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# **Validation Report**

**Triveni Engineering and Industries Ltd.**

**Validation of the “Bagasse based Co-generation  
Power Project at Khatauli”, India**

**Report No. 877510, Revision 01**

**2006, December 21**

TÜV SÜD Industrie Service GmbH  
Carbon Management Service  
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<b>Summary:</b>				
<p>The Certification Body “Climate and Energy” has been ordered by Triveni Engineering and Industries Ltd. to perform a validation of the above mentioned project. The project is a unilateral CDM project.</p> <p>Using a risk based approach, the validation of this project has been performed by document reviews and on-site inspection, audits at the locations of the project and interviews at the offices of the project developer and the project owner.</p> <p>As the result of this procedure, it can be confirmed that the submitted project documentation is in line with all requirements set by the Kyoto Protocol, the Marrakech Accords and relevant guidance by the CDM Executive Board.</p> <p>Additionally the assessment team reviewed the estimation of the projected emission reductions. We can confirm that the indicated amount of emission reduction of 868 077 tonnes CO<sub>2</sub>e over a crediting period of ten years, resulting in a calculated annual average of 86 808 tonnes CO<sub>2</sub>e, represents a reasonable estimation using the assumptions given by the project documents.</p>				
Work carried out by:	<ul style="list-style-type: none"> <li>• Dr. Ayse Frey (Project manager, GHG auditor)</li> <li>• Sunil Kathuria (GHG lead auditor, Lead Auditor Environmental Management Systems (ISO 14001), Local expert)</li> <li>• Prabhat Kumar (GHG auditor, Auditor Environmental Management Systems (ISO 14001), Local expert)</li> <li>• Dr. Alexandra Babeck (GHG auditor)</li> </ul>		Internal Quality Control by: Javier Castro	



## Abbreviations

<b>BM</b>	Build Margin
<b>CAR</b>	Corrective Action Request
<b>CDM</b>	Clean Development Mechanism
<b>CEA</b>	Central Electricity Authority
<b>CER</b>	Certified Emission Reduction
<b>CR</b>	Clarification Request
<b>DNA</b>	Designated National Authority
<b>DOE</b>	Designated Operational Entity
<b>EB</b>	Executive Board
<b>EIA / EA</b>	Environmental Impact Assessment / Environmental Assessment
<b>ER</b>	Emission Reduction
<b>GHG</b>	Greenhouse gas(es)
<b>KP</b>	Kyoto Protocol
<b>MNES</b>	Ministry of Non-conventional Energy Sources
<b>MP</b>	Monitoring Plan
<b>ODA</b>	Official Development Assistance
<b>PDD</b>	Project Design Document
<b>PPA</b>	Power Purchase Agreement
<b>TEIL</b>	Triveni Engineering and Industries Ltd.
<b>TÜV SÜD</b>	TÜV SÜD Industrie Service GmbH
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>UP</b>	Uttar Pradesh
<b>UPERC</b>	Uttar Pradesh Electricity Regulatory Commission
<b>UPPCL</b>	Uttar Pradesh Power Corporation Limited
<b>VVM</b>	Validation and Verification Manual



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Annex 1: Validation Protocol

Annex 2: Information Reference List

## 1 INTRODUCTION

### 1.1 Objective

Triveni Engineering and Industries Ltd. has commissioned TÜV SÜD Industrie Service GmbH (TÜV SÜD) to validate the “Bagasse based Co-generation Power Project at Khatauli”, India. The validation serves as a design verification and is a requirement of all CDM projects. The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, the monitoring plan (MP), and the project's compliance with relevant UNFCCC and host country criteria are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

UNFCCC criteria refer to the Kyoto Protocol criteria and the CDM rules and modalities as agreed in the Bonn Agreement and the Marrakech Accords.

### 1.2 Scope

The validation scope 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 Kyoto Protocol requirements, UNFCCC rules and associated interpretations. TÜV SÜD has, based on the recommendations in the Validation and Verification Manual, employed a risk-based approach in the validation, 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 client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

The audit team has been provided with the first PDD version in March 2006. Based on this documentation, a document review and a fact finding mission in form of an on site audit has taken place. In response to the CAR and CRs the PDD has been revised. A final PDD version was submitted in December 2006. The PDD and the results from the on site audit serves as the basis for the assessment presented herewith.

Studying the existing documentation belonging to this project, it was obvious that the competence and capability of the validation team has to cover at least the following aspects:

- Knowledge of Kyoto Protocol and the Marrakech Accords
- Environmental and Social Impact Assessment
- Skills in environmental auditing (ISO 14000, EMAS)
- Quality assurance
- Technical aspects of sugar manufacturing process and equipments
- Technical aspects of biomass cogeneration plants
- Monitoring concepts
- Political, economical and technical random conditions in host country

According to these requirements TÜV SÜD has composed a project team in accordance with the appointment rules of the TÜV certification body “climate and energy”:

**Dr. Ayse Frey** is an auditor and project manager for CDM/JI projects as well as an energy expert at TÜV SÜD Industrie Service GmbH. In her position she is responsible for the implementation of validation, verification and certifications processes for greenhouse gas mitigation projects in the context of the Kyoto Protocol. After her studies in civil and environmental engineering, she completed a PhD in the field of water and waste policy. She has extensive experience with the CDM and JI flexible mechanisms as well as with management systems.

**Sunil Kathuria** is a lead auditor for CDM projects and a lead auditor for quality and environmental management systems (according to ISO 9001 and ISO 14001) at TÜV South Asia, TÜV SÜD Group. He is based in New Delhi. In his position he is implementing validation, verification and certifications audits for CDM projects. He has received extensive training in the CDM validation process and has already participated in several CDM project assessments.

**Prabhat Kumar** is an auditor for quality and environmental management systems (according to ISO 9001 and ISO 14001) and an auditor for CDM projects at TÜV South Asia, TÜV SÜD Group. He is also based in New Delhi. He has received extensive training in the CDM validation process and participated already in several CDM project (pre-) assessments.

**Dr. Alexandra Babeck** is an auditor for CDM projects as well as a technical expert on food technology, energy systems and environmental technologies. Before joining the TÜV SÜD Industrie Service GmbH as co-operation partner she worked as an expert for energy efficiency, renewable energy, environmental technologies and emission trading. She participated already in several CDM project assessments.

The audit team covers the above mentioned requirements as follows:

- Knowledge of Kyoto Protocol and the Marrakech Accords (ALL)
- Environmental and Social Impact Assessment (ALL)
- Skills in environmental auditing (ALL)
- Quality assurance (ALL)
- Technical aspects of sugar manufacturing process (BABECK / KATHURIA)
- Technical aspects of biomass cogeneration plants and grid operation (ALL)
- Monitoring concepts (ALL)
- Political, economical and technical random conditions in host country (KATHURIA / KUMAR)

In order to have an internal quality control of the project, a team of the following persons has been composed by the certification body “climate and energy”:

- Javier Castro (deputy head of the certification body “climate and energy”)

### 1.3 GHG Project Description

The project activity takes place adjacent to the sugar plant of Triveni Engineering Industries Limited in Khatauli, and involves the installation of a 23 MW<sub>e</sub> high-pressure cogeneration unit, which is operated next to existing biomass power generation units. The surplus electricity generated by the plant will be exported to the state electricity company, Uttar Pradesh Power Corporation Limited (UPPCL), which is part of the Northern Region grid.

The plant is located in Khatauli, Muzaffarnagar district, Uttar Pradesh. The project is a unilateral CDM project. Project participant is Triveni Engineering and Industries Ltd., India. Host Party of the project activity is India.

The category of the project activity is in Scope 1 – Energy industries (renewable - / non-renewable sources). The approved and applied baselines and monitoring methodologies are ACM0006 / Version 03 “Consolidated baseline methodology for grid-connected electricity generation from biomass residues” and ACM0002 / Version 06 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”.

Project start was in September 2004. The fixed crediting period of 10 years should start on 1<sup>st</sup> February 2007 or the date of registration, at the latest.

## 2 METHODOLOGY

The project assessment aims at being a risk based approach and is based on the methodology developed in the Validation and Verification Manual (for further information see [www.vvmanual.info](http://www.vvmanual.info)), an initiative of all Applicant Entities, which aims to harmonize the approach and quality of all such assessments.

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

- It organises, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of three tables. The different columns in these tables are described in Figure 1.

The completed validation protocol is enclosed in Annex 1 to this report.

<b>Validation Protocol Table 1: Mandatory Requirements</b>			
<b>Requirement</b>	<b>Reference</b>	<b>Conclusion</b>	<b>Cross reference</b>
The requirements the project must meet.	Gives reference to the legislation or agreement where the requirement is found.	This is either acceptable based on evidence provided (OK), or a <b>Corrective Action Request (CAR)</b> of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the Validation report.	Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.

<b>Validation Protocol Table 2: Requirement checklist</b>				
<b>Checklist Question</b>	<b>Reference</b>	<b>Means of verification (MoV)</b>	<b>Comment</b>	<b>Draft and/or Final Conclusion</b>
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	Gives reference to documents where the answer to the checklist question or item is found.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (OK), or a <b>Corrective Action Request (CAR)</b> due to non-compliance with the checklist question (See below). <b>Clarification</b> is used when the validation team has identified a need for further clarification.

<b>Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests</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 Corrective Action Request or a Clarification Request, these should be listed in this section.	Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.	The responses given by the Client or other project participants during the communications with the validation team should be 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

## 2.1 Review of Documents

The project design document submitted by the client and additional background documents related to the project design and baseline were reviewed. A complete list of all documents reviewed is attached as annex 2 to this report. The project design document underwent several revisions addressing clarification requests issued by TÜV SÜD. The audit team has been provided with a first PDD version in March 2006 which had been made public on [www.netinform.de](http://www.netinform.de). The project design document was assessed by several revisions addressing changes to the baseline and monitoring methodology requested by the CDM Executive Board and clarification requests issued by TÜV SÜD. Since the methodology was revised during the validation process, the revised PDD based on the applied version (ACM0006 Version 03) was made public again for the global stakeholder process as per the decision taken by the EB at its 27<sup>th</sup> meeting (EB 27, paragraph 29). The final PDD version submitted in December 2006 serves as the basis for the assessment presented herewith.

## 2.2 Follow-up Interviews

In the period of April 07-08, 2006 TÜV SÜD performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of Triveni Engineering and Industries Ltd. were interviewed. The main topics of the interviews are summarised in Table 1.

**Table 1 Interview topics**

Interviewed organisation	Interview topics
Triveni Engineering and Industries Ltd.	<ul style="list-style-type: none"> <li>➤ Project design</li> <li>➤ Technical equipment</li> <li>➤ Sustainable development issues</li> <li>➤ Baseline determination</li> <li>➤ Additionality</li> <li>➤ Crediting period</li> <li>➤ Monitoring plan</li> <li>➤ Management system</li> <li>➤ Environmental impacts</li> <li>➤ Stakeholder process</li> <li>➤ Approval by the Parties involved</li> </ul>

## 2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve the requests for corrective actions and clarification and any other outstanding issues which needed to be clarified for TÜV SÜD's positive conclusion on the project design. The Corrective Action Requests and Clarification Requests raised by TÜV SÜD were resolved during communications between the client and TÜV SÜD. To guarantee the transparency of the validation process, the concerns raised and responses given are summarised in chapter 3 below and documented in more detail in the validation protocol in annex 1.

### 3 VALIDATION FINDINGS

In the following sections the findings of the validation are stated. The validation findings for each validation subject are presented as follows:

- 1) The findings from the desk review of the project design documents and the findings from interviews during the follow up visit are summarised. A more detailed record of these findings can be found in the Validation Protocol in annex 1.
- 2) Where TÜV SÜD had identified issues that needed clarification or that represented a risk to the fulfilment of the project objectives, a Clarification or Corrective Action Request, respectively, have been issued. The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the Validation Protocol in annex 1. The validation of the project resulted in ten Clarification and seven Corrective Action Requests.
- 3) Where Clarification or Corrective Action Requests have been issued, the exchanges between the client and TÜV SÜD to resolve these Clarification or Corrective Action Requests is summarised.
- 4) The conclusions for validation subject are presented.

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

#### 3.1 Project Design

##### 3.1.1 Discussion

The project is a unilateral project. Project participant is Triveni Engineering and Industries Ltd., India. The involved Party, India, as the host Party meets all relevant participation requirements. The project has received a Letter of Approval from the Indian government in March 2006.

The project does confirm with the project category Scope 1. “Energy industries (renewable/non-renewable sources”. The objective of the project is to utilize the available sugar mill generated bagasse to generate steam and electricity for internal use and to export the surplus electricity to the Uttar Pradesh Power Corporation Limited (UPPCL) grid, which is part of the Northern Region grid.

The PDD describes clearly the pre- and post project activity and defines the project’s spatial boundaries. The project involves the implementation of a 23 MW<sub>e</sub> high-pressure cogeneration unit, which is operated next to existing biomass heat and power generation units. Biomass is mainly supplied from the adjacent Khatauli sugar plant. However records showed that biomass has been also purchased from other sites, therefore related project emissions needs to be considered in the PDD. All components and facilities used to mitigate GHGs or which may form a potential source of GHGs are covered in the revised PDD. Information regarding the capacity of the installation is clearly described and has been supported by corresponding documentation. During the visit on site the given information has been confirmed.

The project design engineering does reflect current good practices. The project is professionally developed and the applied technology uses existing domestic boiler and imported turbine

technologies. The efficiency of electricity generation is higher in the new power unit than in the existing units.

The life-time of the project technology is predicted with 20 years and it is unlikely that the key technology applied will be substituted by other or more efficient technologies within the crediting period of 10 years.

The project created additional season independent employment in operation and maintenance of the cogeneration plant including security. During the visit on site it has been confirmed that that qualified and specialised staff is available to meet the operation and maintenance needs of the plant.

All necessary permissions and licences for erection and operation of the plant have been obtained. The relevant documentation has been verified. The issuance of the Letter of Approval by the Indian DNA indicates that the project is in line with sustainable development policies of the country and fulfils national CDM requirements.

The funding for the project does not lead to a diversion of official development assistance as according to the information obtained by the audit team. Official Development Assistance (ODA) does not contribute to the financing of the project.

Both, the starting date as well as the crediting period are clearly defined. A fixed crediting period of 10 years is applied that should start on 01.02.2007 or the date of registration at the latest.

### 3.1.2 Findings

#### Corrective Action Request No. 1:

The means for transportation of biomass to the project site should be included. Project description e.g. in B.1.1. and the figure on page 18 of the PDD should be reviewed accordingly.

#### Response:

As per the detailed project report there should be enough surplus biomass available during cane crushing season to meet the demand during off-season. Thus there shall be no bagasse purchase from outside. Due to unusual cropping pattern and associated sugar cane unavailability. Bagasse was purchased during 05 -06 season.

Thus if there will be any biomass purchase from outside in the future, project emission due to transportation shall be calculated and deducted from the baseline emissions for emission reduction calculations.

The project emissions due to bagasse purchase during crediting period has been estimated based on data for the year 2005-06. However actual monitoring shall be done and appropriate project emission shall be deducted. Wood chips used in the February- March 06 was due to the start ups of the boiler and shall not be used during normal boiler operations. Hence there shall be no impact on plant performance. This can be verified at the time of verification by verifying agency.

#### Clarification Request No. 1

According to the monthly performance report power is provided by “DG generation”.

Please clarify the meaning of DG generation. Does this mean that power is provided by diesel gensets? In this case the project description needs to be adjusted. CO<sub>2</sub> emissions from on-site fuel consumption of fossil fuels, co-fired in the biomass power plant are to be considered.

Response:

There shall be no co-firing in the project cogen plant. The DG generation refers to the diesel generation in case of failure of power (TG units) as stand by units.

Past year details clearly shows that less than 2 percent of the total electricity generated at plant site is from DG sets. Hence they are excluded from description.

### 3.1.3 Conclusion

The project does comply with the CDM requirements. All components and facilities used to mitigate GHGs or which may form a potential source of GHGs are covered.

## 3.2 Baseline and Additionality

### 3.2.1 Discussion

The project is based on the approved baseline methodology ACM0006, version 03 “Consolidated baseline methodology for grid-connected electricity generation from biomass residues” of 19 May 2006 which is deemed to be the one most applicable for this project. The PDD responds convincingly to each of the applicability criteria which are outlined in the baseline methodology.

The application of the methodology, the discussion of the baseline scenario alternatives and determination of the baseline are presented transparently in the updated PDD. The application follows each of the steps outlined in the methodology and answers the corresponding sections in a proper manner. Baseline scenario 12 is identified as the most likely alternative.

The baseline is been determined using reliable assumptions. The grid emission factor calculation has been revised and is in accordance with the latest version of ACM0002 “Consolidated baseline methodology for grid connected electricity generation from renewable sources”. The baseline is based on project specific data and does sufficiently take into account relevant national and sectoral policies and developments.

The demonstration of the projects additionality is following the “tool for the demonstration and assessment of additionality”. Taking into account the guidelines given by this tool, the PDD complies with each defined step. The audit team verified that start of project activities has been before the registration date of the first clean development mechanism project. Evidence has been provided that CDM has been considered in the decision to proceed with the project activity.

Via barrier analysis the project demonstrates that it is not the baseline scenario. The barrier due to prevailing practice describes that it is not common to operate bagasse fueled high pressure boiler systems in the Indian sugar industry for efficient electricity generation in order to export electricity to the grid. The project is one of the first projects in Uttar Pradesh with all of them applying for CDM registration. Supporting documentation giving evidence for the same has been submitted. In addition other barriers related to complex clearance procedures and the export of electricity seems to prevent the implementation without CDM incentive. The analysis is substantiated by respective literature and documents.

References have been made to data sources used in general. Further details should be provided for verification of data . Key parameters applied for baseline determination have been listed but concrete values should be added in order to allow reproduction.

### 3.2.2 Findings

#### Corrective Action Request No. 2

Please discuss heat generation scenario H2 which would result in baseline scenario 13. of the approved baseline methodology ACM 0006.

The power generation scenario discussed should focus on realistic baseline scenarios rather than exclude scenarios not leading to CO<sub>2</sub> reductions or lowering baseline emissions (PDD p.10).

#### Response:

PDD has been revised accordingly.

#### Corrective Action Request No. 3

Please justify the applicability for each single component of the selected baseline scenario according to the “description of the situation” in ACM0006, table 1.

#### Response:

PDD has been revised and applicability of selected scenario is justified.

#### Corrective Action Request No. 4

The barrier analysis should concentrate on specific project barriers exceeding barriers due to normal project evolution. Documentary evidence needs to be provided.

#### Response:

The PDD has been revised.

#### Clarification Request No. 2:

Please discuss and justify the use of default values instead of plant or country specific values and provide concrete values for the baseline parameters applied for the calculations.

#### Response:

Baseline calculations for emission factor have been revised.

Excel sheet has been attached with details of baseline calculation (TEIL\_ER\_V04).

The emission factor calculation in PDD version 01 was based on electricity generation details for the year 2002-03, 2003-04 and 2004-05 as the details for 2005-06 was not released by that

time. The revised version has included generation details for the 2005-06 year ending 31<sup>st</sup> March 2006.

Clarification Request No. 3:

Data sources should be clearly assigned to the data provided in order to allow retraceability.

Response:

Data sources have been provided in the PDD for all calculations.

Clarification Request No. 4:

“Problems with grid synchronisation” (p.14) seems to result in a financial barrier for the installation/maintenance of protection systems. Please provide documentary evidence.

Response:

“Problems with grid synchronisation” was elaborated in the PDD to emphasize that due to variable frequency of grid there are chances of damages to the project equipments. Installation of Protections equipments incurred additional cost. However the cost of equipments is small compared to the total project cost and hence analysis of the same has not been done. Barrier due to synchronisation has been removed from the PDD because there is a strong barrier in respect to " Prevailing practice barrier" with the project activity.

Clarification Request No. 5:

Please provide documentary evidence on the figures provided in table B-6 of the PDD. In addition please review the related text on page 16.

Response:

References and evidence have been provided. Corrections have been done in the PDD.

Clarification Request No. 6:

References for literature and data sources are provided in general. However a clear documentation of the data sources with an unambiguous reference to each of the figures provided should be given in order to allow a verification of the same.

Response:

PDD has been revised with clear documentation of the data sources.

### 3.2.3 Conclusion

The project does comply with the requirements as it has been demonstrated that baseline scenario 12 is the most likely baseline scenario. Furthermore, documentary evidence to support the barrier and prevailing practice analyses as well as common practice have been submitted. In addition, the baseline emission factor calculation for the Northern grid has been revised and clear references has been provided to the values applied. Country specific values have been applied wherever available.

## 3.3 Monitoring Plan

### 3.3.1 Discussion

The selected monitoring methodology ACM 0006 is deemed to be the most applicable for this project. The application of the monitoring methodology is transparent.

Monitoring methodology provides a consistent approach in monitoring relevant parameters in relation to baseline emissions. The selection of GHG indicators is in conformity with the requirements. Respective parameters to monitor possible project emissions needed to be included. The revised PDD transparently describes the monitoring of all relevant parameters to determine project and baseline emissions as well as to demonstrate plausibility and gives opportunity for real measurements of achieved emission reductions.

Information on accuracy level of measurement instruments is included in the revised PDD. Recording frequency and archiving methods are considered being reasonable and appropriate as well. Quality control and quality assurance procedures were stated to be planned for baseline data monitoring. However it was not outlined what type of procedures are planned. More detailed information has been provided in the revised PDD. As the most relevant data are operational parameters delivery of high quality data should be ensured. The monitoring will allow cross checking of values.

As the most likely baseline scenario is the use of the biomass for energy generation no leakage is to be considered according to the methodology. In line with the methodology, data on the quantity of electricity generated in pre-project scenario (EG historic) is included in the revised PDD, thus accounting for any diversion of biomass from the existing power plant to the new generation unit. Respective evidence has been provided to the audit team.

The project is considered to have no negative environmental, social and economic effects and a monitoring of such data is also not required by the applied monitoring methodology. This approach is deemed sufficient.

The PDD describes the overall operational and management structure for monitoring. A CDM team has been formed, which will be responsible for monitoring of all relevant data as well as record keeping. A separate working document on “GHG Performance Monitoring, Measurement and Reporting of data” has been elaborated and submitted to the audit team, which defines the GHG monitoring organisation structure of the project in detail together with relevant procedures for project management. Project performance is compiled on daily and monthly basis. Monitoring reports are regularly reviewed by members of the CDM team.

### 3.3.2 Findings

#### Corrective Action Request No. 6:

Specific uncertainty levels, methods and associated accuracy level of measurement instrument and calibration procedures to be used for parameters and variables should be identified, along with detailed quality assurance and quality control procedures. Please add this information in the PDD.

#### Response:

PDD has been revised specifying uncertainty levels of the instruments, accuracy and calibration procedure

#### Corrective Action Request No. 7

Please correct the monitoring plan to include the project emissions due to transportation of purchased biomass.

#### Response:

As per the detailed project report there should be enough surplus biomass available during cane crushing season to meet the demand during off-season. Thus there shall be no bagasse purchase from outside.

However there shall be a monitoring procedure for purchased baggase and if in future there shall be any purchase from outside, project emission due to transportation shall be calculated and deducted from the baseline emissions for emission reduction calculations. These monitoring procedures/plan are included in revised PDD version.

#### Clarification Request No. 7:

The methodology selected (scenario 12) requires the net quantity of electricity generated during the most recent three years in all power plants fired with the bagasse. Respective data and evidence need to be provided.

#### Response:

Data has been attached and included in the PDD.

#### Clarification Request No. 8:

Respective procedures including the documentation of responsibilities for data measurements, frequency of calibration, maintenance of monitoring equipment and installations etc. needs to be submitted to DOE.

#### Response:

A separate document GHG procedures is attached. The internal document “TEIL GHG Performance Monitoring, Measurement and Reporting of data” for Khatauli, defines the respective procedures in detail.

Clarification Request No. 9:

Respective procedures covering internal audits, performance reviews and corrective actions should be defined and submitted to the audit team.

Response:

The internal document “TEIL GHG Performance Monitoring, Measurement and Reporting of data” for Khatauli, defines respective procedures. GHG procedure is attached.

### **3.3.3 Conclusion**

All clarification and corrective action requests have been resolved and the project complies with the requirements as per the applied methodology.

## **3.4 Calculation of GHG Emissions**

### **3.4.1 Discussion**

The project design captures all direct and indirect GHG emissions in the baseline and project scenario. Project emissions emerge from transport of fuel bagasse.

The calculations of the baseline emissions are documented in a complete and transparent manner. Formulae have been correctly applied.

Projections on electricity generation are based on the detailed project report elaborated at the project planning stage. The quantity of biomass to be transported has been estimated based on data for the year 2005-06. These approach is appropriate.

As per the methodology and the applied baseline scenario leakage effects do not need to be addressed. Emission reductions or increase due to the displacement of heat can be estimated as zero.

### **3.4.2 Findings**

Clarification Request No. 10

Text in A.4.4 is inconsistent to table A.4.4.1. Please review.

Response:

PDD has been revised. Correction has been done in the PDD with regards to the inconsistencies in the values of emission reductions.

### **3.4.3 Conclusion**

The calculation of GHG emissions and used data are according to applied methodologies and their requirements.

## **3.5 Environmental Impacts**

### **3.5.1 Discussion**

An environmental impact assessment has been undertaken although a formal EIA is not required for this project according to Indian legislation. The environmental impacts and respective mitigation measures are addressed in the PDD and can be seen as being low.

It is not expected that the project will create adverse environmental effects. Transboundary effects are also not expected. The project does comply with the environmental legislation and the company has obtained the relevant consents from the Uttar Pradesh Pollution Control Board.

### **3.5.2 Findings**

None

### **3.5.3 Conclusion**

The project does comply with the requirements.

## **3.6 Comments by Local Stakeholders**

### **3.6.1 Discussion**

Besides regulatory authorities local stakeholders such as the village Gram Panchayat as well as schools and colleges has been directly addressed to comment on the project. No stakeholder process is required according to national legislation.

A summary on the results has been included in the PDD. No concerns was raised during the consultation with local stakeholders. Corresponding documents has been submitted to the audit team.

No objection certificates and consents for operation have been obtained from the State Pollution Control Board and Uttar Pradesh Electricity Regulatory Commission (UPERC). A Power Purchase Agreement has been signed with Uttar Pradesh Power Corporation Limited (UPPCL).

### **3.6.2 Findings**

None

### **3.6.3 Conclusion**

The project does comply with the requirements.



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

TÜV SÜD published the project documents on its website and invited comments from Parties, stakeholders and non-governmental organizations during a period of 30 days, from March 17, to April 15, 2006.

Published on:

[http://www.netinform.de/KE/Wegweiser/Guide2.aspx?ID=1600&Ebene1\\_ID=26&Ebene2\\_ID=444&mode=1](http://www.netinform.de/KE/Wegweiser/Guide2.aspx?ID=1600&Ebene1_ID=26&Ebene2_ID=444&mode=1)

No comments have been received.

As per the decision taken at the 27<sup>th</sup> EB meeting (EB27 Report, paragraph 29), the revised PDD based on ACM0006 Version 03 was made public again during a period of 30 days from November 15 to December 14, 2006.

Published on:

[http://www.netinform.de/KE/Wegweiser/Guide2.aspx?ID=2307&Ebene1\\_ID=26&Ebene2\\_ID=682&mode=1](http://www.netinform.de/KE/Wegweiser/Guide2.aspx?ID=2307&Ebene1_ID=26&Ebene2_ID=682&mode=1)

No comments have been received.

## VALIDATION OPINION

TÜV SÜD has performed a validation of the “Bagasse based Co-generation Power Project at Khatauli”. The project is a unilateral CDM project. Party involved is India as host country. The validation was performed on the basis of UNFCCC criteria and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and subsequent decisions by the CDM Executive Board.


The review of the project design documentation and the subsequent follow-up interviews have provided TÜV SÜD with sufficient evidence to determine the fulfilment of stated criteria. In our opinion, the project does meet all relevant UNFCCC requirements for the CDM and all relevant host country criteria. The project will hence be recommended by TÜV SÜD for registration with the UNFCCC under the CDM.

By avoiding GHG emissions from fossil fuelled electricity generation, the project results in reductions of GHG emissions that are real, measurable and give long-term benefits to the mitigation of climate change. An analysis of the barriers demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented as designed, the project is likely to achieve the estimated amount of emission reductions.

Additionally the assessment team reviewed the estimation of the projected emission reductions. We can confirm that the indicated amount of emission reduction of of 868 077 tonnes CO<sub>2</sub>e over a crediting period of ten years, resulting in a calculated annual average of 86 808 tonnes CO<sub>2</sub>e, represents a reasonable estimation using the assumptions given by the project documents.

The validation is based on the information made available to TÜV SÜD and the engagement conditions detailed in this report. The validation has been performed using a risk based approach as described above. The only purpose of this report is its use during the registration process as part of the CDM project cycle. Hence, TÜV SÜD can not be held liable by any party for decisions made or not made based on the validation opinion, which will go beyond that purpose.

Munich, 2006-12-21



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Javier Castro

**Deputy Head of certification body  
“climate and energy“**

Munich, 2006-12-21



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Dr. Ayse Frey

**Project Manager**

## Annex 1: Validation Protocol



**Table 1 Mandatory Requirements for Clean Development Mechanism (CDM) Project Activities**

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art.12.2	☑	Table 2, Section E.4.1
2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof	Kyoto Protocol Art. 12.2, Marrakesh Accords, CDM Modalities §40a	☑	Table 2, Section A.3
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art.12.2.	☑	Table 2, Section E.4.1
4. The project shall have the written approval of voluntary participation from the designated national authorities of each party involved	Kyoto Protocol Art. 12.5a, Marrakesh Accords, CDM Modalities §40a	☑	The project is a unilateral project and has received a Letter of Approval from the Indian government.  The document contains all relevant elements defined for such documents (see EB 16 annex 6)
5. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	☑	Table 2, Section E
6. Reduction in GHG emissions shall be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM	Kyoto Protocol Art. 12.5c, Marrakesh Accords, CDM Modalities §43	☑	Table 2, Section B.2



REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
project activity			
7. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance	Marrakech Accords	☑	According to the information obtained by the audit team ODA does not contribute to the financing of the project.
8. Parties participating in the CDM shall designate a national authority for the CDM	Marrakech Accords, CDM Modalities §29	☑	India has established a designated national authority.
9. The host country shall be a Party to the Kyoto Protocol	Marrakech Accords, CDM Modalities §30	☑	India is a Party to the Kyoto Protocol and has accessed the Protocol at August 26, 2002; entry into force on February 02, 2005.
10. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received	Marrakech Accords, CDM Modalities §37b	☑	Table 2, Section G
11. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	Marrakech Accords, CDM Modalities §37c	☑	Table 2, Section F
12. Baseline and monitoring methodology shall be previously approved by the CDM Methodology Panel	Marrakech Accords, CDM Modalities §37e	☑	Table 2, Section B.1.1 and D.1.1
13. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP	Marrakech Accords, CDM Modalities §37f	☑	Table 2, Section D



REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
14. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available	Marrakech Accords, CDM Modalities, §40	☑	A global public stakeholder process on the UNFCCC website has taken place from March 17 to April 15, 2006.  <a href="http://www.netinform.de/KE/Wegweiser/Guide2.aspx?ID=1600&amp;Ebene1_ID=26&amp;Ebene2_ID=444&amp;mode=1">http://www.netinform.de/KE/Wegweiser/Guide2.aspx?ID=1600&amp;Ebene1_ID=26&amp;Ebene2_ID=444&amp;mode=1</a>
15. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances	Marrakech Accords, CDM Modalities, §45c,d	☑	Table 2, Section B.2
16. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure	Marrakech Accords, CDM Modalities, §47	☑	Table 2, Section B.2
17. The project design document shall be in conformance with the UNFCCC CDM-PDD format	Marrakech Accords, CDM Modalities, Appendix B, EB Decisions	☑	The project design document does conform with the CDM Project Design Document format (version 02, from 1 July 2004) valid by the time of PDD submission.



**Table 2 Requirements Checklist**

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
<b>A. General Description of Project Activity</b> <i>The project design is assessed.</i>					
<b>A.1. Project Boundaries</b> <i>Project Boundaries are the limits and borders defining the GHG emission reduction project.</i>					
A.1.1. Are the project's spatial (geographical) boundaries clearly defined?	1,2,3,4,11,34	DR I	<p>The Project is located adjacent to the sugar plant of Triveni Engineering Industries Limited in Khatauli, Muzaffarnagar district, Uttar Pradesh. The projects spatial boundary includes the project site (bagasse fuel storage and processing units, boiler/turbine and auxiliaries) as well as all power plants connected to the state grid of Uttar Pradesh.</p> <p>However according to the report on "bagasse consumed and stock" for the period of 10/05-03/06 it seems that bagasse is not only originate from the adjacent Khatauli sugar plant but is also purchased from other sites. In addition the boiler is fuelled with wood chips.</p>	<b>CAR 1</b>	<input checked="" type="checkbox"/>

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



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			<p><u>Corrective Action Request No. 1</u></p> <p>The means for transportation of biomass to the project site should be included. Project description e.g. in B.1.1. and the figure on page 18 of the PDD should be reviewed accordingly.</p>		
<p>A.1.2. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?</p>	<p>1,2, 3,4, 7,11, 34, 39</p>	<p>DR I</p>	<p>The project involves a 23 MWe grid connected cogeneration plant fuelled by bagasse and wood chips and consisting of a boiler, turbo-generator, auxiliary components, and switch yard. The exported power will be stepped up from 11 kV to 132 kV and will be interfaced with the grid substation of Uttar Pradesh Power Corporation Ltd. (UPPCL) located at 5 km from the site.</p> <p>According to the monthly performance report power is provided by "DG generation".</p> <p><u>Clarification Request No. 1</u></p> <p>Please clarify the meaning of DG generation. Does this mean that power is provided by diesel gensets? In this case the project description needs to be adjusted. CO<sub>2</sub> emissions from on-site fuel consumption of fossil fuels, co-fired in the</p>	<p><b>CR 1</b></p>	<p><input checked="" type="checkbox"/></p>

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



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			biomass power plant are to be considered.		
<b>A.2. Technology to be employed</b> <i>Validation of project technology focuses on the project engineering, choice of technology and competence/maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.</i>					
A.2.1. Does the project design engineering reflect current good practices?	1,2,3, 4,7,8, 9,12, 28,32, 34,35, 36	DR I	Yes, the project design engineering does reflect good practices. The detailed project report was carried out by Avant Garde Engineers & consultants Ltd.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.2.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	1,2,3, 4,7,8, 9,12, 28,32, 34,35, 36	DR I	Yes, the project uses the latest technology of generating and exporting electrical power to the grid. The cogeneration plant comprises a 120 tonnes per hour (tph) high pressure boiler and a 23 MW turbo generator set. The boiler is designed with spreader stoker, travelling grate, membrane furnace walls, and electrostatic precipitators for dust separation. The turbine is a double extraction cum condensing machine.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	1,2,3, 4,7,8, 9,12, 28,32,	DR I	It is unlikely that the key technology applied will be substituted by other or more efficient technologies within the crediting period of 10 years.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
	34,35, 36				
A.2.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	1,2,3, 4,7,8, 9,12, 16,28, 32,34, 35,36	DR 	No, extensive initial training is not required as operation and maintenance activities are undertaken by trained technical staff with background of working in power plants.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.2.5. Does the project make provisions for meeting training and maintenance needs?	1,2,3, 4,7,8, 9,12, 16,28, 32,34, 35,36	DR 	Trained manpower is available to meet the operation and maintenance needs of the plant .	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>A.3. Contribution to Sustainable Development</b> <i>The project's contribution to sustainable development is assessed.</i>					
A.3.1. Is the project in line with relevant legislation and plans in the host country?	1,2, 5,6, 12, 13, 28, 33	DR 	<p>The project is in line with the Indian government regulations.</p> <p>The state government promotes power generation in the private sector, however there are no regulatory requirements related to the installation of bagasse based cogeneration.</p>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.3.2. Is the project in line with host-country specific CDM requirements?	1,2,5, 6,12,	DR 	Yes, the confirmation from host country India has been obtained on 10 <sup>th</sup> March	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
	13,28, 33		2006 within the Letter of Approval.		
A.3.3. Is the project in line with sustainable development policies of the host country?	1,2,5, 6,12, 13,28, 33	DR 	Yes, the project is in line with the sustainable development policies of Government of India.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.3.4. Will the project create other environmental or social benefits than GHG emission reductions?	1,2, 5,6, 12, 13, 28, 33	DR 	Yes, the project will provide for additional - season independent - employment in operation and maintenance of the cogeneration plant including security.  Furthermore the project supports a reliable, renewable supply of electricity.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>B. Project Baseline</b>					
<i>The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i>					
<b>B.1. Baseline Methodology</b>					
<i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
B.1.1. Is the baseline methodology previously approved by the CDM Methodology Panel?	1,2, 3,4, 39	DR 	Yes, the baseline methodology applied has been approved by the CDM Executive Board and is published as under the name ACM0006, version 03 dated 19 <sup>th</sup> of May 2006: "Consolidated baseline methodology for grid-connected electricity generation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
B.1.2. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	1,2, 3,4, 39	DR I	<p>from biomass residues”.</p> <p>The baseline discussion is not transparent and the derived baseline scenario is not convincing. It states that in the absence of the project activity the biomass would be used for heat generation in boilers - scenario H 4 – without discussing scenario H2 which seems to be a credible alternative as in the pre-project scenario the biomass is used for heat and electricity generation in boilers with a lower efficiency.</p> <p><u>Corrective Action Request No. 2</u></p> <p>Please discuss heat generation scenario H2 which would result in baseline scenario 13. of the approved baseline methodology ACM 0006.</p> <p>The power generation scenario discussed should focus on realistic baseline scenarios rather than exclude scenarios not leading to CO<sub>2</sub> reductions or lowering baseline emissions (PDD p.10).</p>	CAR 2	<input checked="" type="checkbox"/>



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
<b>B.2. Baseline Determination</b> <i>The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.</i>					
B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent?	1,2, 3,4, 39	DR I	See comments in B.1.2	<b>CAR 2</b>	<input checked="" type="checkbox"/>
B.2.2. Has the baseline been determined using conservative assumptions where possible?	1,2, 3,4, 39	DR I	<p>The calculation of emission reductions is based on the electricity supplied to the grid by the biomass based cogeneration plant.</p> <p>The baseline emission factor is calculated using the combined margin approach.</p> <p>The calculation of fuel CO<sub>2</sub> emission coefficients is based on IPPC default values.</p> <p><u>Clarification Request No. 2:</u> Please discuss and justify the use of default values instead of plant or country specific values and provide concrete values for the baseline parameters applied for the calculations.</p> <p><u>Clarification Request No. 3:</u> Data sources should be clearly assigned to</p>	<b>CR 2, CR 3</b>	<input checked="" type="checkbox"/>

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



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			the data provided in order to allow retraceability.		
B.2.3. Has the baseline been established on a project-specific basis?	1,2,3,4,39	DR 	<u>Corrective Action Request No. 3</u> Please justify the applicability for each single component of the selected baseline scenario according to the “description of the situation” in ACM0006, table 1.	<b>CAR 3</b>	<input checked="" type="checkbox"/>
B.2.4. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	1,2,3,4	DR 	Yes.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.2.5. Is the baseline determination compatible with the available data?	1,2,3,4	DR 	Yes.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.2.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	1,2,3,4,31,32,39	DR 	Yes.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.2.7. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario (e.g. through (a) a flow-chart or series of questions that lead to a narrowing of potential baseline options, (b) a qualitative or quantitative assessment of different potential options and an indication of why the non-project option is more likely, (c) a qualitative or quantitative assessment of one or more barriers facing the	1,2,3,4,31,32,39,40,41	DR 	The demonstration of the projects additionality is following the “tool for the demonstration and assessment of additionality”. However project proponent should concentrate on the main barrier(s) and remove barriers without strong documentary evidence from the PDD.  <u>The barriers regarding human resources and organisation are very general and not</u>	<b>CAR 4, CR 4, CR 5</b>	<input checked="" type="checkbox"/>

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
proposed project activity or (d) an indication that the project type is not common practice in the proposed area of implementation, and not required by a Party's legislation/regulations)?			<p>really project specific.</p> <p><u>Corrective Action Request No. 4</u> The barrier analysis should concentrate on specific project barriers exceeding barriers due to normal project evolution. Documentary evidence needs to be provided.</p> <p><u>Clarification Request No. 4:</u> "Problems with grid synchronisation" (p.14) seems to result in a financial barrier for the installation/maintenance of protection systems. Please provide documentary evidence.</p> <p><u>Clarification Request No. 5:</u> Please provide documentary evidence on the figures provided in table B-6 of the PDD. In addition please review the related text on page 16.</p>		
B.2.8. Have the major risks to the baseline been identified?	1,2, 3,4, 31, 32,33	DR 	Yes.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.2.9. Is all literature and sources clearly referenced?	1,2, 3,4, 39	DR 	<p>References for literature and data sources are provided in general.</p> <p><u>Clarification Request No. 6:</u></p>	<b>CR 6</b>	<input checked="" type="checkbox"/>

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			However a clear documentation of the data sources with an unambiguous reference to each of the figures provided should be given in order to allow a verification of the same.		
<b>C. Duration of the Project/ Crediting Period</b> <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>					
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	1,2, 3,4	DR I	Yes. The project starting date is 29th September 2004 and the operational lifetime for the project is estimated as 20 years which is reasonable..	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C.1.2. Is the assumed crediting time clearly defined and reasonable (renewable crediting period of max. two x 7 years or fixed crediting period of max. 10 years)?	1,2, 3,4, 39	DR I	Yes, the crediting period is fixed for 10 years. <u>Corrective Action Request No. 5:</u> Note that the credits will be issued only for the period after the date of registration of the proposed activity as a CDM project therefore please review the start of the crediting period.	<b>CAR 5</b>	<input checked="" type="checkbox"/>

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
<p><b>D. Monitoring Plan</b></p> <p><i>The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed ((Blue text contains requirements to be assessed for optional review of monitoring methodology prior to submission and approval by CDM EB).</i></p>					
<p><b>D.1. Monitoring Methodology</b></p> <p><i>It is assessed whether the project applies an appropriate baseline methodology.</i></p>					
D.1.1. Is the monitoring methodology previously approved by the CDM Methodology Panel?	1,2,3,4,39	DR I	Yes, it refers to ACM0006, version 03, that has been approved by the CDM Executive Board.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.1.2. Is the monitoring methodology applicable for this project and is the appropriateness justified?	1,2,3,4	DR I	Yes, the project involves biomass residues based cogeneration with electricity export to the grid.  The fulfilment of the applicability conditions is not clearly discussed, see above B.1.2.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.1.3. Does the monitoring methodology reflect good monitoring and reporting practices?	1,2,3,4,38,39	DR I	<u>Corrective Action Request No. 6:</u> Specific uncertainty levels, methods and associated accuracy level of measurement instrument and calibration procedures to be used for parameters and variables should be identified, along with detailed quality assurance and quality control procedures.	<b>CAR 6</b>	<input checked="" type="checkbox"/>

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			Please add this information in the PDD.		
D.1.4. Is the discussion and selection of the monitoring methodology transparent?	1,2, 3,4	DR I	Yes.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>D.2. Monitoring of Project Emissions</b> <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	1,2, 3,4, 39	DR I	<p>The monitoring plan does not include the project emission due to transportation of the purchased biomass.</p> <p><u>Corrective Action Request No. 7</u> Please correct the monitoring plan to include the project emissions due to transportation of purchased biomass.</p>	<b>CAR 7</b>	<input checked="" type="checkbox"/>
D.2.2. Are the choices of project GHG indicators reasonable?	1,2, 3,4	DR I	See above in D2.1	<b>CAR 7</b>	<input checked="" type="checkbox"/>
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?	1,2, 3,4	DR I	Yes it should be possible to determine the GHG indicators.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.2.4. Will the indicators give opportunity for real measurements of achieved emission reductions?	1,2, 3,4	DR I	See above in D2.1	<b>CAR 7</b>	<input checked="" type="checkbox"/>
D.2.5. Will the indicators enable comparison of project data and performance over time?	1,2, 3,4	DR I	Yes.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
<b>D.3. Monitoring of Leakage</b> <i>It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</i>					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	1,2,3,4	DR I	The main potential source of leakage for this project activities is an increase in emission from fossil fuel combustion due to the diversion of biomass from other uses. As per the methodology and the applied baseline scenario leakage effects do not need to be addressed.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.3.2. Have relevant indicators for GHG leakage been included?	1,2,3,4	DR I	Not applicable, see above D 3.1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.3.3. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	1,2,3,4	DR I	See above in D3.1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.3.4. Will it be possible to monitor the specified GHG leakage indicators?	1,2,3,4	DR I	See above in D3.1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>D.4. Monitoring of Baseline Emissions</b> <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	1,2,3,4	DR	Yes, the monitoring of electricity data has been provided according to the requirements of ACM0006. Recalculation of the emission factor for the	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			grid electricity replaced by the project activity is not required as it is based on an ex-ante approach.		
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	1,2, 3,4	DR	Yes the choice of indicators are reasonable.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.4.3. Will it be possible to monitor the specified baseline indicators?	1,2, 3,4, 39	DR	<u>Clarification Request No. 7:</u> The methodology selected (scenario 12) requires the net quantity of electricity generated during the most recent three years in all power plants fired with the bagasse. Respective data and evidence need to be provided.	<b>CR 7</b>	<input checked="" type="checkbox"/>
<b>D.5. Monitoring of Sustainable Development Indicators/ Environmental Impacts</b> <i>It is checked that choices of indicators are reasonable and complete to monitor sustainable performance over time.</i>					
D.5.1. Does the monitoring plan provide the collection and archiving of relevant data concerning environmental, social and economic impacts?	1,2, 3,4	DR	The methodology does not require the monitoring of such data.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.5.2. Is the choice of indicators for sustainability development (social, environmental, economic) reasonable?	1,2, 3,4	DR	No, according to the methodology there is no need to define specific indicators.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.5.3. Will it be possible to monitor the specified sustainable development indicators?	1,2, 3,4	DR	See the comments in D5.2.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.5.4. Are the sustainable development indicators in	1,2,	DR	See the comments in D5.2.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
line with stated national priorities in the Host Country?	3,4, 12				
<b>D.6. Project Management Planning</b> <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>					
D.6.1. Is the authority and responsibility of project management clearly described?	1,2, 6,11 16, 29, 30	DR I	Yes, the authority and responsibility of project management is clearly defined. An organization chart has been provided to the DOE.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.6.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	1,2, 6,11 16, 29, 30	DR I	Yes.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.6.3. Are procedures identified for training of monitoring personnel?	1,2, 6,11 16, 29, 30	DR I	Since the people are trained and already having background of working in power projects no special training is envisaged.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.6.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	1,2, 6,11 16, 29, 30	DR I	The risk of emergency situation with unintended emissions is low	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
D.6.5. Are procedures identified for calibration of monitoring equipment?	1,2, 6,11 16, 29, 30	DR I	<p>Procedures for calibration of monitoring equipment for the power exported and imported are defined within the Power Purchase Agreement signed with UPPCL.</p> <p>In addition these procedures shall also be defined/documented for other monitoring parameters and systematically integrated into management procedures.</p> <p><u>Clarification Request No. 8:</u> Respective procedures including the documentation of responsibilities for data measurements, frequency of calibration, maintenance of monitoring equipment and installations etc. needs to be submitted to DOE.</p>	CR 8	<input checked="" type="checkbox"/>
D.6.6. Are procedures identified for maintenance of monitoring equipment and installations?	1,2,6, 11,16, 27,29, 30	DR I	See the comments in D.6.5.	CR 8	<input checked="" type="checkbox"/>
D.6.7. Are procedures identified for monitoring, measurements and reporting?	1,2,6, 16,27, 28,29, 30	DR I	See above D.6.1.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.6.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process	1,2,6, 16,27,	DR I	Day to day record keeping of various parameters relating to boiler, turbine, export	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
performance documentation)	28,29, 30		of power are maintained through an integrated control system.		
D.6.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	1,2,6, 16,27, 28,29, 30	DR I	See the comments in D.6.5.	CR 8	<input checked="" type="checkbox"/>
D.6.10. Are procedures identified for review of reported results/data?	1,2,6, 16,27, 29,30	DR I	See the comments in D.6.5.	CR 8	<input checked="" type="checkbox"/>
D.6.11. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	1,2,6, 16,27, 29,30	DR I	No procedures have been defined. <u>Clarification Request No. 9:</u> Respective procedures covering internal audits, performance reviews and corrective actions should be defined and submitted to the audit team.	CR 9	<input checked="" type="checkbox"/>
D.6.12. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	1,2, 6,16, 27,28, 29,30	DR I	Project performance is recorded live, compiled on a daily basis and summarised monthly. Monitoring reports are regularly reviewed by CDM team before its release.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.6.13. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	1,2, 6,16, 27,29, 30	DR I	See above D.6.11.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
<b>E. Calculation of GHG Emissions by Source</b> <i>It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.</i>					
<b>E.1. Predicted Project GHG Emissions</b> <i>The validation of predicted project GHG emissions focuses on transparency and completeness of calculations.</i>					
E.1.1. Are all aspects related to direct and indirect GHG emissions captured in the project design?	1,2, 3,4	DR	Direct emissions may arise from the transport of bagasse to the site.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
E.1.2. Are the GHG calculations documented in a complete and transparent manner?	1,2, 3,4	DR	Yes.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
E.1.3. Have conservative assumptions been used to calculate project GHG emissions?	1,2, 3,4	DR	Yes. Projections have been estimated based on data for the year 2005-06.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
E.1.4. Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	1,2, 3,4	DR	Yes.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
E.1.5. Have all relevant greenhouse gases and source categories listed in Kyoto Protocol Annex A been evaluated?	1,2, 3,4	DR	The methodology only requires the evaluation of CO <sub>2</sub> .	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
<b>E.2. Leakage</b> <i>It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed.</i>					
E.2.1. Are potential leakage effects beyond the chosen project boundaries properly identified?	1,2, 3,4	DR	See above D.3.1.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
E.2.2. Have these leakage effects been properly accounted for in calculations?	1,2, 3,4	DR	See above E.2.1.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
E.2.3. Does the methodology for calculating leakage comply with existing good practice?	1,2, 3,4	DR	See above E.2.1.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
E.2.4. Are the calculations documented in a complete and transparent manner?	1,2, 3,4	DR	See above E.2.1.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
E.2.5. Have conservative assumptions been used when calculating leakage?	1,2, 3,4	DR	See above E.2.1.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
E.2.6. Are uncertainties in the leakage estimates properly addressed?	1,2, 3,4	DR	See above E.2.1.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>E.3. Baseline Emissions</b> <i>The validation of predicted baseline GHG emissions focuses on transparency and completeness of calculations.</i>					
E.3.1. Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions?	1,2, 3,4	DR	Yes. Operational characteristics were developed within the detailed project report.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			<p>The baseline emission factor is calculated using the combined margin approach and is based on Northern regional grid data.</p> <p>Due to non availability of dispatch data and since low cost/must run power generation is less than 50 % of the total grid generation, simple OM method has been chosen for calculating the operating margin emission factor (see also B.2.2).</p>		
E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	1,2, 3,4	DR	Yes..	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
E.3.3. Are the GHG calculations documented in a complete and transparent manner?	1,2, 3,4	DR	The calculation approach follows the approved methodology.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
E.3.4. Have conservative assumptions been used when calculating baseline emissions?	1,2, 3,4, 39	DR	Yes.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
E.3.5. Are uncertainties in the GHG emission estimates properly addressed in the documentation?	1,2, 3,4	DR	Yes.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
E.3.6. Have the project baseline(s) and the project emissions been determined using the same appropriate methodology and conservative assumptions?	1,2, 3,4	DR	Yes.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
<b>E.4. Emission Reductions</b>					
Validation of baseline GHG emissions will focus on methodology transparency and completeness in emission estimations.					
E.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	1,2,3,4 13,14,15,39	DR I	<u>Clarification Request No. 10</u> Text in A.4.4 is inconsistent to table A.4.4.1. Please review.	CR 10	<input checked="" type="checkbox"/>
<b>F. Environmental Impacts</b>					
<i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i>					
F.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	1,2,3,4 13,14,15	DR I	Yes, the PDD describes the environmental impacts.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	1,2,3,4 13,14,15	DR I	An EIA is not required.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
F.1.3. Will the project create any adverse environmental effects?	1,2,3,4 13,14,15	DR I	No, the project is not expected to create adverse environmental effects	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
F.1.4. Are transboundary environmental impacts considered in the analysis?	1,2,3,4	DR	Transboundary impacts are not considered	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
	13,14, 15	I	to be of relevance.		
F.1.5. Have identified environmental impacts been addressed in the project design?	1,2, 3,4 13,14, 15	DR I	The relevant environmental impacts have been considered.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
F.1.6. Does the project comply with environmental legislation in the host country?	1,2,3, 4,13, 14,15	DR I	Yes, the company has obtained the relevant consents from the Pollution Control Boards.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>G. Stakeholder Comments</b> <i>The validator should ensure that a stakeholder comments have been invited and that due account has been taken of any comments received.</i>					
G.1.1. Have relevant stakeholders been consulted?	1,2,3, 4,17, 18,19, 20-26	DR I	Yes, besides regulatory authorities further local stakeholders such as the village Panchayat has been addressed.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	1,2,3, 4,17, 18,19, 20-26	DR I	Yes and the consultations were done in local language.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
G.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	1,2,3, 4,17, 18,19, 20-26	DR I	A stakeholder consultation process is not required according to Indian legislation.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
G.1.4. Is a summary of the stakeholder comments	1,2,3,	DR	Yes.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
received provided?	4,17, 18,19, 20-26	I			
G.1.5. Has due account been taken of any stakeholder comments received?	1,2,3, 4,17, 18,19, 20-26	DR I	No negative comments has been received.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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**Table 3 Resolution of Corrective Action and Clarification Requests**

Draft report clarifications and corrective action requests by validation team	Ref. To checklist question in table 2	Summary of project owner response	Validation team conclusion
<p><b>CAR 1</b></p> <p>However according to the report on “bagasse consumed and stock” for the period of 10/05-03/06 it seems that bagasse is not only originate from the adjacent Khatauli sugar plant but is also purchased from other sites. In addition the boiler is fuelled with wood chips.</p> <p><u>Corrective Action Request No. 1</u></p> <p>The means for transportation of biomass to the project site should be included. Project description e.g. in B.1.1. and the figure on page 18 of the PDD should be reviewed accordingly.</p>	<p>A.1.1</p>	<p>As per the detailed project report there should be enough surplus biomass available during cane crushing season to meet the demand during off-season. Thus there shall be no bagasse purchase from outside. (Refer attached DPR pages for Baggase balance)</p> <p>Due to unusual cropping pattern and associated sugar cane unavailability. Bagasse was purchased during 05 -06 season.</p> <p>Thus if there will be any biomass purchase from outside in the future, project emission due to transportation shall be calculated and deducted from the baseline emissions for emission reduction calculations.</p> <p>The project emissions due to bagasse purchase during crediting period has been estimated based on data for the year 2005-06. However actual monitoring shall be done and</p>	<p><input checked="" type="checkbox"/></p> <p>PDD has been revised and takes account on possible project emissions due to the purchase of biomass.</p>



Draft report clarifications and corrective action requests by validation team	Ref. To checklist question in table 2	Summary of project owner response	Validation team conclusion
		<p>appropriate project emission shall be deducted.</p> <p>Wood chips used in the February-March 06 was due to the start ups of the boiler and shall not be used during normal boiler operations. Hence there shall be no impact on plant performance. This can be verified at the time of verification by verifying agency.</p>	
<p><b>CAR 2</b>  <u>Corrective Action Request No. 2</u>            Please discuss heat generation scenario H2 which would result in baseline scenario 13. of the approved baseline methodology ACM 0006.            The power generation scenario discussed should focus on realistic baseline scenarios rather than exclude scenarios not leading to CO<sub>2</sub> reductions or lowering baseline emissions (PDD p.10).</p>	<p>B.1.2.</p>	<p>PDD has been revised accordingly.</p>	<p><input checked="" type="checkbox"/></p> <p>Discussion on alternative power scenarios is comprehensible.            H4 is deemed to be the most likely baseline scenario as the heat requirement of plant is actually met by existing boilers. The installation of a cogeneration plant with the same firing capacity as the proposed project activity but different efficiency of heat generation would not be a likely scenario, because of the heat balance.</p>
<p><b>CAR 3</b>  <u>Corrective Action Request No. 3</u>            Please justify the applicability for each single component of the selected baseline</p>	<p>B.2.3</p>	<p>PDD has been revised and applicability of selected scenario is justified.</p>	<p><input checked="" type="checkbox"/></p> <p>The selected baseline scenario is deemed to be the most likely alternative.</p>



Draft report clarifications and corrective action requests by validation team	Ref. To checklist question in table 2	Summary of project owner response	Validation team conclusion
scenario according to the “description of the situation” in ACM0006, table 1.			
<p><b>CAR 4</b></p> <p>The barriers regarding human resources and organisation are very general and not really project specific.</p> <p><u>Corrective Action Request No. 4</u></p> <p>The barrier analysis should concentrate on specific project barriers exceeding barriers due to normal project evolution. Documentary evidence needs to be provided.</p>	B.2.7.	The PDD has been revised.	<p><input checked="" type="checkbox"/></p> <p>Barrier analysis has been revised and concentrates on barrier due to prevailing practice and institutional barriers.</p> <p>The analysis is supported by document “UP_ Final order Tariff “ and the thirteens report of MNES outlining the difficulties associated with the structural changes in the power sector, the precarious financial situation of the power sector as well as complex clearance procedures.</p> <p>In addition a letter of the UP Sugar Mills Association has been provided that confirms that high pressure/high temperature boiler configuration is new to the sector.</p>
<p><b>CAR 5</b></p> <p>Yes, the crediting period is fixed for 10 years.</p> <p><u>Corrective Action Request No. 5:</u></p>	C.1.2.	Crediting period shall start after the registration of the project activity. PDD has been revised accordingly.	<p><input checked="" type="checkbox"/></p>



Draft report clarifications and corrective action requests by validation team	Ref. To checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>Note that the credits will be issued only for the period after the date of registration of the proposed activity as a CDM project therefore please review the start of the crediting period.</p>			
<p><b>CAR 6</b></p> <p><u>Corrective Action Request No. 6:</u> Specific uncertainty levels, methods and associated accuracy level of measurement instrument and calibration procedures to be used for parameters and variables should be identified, along with detailed quality assurance and quality control procedures. Please add this information in the PDD.</p>	<p>D.1.3.</p>	<p>PDD has been revised specifying uncertainty levels of the instruments, accuracy and calibration procedure</p>	<p><input checked="" type="checkbox"/></p>
<p><b>CAR 7</b></p> <p>The monitoring plan does not include the project emission due to transportation of the purchased biomass.</p> <p><u>Corrective Action Request No. 7:</u> Please correct the monitoring plan to include the project emissions due to transportation of purchased biomass.</p>	<p>D.2.1.</p>	<p>As per the detailed project report there should be enough surplus biomass available during cane crushing season to meet the demand during off-season. Thus there shall be no bagasse purchase from outside.</p> <p>However there shall be a monitoring procedure for purchased bagasse and if in future there shall be any purchase from outside, project emission due to transportation shall be calculated and</p>	<p><input checked="" type="checkbox"/></p> <p>Although according to the DPR there shall be no bagasse purchase from outside, data records show that bagasse has been purchased from outside (data provided for 2005/2006). Respective monitoring parameters have been included in the PDD.</p>



Draft report clarifications and corrective action requests by validation team	Ref. To checklist question in table 2	Summary of project owner response	Validation team conclusion
		deducted from the baseline emissions for emission reduction calculations. These monitoring procedures/plan are included in revised PDD version.	
<p><b>CR 1:</b> According to the monthly performance report power is provided by “DG generation”.</p> <p><u>Clarification Request No. 1</u> Please clarify the meaning of DG generation. Does this mean that power is provided by diesel gensets? In this case the project description needs to be adjusted. CO<sub>2</sub> emissions from on-site fuel consumption of fossil fuels, co-fired in the biomass power plant are to be considered.</p>	A.1.2.	<p>There shall be no co-firing in the project cogen plant.</p> <p>The DG generation refers to the diesel generation in case of failure of power (TG units) as stand by units.</p> <p>Past year details clearly shows that less than 2 percent of the total electricity generated at plant site is from DG sets. Hence they are excluded from description.</p>	<p><input checked="" type="checkbox"/></p> <p>It has been demonstrated that DG sets are installed in sugar plant for emergency cases only. Thus related emissions do not need to be considered.</p>
<p><b>CR 2:</b> The calculation of fuel CO<sub>2</sub> emission coefficients is based on IPCC default values.</p> <p><u>Clarification Request No. 2:</u> Please discuss and justify the use of default values instead of plant or country specific values and provide concrete values for the baseline parameters applied for the calculations.</p>	B.2.2.	<p>Baseline calculations for emission factor have been revised.</p> <p>Excel sheet has been attached with details of baseline calculation (TEIL_ER_V04).</p> <p>The emission factor calculation in PDD version 01 was based on electricity generation details for the year 2002-03, 2003-04 and 2004-05 as the details for 2005-06 was not released by that time.</p>	<p><input checked="" type="checkbox"/></p> <p>Country specific values have been used wherever available. Calculations are traceable and it can be confirmed that appropriate and conservative baseline parameters have been applied.</p>



Draft report clarifications and corrective action requests by validation team	Ref. To checklist question in table 2	Summary of project owner response	Validation team conclusion
		The revised version has included generation details for the 2005-06 year ending 31 <sup>st</sup> March 2006.	
<p><b>CR 3:</b>  <u>Clarification Request No. 3:</u>            Data sources should be clearly assigned to the data provided in order to allow retraceability.</p>	B.2.2.	Data sources have been provided in the PDD for all calculations.	☑
<p><b>CR 4:</b>  <u>Clarification Request No. 4:</u>            “Problems with grid synchronisation” (p.14) seems to result in a financial barrier for the installation/maintenance of protection systems. Please provide documentary evidence.</p>	B.2.7.	“Problems with grid synchronisation” was elaborated in the PDD to emphasize that due to variable frequency of grid there are chances of damages to the project equipments. Installation of Protections equipments incurred additional cost. However the cost of equipments is small compared to the total project cost and hence analysis of the same has not been done. Barrier due to synchronisation has been removed from the PDD because there is a strong barrier in respect to " Prevailing practice barrier" with the project activity.	☑
<p><b>CR 5:</b>  <u>Clarification Request No. 5:</u></p>	B.2.7.	References and evidence have been provided. Corrections have been done	☑ References have been provided. The



Draft report clarifications and corrective action requests by validation team	Ref. To checklist question in table 2	Summary of project owner response	Validation team conclusion
Please provide documentary evidence on the figures provided in table B-6 of the PDD. In addition please review the related text on page 16.		in the PDD.	different data sources underline that the project activity is not common practice in the sector and that similar activities are relying on CDM-income. In addition a letter of the UP Sugar Mills Association has been submitted that confirms the situation in the sector.
<p><b>CR 6:</b> References for literature and data sources are provided in general. <u>Clarification Request No. 6:</u> However a clear documentation of the data sources with an unambiguous reference to each of the figures provided should be given in order to allow a verification of the same.</p>	B.2.9.	PDD has been revised with clear documentation of the data sources.	☑
<p><b>CR 7:</b> <u>Clarification Request No. 7:</u> The methodology selected (scenario 12) requires the net quantity of electricity generated during the most recent three years in all power plants fired with the bagasse. Respective data and evidence need to be provided.</p>	D.4.3.	Data has been attached and included in the PDD.	☑ EG <sub>historic</sub> is based on the electricity generation data of the most recent years before project implementation (pre-project scenario: crushing seasons from 02/03, 03/04 and 04/05 ). Respective data has been included in the PDD. An Excel sheet with monthly electricity generation data has been provided evidencing the values



Draft report clarifications and corrective action requests by validation team	Ref. To checklist question in table 2	Summary of project owner response	Validation team conclusion
			provided.
<p><b>CR 8:</b>            Procedures for calibration of monitoring equipment for the power exported and imported are defined within the Power Purchase Agreement signed with UPPCL.            In addition these procedures shall also be defined/documented for other monitoring parameters and systematically integrated into management procedures.</p> <p><u>Clarification Request No. 8:</u>            Respective procedures including the documentation of responsibilities for data measurements, frequency of calibration, maintenance of monitoring equipment and installations etc. needs to be submitted to DOE.</p>	D.6.5	A separate document GHG procedures is attached. The internal document “TEIL GHG Performance Monitoring, Measurement and Reporting of data” for Khatauli, defines the respective procedures in detail.	<input checked="" type="checkbox"/>
<p><b>CR 9:</b>  <u>Clarification Request No. 9:</u>            Respective procedures covering internal audits, performance reviews and corrective actions should be defined and submitted to the audit team.</p>	D.6.11.	The internal document “TEIL GHG Performance Monitoring, Measurement and Reporting of data” for Khatauli, defines respective procedures. GHG procedure is attached.	<input checked="" type="checkbox"/>



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<b>Draft report clarifications and corrective action requests by validation team</b>	<b>Ref. To checklist question in table 2</b>	<b>Summary of project owner response</b>	<b>Validation team conclusion</b>
<b>CR 10</b> <u>Clarification Request No. 10</u> Text in A.4.4 is inconsistent to table A.4.4.1. Please review.	E.4.1.	PDD has been revised. Correction has been done in the PDD with regards to the inconsistencies in the values of emission reductions.	<input checked="" type="checkbox"/> Electricity generation projections are based on DPR.

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## Annex 2: Information Reference List



Reference No.	Document or Type of Information
1	<p>On-site interview at the offices and at the sites of Triveni Engineering &amp; Industries Limited. conducted on 7<sup>th</sup> &amp; 8<sup>th</sup> April 2006</p> <p><b>Validation team on-site:</b>            Sunil Kathuria TÜV South Asia ( TUV Sud Group)            Prabhat Kumar TUV South Asia (TUV Sud Group)</p> <p><b>Interviewed persons:</b>            Mr. Sameer Sinha Triveni Engineering &amp; Industries Limited, Vice president –Corporate Planning            Mr. B.A.Ram Triveni Engineering &amp; Industries Limited Deputy General Manager (Power Plant)            Mr.Jag Mohan Sarvate Triveni Engineering &amp; Industries Limited, Manager Human Resources Mechanical            Mr. S.Gnanwal Triveni Engineering &amp; Industries Limited , Deputy Chief Engineer Electrical            Mr . Rakesh Shandilya Triveni Engineering &amp; Industries Limited , Deputy Chief Engineer Instrumentation</p>
2	Project Design Document Version 01 issued by Triveni Engineering & Industries Limited dated 10 <sup>th</sup> November 2005 submitted 10 <sup>th</sup> March, 2006
3	UNFCCC homepage <a href="http://www.unfccc.int">http://www.unfccc.int</a>
4	ACM0006 Version 2.0 issued by CDM-Executive Board Dated 03.03.2006
5	Host Country approval issued by Ministry Of Environment & Forest dated 10 <sup>th</sup> March 2006 Submitted 7 <sup>th</sup> April 2006
6	Power Purchase Agreement between Triveni Engineering & Industries Limited & UP power Corporation Limited Dated 31.05.2005 submitted 7th April, 2006
7	Excerpts from Detailed project Report issued by Avant Grade Engineers & Consultants (P) Limited April 2004 , submitted 7th April, 2006
8	Project Specification Details issued by Triveni Engineering & Industries Limited dated 21.01.2006, submitted 7th April, 2006
9	Purchase order for Boiler issued by Triveni Engineering & Industries Limited dated 29.09.2004, submitted 7th April, 2006
10	Agreement for appointment of CDM Consultant issued by Triveni Engineering & Industries Limited, submitted 7th April, 2006
11	Power Generation report for the period October 2005-March 2006 , issued by Triveni Engineering & Industries Limited dated 01.04.2006, submitted 7th April, 2006
12	No Objection Certificate for erection of Chimney issued by Airport Authority of India dated 02.08.2005 , submitted 7th April, 2006
13	Consent to establish under Water Act issued by Uttar Pradesh State Pollution Control Board dated 28.09.2005, submitted 7th April,



## Information Reference List

Reference No.	Document or Type of Information
	2006
14	Sample of Steam & Water Analysis Report , issued by Triveni Engineering & Industries Limited dated 06.04.2006 , submitted 7th April, 2006
15	Water Testing Report issued by Triveni Engineering & Industries Limited dated 06.04.2006 , submitted 7th April, 2006
16	Organisation Chart for the Cogeneration Unit issued by Triveni Engineering & Industries Limited dated 06.03.2006 , submitted 7th April, 2006
17	Stake Holder Comment issued by Chaudhry Harbans Singh Degree College ,Khatuli submitted 5th May 2006
18	Stake Holder Comment issued by Kabul Kanya Inter College Khatuli Uttar Pradesh dated 04.04.2006 submitted 5th May 2006
19	Stake Holder Comment issued by Chief Teacher Village Ladpur , dated 05.04.2006 submitted 5th May 2006
20	Stake Holder Comment issued by Principal Lal Dayal Public School ,dated 05.04.2006 submitted 5th May, 2006
21	Stake Holder Comment issued by Principal Janta Inter College Khatuli ,dated 05.04.2006 submitted 5th May, 2006
22	Stake Holder Comment issued by Principal Adarsh Janta Junior High School, dated 05.04.2006; submitted 5th May, 2006
23	Stake Holder Comment issued by Gram Panchyat Sahupur Khatuli, dated 05.04.2006; submitted 5th April, 2006
24	Stake Holder Comment issued by Gram Panchyat Yusufpur , submitted 7th April, 2006
25	Stake Holder Comment issued by Gram Panchyat Sahupur Khatuli , submitted 5th April, 2006
26	Stake Holder Comment issued by Gram Panchyat Dahod Khatuli , submitted 5th April, 2006
27	Copy of the First Monthly purchased Bill for the period October 2005 & March 2006 jointly issued by Triveni Engineering & Industries Limited & Executive Engineer-Transmission UPPCL Dated 10.11.2005 & 04.04.2006 , submitted 7th April, 2006
28	Permission to operate Boiler from 28.09.2005 until 27.09.2006 issued by Deputy Director of Boiler Uttar Pradesh, submitted 7th April, 2006
29	Sample of Daily Plant report issued by Triveni Engineering & Industries Limited Dated dated 05 -06.04.2006, submitted 7th April, 2006
30	Sample of Daily Report-Turbine issued by Triveni Engineering & Industries Limited Dated dated 05 -06.04.2006, submitted 7th April, 2006
31	Sample of Daily Report-Boiler issued by Triveni Engineering & Industries Limited Dated dated 05 -06.04.2006 Submitted 7th April, 2006
32	Sample of Daily Generation Slips - issued by Triveni Engineering & Industries Limited Dated dated 03 -05.04.2006 Submitted 7th April, 2006



Reference No.	Document or Type of Information
33	Consent to establish under Air Act issued by Uttar Pradesh State Pollution Control Board dated 28.09.2005, submitted 7th April, 2006
34	Details of Bagasse Consumption for the period Oct05-Mar06 issued by Triveni Engineering & Industries Limited Dated Submitted 7th April, 2006
35	Balance sheet for Co-Generation Khatauli dated 31.01.2006, issued by Triveni Engineering & Industries Limited Dated Submitted 7th April, 2006
36	Project Schedule of Erection Of Boiler issued by ISGEC John Thompson dated 15.10.2004, submitted 7th April, 2006
37	Rapid Environment Impact Assessment Study on the co-gen plant issued by Environmental & Technical Reserch Centre dated nil submitted 5 <sup>th</sup> May, 2006
38	Report of the Executive Borad's 23 <sup>rd</sup> meeting on 24 February 2006. (CDM-EB-23)
39	Revised Project Design Document Version 04 issued by Triveni Engineering & Industries Limited dated 4 <sup>th</sup> December 2006 submitted December, 2006
40	Letter from the UP Sugar Mills Association concerning high pressure boiler applications in UP, undated, submitted December 2006.
41	Petition No. 138 of 2004 from Uttar Pradesh Electricity Regulatory Commission, submitted December 2006
42	Inter office memo of Triveni Engineering & Industries Ltd. dated 15.09.04, submitted December 2006
43	Letter of Triveni Engineering & Industries Ltd. to Ernst & Young Private Limited, dated 23.09.04, submitted December 2006
44	Fax of Triveni Engineering & Industries Ltd. to Ernst & Young Private Limited, dated 13.10.2004, submitted December 2006