

Plant operation	240	days/year	The plant operating days is based on the operating days considered in the Feasibility report which was available at the time of investment decision. Since the FSR is prepared by third party the value considered in the project activity is appropriate		
Working days during Crushing	150	days/year	The working days during crushing is based on the crushing days mentioned in the Feasibility report which was available at the time of investment decision. Considering the season days of sugar mills in Thailand 150 days of crushing days is considered to be appropriate.		
Working days during Remelting	45	days/year	The working days during remelting is based on the crushing days mentioned in the Feasibility report which was available at the time of investment decision. The working day is verified and found to be appropriate.		
Plant Load Factor	80%		The Plant load factor is based on the feasibility report which was available at the time of investment decision. Since the FSR is prepared by third party agency the PLF considered in the project is in line with EB 48, annex 11. Hence the PLF considered is deemed acceptable..		
Fuel Consumption at On-season (Full Capacity)	60,153.78	kg/hr	The fuel consumption is based on the feasibility report which was available at the time of investment decision. The fuel consumption is arrived based on the efficiency of the power generation. The fuel consumption is during season and off season is calculated based on the steam and power generation during the respective season. The same is checked and found to be in acceptable limit. Hence the fuel consumption considered in the financial calculation is appropriate.		
Fuel Consumption at Off-season	57,496.98	kg/hr			
Electricity Exported to the grid	145.6	GWh	The electricity exported to grid is calculated based on the surplus electricity availability during season and non-season time. The surplus electricity is calculated based on the production capacity and third party demand provided in the DPR		
			Crushing	Remalting	Off-season
			216.00 GWh	64.80 GWh	64.80 GWh
			The total surplus of 146.6 GWh which will be exported to grid is correct and appropriate for the financial calculation		



Tariff	2.58	BHT/kWh	<p>The tariff is based on the tariff provided in the Provincial Electricity Authority (PEA) of Thailand which was available at the time of investment decision.</p> <p>(<a href="http://www.eppo.go.th/power/data/index.html">http://www.eppo.go.th/power/data/index.html</a>)</p> <p>Since there is no source available at the time of investment decision for the third-party sale, the PP has considered the same EGAT sale price of 2.58 BHT/kWh is taken for the electricity that are sold to third party also.</p> <p>Hence the tariff considered for the electricity sell to EGAT as well as electricity sold to third party is seems to be appropriate for the project activity.</p>
Tariff pricing subsidy	0.30 (7 years as from the Commercial Operation Date (COD) )	BHT/kWh	<p>The tariff pricing subsidy is based on the Adder Rates for VSPPs which was available at the time of investment decision. The adder policy of VSPP is verified and found that the value considered in the project is correct.</p>
Total Investment	2,270,000,000	BHT	<p>The total investment is based on the feasibility report available at the time of investment decision. The purchase orders of the project is verified and found that the actual project cost is within 10% limit of the cost considered in the financial calculation.</p> <p>Since the investment cost considered is based on the FSR prepared by third party agency and it is comparable with the actual project cost, the cost considered is appropriate and acceptable.</p>
Operation and maintenance expenses	102,150,000	BHT/year	<p>The operation &amp; maintenance expense is based on the feasibility report which was available at the time of investment decision. Since the FSR is prepared by third party the O&amp;M cost considered in the FSR is appropriate for this project activity.</p>
Tax rate	30%		<p>The tax rate is based on the Thailand tax regulation</p> <p><a href="http://www.rd.go.th/publish/6044.0.html">http://www.rd.go.th/publish/6044.0.html</a>. Hence the tax rate considered is correct and appropriate.</p>
Project life time	20	Years	<p>The life time is based on the FSR which was available at time of investment decision. Considering the average biomass plant life time in Thailand the project life time considered is seems to be appropriate.</p>

Post Tax Equity IRR for the given project activity comes out to be 14.72% against the benchmark value of 19.23%. Thus, it is evident that the project is not financially attractive.

### 3.5.3.2 Sensitivity analysis

The robustness of the conclusion drawn above, namely that the project is not financially attractive, has been tested by subjecting critical assumptions to reasonable variation. As required by Annex 05 of EB 62, only variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation. PPs have identified the total revenue from the project activity is dependent on the Plant Load Factor & Steam Revenue & Tariff and Project Cost, O&M Costs & Fuel Cost constitute more than 20% of the project costs. These three factors have been subjected to a 10% variation on either side and the results of the sensitivity analysis so conducted are given in the following tables.

**Table 7: Sensitivity Analysis**

Factors	-10%	0%	+10%
Plant Load Factor	11.82%	14.72%	17.56%
Project Cost	17.71%	14.72%	12.17%
Fuel Cost	15.53%	14.72%	13.90%
Steam Cost	14.05%	14.72%	15.38%
Tariff	11.75%	14.72%	17.56%
O&M Cost	15.41%	14.72%	14.03%
Benchmark	19.23%		
With CDM	13.90%		

The validation team thus confirms that the sensitivity analysis is in accordance with the “Tool for demonstration and assessment of additionality” version 06.0.0” and “Guidelines on the assessment of investment analysis” version 05. All input parameters used for sensitive analysis constitute more than 20% of either total project costs or total project revenues. The justifications provided by the PP with the variations of these parameters are been analysed, clarified and accepted by the DOE.

### 3.5.4 Barrier analysis

No barrier is justified by PP

### 3.5.5 Common practice analysis

There are 3 other large scale grid based bagasse cogeneration plants that are registered as the CDM project as they are all face with the financial investment return (Table 5) –Dan Change and Phu Khieo undertaken by the Mitr Phol Group. Khon Kaen Sugar Power Plant undertaken by Khon Kean Sugar Industry Public Co., Ltd, which registered in July 2007. The current project which was passed the process of CDM project approval of Thailand by Thailand Greenhouse Gas Management Organization (TGO)<sup>3</sup> and still on the process of DOE consideration is Surin Electricity Company Limited. As the statistic of the TGO and Energy Policy and Planning Office (EPPO)<sup>4</sup>, Ministry of Energy, Royal Thai Government shown that almost large scale power plant need the subsidy, adder or support cost from outsider.

**Table : Biomass-based (bagasse) power plant in Thailand**

Projects	Fuel	Installed Capacity	Status
Dan Chang Bio-Energy Cogeneration Project (DCBC)	Bagasse	48	Registered as CDM Project
Phu Khieo Bio-Energy Cogeneration Project (PKBC)	Bagasse	56.9	Registered as CDM Project

<sup>3</sup> Lis of the CDM Projects which are currently being analyzed by Thailand by Thailand Greenhouse Gas Management Organization (Public Organization) (TGO). [http://www.tgo.or.th/english/index.php?option=com\\_content&view=section&id=6&Itemid=56](http://www.tgo.or.th/english/index.php?option=com_content&view=section&id=6&Itemid=56)

<sup>4</sup> Energy Statistic of Thailand 2010. The Energy Policy and Planning Office (EPPO), Ministry of Energy. <http://www.eppo.go.th/info/YearBook/EnergyStatisticsofTHAILAND2010.pdf>



Khon Kaen Sugar Power Plant	Bagasse	30	Registered as CDM Project
Surin Electricity Company Limited	Bagasse	30	Applying for CDM Project

All the data are verified and found to be correct. Hence the project is not a common practice in the project region

### 3.5.6 Conclusion of assessment of Additionality

The CDM was seriously considered by the PP. The evidences were transparently reviewed by the validation team and considered to be effective. Investment analysis and sensitivity analysis clearly demonstrate that the proposed project activity is financially unattractive. Common practice analysis was carried out showing that the proposed project activity is financially unattractive. Therefore, the proposed project activity is not business-as-usual, i.e. the proposed project activity is additional.

## 3.6 Monitoring

The project monitoring plan is in compliance with the monitoring methodology ACM0006, version 12.1.1. It is DOE's opinion that the project participant is able to implement the monitoring plan.

### 3.6.1 Parameters determined ex-ante

As described in the PDD following are the parameters required;

1. Biomass residues categories and quantities used for the selection of the baseline scenario selection and assessment of additionality
2. CAPHG,h = Baseline capacity of heat generator h (GJ/h)
3. CAPEG,CG,i = Baseline electricity generation capacity of heat engine i (MW)
4. CAPEG,PO,j = Baseline electricity generation capacity of heat engine j (MW)
5. LFCHG,h = Baseline load factor of heat generator h (ratio)
6. Grid emission factor in year y
7. Net calorific value of biomass residue (bagasse) of category n in year y
8. CO<sub>2</sub> emission factor of the most carbon intensive fossil fuel used in the country
9. Default CO<sub>2</sub> emission factor for freight transportation activity f

The validation team confirms that all relevant parameters have been sufficiently considered and the values of the parameters are real, measureable and conservative.

### 3.6.2 Parameters monitored ex-post

According to the methodology ACM0006, version 12.1.1, the parameters required for the this project to be monitored is:

Sl. No.	Parameters	Description
1.	Biomass residues categories and quantities used in the project activity	- Type, - Source, - Fate, - Use in the project scenario - Quantity
2.	For biomass residues categories for which scenarios B1:, B2: or B3: is deemed a plausible baseline alternative, project participants shall demonstrate that this is a realistic and credible alternative scenario	- Quantity of available biomass residues of type n in the region - Quantity of biomass residues of type n that are utilized in the defined geographical region - Availability of a surplus of biomass residues type n (which cannot be sold or utilized) at the ultimate supplier to the project and a representative sample of other suppliers in the defined geographical region
3.	BRPJ,n,y	Quantity of biomass residues of category n used in the project activity in year y (tonnes on dry-basis)
4.	BRB1/B3,n,y	Quantity of biomass residues of category n used in the

		project activity in year $y$ for which the baseline scenario is B1: or B3: (tonnes on dry basis)
5.	BRB5/B8,n,y	Quantity of biomass residues of category $n$ used in the project activity in year $y$ , for which the baseline scenario is B5:, B6:, B7: or B8: (tonnes on dry-basis)
6.	BRTR,y	Quantity of biomass residues that has been transported to the project site during the year $y$ (tonnes of dry matter)
7.	Df,m	Return trip road distance between the origin and destination of freight transportation activity $f$ in monitoring period $m$
8.	FRf,m	Total mass of freight transported in freight transportation activity $f$ in monitoring period $m$
9.	EFCO2,LE	EFCO2,LE = CO2 emission factor of the most carbon intensive fossil fuel used in the country (tCO2/GJ)
10.	ELPJ,gross,y	Gross quantity of electricity generated in all power plants which are located at the project site and included in the project boundary in year $y$ (MWh)
11.	ELPJ,imp,y	Project electricity imports from the grid in year $y$ (MWh)
12.	ELPJ,aux,y	Total auxiliary electricity consumption required for the operation of the power plants at the project site in year $y$ (MWh)
13.	NCVBR,n,y	Net calorific value of biomass residue of category $n$ in year $y$ (GJ/tonne on dry-basis)
14.	Moisture content of the biomass residues	Moisture content of each biomass residues type $k$
15.	LOC <sub>y</sub>	Length of the operational campaign in year $y$ (hour)

The measurement and calculation methods given in the PDD is verified and found it is correct and inline with the methodology requirements. In summary, the validation team is convinced of compliance of the monitoring plan with the requirements of the monitoring methodology of ACM0006, version 12.1.1. During the on-site assessment, the validation team interviewed the PP also confirmed that the monitoring arrangements described in the monitoring plan are feasible within the project design. The emission reductions resulting from the proposed CDM project activity can be reported ex post and verified.

### 3.6.3 Management system and quality assurance

The project owner appoints trained technicians for operation and maintenance of Monitoring equipment which is also responsible for management of monitoring and reporting of the project. The management team for monitoring of the project is identified in the PDD.

Detailed procedures have been developed in the PDD as follows:

- Monitoring organization;
- Monitoring equipment and installation;
- Data collection and QA/QC;
- Training of monitoring personals
- Calibration;
- Data management;
- Monitoring.

The monitoring arrangements described in the monitoring plan of the PDD have been assessed by the validation team, by means of documentation review, interviewing with the representative from the project owner and on-site observation. On that basis the effective implementation of the monitoring plan is considered feasible.

In conclusion, it is the validation team's opinion that the monitoring, management & quality assurance plan of the bundled project identified in the PDD is in compliance with the requirements of the methodology ACM0006, version 12.1.1.

### 3.7 Sustainable Development

The DNA of Thailand as host country, i.e. Ministry of Natural resource and Environment, Thailand issued the LoA of the project in 19/10/2012/. It is stated in the LoA that the “Grid-connected Biomass Power Plant at Takli District of Nakhon Sawan Province in Thailand” assists Thailand in achieving sustainable development. The validity of the LoA from Thailand has been assessed by the validation team in the section 3.1.1.

### 3.8 Environmental Impacts

The validation team concludes that the environmental impact by the project activity is been assessed by the project proponent and the same is stated in the PDD. Since the project uses biomass residue from sugar mill and water for steam generation, it does not produce significant environmental impacts. To confirm the impact associated with the project proponent, the validation team has physically inspected during the on-site visit and also through conducting the relevant stakeholders. It is validation team’s opinion that the project activity does not cause the adverse environmental impacts and there are no regulations or requirement by the host country to conduct the EIA for the project activity. The same is confirmed from the MOEF website (The Enhancement and Conservation of the National Environmental Quality Act B.E. 2535 (NEQA 1992)”; [http://www.pcd.go.th/info\\_serv/en\\_reg\\_envi.html](http://www.pcd.go.th/info_serv/en_reg_envi.html))

### 3.9 Local Stakeholder Consultation

TUV Rheinland considers the local stakeholder consultation carried out adequately. The local stakeholder consultation was carried on September of 2011 and consist of 2 parts;

1. **Public participation meeting of household level**, which settle within a radius of 7 kilometers around the project site, cover 17 villages of 4 sub-districts of Nakorn Sawan and 4 villages of Chainat province.
2. **Public participation meeting of 7 groups** of stakeholder 5 kilometers around the project who had a direct impact from the project activities such as local government office, educational institute, NGOs, mass media and villager.

The stakeholders meeting have resulted with some comments. All the comments are just clarification request by stakeholders and the same is answered by the project participants. No negative comments raised by the PP. These are confirmed through the minutes of meeting/ and through interview/ with the stakeholders during the site visit.

### 3.10 Comments by Parties, Stakeholders and NGOs

The PDD version 01 of “01/03/2012” was made publicly available on (<http://cdm.unfccc.int/Projects/Validation/DB/ONGF6E013RBLW0KWI7XKEDKIC3XU4J/view.html>) from 29/04/12 – 28/05/2012 in order to invite comments from public stakeholders. No comment was received

## Appendix A

### CDM Validation Protocol

Grid-connected Biomass Power Plant at Takli District of Nakhon Sawan Province in Thailand

In

Thailand

Report No. 01 997 9105069848

**Table 1: Validation requirements**

(based on § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual version 1.2)

Checklist question	Ref.	MoV5	Findings, comments, references, data sources	Draft conclusion	Final conclusion
<b>1. Approval(VVM V E.1)</b>					
1.1 Have Letters of Approval have been provided from all involved Parties? <i>If yes, indicate: when and by which Party the LoA has been issued, with a clear reference to the LoA itself and any supporting documentation; whether the LoA was provided to the DOE by the project participants or directly by the DNA; the means of validation employed to assess the authenticity of the document; and By a clear statement, that the DOE considers the LoA to be valid.</i>	/unfccc/ /P01/	DR,I	Approval from All the parties involved in the project activity is not submitted. Hence CAR-01 is raised	<del>CAR-01</del>	OK
1.2 Are all Parties, who issued the LoA, Parties to the Kyoto Protocol and are this, stated in the LoA?	/unfccc/ /P01/	DR,I	Approval from All the parties involved in the project activity is not submitted. Hence CAR-01 is raised	<del>CAR-01</del>	OK
1.3 Is every LoA from the Parties involved issued by an organisation listed as Designated National Authority (DNA) on the UNFCCC web site? <i>Indicate the official name of the DNA and contact person name.</i>	/unfccc/ /P01/	DR,I	Approval from All the parties involved in the project activity is not submitted. Hence CAR-01 is raised	<del>CAR-01</del>	OK
1.4 Is the participation in the CDM project activity voluntary and is this stated in all LoAs? <i>Indicate the source of proof.</i>	/unfccc/ /P01/	DR,I	Approval from All the parties involved in the project activity is not submitted. Hence CAR-01 is raised	<del>CAR-01</del>	OK
1.5 Is the LoA unconditional with respect to 1.2 to 1.4?	/unfccc/ /P01/	DR,I	Approval from All the parties involved in the project activity is not submitted. Hence CAR-01 is raised	<del>CAR-01</del>	OK
1.6 Is the title of the CDM project activity as given in	/unfccc/	DR,I	Approval from All the parties involved in the	<del>CAR-01</del>	OK

<sup>5</sup> MoV = Means of Validation, DR = Document Review, I = Interview, www = internet search.

the PDD identical with the title given in all LoAs and Modalities of Communication? <i>Provide Yes/No answer, and include details into Tables 2, 3 and 4 accordingly.</i>	/P01/		project activity is not submitted. Hence CAR-01 is raised		
1.7 If any of provided LoAs contains additional specification of the CDM project activity (PDD version number, validation report version number, amount of ER, etc.) are those specifications valid and consistent with other documents?	/unfccc/ /P01/	DR,I	Approval from All the parties involved in the project activity is not submitted. Hence CAR-01 is raised	<del>CAR-01</del>	OK
1.8 Does the project activity involve any public funding from Annex I Parties? If yes, has Annex I Party provided a written confirmation that the use of such funding does not lead to the diversion of the official development assistance.	/unfccc/ /P01/	DR,I	No the project does not involve any public funding.	OK	OK
1.9 Is the MOC provided in line with the latest template available from the UNFCCC	/unfccc/ /P01/	DR,I	Approval from All the parties involved in the project activity is not submitted. Hence CAR-01 is raised	<del>CAR-01</del>	OK
1.10 Is MOC correctly filled and signed by authorized signatories identifying the focal point?	/unfccc/ /P01/	DR,I	Approval from All the parties involved in the project activity is not submitted. Hence CAR-01 is raised	<del>CAR-01</del>	OK
1.11 Is the written confirmation obtained by the PP's stating the authorization, specimen signatures and personal details are valid and accurate?	/unfccc/ /P01/	DR,I	Approval from All the parties involved in the project activity is not submitted. Hence CAR-01 is raised	<del>CAR-01</del>	OK
<b>2. Participation (VVM V E.2)</b>					
2.1 Are the Parties and project participants (PP) listed in the section A.3 of the PDD correctly and is this information consistent with the contact details provided in Annex 1 of the PDD?	/P01/	DR	Yes, PPs listed in the section A.3 of the PDD are Kaset Thai Bio Power Co., Ltd., Arcadia Energy (Suisse) S.A & Quality Carbon Assets AG. which are correct and consistent with the contact details provided in the Annex 1 of the PDD.	OK	OK
2.2 Has every Party involved approved the participation of each corresponding PP, either by means of a LoA or by a separate written document?	/unfccc/ /P01/	DR,I	Approval from All the parties involved in the project activity is not submitted. Hence CAR-01 is raised	<del>CAR-01</del>	OK

<i>Indicate Yes / No answer and describe all inconsistencies in the Tables 2, 3 and 4 accordingly.</i>					
2.3 Do all participating Parties fulfil the participation requirements as follows: a) Party has ratified the Kyoto Protocol b) Party has designated a Designated National Authority c) The assigned amount has been determined	/unfccc/ /P01/	DR,I	Approval from All the parties involved in the project activity is not submitted. Hence CAR-01 is raised	<del>CAR-01</del>	OK
2.4 Do the letters of approval meet the following requirements? a) LoA confirms that Party has ratified the Kyoto Protocol b) LoA confirms that participation is voluntary c) The LoA confirms that the project contributes to the sustainable development of the host country? d) The LoA refers to the precise project activity title in the PDD  <i>In case of doubt regarding the authenticity of the letter of approval, describe how it was verified that the letter of approval is authentic</i>	/unfccc/ /P01/	DR,I	Approval from All the parties involved in the project activity is not submitted. Hence CAR-01 is raised	<del>CAR-01</del>	OK
<b>3. Project Design Document (VVM V E.3)</b>					
3.1 Is the PDD presented for validation based on the latest template available at the UNFCCC website? <i>Indicate Yes / No answer and describe all inconsistencies in the Tables 2, 3 and 4 accordingly.</i>	/unfccc/ /P01/ /B6/	DR www	Yes, the PDD applies the latest Project Design Document Form (CDM-PDD) version 03, 28 July 2006 ( <a href="http://cdm.unfccc.int/Reference/PDDs_Forms/PDDs/PDD_form04_v03_2.pdf">http://cdm.unfccc.int/Reference/PDDs_Forms/PDDs/PDD_form04_v03_2.pdf</a> ).	OK	OK
3.2 Has the PDD been established in accordance with the CDM requirements for completing PDDs issued by the CDM EB?	/unfccc/ /P01/ /B6/	DR www	Yes, the PDD has been established in line with Guidelines for Completing Project Design Document (CDM-PDD) and the Proposed New Baseline and Monitoring Methodologies (CDM-NM), version 07, issued by the CDM EB.	OK	OK
<b>4. Project Description (VVM V E.4)</b>					
4.1 Does the PDD contain a description, which provides	/P01/	DR	The clear description of project activity is not	<del>CAR-03</del>	OK



<p>the reader with a clear understanding of the precise nature of the project activity and the technical aspects of its implementation?</p> <p>4.1b) Is the description (incl. any process flow-charts, Spreadsheets etc.) complete, coherent and consistent with the provisions of the monitoring plan?</p> <p>4.1c) Is the project's location clearly defined?</p>			provided in section A.4.3. Hence CAR-03 is raised		
<p>4.2 In the case of greenfield project activity, is the project design described sufficiently by means of specifications, drawings and manuals?</p> <p><i>Provide Yes/No answer and indicate the documents which have been reviewed in relation to the issue.</i></p>	/P01/	DR	The clear description of project activity is not provided in section A.4.3. Hence CAR-03 is raised	CAR-03	OK
<p>4.3 Does the project activity reflects current good practices, uses state of the art technology or would the technology result in a significantly better performance, than any commonly used technologies in the host country?</p> <p><i>Provide the description of how validation has been carried out and what comparisons have been made.</i></p>	/P01/	DR	The clear description of project activity is not provided in section A.4.3. Hence CAR-03 is raised	CAR-03	OK
<p>4.4 In cases where the project activity involves the alteration of an existing installation or process, does the PDD provide a clear description of the differences between the project and the pre-project scenario?</p> <p><i>Please, provide Yes/Now answer and update Tables 2, 3 and 4 accordingly, if there is anything unclear in the provided description.</i></p>	/P01/	DR	No, the project is green field power project. Hence not applicable	OK	OK
<p>4.5 What type is the project?</p> <p>i) Project in existing facility or utilizing existing equipment(s)</p> <p>ii) Project is either a large scale project or a non-bundled small scale project with emission reductions exceeding 15 000 tCO<sub>2</sub>e per year. In this case, a site visit must be performed.</p>	/P01/	DR	The project is green field large scale project activity where the emission reduction is exceeding 15,000 tCO <sub>2</sub> e per year.	OK	OK



<p>iii) Project is a bundled small scale project, with each project in the bundle with emission reductions not exceeding 15,000 tCO<sub>2</sub>e per year. In such case the number of physical site visits may be based on sampling, if the sampling size is appropriately justified through statistical analysis.</p> <p>iv) The project is an individual small scale project activity with emission reductions not exceeding 15 000 tCO<sub>2</sub>e per year. In this case, DOE may not conduct a physical site visit as appropriate.</p> <p>v) Greenfield project</p>					
<p>4.6 How was the design of the project assessed?</p> <p>i) Physical site inspection</p> <p>ii) Reviewing available designs and feasibility studies</p> <p><i>If a physical site inspection is not undertaken, justify why no site visit was undertaken:</i></p>	/P01/	DR	The project design was assessed through physical site inspection as well as review of feasibility study report.	OK	OK
<p>4.7 Does the project qualify as a small scale CDM project activity as defined in paragraph 6(c) of decision 17/CP.7 on the modalities and procedures for the CDM?</p>	/P01/	DR	Not applicable as the project is large scale project activity	OK	OK
<p>4.8 Is the small scale project activity a debundled component of a larger project activity in accordance with the rules defined in appendix C of the simplified modalities and procedures for small-scale CDM project activities?</p> <p><i>A proposed small-scale project activity shall be deemed to be a debundled component of a large project activity if there is a registered small-scale CDM project activity or an application to register another small-scale CDM project activity:</i></p> <p><i>(a) With the same project participants;</i></p> <p><i>(b) In the same project category and technology/measure; and</i></p> <p><i>(c) Registered within the previous 2 years; and</i></p>	/P01/	DR	Not applicable as the project is large scale project activity	OK	OK

<i>(d) Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point?</i>					
<b>5. Baseline and Monitoring methodology(VVM V E.5)</b>					
<b>5.1 General requirements</b>					
<p>5.1.1 Is the methodology used in the project activity approved by the CDM EB and is the selected version still valid?</p> <p><i>If during the course of validation the originally applied version of the methodology expires, a CAR shall be raised in Table 3 of the validation protocol. Any new requirements of the revised version of the methodology not yet validated in Table 2 of the validation protocol shall be validated in Table 3 as part of the assessment of the CAR raised.</i></p>	/P01/ /B2/	DR	PP has applied the approved consolidated methodology ACM0006, version 12.0.1. which is valid while submitting to the validation. No updated version is available at the time of validation. DOE has confirmed this through UNFCCC website.	OK	OK
<b>5.2 Applicability of the selected methodology</b>					
<p>5.2.1 Does the project activity qualify under the criteria for small-scale CDM project activities set out in § 6 (c) of decision 17/CP.7 and Annex II of the Modalities and Procedures for the CDM?</p> <p><i>Please provide Yes/No response and description of how this was validated.</i></p> <p><i>In case of calculated emission reductions varying over time, SSC-applicability limits must be met for every single year in any of the max. 3 subsequent crediting periods.</i></p> <p>5.2.1a) If the project applies a small-scale methodology, does the project also comply with the general guidelines to SSC CDM methodologies, which provides guidelines on equipment capacity, equipment performance/lifetime, baseline identification for type-II/III Greenfield project activities, sampling and other monitoring-related issues?</p>	/P01/	DR	Not applicable as the project is large scale project activity	OK	OK
5.2.1.1 If yes, does the PDD extensively demonstrates	/P01/	DR	Not applicable as the project is large scale	OK	OK

and confirms that the small-scale project activity is not a debundled component of a larger project? <i>Please indicate Yes/No answer. In case of positive conclusion provide details of the validation measures taken and data found during the procedure. Otherwise amend the Tables 2, 3 and 4 accordingly.</i>			project activity		
5.2.2 Are all applicability conditions of the selected baseline and monitoring methodology and all tools involved satisfied by the project activity? <i>Please indicate Yes/No answer. In case of positive conclusion provide details of the validation measures. Otherwise amend the Tables 2, 3 and 4 accordingly.</i>	/P01/ /B2/	DR	All the applicability criteria of ACM 0006, version 12.0.1 is not justified. Hence CAR-04 is raised	<del>CAR-04</del>	OK
5.2.3 Is the selection of the applied baseline and monitoring methodology justified?	/P01/ /B2/	DR	<p>All the applicability criteria of ACM 0006, version 12.0.1 is not justified. Hence CAR-04 is raised also the following clarification is requested CL-05:</p> <p>Point 2 of the applicability condition says “For projects that use biomass residues from a production process (e.g. production of sugar or wood panel boards), the implementation of the project does not result in an increase of the processing capacity of raw input (e.g. sugar, rice, logs, etc.) or in other substantial changes (e.g. product change) in this process”</p> <p>But from the explanation mentioned in the section A.2 and from the verification of minutes of TIS group special meeting convened on 20<sup>th</sup> June 2010, it is apparent that the cogeneration plant is installed only because of the expansion in the sugar production.</p> <p>Please clarify how the project activity satisfies the point no 2 of the applicability</p>	<del>CAR-04</del> <del>CL-05</del>	OK

			condition in the methodology		
5.2.4 Is the selected methodology correctly quoted in all related documents?	/P01/ /B2/	DR	Yes, the selected methodology and tool used in the project activity are correctly quoted	OK	OK
5.2.5 Does the PDD sufficiently describe all the GHG emission sources or sinks occurring as a result of project activity, which have not been accounted for under the selected methodology and are expected to contribute more than 1% of the overall expected average annual emission reductions? <i>Provide Yes/No answer. Indicate the sources or sinks of GHG, which were proved to be negligible. Otherwise amend the Tables 2, 3 and 4 accordingly.</i>	/P01/ /B2/	DR	As per the PDD proposed project activity displaces the electricity from the grid there by reduces the CO <sub>2</sub> emissions otherwise been released from the fossil fuel based grid connected power plants. This is in compliance with the selected baseline methodology ACM0006. No other GHG emission sources or sinks occurring as a result of project activity. PDD sufficiently described and accounted the baseline CO <sub>2</sub> emission reductions occurred due to the project activity in section B.4.	OK	OK
<b>5.3 Project boundary</b>					
5.3.1 Does the PDD correctly describe the project boundary? Are they clearly defined and in accordance with the methodology? <i>Provide Yes/No answer. And amend the Tables 2, 3 and 4, if needed.</i>	/P01/ /B2/	DR	The following issue is raised: CL-06: Section B.3 of PDD: 1. The description on the project boundary is not inline with the methodology requirement. 2. The description mentioned in the section is not project specific; it is very generic 3. Please clarify why power plants & boilers that are installed in EPPCO, EPC & KTIS are not included in the project boundary	CL-06	OK
5.3.2 Does the PDD correctly indicate and describe the emission sources and sinks of GHG gases that are included in the project boundary?	/P01/ /B2/	DR	Yes, the PDD correctly indicate and describe the emission source and sink of GHG gases that are included in the boundary	OK	OK
5.3.3 In cases where the methodology allows project participants to choose whether a source or gas is to be included in the project boundary, is the choice explained and justified by PPs?	/P01/ /B2/	DR	Yes, methodology allows PP to choose the source or gas to be included. The same is justified in this PDD	OK	OK

5.3.4 Does the project involve other emissions sources not foreseen by the methodologies that may question the applicability of the methodology? Do these sources contribute with more than 1% of the estimated emission reductions of the project?	/P01/ /B2/	DR	No such emission sources are expected in the proposed project activity that deviates the project from the applicability of the methodology	OK	OK
<b>5.4 Baseline identification</b>					
5.4.1 Has the procedure contained in the selected methodology to identify the most reasonable baseline scenario been applied correctly and documented in the PDD?	/P01/ /B2/	DR	<p>Subject to closure of the following issues: CAR-07 Section B.4 of PDD: The steam &amp; electricity generated in the project activity will be supplied to the industries EPPCO, EPC &amp; KTIS. But not considering the power plants and boilers installed in the industries for the baseline identification is not correct.</p> <p>CAR-08: Section B.4 of PDD: The fate of biomass in the absence of the project activity is not consistently mentioned in the section During the site visit discussion and from verification of other sections of the PDD, it is very clear that biomass for this project activity is procured from the identified sugar plants KTIS &amp; RS. But the identified baseline scenario for the fate of biomass in the baseline scenario is 'B8: unidentified' with is not appropriate.</p> <p>CAR-09: Section B.4 of PDD: 1. No explanation is provided on how the alternative 1 is eliminated 2. As per applicability condition of ACM0012, the baseline of heat should be</p>	<del>CAR-07</del> <del>CAR-08</del> <del>CAR-09</del>	OK

			Scenarios H2: to H7:, or a combination of any of those scenarios. But identified baseline scenario of heat for this project activity is H1. Clarify how this project satisfy the above mentioned applicability condition.		
5.4.1.1 Is the identified baseline scenario plausible?	/P01/ /B2/	DR	Subject to closure of CAR-07, CAR-08 & CAR-09	<del>CAR-07</del> <del>CAR-08</del> <del>CAR-09</del>	OK
5.4.1.2 Are all assumptions stated in a transparent and conservative manner?	/P01/ /B2/	DR	Subject to closure of CAR-07, CAR-08 & CAR-09	<del>CAR-07</del> <del>CAR-08</del> <del>CAR-09</del>	OK
5.4.2 Does the selected methodology require the use of tools and does PDD reflects that correctly?	/P01/ /B2/	DR	Yes	OK	OK
5.4.2.1 Were all the tools applied correctly?	/P01/ /B2/	DR	Yes	OK	OK
5.4.3 In case the methodology requires several alternative scenarios to be considered in the identification of the most reasonable baseline scenario, have all scenarios been considered and have no reasonable alternative scenario been excluded?	/P01/ /B2/	DR	Subject to closure of CAR-07, CAR-08 & CAR-09	<del>CAR-07</del> <del>CAR-08</del> <del>CAR-09</del>	OK
5.4.3.1 Has the choice of the baseline scenario been done using conservative assumptions?	/P01/ /B2/	DR	Subject to closure of CAR-07, CAR-08 & CAR-09	<del>CAR-07</del> <del>CAR-08</del> <del>CAR-09</del>	OK
5.4.4 Is the identified baseline scenario reasonable according to the assumptions, calculations and rationales used in the PDD and other reference sources?	/P01/ /B2/	DR	Subject to closure of CAR-07, CAR-08 & CAR-09	<del>CAR-07</del> <del>CAR-08</del> <del>CAR-09</del>	OK
5.4.6 Does the PDD describe how the national and sectoral policies, macro-economic trends and political aspirations relevant to the baseline scenario have been identified and considered in	/P01/ /B2/	DR	Subject to closure of CAR-07, CAR-08 & CAR-09	<del>CAR-07</del> <del>CAR-08</del> <del>CAR-09</del>	OK



the PDD?					
5.4.7 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 project activity?	/P01/ /B2/	DR	Subject to closure of CAR-07, CAR-08 & CAR-09	<del>CAR-07</del> <del>CAR-08</del> <del>CAR-09</del>	OK
<b>5.5 Algorithm and/or formulae used to determine emission reductions</b>					
5.5.1 Are all calculations applied and documented according to the selected methodology and in a complete and transparent manner to calculate emission reductions from the project activity? 5.5.1b) Are correct units applied and consistency between parameter dimensions and parameter value ensured? <i>See also Question 4.1.b) with respect to consistency of parameter values between calculation spreadsheets and PDD.</i>	/P01/ /B2/	DR	Subject to closure of the following issue CAR-19: Section B.6.1 of PDD: The detailed explanation on each applicable parameter used in the formula of emission reduction is not properly explained. Please check all the comments mentioned in the PDD	CAR-19	OK
5.5.2 In case the methodology allows a selection between different options for equations or parameters, has adequate justification been given and have the correct equations and parameters been used, in accordance with the methodology selected?	/P01/ /B2/	DR	Subject to closure of the following issue CAR-19: Section B.6.1 of PDD: The detailed explanation on each applicable parameter used in the formula of emission reduction is not properly explained. Please check all the comments mentioned in the PDD	<del>CAR-19</del>	OK
5.5.3 In case some data and parameters will not be monitored throughout the crediting period, but have already been determined and fixed, are all data sources, assumptions and calculations correct, applicable to the proposed CDM project activity and conservative?	/P01/ /B2/	DR	Yes	OK	OK
5.5.4 In case data and parameters will be monitored on implementation and hence become available only after validation of the project activity, are the estimates provided in the PDD for these data and	/P01/ /B2/	DR	Yes	OK	OK

parameters reasonable?					
5.5.5 Have the major risks and uncertainties, which can influence the emission reduction estimates, been identified and addressed in the PDD?	/P01/ /B2/	DR	Yes	OK	OK
5.5.6 Are the calculations documented according to the approved methodology and in a complete and transparent manner in calculating the project emissions? Have conservative assumptions been used when calculating the project emissions?	/P01/ /B2/	DR	Subject to closure of CAR-19	CAR-19	OK
5.5.7 Are uncertainties in the project emission estimates properly addressed?	/P01/ /B2/	DR	Yes	OK	OK
<b>5.6 Leakage</b>					
5.6.1 Has the leakage been identified and calculated according to the approved methodology?	/P01/ /B2/	DR	Not applicable as no leakage emission are envisaged	OK	OK
5.6.2 Have the leakage been addressed in complete, conservative and substantiated manner?	/P01/ /B2/	DR	Not applicable as no leakage emission are envisaged	OK	OK
5.6.3 Are uncertainties in the leakage emission estimates properly addressed?	/P01/ /B2/	DR	Not applicable as no leakage emission are envisaged	OK	OK
<b>6. Methodology-related issues for afforestation or reforestation CDM project activities</b>					
<i>Add specific A/R requirements – if applicable!</i>			<i>Not applicable for this CDM project activity</i>	<i>O.K.</i>	<i>O.K.</i>
<b>7. Additionality (VVM V E.6)</b>					
7 a) What approach/tool does the project use to assess additionality? Is this in line with the methodology? In case of small-scale CDM project activities, is Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities applied considering also the “Non-binding best practice examples to demonstrate additionality for SSC project activities”.	/P01/ /P2.1/	DR	Since the project is a large scale project the project proponent used <b>Tool for the demonstration and assessment of additionality</b> , version 6.0.0 to assess the additionality. This is in accordance with the methodology requirement.	OK	OK
7 b) Have the regulatory requirements correctly been taken into account to evaluate the project activity and the alternatives? Is sufficient evidence	/P01/ /P2.1/	DR	Yes,	OK	OK

provided to support the relevance of the arguments made?					
7 c) What is the project additionality mainly based on (Investment analysis or barrier analysis)?	/P01/ /P2.1/	DR	Additionality is based on the investment analysis	OK	OK
<b>7.1 Prior consideration of the CDM (VVM V E.6.III.a)</b>					
7.1.1 Is there documented evidence provided by the project participants on how and when the decision to proceed with the project activity was taken?	/P01/ /P6/	DR	Yes, minutes of board resolution copy is submitted. However the following issue is raised CL-18: Section B.4 of PDD: As per the chronology, the KTBP company itself formed on 26 <sup>th</sup> August 2010. But the board has decided to go ahead with the KTBP cogen project with CDM on 13 <sup>th</sup> August 2012 which is before forming the company. Please clarify.	CL-18	OK
7.1.2 Is the starting date of the project activity, reported in the PDD, in accordance with the "Glossary of CDM terms" and CDM VVM (§99)? <i>Note: Confirm the starting date indicated in C.1. Is consistent within the PDD, in particular with respect to the project implementation history.</i>	/P01/ /P6/	DR	Yes, the start date is in accordance with glossary of CDM terms	OK	OK
7.1.3 Is the date stated in the provided evidence consistent with other available evidence (e.g. dates of construction, purchase orders for equipment)?	/P01/	DR	Yes, the date stated in the provided evidence is consistent with other available real action.	OK	OK
7.1.4 If the project was not published and the starting date is on or after 2nd August 2008, was it possible to receive from UNFCCC secretariat and DNA a written confirmation that PPs previously informed the above entities on commencement of the project activity and of their intention to seek CDM status? <i>Note: in case where PP has only informed DNA or UNFCCC, check if the project start date was under the</i>	/P01/	DR	Yes, the project start date is after 2 <sup>nd</sup> august 2008 but before publication of PDD for GSP. Hence PP has intimated to DNA & UNFCCC for their intention to consideration of CDM	OK	OK

<i>first version of the “prior consideration of the CDM guidelines”</i>					
7.1.5 For the project activities with a starting date before 2nd August 2008 and before the actual publication, was there enough evidence presented to prove that PPs were previously aware of CDM?	/P01/	DR	Not applicable	OK	OK
7.1.6 For the project activities with a starting date before 2nd August 2008 and before the actual publication, was there enough evidence presented to prove that CDM benefits have been a decisive factor in the decision to proceed with the project activity?	/P01/	DR	Not applicable	OK	OK
7.1.7 Does the individual or body that took the decision to proceed with the project activity have/had the authority to do so?	/P01/ /P5/ /P6/	DR	Yes, the decision is taken by board of directors who have the authority to do so. Nevertheless CL-18 is raised	<del>CL-18</del>	OK
7.1.8 For the project activities with a starting date before 2nd August 2008 and before the actual publication, was there enough evidence presented to prove that PPs were taking continuing and real actions to secure CDM status for the project in parallel with its implementation?	/P01/	DR	Not applicable	OK	OK
7.1.7 In case there is a significant gap between the start date of the project activity and the commencement of validation, how was it possible for the project participant to commit funds to the project in advance of receiving a positive validation opinion?	/P01/	DR	Not applicable	OK	OK
7.1.8 How has the starting date of the project activity been determined? What are the dates of the first contracts for the project activity? When was the first construction activity?	/P01/	DR	Not applicable	OK	OK
7.1.9 Is the stated expected operational lifetime of the project activity reasonable?	/P01/	DR	Yes.	OK	OK

7.1.10 Is the crediting period start date, the type (renewable/fixed) and the length of the crediting period clearly defined and reasonable?	/P01/	DR	Yes.	OK	OK
<b>7.2 Identification of alternatives(VVM V E.6.III.b)</b>					
7.2.1 Does the PDD identify and list credible alternatives to the CDM project activity in order to determine the most realistic baseline scenario, unless selected approved methodology prescribes/identifies the baseline scenario and no further analysis is required?	/P01/	DR	Subject to closure of CAR-07, CAR-08 & CAR-09	OK	OK
7.2.2 Does the list of alternatives include as one of the options that the project activity is undertaken without being registered as a CDM project activity?	/P01/	DR	Subject to closure of CAR-07, CAR-08 & CAR-09	OK	OK
7.2.3 Does the list contain all realistic/credible alternatives that the DOE, on the basis of its local and sectoral knowledge, considers to be viable means of supplying the outputs or services that are to be supplied by the project activity? <i>Note: All alternatives listed in the selected methodology should be included, as well as those not covered by the methodology.</i>	/P01/	DR	Subject to closure of CAR-07, CAR-08 & CAR-09	OK	OK
7.2.4 Is the exclusion of the alternatives for legal reasons justified? <i>Note: Some alternatives might be illegal, according to the local regulations, but still widely practiced due to lack of enforcement. It should be verified.</i>	/P01/	DR	Subject to closure of CAR-07, CAR-08 & CAR-09	OK	OK
<b>7.3 Investment Analysis(VVM V E.6.III.c)</b>					
7.3.1 Are all sources of revenues (including savings) have been considered in the PDD and all calculations?	/P01/ /P2.1/	DR	Yes, all the sources of revenue are considered	OK	OK
7.3.2 Is the type of investment analysis selected correctly in the PDD? Is the choice of benchmark analysis, investment comparison or simple cost	/P01/ /P2.1/	DR	Subject to closure of CAR-10 Section B.5 of PDD: No justification is provided how the	CAR-10	OK

analysis correct?			benchmark analysis is appropriate for this project activity		
7.3.3 Is the selected financial indicator chosen and applied correctly? Is it on equity/project basis? Before/after tax? Is the financial indicator in correspondence with the benchmark?	/P01/ /P2.1/	DR	Yes, the selection of financial indicator equity IRR is justified for the benchmark selected	OK	OK
7.3.4 Is the guidance on IRR calculation and assessment correctly applied? <i>Note: Means of validation should be recorded. All input parameters need to be assessed and if possible compared with the input parameters applied by similar project activities. Special procedure (ICP-5-8-CDMJIG2) applies for validation of input data derived from FSR/PDR or other governmentally approved project-specific study. A similar approach should also be taken for other project types. In case the validation team is not able to cross-check information with other similar projects activities for one or several of the input parameters, due to limited number of registered CDM projects being available, the team is required to determine and describe other information sources that are used by the validation team to make an assessment of the reasonableness of the respective input parameter.</i>	/P01/ /P2.1/	DR	Subject to closure of CAR-11, CAR-12, CAR-13, CAR-14, CAR-15 & CAR-16	<del>CAR-11, CAR-12, CAR-13, CAR-14, CAR-15 &amp; CAR-16</del>	OK
7.3.5 In case project participants use values from Feasibility Study Reports (FSR) is it possible to verify that the period between the FSR date and investment decision was reasonably short and FSR values did not change materially?	/P01/ /P2.1/	DR	Subject to closure of CAR-11, CAR-12, CAR-13, CAR-14, CAR-15 & CAR-16	<del>CAR-11, CAR-12, CAR-13, CAR-14, CAR-15 &amp; CAR-16</del>	OK
7.3.6 Are all the values consistent between FSR and PDD and are inconsistencies properly justified?	/P01/ /P2.1/	DR	The consistency of value between source document and IRR sheet are checked and found be correct	OK	OK
7.3.7 Were all the values from FSR applicable and valid at the time of the investment decision?	/P01/ /P2.1/	DR	Yes.	OK	OK



7.3.8 Is it reasonable to assume that no investment would be made at a rate of return lower than the benchmark by, for example, assessing previous investment decisions by the project participants or some verifiable circumstances that have led to a change in the benchmark?	/P01/ /P2.1/	DR	Yes. The same is justified in the PDD	OK	OK
7.3.9 Is the Investment Analysis prepared in compliance with the latest version of the "Guidance on the Assessment of Investment Analysis" as provided by the CDM EB?	/P01/ /P2.1/	DR	Subject to closure of CAR-11, CAR-12, CAR-13, CAR-14, CAR-15 & CAR-16	<del>CAR-11, CAR-12, CAR-13, CAR-14, CAR-15 &amp; CAR-16</del>	OK
7.3.10 Do the project include all the data sources used (input & output / loss & profit) and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95. Does the income tax calculation take depreciation into account? Is the depreciation year in accordance with normal accounting practice in the host country? Has salvage value been taken into account? Is working capital returned in the last year of operation? How are the PLF of the project assessed? How are output price assessed? How are O&M cost assessed?	/P01/ /P2.1/	DR	Subject to closure of CAR-11, CAR-12, CAR-13, CAR-14, CAR-15 & CAR-16	<del>CAR-11, CAR-12, CAR-13, CAR-14, CAR-15 &amp; CAR-16</del>	OK
7.3.11 Sensitivity analysis: Have the key parameters contributing to more than 20% of the revenue/costs during operating or implementation been identified? Has possible correlation between the parameters been considered? Is the range of variations (10% in default) is reasonable in the project context? Have the key parameters been vary to reach or cross the benchmark and have the likelihood of this to happen been justified?	/P01/ /P2.1/	DR	Yes, the key parameters contributing to more than 20% of the revenue/costs during operating or implementation been included in sensitivity analysis	Ok	OK
<b>7.4 Barrier analysis(VVM V E.6.III.d)</b>					

7.4.1 Are there any issues addressed in the barrier analysis that have a clear impact on the financial viability of the project activity and that shall be assessed by an investment analysis?	/P01/ /P2.1/	DR	Not applicable	OK	OK
7.4.2 Do the listed barriers exist and is their existence substantiated? <i>Note: (a) by independent sources of data such as relevant national legislation, surveys of local conditions and national or international statistics and/or (b) by interviews with relevant individuals: including members of industry associations, government officials or local experts if necessary?</i>	/P01/ /P2.1/	DR	Not applicable	OK	OK
7.4.3 Would any of the identified barriers prevent the implementation of the project activity but not equally prevent the implementation of the possible alternatives, in particular the implementation of the identified baseline scenario?	/P01/ /P2.1/	DR	Not applicable	OK	OK
<b>7.5 Common practice analysis(VVM V E.6.III.e)</b>					
7.5.1 If the PPs claim in the PDD that CDM project activity is the “first of its kind”, is it justified?	/P01/ /P2.1/	DR	Subject to closure of CAR-17: Section B.4 of PDD: The justification on common practice analysis is not appropriate. It is discussed only about CDM registered project. Projects that are developed without CDM consideration should be considered in the common practice analysis. Moreover is should be inline with the latest additionality tool requirement.	OK	OK
7.5.2 Are the geographical boundaries of the project activity identified correctly?	/P01/ /P2.1/	DR	Subject to closure of CAR-17	OK	OK
7.5.3 Does the PDD provide an explanation why this region was selected and deemed more appropriate	/P01/	DR	Subject to closure of CAR-17	OK	OK

and is this explanation traceable and reliable?	/P2.1/				
7.5.4 Are there similar operational project activities, other than CDM activities, “widely observed and commonly carried out” in the defined region? <i>Note: Use official sources and local and industry expertise.</i>	/P01/ /P2.1/	DR	Subject to closure of CAR-17	OK	OK
7.5.5 In case there are similar commercially operated project activities, other than CDM activities, already “widely observed and commonly carried out” in the defined region, are there essential distinctions between the CDM project activity and the other similar activities?	/P01/ /P2.1/	DR	Subject to closure of CAR-17	OK	OK
<b>8. Monitoring plan (VVM V E.7)</b>					
8.1 Are all parameters required by the selected approved methodology or tool identified and listed in the PDD? Note: not all methodologies indicate monitoring parameters in tabular form or by reference to the variables used in formulae; Nonetheless, all parameters indicated in the methodology and applicable to the project must be listed in the PDD, omissions due to non-applicability be justified.	/P01/ /P2.1/	DR	Yes, all parameters required by methodology are identified. Nevertheless CAR-23 is raised	<del>CAR-23</del>	OK
8.2 Is the measurement method clearly stated for each value to be monitored and deemed appropriate?  Does the monitoring plan record data in the original form as generated, providing QA/QC procedures to be used on the measurement method? <i>Note 1: if the measurement unit is different from the unit to be applied in the methodology, describe the actual measurement and any according conversion method to match the unit used in the methodology.</i>	/P01/ /P2.1/	DR	Yes, measurement methods clearly stated for reach parameter	OK	OK

<i>Example: liquid fuels may be monitored as weight or volume. If measured as volume, the measurement method and equipment including the according unit (e.g., litter) shall be described in B.7.1, as well as the conversion into weight units as needed. Note 2: Data on invoices / delivery slips may be used for QA/QC purposes, but do not constitute an actual means of monitoring and thus cannot be applied as a source of data.</i>					
8.3	Are values of the ex-ante parameters / monitoring parameters selected correctly and conservative in accordance to methodology or tools? See the NOTE in section 3.6.1 above!	/P01/ /P2.1/	DR	Yes	OK OK
8.4	Is the measurement equipment for each parameter described and deemed appropriate?  Are the locations of all measurement equipment clearly identified and consistently described, incl. process flow-charts contained in the PDD?	/P01/ /P2.1/	DR	Yes	OK OK
8.5	Is the measurement accuracy addressed and deemed appropriate?	/P01/ /P2.1/	DR	Yes	OK OK
8.6	Are procedures in place on how to deal with erroneous measurements and are the corrective actions identified?	/P01/ /P2.1/	DR	Yes	OK OK
8.7	Is the frequency of measurement identified and deemed appropriate?	/P01/ /P2.1/	DR	Yes	OK OK
8.8	Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/P01/ /P2.1/	DR	Yes	OK OK
8.9	Are the sampling, measurement methods and procedures defined?	/P01/ /P2.1/	DR	Not applicable	OK OK

8.10 Are procedures identified for maintenance of monitoring equipment and installations?	/P01/ /P2.1/	DR	Yes	OK	OK
8.11 Are the equipment calibration intervals identified and justified?	/P01/ /P2.1/	DR	Yes	OK	OK
8.12 Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)?	/P01/ /P2.1/	DR	Yes	OK	OK
8.13 Are the monitoring arrangements described in the monitoring plan feasible within the project design?	/P01/ /P2.1/	DR	Yes	OK	OK
8.14 Are the means of implementation of the monitoring plan, including the data management and quality assurance and quality control procedures, sufficient to ensure that the emission reductions achieved by / resulting from the project activity can be reported ex post and verified?	/P01/ /P2.1/	DR	Yes	OK	OK
8.15 Do the PPs make provisions for personnel training needs?	/P01/ /P2.1/	DR	Subject to closure of CAR-24	<del>CAR-24</del>	OK
8.16 Is the authority and responsibility of overall project management clearly described?	/P01/ /P2.1/	DR	Yes	OK	OK
8.17 Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/P01/ /P2.1/	DR	Subject to closure of CAR-24	<del>CAR-24</del>	OK
8.18 Are procedures identified for review of reported results/data?	/P01/ /P2.1/	DR	Subject to closure of CAR-24	<del>CAR-24</del>	OK
8.19 Is the data archiving period for this project activity stated in the PDD and appropriate?	/P01/	DR	Yes	OK	OK

<i>Note: All archived monitoring data, required for verification and issuance, should be kept for at least two years after the end of the crediting period or the last issuance of CER.</i>	/P2.1/				
8.20 Is the monitoring parameters for all project emissions captured?	/P01/ /P2.1/	DR	Yes	OK	OK
8.21 Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/P01/ /P2.1/	DR	Yes	OK	OK
8.22 Are the data management and quality assurance and quality control procedures sufficient to ensure that the emission reductions achieved by/resulting from the project can be reported ex post and verified?	/P01/ /P2.1/	DR	Subject to closure of CAR-24	<del>CAR-24</del>	OK
<b>8.2 Monitoring of the leakage</b>					
8.2.1 Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/P01/ /P2.1/	DR	Not applicable	OK	OK
8.2.2 Is the choice of project leakage indicators made according to selected methodology in a reasonable and conservative manner? <i>Note: local knowledge and sectoral expertise shall also be considered.</i>	/P01/ /P2.1/	DR	Not applicable	OK	OK
8.2.3 Is the measurement method clearly stated and deemed appropriate for each leakage value?	/P01/ /P2.1/	DR	Not applicable	OK	OK
<b>9. Sustainable development(VVM V E.8)</b>					
9.1 Does the LoA from the Host country DNA contain the confirmation that the proposed CDM project activity contributes to the sustainable development of the host Party?	/P01/	DR	Subject to closure of CAR-01	OK	OK



9.2	If PDD indicates any additional environmental benefits of the project, other than GHG emission reductions, were those benefits properly substantiated?	/P01/	DR	Subject to closure of CAR-01	OK	OK
<b>10. Stakeholders' consultation and comments (VVM V E.9)</b>						
10.1	Were the stakeholders identified in appropriate and complete manner?	/P01/	I,DR	Yes, all the relevant stakeholders are indemnified in appropriate and complete manner	OK	OK
10.2	Are the identified stakeholders plausible?	/P01/	I,DR	Yes, all the stakeholders identified are plausible	OK	OK
12.3	Does PDD describe the means being used to invite local stakeholder's comments?	/P01/	I,DR	The stakeholders are invited through formal invitation. The same is described in the Section E.1 of PDD	OK	OK
12.4	Were those means appropriate?	/P01/	I,DR	Since the individual invitations were distributed, the inviting means is appropriate. The copy of invitations letter are verified and found to be OK.	OK	OK
12.5	Was the project presented to the stakeholders in unbiased manner?	/P01/	I,DR	Yes, the project presented to the stakeholders in unbiased manner, the same is conformed through the minutes of stakeholders meeting and also interview with the stakeholders during site visit.	OK	OK
12.6	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?	/P01/	I,DR	No, no national regulation/laws require conducting stakeholders meeting for wind power project.	OK	OK
12.7	Is a summary of the stakeholder comments provided in the PDD?	/P01/	DR	Subject to closure of CAR-26	<del>CAR-26</del>	OK
12.8	Has due account of any stakeholder comments been taken by PPs and reflected in the PDD?	/P01/	DR	Subject to closure of CAR-26	<del>CAR-26</del>	OK
<b>11. Environmental impacts(VVM V E.10)</b>						
11.1	Is the documentation supplied by the PPs regarding environmental impacts relevant and accurately reflected in the PDD?	/P01/ /P12/	DR	EIA report is not submitted. Hence CAR-25 is raised	<del>CAR-25</del>	OK

11.2 Is an environmental impact assessment (EIA) required for the CDM project activity? <i>Note: determine by using a review of relevant legislation and local expertise.</i>	/P01/ /P12/	DR	Yes. EIA is requirement of Host country	<del>OK</del>	OK
In case an EIA is required, has the EIA has been approved by local authorities and is the outcome accurately reflected in the PDD?	/P01/ /P12/	DR	Subject to closure of CAR-25	<del>CAR-25</del>	OK
11.4 Does the PDD include a brief description of the environmental effects of the project, including trans boundary?	/P01/ /P12/	DR	Subject to closure of CAR-25	<del>CAR-25</del>	OK
11.5 Are those effects properly addressed in the design of the project activity?	/P01/ /P12/	DR	Subject to closure of CAR-25	<del>CAR-25</del>	OK
11.6 Does the project comply with environmental legislation in the host country?	/P01/ /P12/	DR	Yes. The PP has got EIA approval	OK	OK

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

Validation / Verification Manual

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

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

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

The wording of CAR/CL shall clearly address nonconformity or seek clarification, and avoid instructive / consultative language in order to prevent actual or perceived consultancy.

No.	CAR/CL	Observation (CAR/CL)	Reference	Summary of project owner response	Validation team conclusion
1	CAR 01	Letter of Approval from the host party has not been submitted  Also written confirmation stating the authorization, specimen signatures and personal details are not submitted.	1.1 -1.7 1.9- 1.11 2.2- 2.4	The LoA of the project was proved by the broad of the DNA of Thailand and provided to DOE at this time.	The LoA from Thailand has been provided by the PP; the team has reviewed it and has accepted. Hence CAR-01 is closed.
2	CAR 02	Section A.2 of PDD: 1. The details power plant & boiler capacities installed in the KTIS, EPPCO & EPC is not clearly mentioned 2. Quantity of surplus biomass available from the KTIS mentioned is not correct 3. Explanation on how the GHG emission reduction to be achieved is missing	-	1. The details power plant & boiler capacities installed in the KTIS, EPPCO & EPC is now clearly mentioned in the revised PDD  2. Quantity of the Surplus biomass available is mentioned correctly in the revised PDD  3. The explanation on the GHG emission reduction is achieved is included in the revised PDD	The revised PDD version 02 dated 30/12/2012 has been reviewed and corrections are evident.  The biomass balance has been checked and found that the surplus available. Hence CAR02 is close.
3	CAR 03	Section A.4.3 of PDD: The section is not filled in accordance with the all the requirements of EB 41 annex 12	4.1 4.2 4.3	Section A.4.3 of PDD is filled in accordance with the all the requirements of EB 41 annex 12	The same has been found to be incorporated in the revised PDD. Hence CAR03 is close.
4	CAR 04	Section B.2: All the applicability conditions of the methodology are not justified for this project.	5.2.2 5.2.3	All the applicability condition has been justified in the revised PDD.	All the applicability conditions have been checked and found to adhere to the description and

						meet the requirements. Hence CAR04 is close.
5	CL	05	<p>Point 2 of the applicability condition says “<i>For projects that use biomass residues from a production process (e.g. production of sugar or wood panel boards), the implementation of the project does not result in an increase of the processing capacity of raw input (e.g. sugar, rice, logs, etc.) or in other substantial changes (e.g. product change) in this process</i>”</p> <p>But from the explanation mentioned in the section A.2 and from the verification of minutes of TIS group special meeting convened on 20<sup>th</sup> June 2010, this is not clear.</p> <p>Please clarify how the project activity satisfies the point no 2 of the applicability condition in the methodology.</p>	5.2.3	The implementation of the project activity doesn't result in the increase of the processing capacity of the raw material. The sugar plant is governed by a different entity.	The project activity is a green field project and the sugar factory processing is managed by different entity. The bagasse balance has been checked and found the bagasse is sufficiently available for the described power generation . Hence CL05 is close.
6	CL	06	<p>Section B.3 of PDD:</p> <p>4. The description on the project boundary is not inline with the methodology requirement.</p> <p>5. The description mentioned in the section is not sproject specific; it is very generic</p> <p>6. Please clarify why power plants &amp; boilers that are installed in EPPCO, EPC &amp; KTIS are not included in the project boundary</p>	5.3.1	<p>1. The description of the project boundary is revised to be in line with the methodology requirement.</p> <p>2. The description in section B.3 is made specific to the project activity</p> <p>3. The power plants and the boilers that are installed in KTIS are included in the project boundary as the steam and electricity produced from the project activity will be supplied to</p>	The revised PDD depicts the project boundary, the same has been verified and found ok. Hence CL06 is close.
7	CAR	07	<p>Section B.4 of PDD:</p> <p>The steam &amp; electricity generated in the project activity will be supplied to the industries EPPCO, EPC &amp; KTIS. But not considering the power plants and boilers installed in the industries for the baseline identification is not correct.</p>	<p>5.4.1.1 to 5.4.1.7</p> <p>7.2.1 to 7.2.4</p>	The baseline identification considers the power plants and the industries in the KTIS in the revised PDD.	The revised PDD version 02 dated 30/12/2012 has been reviewed and corrections are evident. Hence CAR07 is close.
8	CAR	08	Section B.4 of PDD:	5.4.1.1	The baseline scenario for the biomass	In the absence of the project

			<p>The fate of biomass in the absence of the project activity is not consistently mentioned in the section</p> <p>During the site visit discussion and from verification of other sections of the PDD, it is very clear that biomass for this project activity is procured from the identified sugar plants KTIS &amp; RS. But the identified baseline scenario for the fate of biomass in the baseline scenario is 'B8: unidentified' with is not appropriate.</p>	<p>to 5.4.1.7</p> <p>7.2.1 to 7.2.4</p>	<p>use in the absence of the project activity is appropriately identified in the revised PDD.</p>	<p>activity, the biomass would have been dumped or left to decay, this was also evident during the site verification. Hence CAR08 is close.</p>
9	CAR	09	<p>Section B.4 of PDD:</p> <p>3. No explanation is provided on how the alternative 1 is eliminated</p> <p>4. As per applicability condition of ACM006, the baseline of heat should be Scenarios H2: to H7:, or a combination of any of those scenarios. But identified baseline scenario of heat for this project activity is H1. Clarify how this project satisfy the above mentioned applicability condition.</p>	<p>5.4.1.1 to 5.4.1.7</p> <p>7.2.1 to 7.2.4</p>	<p>The explanation of the identified alternative scenario is included in the revised PDD.</p> <p>2. The baseline of the heat generation is identified appropriately in accordance with the options provided in the methodology ACM 0006 in the revised PDD.</p>	<p>The project has been derived to applicable condition of P7, H6 and B4. The same has been found to meet the description and project planning. Thus identified baseline is agreeable. Hence CAR09 is close.</p>
10	CAR	10	<p>Section B.5 of PDD:</p> <p>1. No justification is provided how the benchmark analysis is appropriate for this project activity.</p> <p>2. At the time of investment decision the ROE was 17.21%. Then how 21.58 is appropriate and conservative for the project activity.</p>	<p>7.3.2</p>	<p>1. The justification for the use of the benchmark analysis is described in the revised PDD.</p> <p>2. The ROE has been computed using the CAPM model in line with the requirements of Annex 5, EB 62.</p>	<p>Justification for use of benchmark and its applicability is verified form revised PDD. Hence CAR-10 is closed.</p>
11	CAR	11	<p>IRR Sheet&gt;Assumption:</p> <p>1. Management decision date mentioned in the sheet is not consistent with the PDD &amp; supporting documents</p> <p>2. For the calculation of revenue from steam sale, MW power is equated to the tonne of steam which is not correct. Please provide appropriate calculation. Also provided the steam purchase contract between KTIS &amp;</p>	<p>7.3.4</p> <p>7.3.5</p> <p>7.3.9</p> <p>7.3.10</p>	<p>1. The management decision is made consistent in the PDD in line with the supporting evidences.</p> <p>2. The calculation of revenue from steam sale is evidenced from the FSR prepared for the project activity.</p> <p>3. Calculation of the fuel consumption based on GCV is appropriate.</p>	<p>All the input parameters have been cross-checked and verified against supporting evidences and found to be ok. Hence CAR11 is close.</p>

			<p>KTBP</p> <p>3. Fuel consumption is calculated based on the GCV is not correct. It should be calculated based on the NCV</p>			
12	CAR	12	<p>IRR sheet&gt;Depreciation:</p> <p>1. 5% income tax depreciation rate is considered for all the assets which is not correct. 5% is applicable only for civil asset.</p> <p>2. 5% income tax depreciation considered for the civil asset for the first year is not correct. As per the policy the 25% depreciation is applicable for the first year.</p> <p>3. Income tax depreciation rates taken for the calculation is based on the WDV method. But the depreciation is calculated based for the straight line method (SLM) which is wrong.</p>	<p>7.3.4</p> <p>7.3.5</p> <p>7.3.9</p> <p>7.3.10</p>	<p>1. The depreciation rate is considered on the Straight Line Method basis which is in accordance with the tax laws of Thailand</p> <p>2. The depreciation rate is considered on the Straight Line Method basis which is in accordance with the tax laws of Thailand</p> <p>3. The depreciation rate is considered on the Straight Line Method basis which is in accordance with the tax laws of Thailand</p>	<p>The same has been checked. Hence CAR12 is close.</p>
13	CAR	13	<p>IRR Sheet&gt; Profit(woCDM) &amp; 1 Profit(wCDM):</p> <p>1. As per the sheet the COD is 25-April-2012. But the tariff adder is not considered for all the applicable 7 years from the date of COD</p> <p>2. As per the baseline identification the bagasse is dumped in the baseline. But cost considered in the project activity for the bagasse is 550 BHT/MT which seems to be very high for the fuel that has no value in the baseline.</p> <p>3. No escalation is provided for the revenue from the steam.</p> <p>4. No escalation is provided for the electricity tariff from the 12<sup>th</sup> year.</p> <p>5. In the cash outflow income tax depreciation is considered which is not correct. Book depreciation should be considered in the outflow.</p>	<p>7.3.4</p> <p>7.3.5</p> <p>7.3.9</p> <p>7.3.10</p>	<p>1. The tariff is considered for the 7 years in the revised financial indicator calculation sheet.</p> <p>2. The cost is considered from the FSR prepared for the project activity which was the basis for the investment decision.</p> <p>3. The escalation on the revenue of the steam is included in the revised IRR sheet.</p> <p>4. The escalation has already been included in the electricity tariff from the 12<sup>th</sup> year.</p> <p>5. The depreciation rate is considered on the Straight Line Method basis which is in accordance with the tax laws of Thailand</p>	<p>The parameters have been cross verified and found ok. Hence CAR13 is close.</p>



14	CAR	14	<p>IRR sheet&gt; IRR(woCDM) &amp; IRR(wCDM):</p> <p>As per the assumption sheet 30% of capital cost is spent in the year 2012. In the same year the power generation is started. So the cash out flow of this 30% project and the first year revenue should be considered for the same year ie., 2012. But both are considered for two different years in the sheet which is wrong.</p>	<p>7.3.4</p> <p>7.3.5</p> <p>7.3.9</p> <p>7.3.10</p>	<p>The construction period has been considered for 2 years in which the 30% of the project cost is incurred in the 2<sup>nd</sup> year. The operation of the project activity begins only after the 2<sup>nd</sup> year. Hence considering the revenue from 3<sup>rd</sup> year is appropriate.</p>	<p>The construction and implementation plan have considered the revenue generation from the third, the commissioning is seen to begin in 3<sup>rd</sup> year. Hence CAR14 is close.</p>
15	CAR	15	<p>IRR Sheet&gt; Tariff:</p> <ol style="list-style-type: none"> <li>1. The project power generation capacity is 60 MW which is greater than 10 MW. So this project will not fall under VSPP. Then how considering VSPP tariff for this project is appropriate.</li> <li>2. Escalation for the electricity tariff considered is wrong as the monthly escalation is considered for the of yearly escalation calculation</li> <li>3. The web link provided for the source of the tariff is not working.</li> </ol>	<p>7.3.4</p> <p>7.3.5</p> <p>7.3.9</p> <p>7.3.10</p>	<ol style="list-style-type: none"> <li>1. The tariff applicable for SPP is considered in the revised IRR calculation sheet.</li> <li>2. Considering the monthly escalation is appropriate as the average of the monthly escalation has been considered in the IRR calculation sheet.</li> <li>3. The web link for the source of the tariff is revised in the IRR calculation sheet</li> </ol>	<p>The IRR sheet has considered since it is the average of the year. Hence CAR15 is close.</p>
16	CAR	16	<p>IRR Sheet&gt;Benchmark:</p> <ol style="list-style-type: none"> <li>1. The Return on equity calculation is not inline with the CAPM. Please clarify how the benchmark calculation is appropriate.</li> </ol>	<p>7.3.4</p> <p>7.3.5</p> <p>7.3.9</p> <p>7.3.10</p>	<ol style="list-style-type: none"> <li>1. The ROE is calculated in line with the CAPM model in accordance with guidelines of EB 62, Annex 5.</li> </ol>	<p>The RoE is now as per the CAPM model. The same is appropriate. Hence CAR16 is close.</p>
17	CAR	17	<p>Section B.4 of PDD:</p> <p>The justification on common practice analysis is not appropriate. It is discussed only about CDM registered project. Projects that are developed without CDM consideration should be considered in the common practice analysis. Moreover is should be inline with the latest additionality tool requirement.</p>	<p>7.5.1 to 7.5.5</p>	<p>The justification of the common practice in line with the tool for the demonstration and assessment of additionality and the Guidelines of Common Practice is included in the revised PDD.</p>	<p>The common practice has been found to adhere to the tools requirements. Hence CAR17 is close.</p>
18	CL	18	<p>Section B.4 of PDD:</p> <p>As per the chronology, the KTBP company itself</p>	<p>7.1.1</p> <p>7.1.7</p>	<p>The management date has been incorrectly represented in the PDD as</p>	<p>The same has been checked and found ok. Hence CL18 is</p>

			formed on 26 <sup>th</sup> August 2010. But the board has decided to go ahead with the KTBP cogen project with CDM on 13 <sup>th</sup> August 2012 which is before forming the company. Please clarify.		typo error. The same has been corrected in the revised PDD.	close.
19	CAR	19	Section B.6.1 of PDD: The detailed explanation on each applicable parameter used in the formula of emission reduction is not properly explained. Please check all the comments mentioned in the PDD	-	The detailed explanation for all the parameters is included in the revised PDD.	The detailed explanations are evident in the PDD. Hence CAR19 is close.
20	CAR	20	Section B.6.2 of PDD: 1. All the parameters required for this project that are available at the time of validation are not explained in the parameter tables. 2. All the requirements in the parameters table needs is not filled properly. The explanation should be project specific. 3. Some of the parameter table is not inline with the requirement of the PDD template	-	The parameters required for the project that are available at the time of validation are included in the section B.6.2	OK Hence CAR20 is close.
21	CAR	21	Section B.6.3 of PDD: This section should be modified based on the corrections to be done in the section B.6.2	-	The same has been modified.	OK Hence CAR21 is close.
22	CAE	22	Section B.6.4 of PDD: 1. The emission reduction table is not inline with the requirement EB 42 annex 12 2. The emission reduction for the complete 10 years is not given	-	The emission reduction table is revised to be in line with the requirement of EB 62 Annex 12.	The Emission Reductions have been checked and are in line with EB 62 annex 12 requirements.. Hence CAR22 is close.
23	CAR	23	Section B.7.1 of PDD: 1. The monitoring parameter table is not filled inline with the requirement of EB 42 Annex 12 & methodology 2. All the monitoring parameter required for the project activity is not explained	8.1	The monitoring parameter table is filled inline with the requirement of EB 62 Annex 12 and in lien with the methodology ACM 0006	The same is evident in the revised PDD. Hence CAR23 is close.
24	CAR	24	Section B.7.2 of PDD: The following information's are missing, • Monitoring provisions (Training) • Metering of electricity, installation of	8.15 To 8.18 8.22 8.33	All the information has been included in the revised PDD in line with the guidelines for large scale PDD guidelines	The monitoring section have been checked to have been incorporating the requirements. Hence CAR24 is close.

			meters, calibration of meters <ul style="list-style-type: none"> <li>Emergency preparedness/QA/QC procedures</li> <li>Report generation/achieving/ internal review/audits etc</li> </ul>			
25	CAR	25	Section D.2 of PDD: The EIA report is not submitted for verification	11.1 To 11.5	The EIA report for the project activity is submitted to DOE	The EIA report has been checked and found that no major impact is presence due to the project activity. Hence CAR25 is close.
26	CAR	26	Section E.1 of PDD: <ol style="list-style-type: none"> <li>The date &amp; venue of the local stakeholders meeting is not provided</li> <li>Stakeholder meeting supporting documents are not provided</li> </ol> Section E.3 of PDD: <ol style="list-style-type: none"> <li>The due account taken/to be taken in not explained clearly.</li> </ol>	12.7 12.8	The date and venue of the local stakeholder consultation meeting is included in the. The section E.3 is appropriately modified taking into the account the guidelines for the completion of the large scale PDD guidelines. The stakeholder meeting supporting documents are submitted to the DOE.	The stakeholders minutes have been checked and the same is found ok. Hence CAR26 is close.

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

Validation / Verification Manual

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

FAR number	Reference	Summary of project owner response	Validation team conclusion
-	-	-	

## Appendix B

### Certificates of Competence

## Qualification

Kewat, Shailendra /

### Emission Trading

#### United Nations Framework Convention on Climate Change

(The following data is set by the certification body)

Auditor No.:

(AuditorenRegNr)

Appointed:  
(Zugelassen)

ja

Qualification  
Level:  
(Qualifikationsstufe)

Lead Auditor

External:  
(Externer)

Add. reviewer:  
(Zusätzlicher  
Prüfer)

EAC Scopes:  
(EAC Branchen)

CDM 01 - Energy industries (renewable - / non-renewable sources)

CDM 13 - Waste handling and disposal

Add.  
qualification:  
(zus. Qualifikation)

First  
Appointment:  
(Erstberufung)

02-11-2011

Valid to:  
(Gültig bis)

01-11-2014

Remarks:

Valid for TA1.2 & 13.1

Languages:

### Experience Exchange

Date

Location

Remarks

Accreditation(s)

### Monitoring

Latest Monitoring:  
(letzte Beurteilung)

Next Monitoring:  
(nächste Beurteilung)

Remarks:

### History of scope allocation

Date: 2012-05-20  
Change: EAC CDM added  
By: Praveen Urs  
Reason:

Date: 2011-11-03  
Change: EAC CDM added  
By: Manfred Brinkmann  
Reason: Valid for TA1.2

## History

Created:	24-10-2011 09:23:42	Shailendra Kewat/Ind/TUV
Modified:	20-05-2012 21:36:04 ZE8	Praveen Urs/Chn/TUV
	20-05-2012 21:35:05 ZE8	Praveen Urs/Chn/TUV
	16-04-2012 15:22:52 ZE8	Cuiping Deng/Chn/TUV
	16-04-2012 15:22:47 ZE8	Cuiping Deng/Chn/TUV
	04-11-2011 15:40:46 ZE9	Manfred Brinkmann/Jpn/TUV
	03-11-2011 18:58:35 ZE9	Manfred Brinkmann/Jpn/TUV
	03-11-2011 18:57:11 ZE9	Manfred Brinkmann/Jpn/TUV
	24-10-2011 09:23:58	Shailendra Kewat/Ind/TUV



Qualification
Chankeat Charocnnitniyom

### Emission Trading

#### United Nations Framework Convention on Climate change

Appointed:	<input checked="" type="checkbox"/>	Qualification level:	Local Expert
External:	<input checked="" type="checkbox"/>		
Scopes:	13 Waste handling and disposal		

Scope:	13.1;
Languages:	Thai English
Legal requirements	<input checked="" type="checkbox"/>

#### Validity:

First Appointment	23 April 2012	Valid To:	22 April 2015
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#### Approved By:

Mr. Praveen Urs	
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#### History of Scope Allocation:

Date:	
Change:	
By:	
Reason:	

## Qualification

NESARI, RAMCHANDRA /

### Emission Trading

#### United Nations Framework Convention on Climate Change

(The following data is set by the certification body)

Auditor No.:  
(AuditorenRegNr)

Appointed: ja Qualification Expert  
(Zugelassen) Level:  
(Qualifikationsstufe)

External: ja Add. reviewer:  
(Externer) (Zusätzlicher  
Prüfer)

EAC Scopes: CDM 04 - Manufacturing industries  
(EAC Branchen) CDM 05 - Chemical industry  
CDM 11 - Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride  
CDM 12 - Solvents use  
CDM 01 - Energy industries (renewable - / non-renewable sources)

Add.  
qualification:  
(zus. Qualifikation)

First 04/23/2012 Valid to: 04/22/2015  
Appointment: (Gültig bis)  
(Erstberufung)

Remarks: TA 1.1, 4.5, 5.1, 11.1, 12.1

Languages: Hindi  
English

## Qualification

MP, Kanal /

### Emission Trading

#### United Nations Framework Convention on Climate Change

(The following data is set by the certification body)

Auditor No.:

(AuditorenRegNr)

Appointed:  
(Zugelassen)

ja

Qualification Level:  
(Qualifikationsstufe)

Lead Auditor

External:  
(Externer)

Add. reviewer:  
(Zusätzlicher Prüfer)

EAC Scopes:  
(EAC Branchen)

CDM 01 - Energy industries (renewable - / non-renewable sources)

CDM 03 - Energy demand

CDM 06 - Construction

CDM 13 - Waste handling and disposal

CDM 15 – Agriculture

Add.  
qualification:  
(zus.  
Qualifikation)

First

06/02/201

Valid to:

05/02/2015

Appointment: 2  
(Erstberufung)

(Gültig bis)

Remarks:

TA. 1.2, 3.1, 6.1, 13.1/13.2, 15.1

Languages:

English

Tamil

Hindi

### Experience Exchange

Date

Location

Remarks

Accreditation(s)

## Qualification

Ramalingam, Murali /

### Emission Trading United Nations Framework Convention on Climate Change

(The following data is set by the certification body)

Auditor No.:  
(AuditorenRegNr)

Appointed:  
(Zugelassen)

ja

Qualification  
Level:  
(Qualifikationsstufe)

Lead Auditor

External:  
(Externer)

Add. reviewer:  
(Zusätzlicher  
Prüfer)

EAC Scopes:  
(EAC Branchen)

CDM 01 - Energy industries (renewable - / non-renewable sources)  
CDM 03 - Energy demand

Add.  
qualification:  
(zus. Qualifikation)

First  
Appointment:  
(Erstberufung)

05/15/2012

Valid to:  
(Gültig bis)

05/14/2015

Remarks:

TA 1.2

TA 3.1

Languages:

Tamil

English

## Qualification

Li, Lixin /

## Emission Trading

### United Nations Framework Convention on Climate Change

Auditor No.:

(AuditorenRegNr)

Appointed:

(Zugelassen)

☒ ja

Qualification Level:

(Qualifikationsstufe)

External:

(Externer)

☐ ja

Add. reviewer:

(Zusätzlicher Prüfer)

☒ yes

EAC Scopes:

(EAC Branchen)

CDM 01 - Energy industries (renewable - / non-renewable sources)  
CDM 03 - Energy demand

Add. qualification:

(zus. Qualifikation)

First Appointment:

(Erstberufung)

06/09/2010

Valid to:

(Gültig bis)

05/09/2013

Remarks:

Appointed as Technical Reviewer for  
TA 1.1, 1.2  
TA 3.1

Languages:

## Experience Exchange

Date

Location

Remarks

Accreditation(s)

2010-12-21

Beijing

GC CDM Auditor Experience Exchange, Beijing, 2010-12-21to23  
United Nations Framework Convention on Climate Change

## Monitoring

Latest Monitoring:

(letzte Beurteilung)

Next Monitoring:

(nächste Beurteilung)

Remarks:

## History of scope allocation