VALIDATION REPORT

M/S. AMBIKA SOLVEX LIMITED

VALIDATION OF THE

Biomass based renewable energy project in a Solvent Extraction Plant, India

BUREAU VERITAS CERTIFICATION

REPORT NO. INDIA-VAL/61.49/2007

REVISION NO. 03

VALIDATION REPORT

Date of first issue:	Organisational unit:
23/05/2007	Bureau Veritas Certification Holdings
Client:	**Client ref.:**
Ambika Solvex Limited	Mr. K. C. Garg

Summary:

Bureau Veritas Certification has made a validation of the "Biomass based renewable energy project in a Solvent Extraction Plant, India" project of M/s. Ambika Solvex Limited (hereafter called "the project") located in Village : Mhow Neemuch Road, Jaora Tehsil : Jaora,District: Ratlam on the basis of UNFCCC criteria for the CDM, 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 rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.

The validation scope is defined as an independent and objective review of the project design document, the project's baseline study, monitoring plan and other relevant documents, and consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan ii) follow-up interviews with project stakeholders iii) resolution of outstanding issues and the issuance of the final validation report and opinion iv)The overall validation, from Contract Review to Validation Report & Opinion, was conducted using internal procedures.

The first output of the validation process is a list of Clarification and Corrective Actions Requests (CL and CAR), presented in Appendix A. Taking into account this output, the project proponent revised its project design document.

In summary, it is Bureau Veritas Certification's opinion that the project correctly applies the baseline and monitoring methodology number and meets the relevant UNFCCC requirements for the CDM and the relevant host country criteria.

Report No.:	Subject Group:
INDIA-Val/61.49/2007	CDM
Report title:	
Ambika Solvex Limited	
Work carried out by:	
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Work verified by:	
H. B. Muralidhar	

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Indexing terms

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Abbreviations

ASL	Ambika Solvex Limited
BMS	BVQI Management System
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reductions
CH_4	Methane
CL	Clarification Request
CO_2	Carbon Dioxide
CPP	Captive Power Plant
DIS	Draft of International Standard
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
GHG	Green House Gas(es)
I	Interview
IETA	International Emissions Trading Association
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organisation for Standardization
MoV	Means of Verification
MP	Monitoring Plan
NGO	Non Government Organisation
PDD	Project Design Document
UNFCCC	United Nations Framework Convention for Climate Change
F& S	Finance & System

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1 INTRODUCTION

Ambika Solvex Limited (hereafter called "the client") has commissioned Bureau Veritas Certification to validate its "Biomass based renewable energy project in a Solvent Extraction Plant, India" (Hereafter called "the project") at Village: Mhow Neemuch Road, Jaora Tehsil: Jaora, District: Ratlam, India.

1.1 OBJECTIVE

The validation serves as project design verification and is a requirement of all Client projects. The validation is an independent third party assessment of 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 Article 12 of the Kyoto Protocol, the CDM rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.

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. Bureau Veritas Certification has, based on the recommendations in the Validation and Verification Manual (IETA/PCF, v. 3.3, 2004), 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.

1.3 GHG PROJECT DESCRIPTION

The project activity entails use of renewable biomass for thermal and electrical energy generation at Ambika Solvex Ltd. (ASL). ASL operates a solvent extraction plant, extracting crude oil from Soya seeds.

Prior to project activity, steam was generated in a boiler based on coal and electricity demand was met from the Madhya Pradesh State Electricity Board (MPSEB), which is part of Western Region (WR) grid in India.

The project activity is taken up in two phases. In first phase, the project activity entails combusting renewable biomass in a newly installed boiler for steam generation and thus doing away with the use of coal. In second phase, one

backpressure turbine would be installed to meet the electricity demand in the plant. One additional boiler will be installed to run the turbine at rated capacity. The existing two boilers (3 TPH & 6 TPH) are kept as stand by units, while one boiler (6TPH) is scrapped.

1.4 VALIDATION TEAM

The validation team consists of the following personnel:

Mr. Sameer V. Pendse Bureau Veritas Certification- Team Leader, Climate change verifier
Mr. R. Sankaranarayan Bureau Veritas Certification, Climate change verifier
Mr. Shrikant Saraf Bureau Veritas – Technical Expert
Mr. H. B. Muralidhar Bureau Veritas Certification, Climate change -Internal technical reviewer

2 METHODOLOGY

The overall validation, from Contract Review to Validation Report & Opinion, was conducted using internal procedures In order to ensure transparency, a validation protocol was customised for the project, according to the Validation and Verification Manual (IETA/PCF, v. 3.3, 2004). 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 Appendix A to this report.

Validation Protocol Table 1: Mandatory Requirements			
Requirement	Reference	Conclusion	Cross reference
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), a Corrective Action Request (CAR) or a Clarification Request (CR) of risk or non-compliance with stated requirements. The CAR's and CR's are numbered and presented to the	Used to refer to the relevant protocol questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent validation process.

		client in the Validation Report.	

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

Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Report clarifications and corrective action requests	Ref. to checklist question in tables 2/3	Summary of project owner response	Validation conclusion
If the conclusions from the 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 Tables 2 or 3 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 Tables 2/3, under "Final Conclusion".

Figure 1 Validation protocol tables

2.1 Review of Documents

The Project Design Document (PDD) submitted by Ambika Solvex Limited and additional background documents related to the project design and baseline, i.e. Indian Law , Guidelines for Completing the Project Design Document (CDM-PDD), the Proposed New Methodology: Baseline (CDM-NMB) and the Proposed New Methodology: Monitoring (CDM-NMM) , Approved methodology number , Kyoto Protocol , Clarifications on Validation Requirements to be Checked by a Designated Operational Entity were reviewed.

The following documents were used as references to the validation work, in addition to internal Bureau Veritas Certification procedures: IETA/PCF – Validation and Verification Manual (v. 3.3, Mar 2004) ; ISO DIS 14064-3 - Greenhouse gases — Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions ; ISO DIS 14064-2 - Greenhouse gases — Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements .

To address Bureau Veritas Certification's corrective action and clarification requests Ambika Solvex Limited revised the PDD and resubmitted it in June 2007.

Based on request from review from CDM-EB, Ambika Solvex Limited revised the PDD and resubmitted it in September 2007.

The validation findings presented in this report relate to the project as described in the PDD in September 2007.

2.2 Follow-up Interviews

On 17/08/2006 & 18/08/2006 Bureau Veritas Certification performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of Ambika Solvex were interviewed (see References). The main topics of the interviews are summarised in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
Ambika Solvex Limited	➢ Project description ➢ Contribution of Project towards Sustainable Development ➢ Operational aspects ➢ Monitoring Methodologies, plans and Procedures. ➢ QA/ QC Procedures ➢ Internal review / verification mechanism ➢ Competency Management ➢ Approach towards understanding the issues pertaining to interested parties ➢ Additionality
Local Stakeholders	➢ Social and economical benefits due to Project.
Consultant	➢ Project Category ➢ Additionality ➢ Base line – Justification and Application ➢ Monitoring plans

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to raise the requests for corrective actions and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification positive conclusion on the project design.

To guarantee the transparency of the validation process, the concerns raised are documented in more detail in the validation protocol in Appendix A.

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 original 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 Appendix A.

2) Where Bureau Veritas Certification 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 Appendix A. The validation of the Project resulted in 7 (Seven) Corrective Action Requests and 8 (Eight) Clarification Requests.

3) The conclusions for validation subject are presented.

3.1 Project Design

The project activity entails use of renewable biomass for thermal and electrical energy generation at Ambika Solvex Ltd. (ASL). ASL operates a solvent extraction plant, extracting crude oil from Soya seeds.
Prior to project activity, steam was generated in a boiler based on coal and electricity demand was met from the Madhya Pradesh State Electricity Board (MPSEB), which is part of Western Region (WR) grid in India.

The project activity is taken up in two phases. In first phase, the project activity entails combusting renewable biomass in a newly installed boiler for steam generation and thus doing away with the use of coal. In second phase, one backpressure turbine would be installed to meet the electricity demand in the plant. One additional boiler will be installed to run the turbine at rated capacity.

Bureau Veritas Certification recognises that Ambika Solvex's Project is helping India fulfill its goals of promoting sustainable development. Specifically, the project is in line with host-country specific CDM requirements because –

1. It helps in reduction in Green House Gases (GHG) emissions in steam and power generation.
2. It also helps in conservation of natural resources i.e. coal

3. The project activity creates employment opportunities during the project stage and operation and maintenance of the plant.
4. Use of biomass residues in the region has provided a distinct source of revenue to the people in the region.
5. This will provide necessary impetus for industries to come up with more such projects in the area.
6. The project will encourage technology providers in putting more R&D efforts and funds towards new technology development.

The project design is sound and the geographical (Village: Mhow Neemuch Road, Jaora Tehsil: Jaora, District: Ratlam, India.) and temporal (25 years) boundaries of the project are clearly defined.

Remaining lifetime of existing boilers has been technically tested by competent authority and is found to be 15 years further from the date of test i.e. 12/09/2007. Validation team could access the above document and found it to be in order.

Prominent Corrective action & Clarification Requests related to Project design along with their resolution are listed below

CAR-1 : Section A.3.3 Table 2
Host country approval is not available.

Response from Project Participant
Host country approval dated 3 November 2006 is received.

Conclusion by the validation team
Verified Host country approval dated 03/11/2006. Corrective action request CAR-1 therefore is closed.

CL-1 : Section A.2.4, Table 2
Though indicated as pulsating grate boilers and back pressure turbine, it is not clear whether any transfer of technology to the host country is involved. (Refer A.4.2.of PDD)

Response from Project Participant
This is indigenous technology and no technology transfer has taken place. Information is provided in PDD. (A.4.2)

Conclusion by the validation team
Verified section A.4.2 of revised PDD, version 1.6 dated 11/09/2007. Clarification request CL-1 is therefore closed.

CL-3 : Section A.3.2, Table 2
No adverse environmental or social effects are envisaged. However the PDD is silent about the effects of biomass combustion like mustard and Soya husk, which lead toxic gases like chlorine emissions.

Response from Project Participant
The major problem of Chlorine is heavy deposition of chlorides forming lumps on heat transfer surfaces which results in enhanced corrosion rates and poor heat transfer in the boiler. There is no chlorine emission in gas form from biomass combustion in project activity. Chlorine is removed in the form of chlorides of minerals such as CaCl2 etc.

Conclusion by the validation team
Explanation is found to be sufficient. Clarification request CL-2 is therefore closed.

3.2 Baseline

The Project uses the approved baseline methodology Type I, (Renewable Energy Projects, Sub Category: I.C.-: "Thermal energy for the user"; Version 09, Scope (dated 23 December 2006)

In the absence of Project activity 'Electricity' would have been generated using mainly fossil fuels from various power plants. Similarly steam would have been generated using fossil fuel fired plant (boiler) on site

Project activity is generation of electricity and heat from renewable source i.e. biomass (such as mustard & Soya husk). As per applicability condition of approved methodology Category I, Sub category IC , 'Biomass-based cogenerating systems that produce heat and electricity for use on-site are included in this category.' Similarly, The power generating capacity is 1.2 MW, which is less than 15 MW, & the boilers total output capacity is less than 45 Mwthermal. Total capacity with installation of two boilers of aggregate capacity would be 20 Mwthermal, Considering all these conditions, & therefore methodology is applicable to the project activity.

CDM Consideration and starting date

There is a evidence of Minutes of meeting dated April 5, 2005 chaired by Mr. K.C. Garg – Director. Recorded minutes reveal that Mr. Garg explaining the forum of meeting about plan to convert coal-fired boilers to biomass fired boilers and also generate power by putting a turbine. It has been further recorded that this project would be clean energy project, which would help reducing green house gas emissions. Further, It is also stated that this project will attract carbon credits and help overcoming the risks in implementing the project.

Starting date of the Project activity in the PDD is mentioned to be 06/05/2005, the date on which order for first boiler (10 TPH, 17.5 Kg./ Cm2 convertible to 45 kg/cm2) was placed to Ms/., Cheema Boilers.

Additionality claims and validation of the same.

In line with attachment A to appendix B of the simplified M&P for small-scale CDM project activities, there is sufficient demonstration of additionality based on the Technical barriers and barriers due to 'First of Kind' in the region. There are other barriers mentioned in PDD like investment barrier, barriers due to biomass availability, biomass pricing etc. However validation team is of the opinion that these claims are not barriers in true sense but are considered only as support information for the above-mentioned barriers.

Validation team hereby present validation opinion on claims on Technical barriers and barriers due to 'first of kind' in the region.

Technical Barrier

Claim in PDD:
Use of biomass residues such as Mustard and Soya husk in combustion poses serious operational problems due to chlorine and alkali.

Validation of the claim

DOE validated this claim through literature available for technical problems related to the type of biomass based power plants in terms of chlorine, alkali etc. These documents clearly mention the problems such as low boiler efficiency due to more resistance to heat transfer in the boiler tubes and erosion of tubes with ultimately failure of the boiler leading to higher maintenance cost of the system. Some of the literature references are now included in list of documents.

Claim of First of Kind Project in the region

ASL is the first one to implement husk fired energy generation and the only player in this area to take risk with new technology without having single installation of such kind in the region.

Validation of the claim

There is a certificate issued by India Soya Foundation, based at Indore, India supporting this claim that remaining five plants in the region are having coal based plants and Ambika Solvex is the only plant using biomass as a fuel. India Soya Foundation is Non-Governmental Organisation (NGO) based at Indore, which carries out various activities (like promotion of better agricultural practices, water, organizing camps for farmers for educating them etc.) for soya mills, soya farmers in the region. It has representation for various soya processors/ farmers in the region

This claim of 'First of Kind' was a part of PDD, which was webhosted initially for comments from global stakeholders from 11/07/2006 to 09/08/2006.

However during validation, project participant could not obtain the evidence to support this claim & therefore was deleted from PDD & validation report did not include the same. Now this evidence is obtained.

The claim of proper logistics network for collection and delivery of biomass residues' can be accepted in light of above claim, since for the only project in the region, the project proponent has to develop a viable fuel collection mechanism.

As mentioned above, other claims like biomass availability, operational barriers etc. are assessed by validation team as support information and not really barriers for the project to be additional. DOE is of the opinion, that issues related to investments and biomass pricing may require investment analysis however validation team considered these as only support claims and technical barriers and barriers related to 'First of Kind' were considered to be only arguments to accept additionality.

Validation team is of the opinion that Project activity has sufficient barriers for implementation and therefore emission reductions from project are additional and they are not part of the baseline scenario.

Prominent Corrective action & Clarification Requests related to Baseline along with their resolution are listed below -

CAR-2 : Section B.2.2 Table 2

It is indicated in B 5 of PDD that the boiler efficiencies are based on CERC data and net power generation based on data provided by WREB
Calculation sheet is not available.

Response from Project Participant

Excel sheet is provided for details of calculation.

Conclusion by the validation team

Calculations are verified and found to be satisfactory. Corrective action request CAR-2 is therefore is closed.

CL-4 : Section B.2.1 Table 2

Yes, Refer B.3 of PDD
Technological barriers, Investment barriers, biomass residue availability barriers have been discussed and demonstrated. However evidences/ supportive information is not available for following -
Cleaning frequency, Feed Water quality.
Technology using Soya husk.
First of its kind in the region

Softening requirements vis a vis coal fired needs to be elaborated.

No O & M.

Financial Barrier – Data to be provided.

Production trend to be furnished.
Price husk fluctuations.

Response from Project Participant

Frequent cleaning is carried out by plant people in every 15-20 days. A note of the same is included in log books also. Please refer the attached copy of
- Boiler Log Sheet.

Details of required feed water quality are provided.
It is quite evident from the data provided in PDD (common practice analysis) that this is the first boiler in the region operating on Husk. Information on other Soya plants in the region is provided as annex. This is based on knowledge of project participant These plants are generating steam using fossil fuels only. However this information is not available through verifiable public sources & therefore it is deleted from PDD.
O&M of plant/machinery is carried out by ASL.
Financial details are provided for information.
Production trend is also furnished.
This project activity is first of its kind in the region and there is no established network for biomass supply. However, increase in biomass prices is envisaged as the demand grows for the biomass in the region for energy generation.

Conclusion by the validation team

Explanation is found to be adequate on the issues raised. Verified all the information through support evidences. Clarification Request CL-4 is therefore closed.

3.3 Monitoring Plan

The Project uses the approved consolidated monitoring methodology The Project uses the approved consolidated monitoring methodology (Type I Category I.C Thermal energy for the user"; as per Appendix B of the Simplified modalities and procedures for small-scale CDM project activities (version 9 dated 23/12/20006).

The adopted monitoring methodology has been chosen based on the following reasons:

The project activity is a renewable biomass based co-generating systems that produce heat and electricity for use on-site as required by the methodology.
The power generating capacity is1.2 MW which is less than 15 MW
The total thermal output from the boilers in the project activity is less than 45 MWth.

According to methodology, monitoring needs to include following

- Metering the thermal and electrical energy generated for co-generation projects. In the case of co-fired plants, the amount of fossil fuel input to be monitored

The monitoring plan detailed out in section D.3 of PDD adequately covers all the parameters required to be monitored.

QA/QC procedures have been identified for data reliability and crosscheck mechanism. Calibration procedures are identified for calibration of critical instruments/equipments.

Project does not envisage any project emissions in normal routine operations. However there is likely use of coal or HSD, which has been appropriately addressed.

During the site visit, project has not been fully installed and commissioned. However PDD details out all the procedures for overall operation and maintenance of the project.

Monitoring plan also includes annual evaluation of whether there is a surplus of biomass in the region and any leakage that may need to be estimated and deducted from the emission reductions in accordance with the Board's "General guidance on leakage in biomass project activities. As per monitoring plan, this will be demonstrated using published literature, official reports, surveys etc that the quantity of available biomass in the region is at least 25% larger than the quantity of biomass that is utilized including the project activity. Monitoring plan also has provision to estimate leakage if available biomass is not 25% larger than the quantity of biomass that is utilized including the project activity.

Prominent Corrective action & Clarification Requests related to Monitoring along with their resolution are listed below -

CAR-5 : Section D.2.1 Table 2

Yes, the project emissions mainly relate to start ups or during winter operations. Refer Section E 1.2.1 of PDD. However tabular presentation of data in E.2 mentions project emissions to be zero. Similarly use of D.G. Set is also not accounted for.

Response from Project Participant

Project emissions shall result from auxiliary fuel and auxiliary power consumption during start up in project activity. Auxiliary fuel is coal and auxiliary power during start up shall be taken from DG set and/or Grid. Estimation for project emissions done and included in revised PDD accordingly.

Conclusion by the validation team

Verified project emission calculations & plan for the same in revised PDD, Version 1.6 dated 11/09/2007. Emissions due to use of fossil fuels like Coal and Diesel. Similarly in case of emergencies likely import from gird is also considered. Corrective action Request CAR-5 is therefore closed.

CAR-6 : Section D.3.1 Table 2
One Boiler of 6 TPH has been reportedly transferred to sister concern at Akola on 03/06/06. Leakage of this transfer is not considered.

Response from Project Participant
Since this boiler has been dismantled and disposed off as scrap so no leakage considered. Documents are provided in this regard.

Conclusion by the validation team
With the following evidences made available, Project proponent has confirmed that there is no transfer of equipment.
1. Scrap of boiler from Jaora Plant
2. Undertaking by the company
3. Certificate by the statutory auditor of the company.
4. Declaration by fabricator.
5. Letter by Ambika Solvex dated 05/06/2007 written to Regional Boiler authority intimating that Boiler- Registration No. MP 4173 has been scrapped.

Validation team also visited Akola Plant to verify any transfer of equipment. Evidently a boiler was originally transferred to Akola Plant and then back to Jaroa plant. Evidently this was scrapped from Jaora plant.

Based on these evidences and site visit verification to sister concern, Corrective action request CAR-6 is closed.

CL-5 : Section D.5.4 Table 2
PDD has not identified any emergency situations leading to unintended emissions.
Usage of coal or DG set in case of lack of bio mass supply. During operations abnormal situations??
What about N2O emissions?
Emergency preparedness aspects are added to the PDD (D.5).

Response from Project Participant
Usage of Coal (start up firing) and power from DG set during start up has been considered as project emissions. CER estimation is done accordingly.
For N2O emissions, we have followed guidelines given in approved consolidated methodology ACM0006 wherein N2O emissions from biomass burning are neglected for simplification as these are assumed to be very small.

Conclusion by the validation team
Explanation on emergency situations is found to be adequate and Clarification Request CL-5 is therefore closed.

3.4 Calculation of GHG Emissions

As per Methodology Type I, category C, following baseline emission sources are to be considered
- For renewable energy technologies that displace technologies using fossil fuels, the simplified
baseline is the fuel consumption of the technologies that would have been used in the absence of the project activity times an emission coefficient for the fossil fuel displaced. IPCC default values for emission coefficients may be used.
- For renewable energy technologies that displace electricity the simplified baseline is the electricity consumption times the relevant emission factor calculated as described in category I.D.

For the calculation of baseline emissions for use of steam using fossil fuels conservative boiler efficiency figures as prescribed by CERC are taken. IPCC default values for coal related emission coefficients are used.

For calculation of baseline emissions in case displacement of electricity from grid, is the MWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kg tCO2equ/MWh) calculated.

The relevant grid considered for the calculation of baseline emissions is the Western region grid. Grid emission factor is taken from National Authentic source as Central Electricity Authority (CEA), version 2, June 2007.

Average annual Emission reduction expected to be achieved by the project over fixed crediting period is 25140 etCO2 is found to be acceptable in view of calculations and correctness in data.

As described in Type I – Category C (version 09 dated 23 December 2006) methodology, leakage has to be considered if the energy generating equipment is transferred from another activity or if the existing equipment is transferred to another activity. This aspect was investigated in detail by validation team. Details of this investigation are given in CAR-6.

3.5 Sustainable Development Impacts

No significant environmental impacts have been identified from the project activity. The project activity does not require environment impact study to be undertaken as per regulations for pollution control in India. The project activity envisages the use of biomass residue as fuels in steam and power generation and displacement of fossil fuels. Due care is being taken by the project proponent in order to protect environmental conditions. Following measures are planned towards achievement of this,

1. Transportation of biomass/ash through covered trucks.
2. Proper storage of biomass/coal in a covered shed.
3. Fire fighting arrangement at fuel storage yard.

This CDM initiative would contribute towards:
Strengthening the Western grid which is power deficit
Generation of energy from biomass a renewable energy source
Avoiding use of coal on site for generation of steam thereby avoiding emissions.

In view of above and contribution towards the country's goal of sustainable development and, the development and implementation of systems for ' Biomass based renewable energy project in a Solvent Extraction Plant, India" " were recommended by the Ambika Solvex limited management. The clearance of this CDM initiative by Ambika Solvex Limited would facilitate the process of sustainable energy production.

Prominent Corrective action & Clarification Requests related to Sustainable Development along with their resolution are listed below -

CAR-7 : Section F.1.2 Table 2
Clearance from MOEF is not required. However data provided in PDD and equipments on site do not match with data in approvals from Regional Authorities (Consents from Madhya Pradesh State Pollution control boards). For example boiler capacities.

Response from Project Participant
Modification in this regard has been done in the PDD.

There was typing error and MPPCB has been requested to issue revised approval with correct information. A copy of application is also provided.

Conclusion by the validation team
Application to the Madhya Pradesh Pollution Control Board ASL/ MPPCB/ 2006 dated August 8,2006 Is available. Corrective Action request CAR-7 therefore is closed.

CL-8 : Section F.1.4 Table 2
No. Environmental impacts associated with biomass transportation, biomass storage, coal storage ash disposal etc. are not addressed in PDD.
Response from Project Participant
Due care is being taken by the project proponent for all such things as follows, (F.1)

1. Transportation of biomass/ash through covered trucks.
2. Proper storage of biomass/coal in a covered shed.
3. Fire fighting arrangement at fuel storage yard.

Conclusion by the validation team
Verified section F.1 of PDD, Version 1.6 dated 11/09/2007 for addressal of environmental impacts. Clarification request CL-8 is therefore closed.

3.6 Comments by Local Stakeholders

Stakeholder consultation for the project activity has been conducted to account for the views of the people being affected either directly or indirectly due to the project activity. This has been carried out at different levels of stakeholders. Evidently stakeholders generally expressed satisfaction about the implementation of the project. Project proponent has maintained the copies of invitation letters, records of actual consultation etc.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

According to the modalities for the Validation of CDM projects, the validator shall make publicly available the project design document and receive, within 30 days, comments from Parties, stakeholders and UNFCCC accredited non-governmental organisations and make them publicly available.

Bureau Veritas Certification published the project documents on the UNFCCC CDM website (http://cdm.unfccc.int) on 11/07/2006 and invited comments within 09/08/2006 by Parties, stakeholders and non-governmental organisations.

No comments received during the commenting period.

5 VALIDATION OPINION

Bureau Veritas Certification has made a validation of the “Biomass based renewable energy project in a Solvent Extraction Plant, India” project of M/s. Ambika Solvex Limited (hereafter called “the project”) located in Village: Mhow Neemuch Road, Jaora Tehsil: Jaora, District: Ratlam . The validation was performed on the basis of UNFCCC criteria and host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

The validation consisted of the following three phases: i) a desk review of the project design and the baseline and monitoring plan ii) follow-up interviews with project stakeholders iii) the resolution of outstanding issues and the issuance of the final validation report and opinion .

By generating steam & electricity from biomass, the project is expected to result in reductions of GHG emissions partially displacing electricity that would have otherwise been purchased from the grid & also reductions of GHG emissions in case of use of coal for generation of steam. An analysis of the technological& other 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 and maintained as designed, the project is likely to achieve the estimated amount of emission reductions.

The review of the project design documentation (September 2007 version 1.6) and the subsequent follow-up interviews have provided Bureau Veritas Certification with sufficient evidence to determine the fulfillment of stated criteria. In our opinion, the project correctly applies and meets the relevant UNFCCC requirements for the CDM and the relevant host country criteria.

The validation is based on the information made available to us and the engagement conditions detailed in this report.

6 REFERENCES

Category 1 Documents:
Documents provided by Ambika Solvex Limited that relate directly to the GHG components of the project.

/1/ Host country Approval dated 3 November 2006

/2/ PDD – Initial version – Version 1, dated 19/06/2006 & Final Version – Version 1.6 dated 11/09/2007

Evidence of CDM Consideration and Starting date of Project Activity

/3/ Minutes of meeting dated 5 May 2005 mentioning planning and consideration of carbon credits

/4/ Purchase order dated 6 May 2005 placed on M/s. Cheema Boilers – for 1 no. 10 TPH , 17.5 Kg/cm2 convertible to 45 Kg./cm2 pressure - evidence of starting date.

Documents and evidences related to additionality

/5/ Behaviour of gaseous chlorine and alkali metals during biomass thermal utilisation – Technical Paper by Xiaolin Weia, Uwe Schnellb,*, Klaus R.G. Hein – dated 15/12/2004

/6/ The implications of chlorine-associated corrosion on the operation of biomass-fired boilers – Technical paper by H.P. Nielsena, F.J. Frandsena,K. Dam-Johansena, L.L. Baxterb – dated 28 January 2000

/7/ Certificate from India Soya Foundation mentioning that Ambika Solvex Limited's biomass based co - generation plant is first of kind in the region.

/8/ Recommended boiler feed water characteristics by Boiler manufacturer M/s. Cheema Boilers Limited

/9/ Relevant sections of Balance sheets for year 2001-02, 2002-03, 2003-04, 2004-05.

/10/ Certificate from statutory auditor of the company M/s. V. Bomb & Co. stating that Project is funded through internal accruals only and no loan is taken for the same.

Relevant national / sectoral legal requirements as applicable to the project

/11/ Application for renewal of consent ASL/MPPCB/2006 dated 8 August

2006.

/12/ Boiler certificate by statutory authority – for boiler MP4173 – 6 TPH dated 22/03/2006 valid upto 21/03/2007 – This boiler has been evidently scrapped.- Refer section of Documents Pertaining To Leakage Investigation below.

/13/ Boiler certificate by statutory authority – for boiler MP4528 – 6 TPH dated 08/08/2006 valid upto 07/08/2007 – This boiler has been evidently scrapped.- Refer section of Documents Pertaining To Leakage Investigation below.

/14/ Boiler certificate by statutory authority – for boiler MP4528 – 6 TPH dated 08/08/2006 valid upto 07/08/2007.

/15/ Boiler certificate by statutory authority – for boiler MP4267 – 3 TPH dated 04/02/2006 valid upto 03/02/2007

/16/ Certificate from Chartered Engineer (Mr. S.L.Jain) dated 12/09/2007 certifying that remaining life time of the boiler MP4528 is 15 years

/17/ Certificate from Chartered Engineer (Mr. S.L.Jain) dated 12/09/2007 certifying that remaining life time of the boiler MP 4267 is 15 years MP4528

Contracts & Agreements relevant to the Project

/18/ Declaration by M/s. Cheema Boilers Limited dated 13/09/006 mentioning life of the equipment to be 25 years.

/19/ Report by M/s. Cheema Boilers Limited on proposed air pollution control system

/20/ Offer letter dated 07/04/2006 by M/s. Siemens for supply of 1.18 MW turbine.

/21/ Purchase order darted 31/01/2007 to M/s. Siemens for 1 No. of 1200 KW turbo generator

/22/ Purchase order darted 23/01/2007 to M/s. Albaj Engineering corporation for 1 No. of 16 TPH, 45 Kg/cm2 pressure, coal/mustard straw fired boiler

Documents pertaining to leakage investigation

/23/ Challan copy from Ambika Solvex – Jaora to Ambika Solvex – Akola dated 03/06/06

/24/ Copy of challan dated 03/08/06 for scrap of boiler to Islam steel fabricator

/25/ Undertaking by Islam Steel Fabricator that the boiler has been scraped.

/26/ Declaration by statutory auditor of the company M/s. V. Bomb & Co. that company has sold old boiler – Sr. No. MP 4173 at a scrap value of INR 55000/-

/27/ Letter from M/s. Ambika Solvex Limited dated 05/06/2006 written to Regional Boiler authority intimating them about scrapping of Boiler MP-4173.

Stakeholder consultation Process

/28/ Article in local news paper ' Amrut Manthan' dated 7 May 2006 inviting comments from local population.

/29/ Letter dated 08/05/2006 to Gram Panchayat for inviting suggestions/comments on project.

/30/ Letter dated 08/05/2006 to S.D.M office for inviting suggestions/comments on project

/31/ Minutes of meeting with Gram Panchayat (local regulatory body) dated 08/05/2006.

/32/ **Other Documents Relevant To Project**

/33/ Calibration Certificates for pressure gauge, draft gauge in September & June 2005 respectively.

/34/ Availability of Soya /husk in the region for years 2003, 2004 & 2005 – abstract from www.spoa.org

/35/ Production data of Ambika Solvex Limited for three years 2002-03, 2003-04, 2004-05

Category 2 Documents:

Background documents related to the design and/or methodologies employed in the design or other reference documents.

Kyoto Protocol to the United Nations Framework Convention on Climate Change, United Nations, 1997

/1/ Guidelines for completing CDM-PDD - Version 04, dated 22/12/2006

/2/ Approved Methodology – I C - Version 8– 03/03/2006

/3/ Approved Methodology – I C - Version 9 – 23/12/2006

Attachment A to Appendix B of simplified modalities and Procedures for small scale CDM Activities – Version 6, dated 30 September 2005.

Persons Interviewed:

List persons interviewed during the validation, or persons that contributed with other information that are not included in the documents listed above.

Mr. Sanjay Kapoor – Manager Accounts
Mr. Mahesh Gupta – Overall office in-charge.
Mr. Imptiyaz Khan – Plant In-charge
Mr. S.N. Anthwal – General Manager – Akola Plant
Mr. Vaibhav Kakulte – Consultant – Emergent Ventures Limited
Mr. Atul Sanghal - Consultant – Emergent Ventures Limited
Mr. Anwar Bhai – From Kachnara – Truck owner, Husk supplier & transporter.
Mr. Narkhan – From Jaora – Husk Supplier.

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APPENDIX A : VALIDATION PROTOCOL

Table 1 Mandatory Requirements for Small Scale 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	See Table 2, Section A.3.3	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, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a	Project proponent has obtained Host country approval (India). Host country approval dated 8 August 2006 is attached.	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.	See Table 2, Section A.3.3	Table 2, Section E.4.1
4. The project shall have written approval of voluntary participation from the designated national authorities of each party involved	Kyoto Protocol Art. 12.5a, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a	Project proponent has obtained Host country approval (India)	Written approval of voluntary participation from the DNA is obtained.
5. The emission reductions should be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	See Table 2, Section E.4.1	Table 2, Section E.1 to E.4
6. Reduction in GHG emissions must 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	Kyoto Protocol Art. 12.5.c, Simplified Modalities and Procedures for Small	Yes. See Table 2, B.2.1	Table 2, Section B.2.1

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference/ Comment
reduced below those that would have occurred in the absence of the registered CDM project activity	Scale CDM Project Activities §26		
7. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance	Marrakech Accords (Decision 17/CP.7)	The Project will not receive any public funding from parties included in Annex I	Declaration by the Project Proponent in Annex. 2 of PDD.
8. Parties participating in the CDM shall designate a national authority for the CDM	Marrakesh Accords (CDM modalities§ 29)	Ministry of Environment and Forest (MOEF) is the Designated National Authority (DNA) of India	Government of India has designated the National Clean Development Mechanism (CDM) Authority under Ministry of Environment & Forest to act as DNA. Source http://cdm.unfccc.int/DNA
9. The host country shall be a Party to the Kyoto Protocol	Marrakesh Accords (CDM modalities§ 30)	Yes	Date of accession – Source http://unfccc.int/parties_and_observers/parties/items/2109.php
10. The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakesh Accords and shall not be a debundled component of a larger project activity	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c	Yes. See Section A.1.1 & A.1.2	Table 2, Section A.1

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference/ Comment
11. The project design document shall conform with the Small Scale CDM Project Design Document format	Simplified Modalities and Procedures for Small Scale CDM Project Activities, Appendix A	Yes. The Project Design Document conforms to current version of Small Scale Project Design Document Format (Version 3, 5 September 2006)	Gaps were identified during documentation review and the requirements of PDD with the small-scale CDM projects were conformed.
12. The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and uses the simplified baseline and monitoring methodology for that project category	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e	Yes. Type I, Category I C	Table 2, Section A.1.3 and B.1
13. Comments by local stakeholders are invited, and a summary of these provided	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22b	Yes See Table 2, Section G.1.1	Table 2, Section G
14. If required by the host country, an analysis of the environmental impacts of the project activity is carried out and documented	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c	Not required by Host Country See Table 2, Section F.1.1	Table 2, Section F
15. Parties, stakeholders and UNFCCC accredited NGOs have been invited to comment on the validation requirements and comments have been made publicly available	Simplified Modalities and Procedures for Small Scale CDM Project Activities §23b,c,d	Project Design Document (PDD) was made publicly available on UNFCC Website for the period of 30 days from 8 April 2006 to 7 May 2006.	Source http://cdm.unfccc.int/Projects/Validation

Table 2 Requirements Checklist

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A. Project Description The project design is assessed.					
A.1. **Small scale project activity** It is assess whether the project qualifies as small scale CDM project activity.					
A.1.1. Does the project qualify as a small scale CDM project activity as defined in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM?	1	DR	Yes. The project is in two stages. First stage is installation of one no. Boiler of 10 TPH capacity @ 45 kg/cm^2 using renewable biomass like mustard and Soya husk eliminating the use of coal for steam generation. Presently this boiler will generate steam at 17 kg/cm^2 to meet the process requirements. After the installation of the turbine the boiler will be operated at the rated pressure to generate 600 kW power. Second Stage involves installation of another boiler with same pressure rating having a capacity of 16 TPH will be installed using renewable biomass and the power generation will increase up to 1.2 MW which is less than 15 MW`	OK	OK
A.1.2. The small scale project activity is not a debundled component of a larger project	1	DR	Not a de-bundled project. . Ambika Solvex has not registered or applied for registration of another	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
activity?		I	small-scale project. Within I km of the project boundary Refer A.4.5 of PDD		
A.1.3. Does proposed project activity confirm to one of the project categories defined for small scale CDM project activities?	2	DR	Type I Renewable energy projects Cat. I C: Renewable energy technologies that supply thermal energy to the user directly	OK	OK
A.2. **Project Design** Validation of project design focuses on the choice of technology and the design documentation of the project.					
A.2.1. Are the project's spatial (geographical) boundaries clearly defined?	1	DR I	Project boundary is defined in section B.4 of PDD. This project boundary includes the production facility, steam generating boilers, turbine, and fuel storage area, auxiliary equipments & allied systems and Western Region Grid.	OK	OK
A.2.2. Are the project's system (components and facilities used to mitigate GHG's) boundaries clearly defined?	1	DR	Refer B.4 of PDD; The project involves thermal energy generation for direct use This includes the biomass storage area, boiler, turbine and solvent extraction plants.	OK	OK
A.2.3. Does the project design engineering reflect current good practices?	-	DR	Yes. The project activity leads to the thermal energy generation for direct use and electricity generation at 0.6 MW after the installation of turbine and 1.2 MW after commissioning of second boiler.	OK	OK
A.2.4. Will the project result in technology	-	DR	Though indicated as pulsating grate boilers and	CL-1	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
transfer to the host country?			extraction cum condensing turbine, it is not clear whether any transfer of technology to the host country is involved. (Refer A.4.2.of PDD)		
A.2.5. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period? Does the project make provisions for meeting training and maintenance needs?		DR I	The local management of Ambika Solvex Limited (ASL) headed by the Factory Manager is carrying out the operation and maintenance. The staffs are competent and qualified. Infrastructure and system are in place to up-keep and efficient operation. However the PDD is silent about the system for maintenance needs preventive maintainer plan is not prepared. Training Documentation also need to be provided.	CL 2	OK
A.3. **Contribution to Sustainable Development** The project's contribution to sustainable development is assessed					
A.3.1. Will the project create other environmental or social benefits than GHG emission reductions?	1	DR I	Yes, • Direct / Indirect employment benefits accruing during project stage • Local employment for the operation and maintenance of powerhouse. • Use of biomass residues available in the region providing source of revenue generation to local people Improvement in basic amenities for the local rural population,	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A.3.2. Will the project create any adverse environmental or social effects?	1	DR	No adverse environmental or social effects are envisaged. However the PDD is silent about the effects of biomass combustion like mustard and Soya husk, which lead toxic gases like chlorine emissions.	CL 3	OK
A.3.3. Is the project in line with sustainable development policies of the host country?	1	DR	Host country approval is not available.	CAR 1	OK
A.3.4. Is the project in line with relevant legislation and plans in the host country?	-	DR I	Indian legislation allows biomass power generation operations	OK	OK
B. Project Baseline The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.					
B.1. **Baseline Methodology** It is assessed whether the project applies an appropriate baseline methodology.					
B.1.1. Is the selected baseline methodology in line with the baseline methodologies provided for the relevant project category?	1,2	DR	Yes, approved methodology For Type I Cat. C, The simplified methods & Procedures for small scale CDM project – Appendix B.	OK	OK
B.1.2. Is the baseline methodology applicable to the project being considered?	1,2	DR	Yes, this methodology is applicable to Renewable energy projects under Thermal Energy for the user.	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.2. **Baseline Determination** It is assessed whether the project activity itself is not a likely baseline scenario and whether the selected baseline represents a likely baseline scenario.					
B.2.1. Is it demonstrated that the project activity itself is not a likely baseline scenario due to the existence of one or more of the following barriers: investment barriers, technology barriers, barriers due to prevailing practice or other barriers?	1	DR	Yes, Refer B.3 of PDD Technological barriers, Investment barriers, biomass residue availability barriers have been discussed and demonstrated. However evidences/ supportive information is not available for following - Cleaning frequency, Feed Water quality. Technology using Soya husk. First of its kind in the region Softening requirements vis a vis coal fired needs to be elaborated. No O & M. Financial Barrier – Data to be provided. Production trend to be furnished. Price husk fluctuations.	CL-4	OK
B.2.2. Is the application of the baseline methodology and the discussion and determination of the chosen baseline transparent and conservative?	1	DR I	It is indicated in B 5 of PDD that the boiler efficiencies are based on CERC data and net power generation based on data provided by WREB	CAR 2	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			Calculation sheet is not available.		
B.2.3. Are relevant national and/or sectoral policies and circumstances taken into account?	-	DR	Evidently relevant national and/or sectoral policies have been have been taken into account.	OK	OK
B.2.4. Is the baseline selection compatible with the available data?	1	DR	Yes refer B 3 of the PDD	OK	OK
B.2.5. Does the selected baseline represent the most likely scenario describing what would have occurred in absence of the project activity?	1,2	DR	Refer B 5 of PDD	OK	OK
C. Duration of the Project / Crediting Period It is assessed whether the temporary boundaries of the project are clearly defined.					
C.1.1. Are the project's starting date and operational lifetime clearly defined?	1	DR	Starting date: 06/05/2005 Expected operational life 25 years.	OK	OK
C.1.2. Is the crediting period clearly defined (seven years with two possible renewals or 10 years with no renewal)?	1	DR	Opted for a fixed crediting period of 10 years starting from 20/08/2007	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
D. Monitoring Plan The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed.					
D.1. **Monitoring Methodology** It is assessed whether the project applies an appropriate monitoring methodology.					
D.1.1. Is the selected monitoring methodology in line with the monitoring methodologies provided for the relevant project category?	1,2	DR	Choice of the monitoring methodologies is not indicated in the PDD section D 2	CAR-3	OK
D.1.2. Is the monitoring methodology applicable to the project being considered?	1,2	DR	Refer D.1.1		OK
D.1.3. Is the application of the monitoring methodology transparent?	1,2	DR	The data is being monitored by ASL on daily basis refer section D 3 of PDD. However refer D.1.1		OK
D.1.4. Will the monitoring methodology give opportunity for real measurements of achieved emission reductions?	1	DR	PDD is silent about plan for calibration of monitoring equipments to ensure real measurements of achieved emission reductions. During site visit, calibration records were not available.	CAR-4	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
D.2. **Monitoring of Project Emissions** It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.2.1. Are the choices of project emission indicators reasonable?	1	DR	Yes, the project emissions mainly relate to start ups or during winter operations. Refer Section E 1.2.1 of PDD. However tabular presentation of data in E.2 mentions project emissions to be zero. Similarly use of D.G. Set is also not accounted for.	CAR-5	OK
D.2.2. Will it be possible to monitor / measure the specified project emission indicators?	1	DR	Yes, provision for monitoring this data is made in Section D 3 of PDD. However refer D.2.1		OK
D.2.3. Do the measuring technique and frequency comply with good monitoring practices?	1	DR	Refer D.2.1		OK
D.2.4. Are the provisions made for archiving project emission data sufficient to enable later verification?	1	DR	No. Refer D.2.1		OK
D.3. **Monitoring of Leakage** It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.					
D.3.1. If applicable, are the choices of leakage indicators reasonable?	1	DR	One Boiler of 6 TPH has been reportedly transferred to sister concern at Akola on 03/06/06. Leakage of this transfer is not considered	CAR-6	OK
D.3.2. If applicable, will it be possible to	1	DR	Refer D.3.1		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
monitor / measure the specified leakage indicators?					
D.3.3. If applicable, do the measuring technique and frequency comply with good monitoring practices?	1	DR	Refer D.3.1		OK
D.3.4. If applicable, are the provisions made for archiving leakage data sufficient to enable later verification?	1	DR	Refer D.3.1		OK
D.4. **Monitoring of Baseline Emissions** It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.4.1. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	1	DR	Reasonable as per approved monitoring plan in Appendix B.	OK	OK
D.4.2. Will it be possible to monitor / measure the specified baseline emission indicators?	1	DR	Yes	OK	OK
D.4.3. Do the measuring technique and frequency comply with good monitoring practices?	1	DR I	Yes.	OK	OK
D.4.4. Are the provisions made for archiving baseline emission data sufficient to enable later verification?	1	DR	Data is being collected in paper. Archiving provision is put in place. Refer D 2.4	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
D.5. **Project Management Planning** It is checked that project implementation is properly prepared for and that critical arrangements are addressed.					
D.5.1. Is the authority and responsibility of project management clearly described?	1	DR	The management structure is defined. Refer D.5 of PDD	OK	OK
D.5.2. Is the authority and responsibility for registration monitoring measurement and reporting clearly described?	1	DR I	The management structure is defined. Refer D.5 of PDD	OK	OK
D.5.3. Are procedures identified for training of monitoring personnel?	1	DR I	Procedures for training of monitoring personnel is indicated in the PDD	OK	OK
D.5.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	1	DR I	PDD has not identified any emergency situations leading to unintended emissions. Usage of coal or D.G set in case of lack of bio mass supply. During operations abnormal situations?? What about N2O emissions?	CL –5	OK
D.5.5. Are procedures identified for calibration of monitoring equipment?	1	DR I	Calibration frequency of meters has been defined as yearly. However the meters requiring calibration have not been identified.	CL-6	OK
D.5.6. Are procedures identified for maintenance of monitoring equipment and installations?	1	DR I	Procedures for maintenance of monitoring equipment and installations are identified.	OK	OK
D.5.7. Are procedures identified for monitoring,	1	DR	Yes, procedures have been Identified in the PDD	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
measurements and reporting?		I			
D.5.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	1	DR I	Yes, procedures have been Identified in the PDD	OK	OK
D.5.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	1	DR I	Procedures for dealing with possible monitoring data adjustments and uncertainties are not identified though Table D 4 of PDD indicates QA/QC procedures are planned.	CL- 7	OK
D.5.10. Are procedures identified for internal audits of GHG project compliance with operational requirements as applicable?	1	DR I	Procedure for internal audit is identified.	OK	OK
D.5.11. Are procedures identified for project performance reviews?	1	DR I	Project performance review is defined as once in 3 months	OK	OK
D.5.12. Are procedures identified for corrective actions?	1	DR I	Procedure for corrective actions is identified.	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
E. Calculation of GHG emission 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.					
E.1. **Project GHG Emissions** The validation of predicted project GHG emissions focuses on transparency and completeness of calculations.					
E.1.1. Are all aspects related to direct and indirect project emissions captured in the project design?	1	DR	Refer D.2.1		OK
E.1.2. Have all relevant greenhouse gases and sources been evaluated?	1	DR	Refer D.2.1		OK
E.1.3. Do the methodologies for calculating project emissions comply with existing good practice?	1	DR	Refer D.2.1		OK
E.1.4. Are the calculations documented in a complete and transparent manner?	1	DR	Refer D.2.1		OK
E.1.5. Have conservative assumptions been used?	1	DR	Refer D.2.1		OK
E.1.6. Are uncertainties in the project emissions estimates properly addressed?	1	DR	Refer D.2.1		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
E.2. **Leakage** 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.					
E.2.1. Are leakage calculation required for the selected project category and if yes, are the relevant leakage effects assessed?	1	DR	Refer D.3.1		OK
E.2.2. Are potential leakage effects properly accounted for in the calculations (if applicable)?	1	DR	Refer D.3.1		OK
E.2.3. Do the methodologies for calculating leakage comply with existing good practice (if applicable)?	1	DR	Refer D.3.1		OK
E.2.4. Are the calculations documented in a complete and transparent manner and (if applicable)?	1	DR	Refer D.3.1		OK
E.2.5. Have conservative assumptions been used (if applicable)?	1	DR	Refer D.3.1		OK
E.2.6. Are uncertainties in the leakage estimates properly addressed (if applicable)?	1	DR	Refer D.3.1		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
E.3. **Baseline GHG Emissions** The validation of predicted baseline GHG emissions focuses on transparency and completeness of calculations.					
E.3.1. Are the baseline emission boundaries clearly defined and do they sufficiently cover sources for baseline emissions?	1	DR	Yes, the baseline emission boundaries have been defined in B 4 and B 5 of the PDD and have adequately cover the baseline sources.	OK	OK
E.3.2. Are all aspects related to direct and indirect baseline emissions captured in the project design?	1	DR	Yes	OK	OK
E.3.3. Have all relevant greenhouse gases and sources been evaluated?	1	DR	Yes.	OK	OK
E.3.4. Do the methodologies for calculating baseline emissions comply with existing good practice?	1	DR	Yes, The PDD has considered baseline emissions as well as the project emissions.	OK	OK
E.3.5. Are the calculations documented in a complete and transparent manner?	1	DR	Yes. Calculations are presented in complete and transparent manner	OK	OK
E.3.6. Have conservative assumptions been used?	1	DR	Refer E.3.5		OK
E.3.7. Are uncertainties in the baseline emissions estimates properly addressed?	1	DR	Refer E.3.5		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
E.4. **Emission Reductions** 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 case?	1	DR	As per PDD, as fossil fuel is being replaced by biomass. The project implemented in the proposed design will result in fewer GHG emissions than the baseline.	OK	OK
F. Environmental Impacts It is assessed whether environmental impacts of the project are sufficiently addressed.					
F.1.1. Does host country legislation require an analysis of the environmental impacts of the project activity?	1	DR I	Not required.	OK	OK
F.1.2. Does the project comply with environmental legislation in the host country?	1	DR I	Clearance from MOEF is not required. However data provided in PDD and equipments on site do not match with data in approvals from Regional Authorities (Consents from Madhya Pradesh State Pollution control board). For example boiler capacities.	CAR-7	OK
F.1.3. Will the project create any adverse environmental effects?	1	DR	No. Project is not likely to create any adverse environmental effects, if implemented in the design detailed out in PDD.	OK	OK
F.1.4. Have environmental impacts been identified and addressed in the PDD?	1	DR	No. Environmental impacts associated with biomass transportation, biomass storage, coal storage ash disposal etc. are not addressed in PDD.	CL-8	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
G. Comments by Local Stakeholder Validation of the local stakeholder consultation process.					
G.1.1. Have relevant stakeholders been consulted?	1	DR I	PDD indicates that a stakeholder meeting has taken place on 08/05/2006. Copies of the same are available.	OK	OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	1	DR	PDD indicates that letters have been sent to SDM office at Jaora and Gram Panchayat to invite comments by local stakeholders. Newspaper invitation is available to this effect.	OK	OK
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	DR	No regulation	OK	OK
G.1.4. Is a summary of the comments received provided?	1	DR	No adverse comments received as per G.3 of PDD from any stakeholder	OK	OK
G.1.5. Has due account been taken of any comments received?	1	DR	No action required as comments have not been received from local stake holders	OK	OK

Ref: 1: GUIDELINES FOR COMPLETING CDM-PDD, CDM-NMB and CDM-NMM – Version 04 – July 8th, 2005
2. Appendix B of the simplified M & P for small-scale CDM project activities – Version 8 – 3rd March 2006.

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

TABLE 3 RESOLUTIONS 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
Host country approval is not available	A.3.3 CAR-1	Host country approval dated 3 November 2006 is received.	Verified Host country approval dated 03/11/2006. Corrective action request CAR-1 therefore is closed.
It is indicated in B 5 of PDD that the boiler efficiencies are based on CERC data and net power generation based on data provided by WREB Calculation sheet is not available.	B.2.2 CAR-2	Excel sheet is provided for details of calculation.	Calculations are verified and found to be satisfactory. Corrective action request CAR-2 is therefore is closed.
Choice of the monitoring methodologies is not indicated in the PDD section D 2	D.1.1 CAR-3	Monitoring shall consist of 9(b) as per indicative simplified baseline and monitoring methodologies for selected small scale CDM project activity categories. This information is added in the PDD (D.1).	Verified Section D.1 of PDD, Version 1.6, dated 11/09/2007. Choice of methodology is adequately explained. Corrective action request CAR-3 is therefore closed.

PDD is silent about plan for calibration of monitoring equipments to ensure real measurements of achieved emission reductions. During site visit, calibration records were not available.	D.1.4 CAR-4	In the project activity, new equipments have been installed. Test certificates for monitoring equipments are provided as received from the manufacturer. Proper calibration plan for monitoring equipments has been chalked out as modified in the PDD (D.5).	Verified calibration certificates and calibration plan as detailed in Section D.5 of PDD, Version 1.6 dated 11/09/2007. Corrective Action Request CAR-4 is therefore is closed.
Yes, the project emissions mainly relate to start ups or during winter operations. Refer Section E 1.2.1 of PDD. However tabular presentation of data in E.2 mentions project emissions to be zero. Similarly use of D.G. Set is also not accounted for.	D.2.1 CAR-5	Project emissions shall result from auxiliary fuel and auxiliary power consumption during start up in project activity. Auxiliary fuel is coal and auxiliary power during start up shall be taken from DG set and/or Grid. Estimation for project emissions done and included in revised PDD accordingly.	Verified project emission calculations & plan for the same in revised PDD, Version 1.6 dated 11/09/2007. Emissions due to use of fossil fuels like Coal and Diesel. Similarly in case of emergencies likely import from gird is also considered. Corrective action Request CAR-5 is therefore closed.

One Boiler of 6 TPH has been reportedly transferred to sister concern at Akola on 03/06/06. Leakage of this transfer is not considered.	D.3.1 CAR-6	Since this boiler has been dismantled and disposed off as scrap so no leakage considered. Documents are provided in this regard.	With the following evidences made available, Project proponent has confirmed that there is no transfer of equipment. 1. Scrap of boiler from Jaora Plant 2. Undertaking by the company 3. Certificate by the statutory auditor of the company. 1. Declaration by fabricator. 5. Letter by Ambika Solvex dated 05/06/2007 written to Regional Boiler authority that Boiler- Registration No. MP 4173 has been scrapped. Validation team also visited Akola Plant to verify any transfer of equipment. Evidently boiler was originally transferred to Akola Plant and then back to Jaroa plant. Evidently this was scrapped from Jaora plant. Based on these evidences and site visit verification to sister concern, Corrective action request CAR-6 is closed.

Clearance from MOEF is not required. However data provided in PDD and equipments on site do not match with data in approvals from Regional Authorities (Consents from Madhya Pradesh State Pollution control boards). For example boiler capacities.	F.1.2 CAR-7	Modification in this regard has been done in the PDD. There was typing error and MPPCB has been requested to issue revised approval with correct information. A copy of application is also provided.	Application to the Madya Pradesh Pollution Control Board ASL/ MPPCB/ 2006 dated August 8,2006 Is available. Corrective Action request CAR-7 therefore is closed.
Though indicated as pulsating grate boilers and back pressure turbine, it is not clear whether any transfer of technology to the host country is involved. (Refer A.4.2.of PDD)	A.2.4 CL-1	This is indigenous technology and no technology transfer has taken place. Information is provided in PDD. (A.4.2)	Verified section A.4.2 of revised PDD, version 1.6 dated 11/09/2007. Clarification request CL-1 is therefore closed.
The local management of Ambika Solvex Limited (ASL) headed by the Factory Manager is carrying out the operation and maintenance. The staffs are competent and qualified. Infrastructure and system are in place to up-keep and efficient operation. However the PDD is silent about the system for maintenance needs Preventive maintainer plan is not prepared. Training Documentation also need to be provided.	A.2.6 CL-2	Preventive maintenance of equipments is carried out as per schedule. Records in this regard are maintained regularly. Documents of preventive maintenance are provided. Documents on training program carried out are provided.	Verified documents and records for preventive maintenance. Clarification Request CL-2 is therefore closed.
No adverse environmental or social effects are envisaged. However the PDD is silent about the effects of biomass combustion like mustard and Soya husk, which lead toxic gases like chlorine emissions.	A.3.2 CL-3	The major problem of Chlorine is heavy deposition of chlorides forming lumps on heat transfer surfaces which results in enhanced corrosion rates and poor heat transfer in the boiler.	Explanation is found to be sufficient. Clarification request CL-2 is therefore closed.

		There is no chlorine emission in gas form from biomass combustion in project activity. Chlorine is removed in the form of chlorides of minerals such as $CaCl_2$ etc.	
Yes, Refer B.3 of PDD Technological barriers, Investment barriers, biomass residue availability barriers have been discussed and demonstrated. However evidences/ supportive information is not available for following - Cleaning frequency, Feed Water quality. Technology using Soya husk. First of its kind in the region Softening requirements vis a vis coal fired needs to be elaborated. No O & M. Financial Barrier – Data to be provided. Production trend to be furnished. Price husk fluctuations.	B.2.1 CL-4	Frequent cleaning is carried out by plant people in every 15-20 days. A note of the same is included in log books also. Please refer the attached copy of Boiler Log Sheet. Details of required feed water quality are provided. It is quite evident from the data provided in PDD (common practice analysis) that this is the first boiler in the region operating on Husk. Information on other Soya plants in the region is provided as annex. This is based on knowledge of project participant These plants are generating steam using fossil fuels only. However this information is not available through verifiable public sources & therefore it is deleted from PDD. O&M of plant/machinery is carried out by ASL. Financial details are provided for information.	Explanation is found to be adequate on the issues raised. Verified all the information through support evidences. Clarification Request CL-4 is therefore closed.

		Production trend is also furnished. This project activity is first of its kind in the region and there is no established network for biomass supply. However, increase in biomass prices is envisaged as the demand grows for the biomass in the region for energy generation.	
PDD has not identified any emergency situations leading to unintended emissions. Usage of coal or DG set in case of lack of bio mass supply. During operations abnormal situations?? What about N2O emissions?	D.5.4 CL-5	Emergency preparedness aspects are added to the PDD (D.5). Usage of Coal (start up firing) and power from DG set during start up has been considered as project emissions. CER estimation is done accordingly. For N2O emissions, we have followed guidelines given in approved consolidated methodology ACM0006 wherein N2O emissions from biomass burning are neglected for simplification as these are assumed to be very small.	Explanation on emergency situations is found to be adequate and Clarification Request CL-5 is therefore closed.
Calibration frequency of meters has been defined as yearly. However the meters requiring calibration have not been identified.	D.5.5 CL-6	Monitoring equipments are identified and details are included in PDD.	Verified section D.5 for various monitoring equipments. Clarification request CL-6 therefore is closed.
Procedures for dealing with possible monitoring data adjustments and uncertainties are not identified though Table D 4 of PDD indicates QA/QC procedures are planned.	D.5.9 CL-7	This issue has been addressed and proper care shall be taken in this regard. Adherence to all such things shall be ensured in periodic internal audits. Please refer D.4 in PDD.	Data reliability as well as QA/QC procedures are detailed in section D.4 of PDD. Clarification request CL-7 is therefore closed.

No. Environmental impacts associated with biomass transportation, biomass storage, coal storage ash disposal etc. are not addressed in PDD.	F.1.4 CL-8	Due care is being taken by the project proponent for all such things as follows, (F.1) 2. Transportation of biomass/ash through covered trucks. 3. Proper storage of biomass/coal in a covered shed. 4. Fire fighting arrangement at fuel storage yard.	Verified section F.1 of PDD, Version 1.6 dated 11/09/2007 for addressal of environmental impacts. Clarification request CL-8 is therefore closed.

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APPENDIX B : CVs of Verifiers

Mr. H.B. Muralidhar: He is the Lead auditor for Environmental Management System, Quality Management system and Occupational Health and Safety Management System.. He has several years of Industrial work experience in the field of environmental management systems He is the technical expert & conducted Validation / Verification for more than 30 CDM Projects

Mr. S. V. Pendse: He is the Lead auditor in Bureau Veritas Certification for Environment Management System, Quality Management System and Occupational Health and Safety Management System. He has done post graduation in the field of Environmental Science and has more than 15 years several years of Industrial work experience in the field of environmental management systems. He has undergone intensive training on Clean Development Mechanism. He is so far has carried out Validation/verification for more than 20 CDM projects.

Mr. R. Sankarnarayanan: He is the Lead auditor in Bureau Veritas Certification for Environment Management System, Quality Management System and Social Accountability SA 8000:2001. He is Chemical Engineer and has more than several years of Industrial work experience in the field of environmental management systems. He has undergone intensive training on Clean Development Mechanism. He is so far has carried out Validation/verification for more than 15 CDM projects.

Mr. Shrikant Saraf: He is the technical expert and has several years of Industrial work experience in the field of monitoring of electrical power, qualitative aspects of monitoring, calibration procedures etc He is so far has carried out Validation/verification for more than 10 CDM projects.

End of Report : INDIA-Val/61.49/2007/Rev.03