



# VALIDATION REPORT

NABHA POWER LIMITED

ENERGY EFFICIENT POWER GENERATION BY  
NABHA POWER LIMITED

**Report No: 8106955414-10/400**

**Date: 2011-08-26**

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<b>Project:</b>	<b>Title:</b>	<b>Initial PDD Version:</b>	<b>Final PDD Version</b>	
	Energy Efficient Power Generation by Nabha Power Limited	2009-08-10	Version 5 dated 2011-08-18	
<b>Client:</b>	Nabha Power Limited	<b>Client ref:</b>	Mr. S. K. Narang	
<b>Project Participant(s):</b>	<b>Host Party:</b>	<b>Other involved parties:</b>		
	India	N/A		
<b>Applied methodology/ies:</b>	<b>Title:</b>	<b>No.:</b>	<b>Scope / TA:</b>	
	Consolidated baseline and monitoring methodology for new grid connected fossil fuel fired power plants using a less GHG intensive technology"	ACM 0013, Version 03	1/1.1	
<b>Validation team / Technical Review and Final Approval</b>	<b>Validation Team:</b>	<b>Technical review:</b>	<b>Final approval:</b>	
	TL: Mr. Manojkumar Borekar TM: Mr. Prasad Jakkaraju TE: Mr. Hemang Shah TM: Mr. Jimmy Sah TM: Mr. Sukanta Das	Mr. Lars Kirchner Mr. Kunal Rami Mr. Rainer Winter	Mr. Rainer Winter	
<b>Expected Emission reductions: [t CO<sub>2e</sub>]</b>	<b>Expected emission reductions over the first crediting period:</b>		<b>Starting date of crediting period:</b>	
	9,364,517 tCO <sub>2e</sub>		2014-05-01	
<b>Confidential content:</b>	<input type="checkbox"/> Yes		<input checked="" type="checkbox"/> No	
<b>Summary of Validation Opinion:</b>	<input checked="" type="checkbox"/> Positive validation opinion		<input type="checkbox"/> Negative validation opinion	
	<p>Nabha Power Limited has commissioned the TÜV NORD JI/CDM Certification Program (CP) to validate the project: "Energy Efficient Power Generation by Nabha Power Limited" with regard to the relevant requirements of the UNFCCC for CDM project activities, as well as criteria for consistent project operations, monitoring and reporting. UNFCCC criteria include article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakech Accords) and the relevant decisions by COP/MOP and CDM Executive Board</p> <p>In the course of the validation 33 Corrective Action Requests (CARs) and 25 Clarification Requests (CLs) were raised and successfully closed.</p> <p>The review of the project design documentation and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and review of comments by parties, stakeholders and NGOs have provided TÜV NORD JI/CDM CP with sufficient evidence to validate the fulfillment of the stated criteria.</p> <p>In detail the conclusions can be summarised as follows:</p> <ul style="list-style-type: none"> <li>• The project is in line with all relevant host country criteria (India) and all relevant UNFCCC requirements for CDM. Project activity approval have been obtained from DNA of (India) vide the Letter of Approval (HCA) dated 14/03/2011.</li> <li>• The project additionality is sufficiently justified in the PDD.</li> <li>• The monitoring plan is transparent and adequate.</li> <li>• The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 9.364,517 tCO<sub>2e</sub> are most likely to be achieved within the 10 years fixed crediting period.</li> </ul> <p>The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation.</p>			
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<b>information:</b>	S01-VA010-A1	275
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## Abbreviations

BAU	Business as Usual
CA	Corrective Action / Clarification Action
CBA	Cost Benefit Ratio Analysis
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CER	Certified Emission Reduction
CERC	Central Electricity Regulatory Commission
CL	Clarification Request
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Carbon dioxide equivalent
CP	Certification Program
CPI	Consumer Price Index
DNA	Designated National Authority
EB	CDM Executive Board
EIA	Environmental Impact Assessment
EPC	Engineering, Procurement and Construction
GHG	Greenhouse gas(es)
HCA	Host Country Approval Letter
IPCC	Intergovernmental Panel on Climate Change
INR	Indian Rupees (Rs.)
IRR	Internal Rate of Return
ITA	Income Tax Act
LoA	Letter of Approval
LTPDL	Larsen & Toubro Power Development Limited
LUCE	Levelized Unit Cost of Electricity
MoEF	Ministry of Environment and Forests, India
MoV	Means of Verification
MP	Monitoring Plan
MWh	Megawatt hour
NEWNE	North East West and North East regional Grid
NHPC	National Hydro power corporation
NPL	Nabha Power Limited
NPV	Net Present Value
PDD	Project Design Document
PLR	Prime Lending rate
PPA	Power Purchase Agreement
PSEB	Punjab State Electricity Board



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PSERC	Punjab State Electricity Regulatory Commission
QC/QA	Quality control/Quality assurance
RBI	Reserve Bank of India
RfP	Request for Proposal
RfQ	Request for Qualification
SECL	South Eastern Coalfields Limited
UMPP	Ultra Mega Power Projects
UNFCCC	United Nations Framework Convention on Climate Change
VVM	Validation Verification Manual
WACC	Weighted Average Cost of Capital

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## 1 OBJECTIVE / SCOPE

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

- the requirements of Article 12 of the Kyoto Protocol;
- the CDM modalities and procedures as agreed in the Marrakech Accords under decision 3/CMP.1
- the annex to the decision;
- subsequent decisions made by COP/MOP & CDM Executive Board and
- other relevant rules, including the host country legislation and sustainability 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 seen as necessary to provide assurance to stakeholders on the quality of the project and its intended generation of certified emission reductions (CERs).

The validation scope is given as a thorough independent and objective assessment of the project design including especially: the correct application of the methodology, the project's baseline study, additionality justification, local stakeholder commenting process, environmental impacts and monitoring plan, which are included in the PDD and other relevant supporting documents, to ensure that the proposed CDM project activity meets all relevant and applicable CDM criteria.

The information included in the PDD and the supporting documents were reviewed against the requirements as set out by the UNFCCC. The validation team has, based on the requirements in the Validation and Verification Manual<sup>VVM</sup>, carried out a full assessment of all evidences to assess the compliance of the project with the key areas as outlined in section V.E. and V.F. of the VVM (version 01.2, EB 55).

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

The validation is not meant to provide any consulting to the project participants. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.



## 2 GHG PROJECT DESCRIPTION

### 2.1 Project Characteristics

Essential data of the project is presented in the following Table 2-1.

**Table 2-1:** Project Characteristics

Item	Data
Project title	Energy Efficient Power Generation by Nabha Power Limited
Project size	<input checked="" type="checkbox"/> Large Scale <input type="checkbox"/> Small Scale
Project Scope (according to UNFCCC sectoral scope numbers for CDM)	<input checked="" type="checkbox"/> 1 Energy Industries (renewable- /non-renewable sources)
	<input type="checkbox"/> 2 Energy distribution
	<input type="checkbox"/> 3 Energy demand
	<input type="checkbox"/> 4 Manufacturing industries
	<input type="checkbox"/> 5 Chemical industry
	<input type="checkbox"/> 6 Construction
	<input type="checkbox"/> 7 Transport
	<input type="checkbox"/> 8 Mining/Mineral production
	<input type="checkbox"/> 9 Metal production
	<input type="checkbox"/> 10 Fugitive emissions from fuels (solid, oil and gas)
	<input type="checkbox"/> 11 Fugitive emissions from production and consumption of halocarbons and hexafluoride
	<input type="checkbox"/> 12 Solvents use
	<input type="checkbox"/> 13 Waste handling and disposal
	<input type="checkbox"/> 14 Afforestation and Reforestation
	<input type="checkbox"/> 15 Agriculture
Applied Methodology	ACM0013 (Version 03)
Technical Area(s)	1.1: Thermal energy generation from fossil fuels and biomass including thermal electricity from solar
Crediting period	<input type="checkbox"/> Renewable Crediting Period (7 y) <input checked="" type="checkbox"/> Fixed Crediting Period (10 y)
Start of crediting period <sup>1</sup>	18-05-2014
Start of crediting period <sup>2</sup>	01-05-2014

### 2.2 Involved Parties and Project Participants

The following parties to the Kyoto Protocol and project participants are involved in this project activity (Table 2-2).

**Table 2-2:** Project Parties and project participants

Characteristic	Party	Project Participant
Host party	India	Nabha Power Limited
Other involved party/ies	-	-

<sup>1</sup> As per the published PDD (version 1)

<sup>2</sup> As per the published PDD (version 5)

## 2.3 Project Location

The details of the project location are given in table 2-3:

**Table 2-3:** Project Location

No.	Project Location
Host Country	India
Region:	Punjab
Project location address:	Village : Nalash, District : Patiala
Latitude:	30°32'36"N to 30°33'51" N
Longitude:	76°33'42"E to 76°35'05" E

## 2.4 Technical Project Description

The proposed project activity is a Greenfield project of 1400 MW power generation facility comprising of 2 units of 700 MW each using super-critical based technology. The project site is located in Nalash village of Patiala district in Punjab. The project activity will employ coal fired super-critical technology for thermal power generation which has higher efficiency compared to the prevailing coal fired sub-critical technology. Both technologies are capable of providing similar services; however, the supercritical technology consumes lesser coal leading to lower GHG emissions. The contracted power generated from this project is to be sold to the PSEB under a long-term PPA<sup>/PPA/</sup> to construct the Nabha Power Project for a contracted capacity of 1320 MW and sale and supply of electricity in bulk to Punjab State Electricity Board (PSEB) for a period of 25 years from the date of commercial operation of the power plant, which is connected to NEWNE grid of India. The coal supply for the project has been assured by South Eastern Coalfields Limited.

The technology (super-critical) used in the project is first-of-its-kind in India. India has no other super-critical technology based coal fired electricity generation plant under commercial operation at the time of PDD web-hosting for global stakeholder consultation process. Based on the historical 3 years data<sup>/cea/</sup>, the baseline fuel is identified as coal (more than 50% of total electricity generation in India) and the baseline scenario is electricity generation by coal fired sub-critical technology of similar to power plant size.

The efficiency of the supercritical technology based power plant is higher (project activity: 40.49%) as compared to the most efficient sub-critical technology (Option 2: 36.04% top j<sup>th</sup> plant efficiency identified in baseline as per ACM0013) while the best plant operating in India with a sub-critical technology has an efficiency of 36.63% (option 1 of ACM0013). Thus the incremental efficiency of super critical technology will lead to reduced coal consumption (considering same fuel type for baseline and project activity) and thereby leading to emission reductions.

The project activity will export net electricity of 107870752.1 MWh (at 93% Load factor) for the 10 year fixed crediting period. The estimated total amount of emission reductions over the chosen 10-year "fixed crediting period" is **9,364,517 tCO<sub>2</sub>e**.

The technical key data are provided in table 2-4 below

**Table 2-4:** Technical data of the project activity

Parameter	Unit	Value/Description
<b>Boiler</b>	-	Once through type
Super heater outlet pressure	kg/cm <sup>2</sup>	257.15
Super heater outlet temperature	°C	568
Super heater outlet flow	Ton/hour	2322
Re-heater outlet pressure	kg/cm <sup>2</sup>	61.47
Re-heater outlet temperature	°C	596
Re-heater outlet flow	Ton/ hour	1886.2
Feed water inlet temperature to economizer	°C	311.9
Lifetime	years	25
Efficiency	%	88.7
<b>Turbine</b>		
Capacity	MW	700
Pressure	kg/cm <sup>2</sup>	247
Main Steam temperature	°C	565
Reheat Steam temperature	°C	593
Lifetime	Years	25

## 3 METHODOLOGY AND VALIDATION SEQUENCE

### 3.1 Validation Steps

The validation of the project consisted of the following steps:

- Contract review
- Appointment of team members and technical reviewers
- Publication of the project design document (PDD)
- Desk review of the PDD and supporting documents
- Validation planning
- On-Site assessment
- Background investigation and follow-up interviews with personnel of the project developer and its contractors
- Draft validation reporting
- Resolution of corrective actions (if any)
- Final validation reporting
- Technical review
- Final approval of the validation

The sequence of the validation is given in the table 3.1 below:

**Table 3.1:** Validation sequence

Topic	Time
Assignment of validation	2010-05-28
Submission of PDD for global stakeholder commenting process	2010-09-14 to 2010-10-13
On-site visit	2010-11-01 to 2011-11-02
Draft reporting finalised	2010-11-19
Final reporting finalised	2011-05-16
Technical review on final reporting finalised	2011-05-16

## 3.2 Contract review

To assure that

- the project falls within the scopes for which accreditation is held,
- the necessary competences to carry out the validation can be provided,
- Impartiality issues are clear and in line with the CDM accreditation requirements

a contract review was carried out before the contract was signed.

## 3.3 Appointment of team members and technical reviewers

On the basis of a competence analysis and individual availabilities a validation team, consistent of one team leader and 4 additional team members, were appointed. Furthermore also the personnel for observation, the technical review and the final approval were determined.

The list of involved personnel, the tasks assigned and the qualification status are summarized in the table 3-2 below.

**Table 3-2:** Involved Personnel

	Name	Company	Function <sup>1)</sup>	Qualification Status <sup>2)</sup>	Scheme competence	Technical competence <sup>4)</sup>	Host country Competence	Team Leading competence
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Manoj Kumar Borekar	TUV India Pvt Ltd	TL	SA	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Prasad Jakkaraju	TUV India Pvt Ltd	TM	LA	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Hemang Shah	TUV India Pvt Ltd	TM/TE	A	<input checked="" type="checkbox"/>	TA 1.1	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Jimmy Sah	TUV India Pvt Ltd	TM	LA	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Sukanta Das	TUV India Pvt Ltd	TM	LA	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Mr.	Kirchner	TUV NORD	TR <sup>3)</sup> /	LA	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>



	Name	Company	Function <sup>1)</sup>	Qualification Status <sup>2)</sup>	Scheme competence	Technical competence <sup>4)</sup>	Host country Competence	Team Leading competence
<input type="checkbox"/> Ms.	Lars	Cert GmbH	OR <sub>3)</sub>					
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Kunal Rami	TUV NORD Cert GmbH	TR <sup>3)</sup> /OR <sub>3)</sub>	A	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Rainer Winter	TUV NORD Cert GmbH	TR <sup>3)</sup> /FA	SA	<input checked="" type="checkbox"/>	1.1	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<sup>1)</sup> TL: Team Leader; TM: Team Member, TR: Technical review; OT: Observer-Team, OR: Observer-TR, FA: Final approval

<sup>2)</sup> GHG Auditor Status: A: Assessor; LA: Lead Assessor; SA: Senior Assessor; T: Trainee; TE: Technical Expert

<sup>3)</sup> No team member

<sup>4)</sup> As per S01-MU03 or S01-VA070 A2 (such as TA 1.1, TA 1.2,.....), according to the Accreditation Standard (Version 2)

Certificates of appointment for the above mentioned team members are enclosed in annex 6 of this report.

### 3.4 Consideration of Public Stakeholder Comments

Acc. to the modalities and procedures the draft PDD, as received from the project participants, has been made publicly available on the dedicated UNFCCC CDM website prior to the validation activity commenced. Stakeholders have been invited to comment on the PDD within the 30 days public commenting period.

In case comments are received, they are taken into account during the validation process. The comments and the discussion of the same are documented in annex 5 of this report.

### 3.5 Validation Protocol

In order to ensure consideration of all relevant assessment criteria, a validation protocol is used. The protocol shows, in a transparent manner, criteria and requirements, means of validation and the results from pre-validating the identified criteria. The validation protocol reflects the generic CDM requirements each CDM project has to meet as well as project specific issues as applicable. The validation protocol serves the following purposes:

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

The validation protocol is described in Figure 1.

<b>Validation Protocol Table A-1: Requirement checklist</b>				
<b>Checklist Item</b>	<b>Validation Team Comment</b>	<b>Reference</b>	<b>Draft Conclusion</b>	<b>Final Conclusion</b>
<i>The checklist items in Table A-1 are linked to the various requirements the project should meet. The checklist is organised in various sections. Each section is then further sub-divided as per the requirements of the topic and the individual project activity.</i>	<i>The section is used to elaborate and discuss the checklist item in detail. It includes the assessment of the validation team and how the assessment was carried out. The reporting requirements of the VVM shall be covered in this section.</i>	<i>Gives reference to the information source on which the assessment is based on</i>	<i>Assessment based on evidence provided if the criterion is fulfilled (OK), or a CAR, CL or FAR (see below) is raised. The assessment refers to the draft validation stage.</i>	<i>In case a corrective action or a clarification the final assessment at the final validation stage is given.</i>

**Figure 1:** Validation protocol table

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

### 3.6 Review of Documents

The published PDD (version 1) and supporting background documents related to the project design and baseline were reviewed.

Furthermore, the validation team used additional documentation by third parties like host party legislation, technical reports referring to the project design or to the basic conditions and technical data.

### 3.7 Follow-up Interviews

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

Two members of the validation team carried out the site visit.

During validation the validation team has performed interviews to confirm selected information and to resolve issues identified in the document review. The main topics of the interviews are summarized in table 3-3.

**Table 3-3:** Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
Project proponent representatives Mr. Sujoy Basak Mr. Ravindra Kudchadkar Mr. J. S. Gill Mr. S. K. Narang Mr. Prabhat K. Saha  Project consultants	<ul style="list-style-type: none"> <li>- Chronological description of the project activity with documents of key steps of the implementation.</li> <li>- Current status of plant design</li> <li>- Technical details of the project realization, project feasibility, designing, operational life time, monitoring of the project</li> <li>- Host Government Approval</li> <li>- Approval procedures and status</li> <li>- Monitoring and measurement equipment and system.</li> <li>- Financial aspects</li> <li>- Crediting period</li> <li>- Project activity starting date</li> <li>- CER allocation / ownership</li> <li>- Baseline study assumptions</li> <li>- Additionality</li> <li>- Sustainable development issues</li> <li>- Monitoring</li> <li>- Analysis of local stakeholder consultation</li> <li>- Roles &amp; responsibilities of the project participants w.r.t. project management, monitoring and reporting</li> <li>- National Legislation</li> <li>- Editorial issues of the PDD</li> </ul>

A comprehensive list of all interviewed persons is part of section 7 'References'.

### 3.8 Project comparison

The validation team has compared the proposed CDM project activity with similar projects or technology that have similar or comparable characteristics and with similar projects in the host country in order to achieve additional information esp. regarding:

- Project technology



- Additionality issues
- Reasons for reviews, requests for reviews and rejections within the CDM registration process.

## 3.9 Resolution of Clarification and Corrective Action Requests

### 3.9.1 Definition

A **Corrective Action Request (CAR)** will be established where:

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

A **Clarification Request (CL)** will be issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

A **Forward Action Request (FAR)** will be issued when certain issues related to project implementation should be reviewed during the first verification.

### 3.9.2 Draft Validation

After reviewing all relevant documents and taken all other relevant information into account, the validation team issues all findings in the course of a draft validation report and hands this report over to the project proponent in order to respond on the issues raised and to revise the project documentation accordingly.

### 3.9.3 Final Validation

The final validation starts after issuance of the proposed corrective action (CA) of the CARs CLs and FARs by the project proponent. The project proponent has to reply on those and the requests are “closed out” by the validation team in case the response is assessed as sufficient. In case of raised FARs the project proponent has to respond on this, identifying the necessary actions to ensure that the topics raised in this finding are likely to be resolved at the latest during the first verification. The validation team has to assess whether the proposed action is adequate or not.

In case the findings from CARs and CLs cannot be resolved by the project proponent or the proposed action related to the FARs raised cannot be assessed as adequate, no positive validation opinion can be issued by the validation team.

The CAR(s) / CL(s) / FAR(s) are documented in chapter 4.

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### **3.10 Technical review**

Before submission of the final validation report a technical review of the whole validation procedure is carried out. The technical reviewer is a competent GHG auditor being appointed for the scope this project falls under. The technical reviewer is not considered to be part of the validation team and thus not involved in the decision making process up to the technical review.

As a result of the technical review process the validation opinion and the topic specific assessments as prepared by the validation team leader may be confirmed or revised. Furthermore reporting improvements might be achieved.

### **3.11 Final approval**

After successful technical review of the final report an overall (esp. procedural) assessment of the complete validation will be carried out by a senior assessor located in the accredited premises of TÜV NORD.

Only after this step the request for registration can be started (in case of a positive validation opinion).

## 4 VALIDATION FINDINGS

In the following table the findings from the desk review of the published PDD, visits, interviews and supporting documents are summarised:

**Table 4-1:** Summary of CARs, CLs and FARs issued

Validation topic <sup>1)</sup>	No. of CAR	No. of CL	No. of FAR
General description of project activity (A) - Project specification - Technical project description - Participation - Contribution to sustainable development - PDD editorial aspects - Technology to be employed	07	-	-
Project Baseline, Additionality and Monitoring Plan (B) - Application of the Methodology - Project Boundary - Baseline identification - Calculation of GHG emission reductions Project emissions Baseline emissions Leakage - Additionality determination - Monitoring Methodology - Monitoring Plan - Project management planning	25	25	-
Duration of the Project / Crediting Period (C)	01	-	-
Environmental impacts (D)	-	-	-
Stakeholder Comments (E)	-	-	-
<b>SUM</b>	<b>33</b>	<b>25</b>	<b>-</b>
<b>Total</b>	<b>58</b>		

<sup>1)</sup> The letters in brackets refer to the validation protocol

The following tables include all raised CARs, CLs and FARs. For an in depth evaluation of all validation items it should be referred to the validation protocols (see Annex 1).

The findings of validation process are summarized in the tables below.

General description of project activity (A)	CAR A1		
<b>Classification</b>	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Host country Approval has not yet obtained. This document is a prerequisite for registration.		
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The Host Country Approval is in progress and will be submitted on receipt		
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	HCA is not received. CAR is not closed.		
<b>Corrective Action #2</b>	HCA has been submitted to the DOE		
<b>DOE Assessment #2</b>	The HCA dated 14/03/2011 has been checked and is acceptable. CAR is closed.		
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements		

General description of project activity (A)	CAR A2		
<b>Classification</b>	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Section A.2 of the PDD should include the scenario existing prior to the start of the implementation of the project activity; PP is requested to elaborate the pre-project scenario addressing. Power generation capacity, fuel, and technology and efficiency and proposed project activity.		
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Corrections sought have provided in the revised PDD		

General description of project activity (A)	CAR A2
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The revised PDD includes the scenario existing prior to the start of the project and the project scenario. However, the reference used for demonstrating the scenario existing prior to the start of the project activities not provided. CAR is open.
<b>Corrective Action #2</b>	Reference has been provided in the revised PDD.
<b>DOE Assessment #2</b>	The revised PDD provides proper references. Thus CAR is closed.
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

General description of project activity (A)	CAR A3
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Section A.2 of the PDD should include in brief how the proposed project activity reduces green house gas emissions (referring scenarios, emissions sources and gases) and also description of the sources and gases included in the project boundary. Correction is sought in this regard.
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Corrections sought have provided in the revised PDD
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The corrections sought have been included in the revised PDD. CAR is closed.
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

General description of project activity (A)	CAR A4		
<b>Classification</b>	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Section A.2 of the PDD describes that the project activity involves the installation of 2X700 MW. However, the same is not in line with the DPR and management board note where the consideration is 2X660 MW. Justify inconsistency and elaborate the same in PDD.		
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The initial quotation available from the EPC Contractor was for 1320 MW only. On account of this the CDM consideration as well as the bid was placed for 1320 MW. Finally, at the time of finalization of EPC Contract, the order placed was for 1400 MW which was allowable as per the terms laid down in the PPA. The same information is presented in Section B.5 of the PDD.		
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Closure of CAR depends on closure of additionally sections CARs/CLs.		
<b>Corrective Action #2</b>	We wish to further clarify that at the time of submission of bid to PSEB, the Board decided to implement 2x660 MW capacity. However, after winning the bid and detailed evaluation of PPA, the Management decided to modify the installed capacity from 2x660 MW to 2x700 MW as per allowable terms of PPA. A board note was placed in the meeting held on 17/03/2010 and a proposal was submitted to PSEB seeking the change in configuration which was approved by PSEB vide its letter dated 13/04/2010. Since, the project under implementation is for 2x700 MW, the PDD has been prepared for 1400 MW.		
<b>DOE Assessment #2</b>	The revised PDD, provides a chronology of events and supporting references. The revised PDD under section B.5 mentions about the change in capacity from 1320 to 1400 MW and subsequently the additionality is assessed on 1400 MW. Thus, CAR is closed.		
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements		

General description of project activity (A)	CAR A5		
<b>Classification</b>	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the</i>	Section A.4.3 of the PDD should include the following: ({Cp the CDM- PDD filling guidelines,(Version 07)}):		

General description of project activity (A)	CAR A5
<i>context (e.g. section)</i>	<ol style="list-style-type: none"> <li>Existing and forecast energy and mass flows and balances of the systems and equipments included in the project activity</li> <li>The type and level of service (normally in terms of mass or energy flow) provided by the systems and equipment that are being installed under the project activity.</li> <li>This section should also describe clearly how the same type and level of services provided by the project activity would have been provided in the baseline scenario. Correction is sought in this regard.</li> </ol>
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Corrections sought have provided in the revised PDD
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<ol style="list-style-type: none"> <li>The Mass and Energy balance diagram project activity is not visible.</li> <li>The Mass and Energy balance diagram for pre-project project activity is not addressed.</li> </ol>
<b>Corrective Action #2</b>	<ol style="list-style-type: none"> <li>Cleaner diagram for project mass-energy balance diagram provided in revised PDD</li> <li>Mass energy balance diagram for baseline provided in revised PDD</li> </ol>
<b>DOE Assessment #2</b>	The revised PDD provides a clear diagram for the project and baseline has been provided. CAR is closed.
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

General description of project activity (A)	CAR A6
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	PP is requested to provide the reference/source of technical parameter provided in section A.4.3. Further, few critical parameters are missing. Further, steam parameters seem to be not correct as per the DPR. Appropriate corrections are sought.
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the</i>	Corrections sought have provided in the revised PDD.





General description of project activity (A)	CAR A6
<i>corrective action taken in details.</i>	
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Appropriate corrections have been made and the technical details of steam turbine, Generator are also been furnished.CAR is closed.
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

General description of project activity (A)	CAR A7
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>PP is requested to compare the net efficiency of the project activity to that of the efficiency the scenario (sub-critical technology) prior to start of the project activity (on weighted average basis and best efficient plants).</p> <p>Further, PP is requested to provide the technical details of the Boiler and turbine generator (BTG) with specific reference source.(in Section A.4.3)</p> <p>Appropriate correction is sought in this regard.</p>
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Corrections sought have provided in the revised PDD.
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Appropriate corrections have been made and the technical details of steam turbine Generator are also been furnished.CAR is closed.
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements



Project Baseline(B)	CAR B1		
<b>Classification</b>	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Applicability criterion 1 of the methodology is not justified fully. PP is requested to provide the efficiency of the project activity (Super Critical technology) and the sub-critical technology with evidences respectively. Further, it is not clear in section A.2, whether the efficiencies provided are on gross basis or net? PP is requested to compare the efficiencies only on net basis as per methodological requirements. Appropriate correction is sought in this regard.		
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Corrections sought have provided in the revised PDD.		
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The corrections in the revised PDD are not appropriate. CAR is open.		
<b>Corrective Action #2</b>	The net efficiency values have been corrected and made consistent in the revised PDD		
<b>DOE Assessment #2</b>	PDD is revised to include efficiencies of both project activity (40.49%) and most efficient sub-critical technology (36.04% as per Option 2) as well as the best operating sub-critical technology (36.63% as per Option 1). PDD is now internally consistent. CAR is closed.		
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements		

Project Baseline (B)	CAR B2		
<b>Classification</b>	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Applicability criterion 3 of the methodology is not justified fully due to the fact that the data on the fuel consumption is not being monitored by CEA at unit level. PP is requested to justify the applicability with appropriate corrections.		
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Corrections sought have provided in the revised PDD.		



Project Baseline (B)	CAR B2
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>Justification is not appropriate due to the following reason:</p> <ol style="list-style-type: none"> <li>1. Specific fuel consumption is estimation at the time of tariff fixation by considering standard specifications. (Heat rate 2450 kcal/kwh is common for all the units of NTPC)</li> <li>2. SHR of 2450 kcal/kWh is based on gross caloric value</li> <li>3. Specific fuel consumption is estimated based on gross calorific value</li> <li>4. Actual station heat rates of the all the 10 plants are below the 2450 kcal/kWh</li> <li>5. Also, not in compliance to AM_CLA_188( more than 2 years prior to the date of submission of the PDD for validation of the project activity)</li> </ol> <p>CAR is open.</p>
<b>Corrective Action #2</b>	<p>The revised PDD contains data at the unit level. Though fuel consumption is not monitored at unit level, the value for the same has been calculated using specific emissions and net generation values of the particular unit as published by CEA. Further, the data provided in the revised PDD is the operating data for the identified power plants.</p> <p>Also, the data used is of vintage 2009-10 which is the year prior to the date of submission of the PDD for validation. Hence, the compliance of AM_CLA_188 has also been justified.</p>
<b>DOE Assessment #2</b>	<p>The specific fuel consumption of the unit level which is available in all respective CERC tariff orders is arrived based on the common assumptions i.e.SHR 2450 kcal/kWh,7.5% auxiliary consumption and 2% of secondary fuel oil consumption.</p> <p>However, in the revised PDD the fuel consumption values have been estimated based on the net generation, auxiliary consumption and specific emissions from individual units as published by CEA. The approach is assessed to be appropriate. Thus CAR is closed.</p>
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<p> <input type="checkbox"/> To be checked during the first periodic verification  <input type="checkbox"/> Appropriate action was taken  <input checked="" type="checkbox"/> Project documentation was corrected correspondingly  <input type="checkbox"/> Additional action should be taken  <input checked="" type="checkbox"/> The project complies with the requirements         </p>

Project Baseline(B)	CAR B3		
<b>Classification</b>	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR

Project Baseline(B)	CAR B3
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>The applicability criterion i.e. construction of a new power plant using the same fossil fuel category should be demonstrated w.r.t. definition of Fossil fuel category and Fossil fuel type.</p> <p>PP is requested to justify the applicability with appropriate corrections.</p>
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>Corrections sought have provided in the revised PDD.</p>
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>No corrections identified in the revised PDD. CAR is open.</p>
<b>Corrective Action #2</b>	<p>The applicability criterion has been addressed in the revised PDD</p>
<b>DOE Assessment #2</b>	<p>PDD has been revised appropriately considering the construction of a new power plant using the same fossil fuel category as opposed to the fossil fuel type. CAR is closed.</p>
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<p> <input type="checkbox"/> To be checked during the first periodic verification  <input type="checkbox"/> Appropriate action was taken  <input checked="" type="checkbox"/> Project documentation was corrected correspondingly  <input type="checkbox"/> Additional action should be taken  <input checked="" type="checkbox"/> The project complies with the requirements         </p>

Project Baseline(B)	CAR B4
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>The project boundary description must include the power plant at the project site and all the power plant considered for calculation of baseline CO<sub>2</sub> emission factor. Appropriate correction is sought in this regard.</p>
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>Corrections sought have provided in the revised PDD.</p>
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>The revised PDD includes the power plants considered for calculation of baseline CO<sub>2</sub> emission factor. CAR is closed.</p>

Project Baseline(B)	CAR B4
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Project Baseline (B)	CAR B5
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>The identification of the baseline alternative as per Step 1 of the approved methodology should include power generation using the same fossil fuel category as in the project activity, but technologies other than that used in the project activity.</p> <p>Appropriate correction is sought in this regard</p>
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>Corrections sought have provided in the revised PDD.</p>
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>All possible realistic and credible alternatives are not identified in the revised PDD.</p> <p>The alternative with linkage based and coal imports have not been considered. The justification for not considering and exclusion should be provided</p>
<b>Corrective Action #2</b>	<p>The objective of Section B.4 in the PDD is to identify the source of power generation with the lowest cost involved. Linkage based and imported coal option will always cost more than a pit-head based option because of associated transportation charges.</p> <p>However, the pit-head based option is bereft of transportation costs and hence, may not be a proper baseline alternative to the project activity. Hence, along with the pit-head option, the linkage based option has also been assessed. Further, since the project location is deeply inland, the imported coal option has been neglected.</p> <p>The same justification is provided in the revised PDD.</p>
<b>DOE Assessment #2</b>	<p>All the plausible alternatives have been considered in line with ACM0013 version3 and justified category and type of fuel, Load factor and operational characteristics which delivers similar services, Power plant technologies that have recently been constructed or are under construction, efficiency and technical lifetime. Furthermore, alternatives available not only to the project participant but also available to other stakeholders in the grid boundary.</p> <p>Further the alternative of pit-head plant has also been</p>

Project Baseline (B)	CAR B5
	demonstrated though the same is not applicable for the current project as the land has been allocated by PSEB and there are no coal mines allocated for the power project, however the LUCE for pit-head based plant has also been computed. Thus CAR is closed.
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Project Baseline(B)	CAR B6
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>The identification of the baseline alternative as per Step 1 of the approved methodology should include that the baseline scenario candidates identified <u>may not be available to project participants, but could be available to other stakeholders within the grid boundary</u> (e.g. other companies investing in power capacity expansions).</p> <p>Appropriate correction is sought in this regard.</p>
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Corrections sought have provided in the revised PDD.
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>All possible realistic and credible alternatives are not identified in the revised PDD.</p> <p>The alternative with linkage based and coal imports have not been considered. The justification for not considering and exclusion should be provided</p>
<b>Corrective Action #2</b>	<p>The objective of Section B.4 in the PDD is to identify the source of power generation with the lowest cost involved. Linkage based and imported coal option will always cost more than a pit-head based option because of associated transportation charges.</p> <p>However, the pit-head based option is bereft of transportation costs and hence, may not be a proper baseline alternative to the project activity. Hence, along with the pit-head option, the linkage based option has also been assessed. Further, since the project location is deeply inland, the imported coal option has been neglected.</p> <p>The same justification is provided in the revised PDD.</p>
<b>DOE Assessment #2</b>	All the plausible alternatives have been considered in line with ACM0013 version3 and justified category and type of fuel, Load factor and operational characteristics which delivers similar services, Power plant technologies that have recently been constructed or are under construction, efficiency and technical

Project Baseline(B)	CAR B6
	lifetime. Furthermore, alternatives available not only to the project participant but also available to other stakeholders in the grid boundary. Further the alternative of pit-head plant has also been demonstrated though the same is not applicable for the current project as the land has been allocated by PSEB and there are no coal mines allocated for the power project, however the LUCE for pit-head based plant has also been computed. Thus CAR is closed.
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Project Baseline (B)	CAR B7
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>The identification of baseline scenario is not as per the Step1 of the approved methodology. In establishing the baseline alternative the following points needs to be addressed with appropriate evidences:</p> <ol style="list-style-type: none"> <li>1. The category and type of fuel that would be used in each alternative (considering the requirement of technology)</li> <li>2. Load factor and operational characteristics which delivers similar services(peak vs. base load power)</li> <li>3. Power plant technologies that have recently been constructed or are under construction or are being planned (e.g. documented in official power expansion plan)</li> <li>4. A clear description of each baseline scenario alternative, including information on the technology, such as the efficiency and technical lifetime, shall be provided in the CDM PDD.</li> </ol> <p>Correction is sought for the non compliance of Step 1 of the approved methodology.</p>
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Corrections sought have provided in the revised PDD.
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The baseline establishment is in compliance with step i of methodology. CAR is closed.
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken





Project Baseline (B)	CAR B7
	<input checked="" type="checkbox"/> The project complies with the requirements

Project Baseline (B)	CAR B8
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	PP is requested to justify appropriate explanations and documentation to support the exclusion of the scenarios, if one or more scenarios are excluded from the baseline alternative identification. The reasons shall be provided in the PDD for identification of baseline alternative and subsequent baseline determination.
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Corrections sought have provided in the revised PDD.
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The alternative with linkage based and coal imports have not been considered. The justification for not considering and exclusion should be provided .CAR is open.
<b>Corrective Action #2</b>	<p>The objective of Section B.4 in the PDD is to identify the source of power generation with the lowest cost involved. Linkage based and imported coal option will always cost more than a pit-head based option because of associated transportation charges.</p> <p>However, the pit-head based option is bereft of transportation costs and hence, may not be a proper baseline alternative to the project activity. Hence, along with the pit-head option, the linkage based option has also been assessed. Further, since the project location is deeply inland, the imported coal option has been neglected.</p> <p>The same justification is provided in the revised PDD.</p>
<b>DOE Assessment #2</b>	<p>All the plausible alternatives have been considered in line with ACM0013 version3 and justified category and type of fuel, Load factor and operational characteristics which delivers similar services, Power plant technologies that have recently been constructed or are under construction, efficiency and technical lifetime. Furthermore, alternatives available not only to the project participant but also available to other stakeholders in the grid boundary.</p> <p>Further the alternative of pit-head plant has also been demonstrated though the same is not applicable for the current project as the land has been allocated by PSEB and there are no coal mines allocated for the power project, however the LUCE for pit-head based plant has also been computed. Thus CAR is closed.</p>
<b>Conclusion</b>	<input type="checkbox"/> To be checked during the first periodic verification



Project Baseline (B)	CAR B8
<i>Tick the appropriate checkbox</i>	<input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Project Baseline(B)	CAR B9
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	National policies and circumstances relevant to the demonstration of baseline for the proposed project activity shall be summarized in section B.5 of the PDD (Cp Para 19, General guidance, Ver 12, EB41 and EB 22, Annex 3 also consider Para 27 of EB55 for case by case basis)
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Corrections sought have provided in the revised PDD.
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Though EB55 para 27 gives an option not to considered national and sectoral policies to demonstrate additionality, PP had made appropriate corrections by considering baseline power plant technologies. Hence, CAR is closed.
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Additionality (B)	CAR B10
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Chronology of events does not include the date of the Board meeting in which CDM was considered and date of allotment of the project to the project developer. The chronology does not conclude how the project is in conformity with Annex 22, EB 49.
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	CDM consideration date is presented in the revised PDD. Further, the details of UNFCCC intimation is mentioned therewith.
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of</i>	PDD has been modified and the date of Board meeting in which the CDM was considered is included. Further the serious CDM considerations under the revised PDD has been demonstrated as





Additionality (B)	CAR B10
<i>non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	per the guidelines under EB 49 Annex 22. CAR is closed
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Additionality (B)	CAR B11
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	RoE has been taken at 19.28% for MAT years and 24.24% beyond MAT years and CERC order has been cited as the basis. CERC order does not appear to recommend this rate. Moreover, considering the fact that the project has been awarded to the project developer based on international competitive bid, it is not only inappropriate, but also vitiates the additionality as the difference between the cost of sub-critical and super critical plant is very high. Hence, reckoning RoE is not acceptable
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Corrections sought have provided in the revised PDD.
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	RoE has been removed from the LUCE calculations. CAR is closed
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Additionality (B)	CAR B12
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	PDD states, "Thus, the indicator selected for benchmark analysis is the levelized tariff for power generation". Neither Additionality Tool nor Annex 58, EB 51 seem to recommend this benchmark (P.16).

Additionality (B)	CAR B12
	Moreover, clarify whether the presented analysis in Sec. B.5. is investment comparison analysis or benchmark analysis as per Additionality Tool.
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Additionality has been demonstrated as per the tool in the revised PDD
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>Project IRR has been used to demonstrate additionality which is in conformity with Methodology ACM 0013 and Additionality Tool.</p> <p>However, the computation of benchmark analysis seems to suffer from following inadequacies:</p> <ul style="list-style-type: none"> <li>a) Financial indicator has been calculated assuming a capacity of 1320 MW while the LUCE has been computed based on 1400 MW</li> <li>b) The basis for energy charges is not found in the documents submitted. Moreover, the capacity charges given in the worksheet do not seem to conform to the charges given in PPA/bid document</li> <li>c) Revenue from ash sales has not been taken into account</li> <li>d) The capacity charges considered in IRR worksheet does not seem to exactly conform to the rates given in PPA. This may be checked. Moreover, the basis for energy charges is also not known. Either the GCV has been taken at very low level or the SHR at a higher level</li> </ul>
<b>Corrective Action #2</b>	<ul style="list-style-type: none"> <li>a) Revised financial indicator has been calculated assuming capacity of 1400 MW</li> <li>b) The bid was submitted by PP to PSEB in an excel format. Details of capacity &amp; energy charges as provided in the additionality sheet are correct and the same may be verified with the excel sheet of bid.</li> <li>c) Revenue from ash sales have been included in the revised sheet</li> <li>d) The bid was submitted by PP to PSEB in an excel format. Details of capacity &amp; energy charges as provided in the additionality sheet are correct and the same may be verified with the excel sheet of bid.</li> </ul>
<b>DOE Assessment #2</b>	<ul style="list-style-type: none"> <li>a) Financial indicator has been calculated based on an installed capacity of 1400 MW, same as that LUCE calculation. Further an assessment of the financials have been conducted at 1320 MW to assess the decision making at the time of first bid submission (22<sup>nd</sup> September 2009) which gives a lower IRR than the project activity, thus the financials for 1400 MW have been considered for further analysis as the same is conservative as well as appropriate (being the actual project activity). CAR is</li> </ul>

Additionality (B)	CAR B12
	<p>closed</p> <p>b) Revised worksheet includes tariff calculation and it is in conformity with RfP submitted by the project developer to PSEB and enshrined in the PPA. CAR is closed</p> <p>c) Revenue from ash sales has been reckoned in the computation of IRR and LUCE. CAR is closed</p> <p>d) Capacity charge calculation has been submitted. It is in conformity with RfP submitted by the project developer to PSEB and enshrined in the PPA. CAR is closed</p>
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Additionality (B)	CAR B13
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>Computation of tax on RoE is not only oversimplification, but is also incorrect, not in conformity with IT Act and hence not acceptable.</p>
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>Tax calculation has been performed as per IT Act in the revised sheet</p>
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>Tax has been computed in the IRR calculation, but it has been removed from the LUCE calculation. This does not seem to be appropriate and acceptable. Tax has to be computed as per IT Act (as done in the case of project activity) and then reckoned while computing LUCE.</p> <p>Further in the IRR calculation sheet, MAT has been provided for 12 years (as per the formula used). Clarify the basis for 12 years.</p> <p>CAR is open</p>
<b>Corrective Action #2</b>	<p>Tax has been included in LUCE calculations. Further, MAT calculations have been corrected in the revised work sheet after considering Section 80 IA benefits.</p>
<b>DOE Assessment #2</b>	<p>Tax has been reckoned in LUCE calculation. MAT provision is in conformity with IT Act. CAR is closed</p>
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly



Additionality (B)	CAR B13
	<input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Additionality (B)	CAR B14
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	It is observed that RfP has been cited as reference for some input figures. Since RfP is a document submitted by the project developer, it is mere assumption. Assumptions are not acceptable evidences.
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The Request for Proposal contains certain documents that is made available by PSEB to prospective bidders to aid the latter while bidding for the project. Hence, the values contained therewith are not assumptions by project developer but actual values provided by PSEB for consideration
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>Then the basis should be "document supplied by PSEB" and not RfP. The document supplied by PSEB should be furnished to DOE for validation.</p> <p>In this context, it is observed that CERC tariff guidelines has been cited as the basis for project duration. Clarify whether the project duration in this instant case is decided by CERC tariff guidelines or RFQ/RFP.</p> <p>CAR is open</p>
<b>Corrective Action #2</b>	<p>The GCV has been sourced from the input parameters of the RfP provided by PSEB to all prospective bidders vide communication dated 11/09/2009. Accordingly, the source for the input parameters has been corrected.</p> <p>Further, the project duration is decided by RfQ. It may additionally be noted that CERC tariff guidelines proposes the same duration. However, RfQ has been given as the basis for project life.</p>
<b>DOE Assessment #2</b>	<p>Calorific value data has been sourced from PSEB communication. The email from PSEB has been verified and the value is found to be correct. CAR is closed</p> <p>The basis for operating life of the project has been corrected. CAR is closed</p>
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Additionality (B)	CAR B15		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>The following issues are raised w.r.t project cost;</p> <ul style="list-style-type: none"> <li>• Cost of the project given in the web hosted PDD (Rs.95000 mn.) is different from the cost available in the public domain (Rs.90000 mn.). Reconcile the difference</li> <li>• Based on the sectoral and local expertise of DOE, it is observed that while the project cost of Rs.68 mn./MW assumed for super critical project is high, project cost of Rs. 34 mn./MW considered for sub critical plant (assuming similar capacity as that of project activity) is too low and therefore is not acceptable. Moreover, this order seems to have been passed in 2008 based on the figures pertaining to 2007.</li> <li>• The cost of super-critical plant is twice the cost of sub-critical plant cost. Published literature on the super critical technology does not suggest a large gap. The cost of super critical plant is high and not acceptable. Moreover, the cost as given in the worksheet and PDD are at variance with the cost published in the public domain.</li> </ul>		
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<ul style="list-style-type: none"> <li>• The cost referred in public domain is for 1320 MW for which the bid is placed. The value of Rs. 95000 million is for 1400 MW supercritical project activity</li> <li>• The project cost/MW for supercritical option is based on quotations received by the PP for 1320 MW at the time of bidding. Though the subcritical project cost is based on order passed in 2008 for values pertaining to 2007, the DOE is requested to note that this document provides the latest available project cost for the subcritical option at the time of CDM consideration</li> <li>• The cost referred in public domain is for 1320 MW for which the bid is placed. This value is based on quotations received by the PP at the time of bidding. The same has been made consistent in the revised additionality sheet</li> </ul>		
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<ul style="list-style-type: none"> <li>• The response implies that the relationship between the cost and the capacity is linear, which does not appear to be correct and acceptable in such a large project as this. Moreover, the cost appears to be very high compared to other super critical power projects proposed with a lower SHR as compared to this project. CAR is open</li> <li>• Published literature (as late as 2007) seems to reveal that the difference between base sub-critical and even advanced super critical plants to be more than 8-10%. In the above background the difference of 100% between the project activity and the sub-critical plant seems to have rendered the project artificially</li> </ul>		

Additionality (B)	CAR B15
	<p>additional. CAR is open</p> <ul style="list-style-type: none"> <li>• The cost of (Rs.47331.34 mn. for 1400 MW assumed for sub critical plant) Rs.33.8 mn/MW is reportedly based on Vindhyachal STPS III project. This project commenced operation in Dec. 2006 and Jun.2007 and the decision was taken in Feb. 2003. Even at the time of approval the cost seems to have been Rs.41.25 mn. In the above background, the response is not convincing. CAR is open</li> <li>• Incidentally, it is observed that L&amp;T has communicated the SHR to be 2082 kcal/kWh on 19/09/2009 and the bid was submitted subsequently on 01/10/2009, SHR has been considered at 2228 kcal/kWh. Clarify the reasons for considering SHR higher than what L&amp;T has indicated</li> </ul>
<b>Corrective Action #2</b>	<p>a) We wish to submit that the linear relationship observed by the DOE is incidental. The cost of the project has been computed based on the detailed calculations of various components constituting the project cost. We have already furnished the communication received from PSEB which specifies the amount payable to Government of Punjab. We now enclose the EPC contract which provides the cost of the plant &amp; equipment. The non-EPC cost which form part of the project cost mainly includes the railway siding, redesigning &amp; lining of Rajpura distributary and other miscellaneous costs which are absolutely negligible - all of which are supported by the PSEB letter already furnished to the DOE. We now enclose the note to board dated 15/03/2010 which provides detailed calculations of IDC; margin for working capital can be ascertained from the worksheet already submitted to DOE. Over and above this, we have added, only a contingency of 2% on (EPC+non-EPC) cost, preliminary &amp; pre-operative expenses of less than 2% of the project cost. The total cost therefore works out to INR 95000 million. Financial institutions who have sanctioned loans for the project have estimated the cost at INR 96000 million. We also enclose a copy of the letter received from Axis Bank as evidence. We further enclose a certificate from a chartered accountant evidencing the contract already entered into, investment made till March 31, 2011 and the contingent liability. These documents prove that the cost of the project is INR 96000 million which is more than the cost given in the webhosted PDD. We therefore submit that the project cost assumed is real and is supported by evidence.</p> <p>b) We submit that the average difference between subcritical &amp; supercritical projects webhosted till.7th April 2011, was 51%. In the case of two projects, the difference has been more than 100% and in the case of another 7 projects, it has been more than 75%. Therefore, the difference of 69% observed in the case of candidate project is within the range. The cost of the supercritical project, as mentioned above, is the actual cost</p>





Additionality (B)	CAR B15
	<p>supported by documentary evidence. In the case of subcritical project, we have considered 3 projects for which the orders have been released in 2008.</p> <p>c) Apropos to the observation made by the DOE, we have considered the average of the cost of 3 subcritical projects, of similar capacity, for which orders have been placed in 2008. We enclose the CEA Report, for July 2009, from which the data has been sourced, as evidence, The average cost works out to INR 40.2 million/MW as against INR 33.8 million.MW considered earlier.</p> <p>d) We wish to submit that the EPC contractor has communicated a Gross SHR of 2082 kcal/kWh. As per CERC Tariff Regulation 2009, auxiliary consumption is 6% which implies a net SHR of 2215 kcal/kWh. However, as per the bid guidelines, a single heat rate value was to be quoted for a continuous period of 25 years of plant operation. Since in the later years of plant operation, the operating efficiency may not meet the initial design values, a further uncertainty margin of 2.4% was chosen and a net value of 2268 kcal/kWh was quoted in the bid.</p>
<b>DOE Assessment #2</b>	<p>a) The documents provided by the project developer reveal that the institutions have estimated the project cost at Rs.96 bn. The CA certificate furnished reveals that the total contracts entered into (including the payment already released thereon) is of the order of Rs.79 bn. Considering the fact that the project's COD is January 2014 – with 3 more years to go – the cost appears to be realistic. Hence, the cost is accepted. CAR is closed.</p> <p>b) The average difference between sub critical and super critical projects already web hosted seems to support the contention of the project developer. The documentary evidence submitted reveal that the sub critical project cost is about Rs.40 mn. /MW only. Hence, the arguments are accepted. CAR is closed.</p> <p>c) Sub critical project cost has been revised to Rs.40.2 mn./MW, which appears to be realistic. Validation team has checked the publications and other projects and find the value to be appropriate. Hence, the sub critical project cost of Rs.40.2 mn. is accepted. CAR is closed</p> <p>d) SHR submitted to the PSEB is stated to include auxiliary consumption and other losses estimated by the project developer. Since the heat rate is supported by the EPC contract (although entered into subsequently) and the heat rate considered in financial indicator calculation is conservative (from additionality demonstration point of view), the explanation is accepted. CAR is closed</p>
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken



Additionality (B)	CAR B15
	<input type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Additionality (B)	CAR B15 A
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address tcontext (e.g. section)</i>	<p>a) PDD cites quotation as the basis for SHR. The letter cannot be considered as quotation.</p> <p>b) Documentary evidence for the GCV of coal has not been submitted and the Nabha Power letter dated 08/09/2009 submitted does not contain information pertaining to GCV of coal.</p> <p>c) Price of coal has been taken at Rs.520/MT. This price seems to pertain to the year 2004 (15/6/2004) as per the document submitted. Clarify how does this cost conform to guidance 6, Annex 58, EB 51</p> <p>d) The newspaper article cited as basis for the price of secondary does not seem to support this price. That apart it pertains to 2007 and not 2009. Clarify how this conforms to Annex 58, EB 51. Moreover, citing newspaper article as the basis for the cost does not seem appropriate.</p> <p>e) Newspaper article has been given as the basis for the escalation in the secondary fuel price. The articles states 5-10% rise in the last one month. Clarify how can it be considered as a rise per annum on a long term basis.</p>
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>a) Required changes have been made in the revised PDD</p> <p>b) The GCV had been provided by PSEB to all prospective bidders as a part of the RfP vide communication dated 11/09/2009. A copy of the mail and its enclosures is attached</p> <p>c) The coal price had been provided by PSEB to all prospective bidders as a part of the RfP vide communication dated 11/09/2009. A copy of the mail and its enclosures is attached.</p> <p>d) Secondary fuel cost as listed on NCDEX on 18/09/2009 has been used in the revised submission. Screenshot of the same is attached</p> <p>e) Secondary fuel cost escalation as listed on the website of the Office of Economic Advisor of India (<a href="http://www.eaindustry.nic.in">www.eaindustry.nic.in</a>)</p>





Additionality (B)	CAR B15 A
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>has been used in the revised submission. Screenshot of the same is attached</p> <p>a) PDD has been modified and L&amp;T letter is stated as the basis for SHR. CAR is closed</p> <p>b) PP has submitted a copy of the email communication dt. 11/09/2009 issued by PSEB which provides the GCV of coal. CAR is closed</p> <p>c) Coal cost is based on PSEB email communication dt. 11/09/2009. PP has submitted a copy of the email communication. Since the email is dated prior to the decision making date, it conforms to guidance 6 of Annex 58, EB 51. CAR is closed</p> <p>d) Secondary fuel cost is evidenced by NCDEX price dated 18/09/2009, which is prior to the decision making date. CAR is closed</p> <p>e) Secondary fuel cost escalation is based on Wholesale Price Index published by the office of the Economic Advisor to Government of India. This is an acceptable source. CAR is closed</p>
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<p><input type="checkbox"/> To be checked during the first periodic verification</p> <p><input type="checkbox"/> Appropriate action was taken</p> <p><input checked="" type="checkbox"/> Project documentation was corrected correspondingly</p> <p><input type="checkbox"/> Additional action should be taken</p> <p><input checked="" type="checkbox"/> The project complies with the requirements</p>

Additionality (B)	CAR B16
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>Gas cost escalation has been assumed at 1.31%, gas transportation cost escalation has been assumed at 3.13%, and CERC notification of 30/9/2009 has been cited as reference. These escalations do not seem to be in conformity with CERC notification.</p>
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>The escalation rates have been referred from CERC notification dated 03/07/2009. The correct references have been provided in the revised PDD.</p>
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>The mistake in the escalation has been corrected and escalation as per CERC notification dated 03/07/2009 has been adopted for NG cost. CAR is closed</p>

Additionality (B)	CAR B16
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Additionality (B)	CAR B17
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Working capital computation in 2013-14 is arithmetically incorrect. The first year operation being for 3 months, the divisor for working capital calculation shall be in accordance to the expected operation.
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Corrections sought have been made in the revised sheet.
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The principle error in the computation of working capital has been corrected. However, it is observed that in the LUCE calculation as well as IRR calculation, interest on working capital seems to have been provided for full year, which does not seem to conform to accepted accounting principle. CAR is open
<b>Corrective Action #2</b>	The interest calculation on W/C has been corrected in the revised sheet.
<b>DOE Assessment #2</b>	Working capital interest calculation has been corrected. Interest is provided for the appropriate duration in the first year. CAR is closed
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Additionality (B)	CAR B18
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	As per PPA, PSEB is required to provide in respect of its monthly bills a monthly, unconditional revolving and irrevocable letter of credit, assuming 2 months receivable does not appear to be appropriate and hence, it is not acceptable.
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The corrections sought have been made in the revised PDD

Additionality (B)	CAR B18
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>Receivables have been reduced to 1 month, which appears appropriate. CAR is closed</p>
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<p> <input type="checkbox"/> To be checked during the first periodic verification  <input type="checkbox"/> Appropriate action was taken  <input checked="" type="checkbox"/> Project documentation was corrected correspondingly  <input type="checkbox"/> Additional action should be taken  <input checked="" type="checkbox"/> The project complies with the requirements         </p>

Additionality (B)	CAR B19
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>Coal consumption given in the worksheet differs from the coal consumption given in PDD (P.26). Appropriate justification and corrections are sought.</p>
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>The corrections sought have been made in the revised PDD</p>
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>Coal consumption has been corrected in the PDD. CAR is closed</p>
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<p> <input type="checkbox"/> To be checked during the first periodic verification  <input type="checkbox"/> Appropriate action was taken  <input checked="" type="checkbox"/> Project documentation was corrected correspondingly  <input type="checkbox"/> Additional action should be taken  <input checked="" type="checkbox"/> The project complies with the requirements         </p>

Additionality (B)	CAR B20
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>It is observed that interest has not been provided for 2013-14. This does not appear to be correct.</p>
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>The corrections sought have been made in the revised PDD</p>
<b>DOE Assessment #1</b>	<p>Interest has been provided in 2013-14 in the revised worksheet.</p>

Additionality (B)	CAR B20
<i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	CAR is closed
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Additionality (B)	CAR B21		
<b>Classification</b>	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Common practice analysis is very sketchy and is not in conformity to Step 4 of Additionality Tool.		
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The corrections sought have been made in the revised PDD		
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The response is misleading. Except the addition of one sentence, that too, from the methodology, no modifications has been made. Though the argument that there are no operating super critical plants in India could be correct, the section does not explain on what basis the conclusion has been arrived at. It is a mere statement by PP, not backed by any reliable and verifiable statistics or evidence. This section does not seem to conform to step 4 of Additionality Tool. Moreover, the statement that there are no operating super critical plants does not appear to be correct as at present. The section requires revision. CAR is open		
<b>Corrective Action #2</b>	Common practice analysis has been further detailed in the revised PDD.		
<b>DOE Assessment #2</b>	Common practice analysis section has been revised and it now conforms to step 4 of Additionality Tool. Supporting evidence has been provided. CAR is closed		
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements		

Additionality (B)	CAR B21A
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Additionality (B)		CAR B21A		
Classification		<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>a) Sub-step 2a does not explain on what basis benchmark analysis has been adopted and how it conforms to Methodology and Annex 58, EB 51</p> <p>b) It does not explain how the project IRR is considered appropriate financial indicator for the project type and decision making context</p> <p>Narration given under sub-step 2c has been wrongly quoted in place for sub-step 2b while the discussion on Benchmark analysis is missing.</p>			
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>a) Choice of benchmark analysis has been justified in revised PDD</p> <p>b) Choice of IRR as financial indicator has been justified in revised PDD</p> <p>c) Corrections have been made in the revise PDD</p>			
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>a) PDD has been revised and provides explanation as to how the benchmark analysis conforms to guidance 16 of Annex 58, EB 51. CAR is closed</p> <p>b) The appropriateness of project IRR for the project type and decision making context has been explained in the revised PDD. CAR is closed</p> <p>c) Narration on selection of benchmark and its conformity to guidance 12 and 13 of Annex 58, EB 51 has been rearranged in the revised PDD. CAR is closed</p>			
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<p><input type="checkbox"/> To be checked during the first periodic verification</p> <p><input type="checkbox"/> Appropriate action was taken</p> <p><input checked="" type="checkbox"/> Project documentation was corrected correspondingly</p> <p><input type="checkbox"/> Additional action should be taken</p> <p><input checked="" type="checkbox"/> The project complies with the requirements</p>			

Calculation of GHG emission reduction (B) (B)		CAR B22		
Classification		<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>The selection of similar plants to the project activity under Step1 of Option 2 is not addressed as per the stipulated methodology.</p> <p>Moreover, SIPAT STPS 2 is commissioned on 27th December 2008 and the data published considering the period April 2009-March 2009. In this regard, the operating hours for the plant is less than 3000 hours. The net electricity exported to the grid is also</p>			

Calculation of GHG emission reduction (B) (B)	CAR B22
	questionable and does not seem to correct. PP is requested to justify the compliance with Step1 of the stipulated methodology (i.e. compliance of the project plant with peak and base load plant selection in the baseline).
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>Sipat STPS is intended to run as a base load plant. The monthly generation report by CEA (available at <a href="http://www.cea.nic.in/god/opm/Monthly_Generation_Report/18col_A_09_10/opm_05.pdf">http://www.cea.nic.in/god/opm/Monthly_Generation_Report/18col_A_09_10/opm_05.pdf</a>) for the month of October 2009 and the period April - October 2009 confirms this.</p> <p>Generation data has now been sourced from power sector reports published by CEA. Relevant web links have been provided in the revised PDD</p>
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>Justification could not be traced on what basis it is in compliance to the CAR.</p> <p>Further, electricity generation for all the units are derived which is not clear the basis for the same.</p> <p>Moreover, justify the reason for not considering the electricity generation values as it is from CEA. CAR is open</p>
<b>Corrective Action #2</b>	<p>Referring to "Description of finding" of CAR B22, the DOE had requested a corrective action on the generation values that had been sourced from CEA version 5. As a response, the PP has now sourced the generation values from CEA version 6 that provides generation value for Year 2009-10 which is required as per the following clause of the methodology:</p> <p>„That have operated (supplied electricity to the grid) in the year prior to the start of the project activity.“</p>
<b>DOE Assessment #2</b>	The generation values available from the latest version 6 are available and the same is used. CAR is closed.
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Calculation of GHG emission reduction (B)	CAR B23
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Calculation of GHG emission reduction (B)	CAR B23		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>The adopted specific fuel consumption is arrived from tariff orders of respective power plant which considered 2450 kcal/kWh of heat rate for all. However, DOE's sectoral expertise and background investigation reveals the design and actual station heat rates are much less than the 2450 kcal/kg. In this regard, how the fuel consumption computation is in compliance with ACM0013. Furthermore, conservativeness is questionable.</p> <p>Moreover, PP is requested to consider the AM_CLA_188 for consideration of base line data.</p>		
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>Taking Rihand-3 as an example, the reported GCV is 3562.33 kcal/kg while the reported specific fuel consumption (SFC) is 0.68 kg/kWh. Based on these values, the station heat rate may be calculated as follows:</p> <p>Station Heat Rate = <math>0.68 \times 3562.33 = 2422</math> kcal/kWh. This proves that the values of the tariff orders are not based on station heat rate value of 2450 kcal/kWh.</p> <p>Justification for compliance with AM_CLA_188 is provided as follows:</p> <p><b>1. The Meth Panel clarifies that the referential point in time for historical data, required for the baseline emissions calculation, is the date of submission of the PDD for validation of the project activity, for which the required data from the power plants to be included in the sample group is available. In any case, this date cannot be before than 2 years prior to the date of submission of the PDD for validation of the project activity.</b></p> <p><b>Response:</b> The baseline emission calculations are based on CEA Monthly Generation sheet for March 2010 and CEA database publication v5.0 dated November 2009. The date of submission of PDD for validation is September 2010. Hence, this requirement is met.</p> <p><b>2. The Meth Panel clarifies that the benchmark emission factor shall be determined based on the performance of the top 15% power plants, which use the same fuel category as the project plant and any technology available in the geographical area. In the case of cogeneration plants, two different types of services are provided to end-users, i.e.: (i) electrical energy and (ii) another form of useful energy (such as heat or steam) not used for electricity generation, through the conversion of a common energy source.<sup>1</sup> In the case of a combined cycle power plant, only one type of service is provided, i.e. electrical energy, with a higher performance efficiency due to the recovery of heat. The information above allows to infer that, a</b></p>		

Calculation of GHG emission reduction (B)	CAR B23
	<p><i>combined cycle power plant provides the same type of service as the project activity (i.e. electricity only) and, furthermore, the combined cycle type of technology is available to the project proponents. Hence, the combined cycle power plants connected to the grid, in the geographical area, are to be included in the calculation of the baseline emissions benchmark.</i></p> <p><b>Response:</b> The benchmark emission factor in the latest PDD is based on the top 15% power plants. The project activity does not involve cogeneration and is not a combined cycle power plant. Hence, this requirement is met.</p> <p><b>3. The Meth Panel clarifies that the levelized cost of electricity production is to be used as the financial indicator as per the methodology</b></p> <p><b>Response:</b> LUCE has been used for baseline determination in revised PDD. Hence, this requirement is met.</p> <p><b>4. The Meth Panel clarifies that the methodology does not provide any indication or provision concerning auxiliary or start-up fuel. Therefore, the panel agreed to recommend to the Board a revision of the methodology in order to include this provision in line with the approved methodology AM0087</b></p> <p><b>Response:</b> The approved revised methodology (ACM0013 v4.0) is available since 17/09/2010. However, requests for registration may be submitted with the previous version until 17/05/2011. Thus, the previous version is still valid for the purposes of CDM validation and registration. Hence, this requirement is met.</p> <p><b>5.1. The Meth Panel clarifies that the sampling group shall consist of power plants that use the same fuel category (i.e. LIQUID fuels -Crude oil and petroleum products-; SOLID fuels -Coal and coal products-; GASEOUS fuels -Natural Gas-) as the project power plant.</b></p> <p><i>The panel also agreed to recommend to the Board a revision of the methodology in order to clarify that the methodology ACM0013 is neither applicable to multi-fuel nor co-firing power plants. Hence, a natural gas power plant cannot be compared against multi-fuel power plants that during their operation use two or more categories of fuel, e.g. natural gas (gaseous) and diesel (liquid), except when the other fuel categories are only used for start-up or auxiliary purposes and less than 3% of the total annual fuel consumption on energy basis</i></p> <p><b>Response:</b> Sample group in the revised PDD contains power plants that use the same fuel category. The approved revised methodology (ACM0013 v4.0) is available since 17/09/2010. However, requests for registration may be submitted with the previous version until 17/05/2011. Thus, the previous version is still valid for the purposes of CDM validation and registration. Hence,</p>



Calculation of GHG emission reduction (B)	CAR B23
	<p>this requirement is met.</p> <p><b>5.2.</b> <i>The Meth Panel clarifies that the methodology is applicable to new fossil fuel fired electricity generation plants connected to the grid. Therefore, biomass fired power plants or coal/biomass co-fired power plants are not applicable to the methodology.</i>  <b>Response:</b> The project activity does not involve biomass firing and is a greenfield activity. Hence, this requirement is met.</p> <p><b>6.</b> <i>The Meth Panel clarifies that the emissions benchmark is to be calculated from the top 15% best performing power plants in their category, as it is clearly requested in the methodology</i>  <b>Response:</b> The benchmark emission factor in the latest PDD is based on the top 15% power plants. Hence, this requirement is met.</p>
<p><b>DOE Assessment #1</b>  <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i></p>	<p>The computation of Specific coal consumption from tariff orders are as follows:  Gross station heat rate: 2450 Kcal/jg  Specific oil consumption : 2 MI/kWh  GCV of oil : 9650 kcal/MI  Heat rate due to oil : <math>(9650 / 1000) \times 2 = 19.30</math> kcal/kWh  Heat rate due to coal : <math>2450 - 19.30 = 2430.70</math> kcal/kWh  Coal calorific value : 3562.33 kcal/kg  Specific coal consumption = <math>2430.70 / 3562.33 = 0.68</math> kg/kwh</p> <p>The following two assumptions which are common for all the baseline plants and the computation of Specific coal consumption has been carried out in tariff order majorly based on the following only:</p> <ol style="list-style-type: none"> <li>1. The Gross station heat rate is 2450 kcal/kWh</li> <li>2. Specific oil consumption is 2 MI/kWh</li> </ol> <p>It is evident from all the tariff orders that Specific coal consumption has been arrived based the above assumptions only. However, the operational station heat rates and actual specific oil and coal consumptions differs considerably.</p> <p>Justification for compliance with AM_CLA_188 is provided as follows:</p> <ol style="list-style-type: none"> <li>1. PP is requested to demonstrate the point no 1 w.r.t. fuel consumption.</li> <li>2. Remaining issues are in compliance with the outcome of AM_CLA_188</li> </ol>
<p><b>Corrective Action #2</b></p>	<p>In the revised PDD, unit-level operating specific emission and net generation data published by CEA has been used for estimation unit-level fuel consumption.</p>



Calculation of GHG emission reduction (B)	CAR B23
<b>DOE Assessment #2</b>	<p>The fuel consumption values have been arrived based on the publicly available sources of net generation, auxiliary consumption and specific emissions at unit level for the year 2009-2010 which is published in CEA version 6. However for 500 MW units the specific emission values are based on the station level and not unit level as the this is a standard practice at NTPC plants in the host country. However the plant with the highest efficiency selected i.e. Bellary TPS has only 1 unit thus for this specific case the unit level and station level data is the same. As per option 2 the efficiency of the best plant is considerably higher (36.04%) than the remaining plants. Thus the fuel consumption of the best plant is available at unit level and is in accordance with the methodology.</p> <p>CAR is closed.</p>
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Calculation of GHG emission reduction (B)	CAR B24
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>The methodology under option1 stipulates "energy efficiency of the power generation technology that has been identified as the most likely baseline scenario". In this regard PP needs to justify why the value of Gross Station Heat Rate has been considered as 2425 kcal/kWh and the auxiliary consumption as 6%.</p>
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>The most likely baseline scenario for the project activity is setting up of a coal-fired subcritical thermal power plant. As per CERC Tariff Regulation dated 19/01/2009, the typical heat rate and auxiliary consumption for such plants is 2425 kcal/kWh and 6% respectively. Hence, the same has been considered in Option 1 of calculation of baseline emission factor.</p>
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>PDD and ER sheet are contradicting. Further approach is not conservative. CAR is open.</p>
<b>Corrective Action #2</b>	<p>The revised PDD &amp; ER sheet now contain the correct net efficiency values of the best operating sub-critical plant in India for the year</p>

Calculation of GHG emission reduction (B)	CAR B24
	2009-10
<b>DOE Assessment #2</b>	The efficiency values in the revised PDD are consistent with proper references. Further the baseline sub-critical efficiency is selected as the best operating plant in the country as per the published data for year 2009-10 by CEA. The plant selected is TORANGALLU EXT-1 for which the efficiency is calculated as 36.63%. Thus the efficiency selected is much better than the efficiency as per option 2. The approach is assessed to be appropriate and conservative. CAR is closed.
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Calculation of GHG emission reduction (B) (B)	CAR B25
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The adopted Gross station heat rate for the project and baseline are based on the GCV value of the coal. The net efficiency calculation should not only be based on net of auxiliary consumption but also based on net calorific value. Appropriate correction is sought in this regard.
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Heat rate is a parameter for expressing efficiency of a unit and equipment design is based at a particular design CV. Expressing this CV as GCV or NCV does in no way affect the efficiency and hence, the coal consumption.
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Justification w.r.t. CV is not appropriate. PP is requested to confirm that the basis of SHR i.e. whether on NCV basis or GCV basis as differs substantially. Traditionally, in India all the 500 MW NTPC plants are designed by GCV basis. As per the methodological requirement, everything should be on net basis. CAR is open
<b>Corrective Action #2</b>	Net efficiency values (net of heat rate as well as CV) has been provided in the revised submission.
<b>DOE Assessment #2</b>	The efficiency values in the revised PDD are consistent with proper references and based on net of heat rate as well as calorific value. CAR is closed.
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken

Calculation of GHG emission reduction (B) (B)	CAR B25
	<input checked="" type="checkbox"/> The project complies with the requirements

Additionality (B)	CL B1
<b>Classification</b>	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	LUCE is used as the financial indicator to demonstrate additionality. Clarify how LUCE is considered an appropriate financial indicator for demonstrating the additionality for the project type and decision making context considering the fact that the project is in private sector and financed by a debt equity mix.
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The appropriate financial indicator has been used for additionality demonstration in the revised PDD
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Project IRR has been used to demonstrate additionality, which seems appropriate. CL is closed
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Additionality (B)	CLB2
<b>Classification</b>	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Power generation using sub critical technology with coal as fuel and power generation with natural gas as fuel are the only two alternatives that have been considered. Clarify the reasons for not considering other alternatives
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Justification for elimination of other baseline alternatives have been further described in the revised PDD
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and</i>	Revised PDD explains the reasons for the elimination of alternatives.  However, though it is in conformity with the methodology to choose

Additionality (B)	CLB2
<i>DOE assessments (#2, #3, etc.) shall be added.</i>	sub-critical pit head based power plant as alternative, it does not appear to be realistic in as much as the project location is pre-determined by the RFQ/RFP. Hence, pit head based sub-critical power plant does not seem to be the appropriate alternative. Moreover, the consideration of sub-critical pit head based power plant seems to have rendered the project artificially additional as the fuel cost considered for alternative is only 30% of the project activity. Consequently, the difference between the LUCE of the project activity and the alternative is as high as Rs.1.20/kWh which does not seem to be the case in any other project. Having regard to the above, sub-critical pit head plant does not appear to be appropriate alternative for baseline determination. CL is open
<b>Corrective Action #2</b>	The LUCE for pit-head subcritical option has been estimated in the revised submission but has not been further considered as a probable baseline alternative due to its inherent lack of transportation charges.
<b>DOE Assessment #2</b>	Revised PDD considers LUCE of sub critical technology - Pit head based coal plant and sub critical technology – linkage based coal plant as alternatives. Sub-critical technology – linkage based coal plant has been taken as baseline, which appears appropriate as the project's location is pre determined. CL is closed
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Additionality (B)	CL B3
<b>Classification</b>	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The opening sentence of Global invitation for RFQ states, "Punjab State Electricity Board (PSEB) has launched an initiative for development of coal based environment friendly Power Project, with a contracted capacity of 1200 MW $\pm$ 10% (1080 – 1320 MW) at Village Nalash near Rajpura, District Patiala, Punjab, India". In the light of the above, clarify whether sub-critical technology alternative is available to the project developer.
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The RfQ does not mention that the project has to be based on a specific technology.
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	It is suggested that the PP read the CL carefully before responding. CL does not state anywhere that RFQ mentions that the project has to be based on a specific technology. Clarify whether there are any other coal based power project technology presently available for exploitation, which is classified as environment friendly. CL is open

Additionality (B)	CL B3
<b>Corrective Action #2</b>	The subcritical alternative was not available to the project proponent at the time of bidding
<b>DOE Assessment #2</b>	It is therefore clear that the sub-critical alternative was not available to the project developer. Hence, the additionality should be demonstrated with benchmark analysis as per the methodology. Since this has been done, CL is closed
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Additionality (B)	CL B4
<b>Classification</b>	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Clarify how the LUCE of sub critical plant represents the acceptable cost, above which the investment would not have been made by the project developer
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The appropriate financial indicator has been used for additionality demonstration in the revised PDD
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>It is suggested that PP read the CL before responding. The response does not answer the CL. In the light of the addition of project IRR as financial indicator, the CL gets modified / enlarged as follows:</p> <p>"Clarify how the LUCE of sub critical plant represents the acceptable cost, above which it is reasonable to conclude that the investment would not have been made by the project developer. Also clarify how the benchmark represents a return below which it is reasonable to conclude that the investment would not have taken place"</p> <p>CL is open</p>
<b>Corrective Action #2</b>	The additionality of the project is now demonstrated using project IRR as the financial indicator and LUCE is used only for identification of the baseline. The average of the Prime Lending Rate of RBI prevailing at the time of decision making, namely 11.50%, has been chosen as the benchmark. The project IRR with CDM benefits works out to 11.07%. If the likely increase in the CER price and the variation of INR/Euro exchange rate are considered, the IRR with CDM would cross the benchmark. Hence, we submit that it is reasonable to conclude that the investment would not have been made by the project developer at a return lower than the benchmark.



Additionality (B)	CL B4
<b>DOE Assessment #2</b>	The financial indicator used for demonstrating additionality has been changed to Project IRR. Project IRR works out to 11.07% with CDM as against the benchmark of 11.50%. Since the difference is quite small and the argument advanced by the PP seems to be logical, it appears reasonable to conclude that investment would not have taken place at return lower than the benchmark. CL is closed
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Additionality (B)	CLB5
<b>Classification</b>	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Clarify the basis for restricting the depreciable value of the asset to 95%. Also, clarify whether the depreciation should be provided <i>upto</i> 95% of the value of the assets or <i>on</i> 95% of the value of the assets. Furnish supporting evidence for the assumption
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Non-depreciable items, mainly land cost, have been considered as 5% of total project cost. It may please be noted here that land cost itself is almost INR 4500 million (approx) of the total project cost (5%).
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Explanation is accepted. CL is closed
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Additionality (B)	CLB6
<b>Classification</b>	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	CV of NG has been taken at 8800 kcal/SCM and CEA V5 has been cited as reference. Clarify what does this mean and where from the input parameter has been sourced.



Additionality (B)	CLB6
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The CV of NG has been considered as 8800 kcal/scm based on the default values provided in one of the CEA v5 publication's spreadsheet titled "Assumption". The spreadsheet is available at <a href="http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm">http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm</a>
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The report cited as basis for the CV, pertains to November 2009, while the decision is reported to have been taken on 22/9/2009. Clarify whether this information been available at the time of decision making and how does the consideration of this information conform to guidance 6 of Annex 58, EB 51. CL is open
<b>Corrective Action #2</b>	The correct source available at time of decision making has been presented in the revised PDD.
<b>DOE Assessment #2</b>	The source of NCV for gas has been changed to GAIL web site. The NCV of gas assumed appears reasonable. CL is closed
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Additionality (B)	CLB7
<b>Classification</b>	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	PDD states, " Additionally, for all power generation projects in India, which are evaluated by Ministry of Power, levelized cost of generation is the evaluation criteria" and Ministry of Power is quoted as reference. Clarify whether the said circular deals with tariff or cost of generation.
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The appropriate financial indicator has been used for additionality demonstration in the revised PDD
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Response does not answer the CL. Anyhow, since the sentence itself has been removed; CL is closed
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements



Additionality (B)		CLB8	
<b>Classification</b>	<input type="checkbox"/> CAR	<input checked="" type="checkbox"/> CL	<input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Unit size has been taken at 700 MW for subcritical plant and NG plant also. Clarify whether sub critical and NG plants are available at 700 MW size and if so whether any project has been set up with this unit size.		
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	All of the alternatives have been compared at 1400 MW regardless of availability of a standard unit size of 700 MW. It may, however, be noted that the LUCE value is independent of project capacity as long as the project cost/MW ratio is maintained		
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Response is not convincing. Methodology does not seem to require such comparison either. The issue also seems to have been raised by GS. CL is open		
<b>Corrective Action #2</b>	For the subcritical option, a 2x600 MW configuration while for the NG option, a 6X 250 MW i.e 2 blocks of 750 MW cluster configuration has been used for computation of LUCE. The sizes are extracted from CEA publication of July 2009 regarding the status of under-construction thermal power plants.		
<b>DOE Assessment #2</b>	PP has considered a cluster of 6 gas turbines of 250 MW each based on the installed capacity of Pragati Power – a project which placed the order for main plant and equipment in 2008. This appears reasonable. CL is closed		
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements		

Additionality (B)		CL B9	
<b>Classification</b>	<input type="checkbox"/> CAR	<input checked="" type="checkbox"/> CL	<input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Clarify the basis for assuming a debt equity ratio of 75:25, repayment holiday and repayment tenure assumed in the calculations.		
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>CERC Tariff notification dated 19/01/2009 allows a debt/equity ratio of 70:30. However, for the present project activity, a debt/equity ratio of 75:25 had been considered. The DOE may please note that this is a more conservative approach than existing norms.</p> <p>The loan repayment &amp; moratorium period are general consideration based on standard industry practice in the power sector. The justification of its wide acceptance may be evaluated by relevant</p>		



Additionality (B)	CL B9
	information provided in the January 2009 newsletter of ICRA ( <a href="http://www.icra.in/Files/Articles/2009-January-Power%20Sector.pdf">http://www.icra.in/Files/Articles/2009-January-Power%20Sector.pdf</a> ) which provides an insight on the CERC Tariff Notification 2009
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	PP is advised to read the CL before answering. CL does not question about the conservativeness at all. It only seeks the basis for such assumption. DOE cannot accept <i>standard industry practice</i> as the basis. It is not in conformity with guidance 11 of Annex 58, EB 51. PP may submit terms of loan document in respect of loans availed up to 3 years before decision making date in support of this assumption. CL is open
<b>Corrective Action #2</b>	Actual loan interest as evidenced by the loan contracted is now considered in interest calculations. This is in conformity with guidance 11 of Annex 58, EB 51.
<b>DOE Assessment #2</b>	In the revised worksheet, actual interest rate as evidenced by the term loan sanctioned to the project has been considered which is in conformity with guidance 11 of Annex 58, EB 51. CL is closed
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Additionality (B)	CL B10		
<b>Classification</b>	<input type="checkbox"/> CAR	<input checked="" type="checkbox"/> CL	<input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The project cost for sub critical technology and NG based power plant given in PDD do not contain the capacity of the plant.		
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Corrections sought have been made in the revised PDD		
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Capacity for the alternatives to the project have been incorporated in the revised PDD. CL is closed		
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements		

Additionality (B)		CL B11		
<b>Classification</b>		<input type="checkbox"/> CAR	<input checked="" type="checkbox"/> CL	<input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Auxiliary consumption has been assumed at the same level for both sub critical and super critical technologies. Further clarification is required.			
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	When comparing different baseline scenarios, the auxiliary has been kept at same level for the sake of comparison. Further, CERC Tariff Notification does not provide different auxiliary consumption values of upcoming subcritical or supercritical power plants.			
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Though the response is incorrect, since most of the super critical plants have assumed same auxiliary consumption for both the project activity and sub-critical alternative, same level of auxiliary consumption is accepted. Further the auxiliary consumption in the web hosted PDD was 6% however during the validation it was observed that the actual EPC contract has been signed and EPC Contractor provides a guarantee for 5.5% for auxiliary has been provided by the EPC contractor. Thus the value for auxiliary consumption has been considered as 5.5% as the same is appropriate as well as conservative. CL is closed			
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements			

Additionality (B)		CL B12		
<b>Classification</b>		<input type="checkbox"/> CAR	<input checked="" type="checkbox"/> CL	<input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Heat rate for NG based alternative is taken at 2000 kcal/kWh. In the assumptions supporting NG alternative, it is stated "Most conservative amongst values provided in CERC Tariff Guidelines dated 19 <sup>th</sup> January, 2009". NG based power plant is alternative and hence considering the lowest heat rate cannot be considered conservative.			
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	While determining the baseline for the project activity, the lowest cost of power generation needs to be calculated for the alternatives. Hence, 2000 kcal/kWh has been deemed most conservative as it represents the most efficient NG fired power plant and thus, provides the lowest cost of power generation by NG			
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The argument is accepted. However, in this context, it is observed that a) the cost of the NG based power project does not seem to conform to the source cited. The source seems to reveal a cost of Rs.71220 mn. for a capacity of 2007.08 MW b) O&M cost has been subjected to an escalation of 5.72% while in the case of project activity and sub-critical plant, it has been			

Additionality (B)	CL B12
	<p>subjected to 5% escalation</p> <p>c) NG price seems to pertain to September 2007, while the investment decision is taken in September 2009, two years after. This source and hence the data does not seem to satisfy Annex 58, EB 51</p> <p>CL is open</p>
<b>Corrective Action #2</b>	<p>a) The project cost for Pragati Power-III has been used to identify the NG-based power project cost. Further, the order for the same had been placed on May 2008 which in conformity with guidance 6 of Annex 58, EB 51.</p> <p>b) O&amp;M cost estimate for coal based project had been provided by O&amp;M solutions to the PP. Since the O&amp;M cost estimate for NG Power Plant was not available, the CERC Tariff Notification, January 2009, has been used.</p> <p>c) Latest available prices of Gas cost (sourced from Oil &amp; Gas Sector Report, 2009) &amp; NG transportation cost (sourced from GAIL website) has been used.</p>
<b>DOE Assessment #2</b>	<p>a) In the revised PDD and worksheet, cost of Pragati Power has been considered as the basis for project cost. As the order for main plant and machinery was placed in May 2008 by this project, the proxy appears reasonable. CL is closed</p> <p>b) O&amp;M cost escalation for NG plant is based on CERC notification, which appears appropriate. CL is closed</p> <p>c) Gas cost has been sourced from Oil &amp; Sector Report 2009 and the transportation cost from GAIL website, which appear to be appropriate. CL is closed</p>
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<p><input type="checkbox"/> To be checked during the first periodic verification</p> <p><input type="checkbox"/> Appropriate action was taken</p> <p><input checked="" type="checkbox"/> Project documentation was corrected correspondingly</p> <p><input type="checkbox"/> Additional action should be taken</p> <p><input checked="" type="checkbox"/> The project complies with the requirements</p>

Additionality (B)	CL B13
<b>Classification</b>	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>Natural gas cost and transportation cost is reported to have been sourced from CRISIL Research and the reference given is 'CRISIL Research'. Either the web link given is not correct or the correct website address has not been given. Further clarification is required.</p>



Additionality (B)	CL B13
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Alternate reference has been provided in revised PDD
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	NG price seems to pertain to September 2007, while the investment decision is taken in September 2009, two years after. This source and hence the data does not seem to satisfy Annex 58, EB 51. CL is open
<b>Corrective Action #2</b>	Latest available prices of Gas cost (sourced from Oil & Gas Sector Report, 2009) & NG transportation cost (sourced from GAIL website) has been used.
<b>DOE Assessment #2</b>	NG price and transportation cost for NG have been taken from the latest available source and the figures pertaining to 2008 or 2009. CL is closed
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Additionality (B)	CL B14
<b>Classification</b>	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	O&M expenses have been considered at Rs.0.85 mn./MW, escalation at 5% and 'third party recommendation' has been cited as the basis. The supporting evidence should be submitted
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The evidence has already been submitted to the DOE during validation visit. A copy of the same is hereby resubmitted for reference.
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Instead of third party document, it may be stated as letter dated 19/09/2009 from O&M solutions. CL is open
<b>Corrective Action #2</b>	The requested change has been made in the revised PDD.
<b>DOE Assessment #2</b>	The basis for O&M cost has been suitably changed in the PDD. CL is closed
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken



Additionality (B)	CL B14
	<input checked="" type="checkbox"/> The project complies with the requirements

Additionality (B)	CL B15
<b>Classification</b>	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Receivables have been computed based on variable cost and fixed cost. Fixed cost includes depreciation and RoE. Clarify whether the bank finances RoE, tax and depreciation. This is neither correct nor acceptable.
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Interest on working capital has been provided in the revised sheet as per standard banking norms
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Receivables estimation has been corrected in the revised worksheet. CL is closed
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Additionality (B)	CL B16
<b>Classification</b>	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Revenue from ash sales, incentive on capacity and salvage value have not been reckoned in the computation of LUCE.
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	LUCE is computation of all expenses pertaining to the project activity. Inclusion of expected sources of revenue from the project and tax thereon results in calculation of tariff and not LUCE
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The understanding does not seem to be acceptable. LUCE is the LUC of electricity generation. In the process, if the plant generates revenue from any sources other than from sale of power, it should be reckoned as it affects the unit cost. The revenue from ash sales should, therefore, be reduced from the total cost and then the LUCE should be computed. Likewise, in the terminal year, salvage value should be deducted from the total cost. CL is open
<b>Corrective Action #2</b>	Ash sales & salvage value revenues have been included in the revised LUCE computations



Additionality (B)	CL B16
<b>DOE Assessment #2</b>	Ash sales and salvage value have been reckoned in the revised LUCE computation. CL is closed
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Additionality (B)	CL B17
<b>Classification</b>	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The PDD is based on 2 X700 MW while the proposal seems to have been submitted for 2 X 660 MW. Clarify when was the unit configuration changed and whether it has been approved by PSERC. Moreover, it appears that subsequently the project size has been enlarged to 2100 MW. In the above background, clarify whether the project cost assumed is for 1400 MW or for 2100 MW.
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The proposal was submitted for 2x660 MW as quotation provided by EPC contractor was for 2x660 MW. However, it may please be noted that both unit configurations are possible and allowed. PSEB has approved the configuration of 2x700 MW on 13/04/2010. The project cost assumed in additionality demonstration is for 1320 MW which was available at the time of investment decision.
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>a) Agreed. The letter has been submitted Clarify whether the entire generation consequent upon the modification of the unit size will be sold to PSEB or the excess capacity will be sold as merchant power.</p> <p>b) Further, it is observed from the PPA that the contracted capacity is given as 1234.2 MW, which works out to 93.5% PLF. Clarify on what basis the PLF in the calculation has been restricted to 85%.</p> <p>c) Finally, assuming 1320 MW installed capacity for project IRR calculation and 1400 MW for LUCE calculation does not appear to be correct and acceptable. In the event of the project getting registered, it might attract provisions of Annex 67, EB 48 as there is an increase in installed capacity and would invite revalidation of additionality. Both LUCE calculation and IRR should be based on similar capacity and LUCE should be based on projections made for IRR calculation. CL is open</p>

Additionality (B)	CL B17
<b>Corrective Action #2</b>	<p>a) Even though the unit capacity has increased, power off take will still be governed by the PPA which clearly identifies PSEB as 100% power off taker</p> <p>b) A contracted capacity of 1234.2 MW does not signify a PLF of 93.5%. 93.5% signifies the installed capacity available for export to PSEB while the balance is meant for internal plant consumption. However, for conservativeness, the revised calculations are now based on 93% PLF which is also the Operating Availability of Generating Stations under Private Sector in 2008-09.</p> <p>c) Both LUCE &amp; IRR computation are now based on 1400 MW capacity.</p>
<b>DOE Assessment #2</b>	<p>a) That entire power has to be sold to PSEB is evidenced by PPA. Hence, the submission of PPA is correct. CL is closed</p> <p>b) The explanation on the relationship between contracted and installed capacity is accepted. Moreover, since the PLF has been increased from 85% to 93% in the revised worksheet, the CL has lost its relevance. CL is closed</p> <p>c) LUCE and IRR calculations are based on 1400 MW in the revised worksheet. CL is closed</p>
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Additionality (B)	CL B18
<b>Classification</b>	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>The DPR describes the following assumptions while assessing the project activity during June 2008:</p> <ul style="list-style-type: none"> <li>Gross calorific value of coal is 3900 kcal/kg,</li> <li>station heat rate of 2450 kcal/kwh</li> <li>plant load factor of 80% have been considered</li> </ul> <p>However, the above parameters are not considered for the project activity assessment which is available to the PP at the time of decision making. The PDD is not consistent with DPR. Appropriate justification is sought.</p>
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>The DPR was provided by PSEB to all prospective bidders before the time of bidding and hence has no bearance on the bids placed by individual bidders.</p>



Additionality (B)	CL B18
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>In the background of above response, project developer/consultant may clarify on what basis the GCV, SHR and PLF had been assumed while submitting the bid. Clarify whether these parameters submitted at the time of Bid and submitted now aren't the same. CL is open</p>
<b>Corrective Action #2</b>	<p>The basis for the 3 parameters are as follows:</p> <p>GCV: Communication from PSEB dated 11/09/2009 to all prospective bidders.</p> <p>SHR: Letter from L&amp;T-EPC dated 19/09/2009</p> <p>PLF: Normative Availability as prescribed in the request for proposal issued by PSEB. However, for conservativeness, the revised calculations are now based on 93% PLF which is also the Operating Availability of Generating Stations under Private Sector in 2008-09.</p>
<b>DOE Assessment #2</b>	<p>The source has been verified by DOE and found to be correct. PLF has been revised to 93%. CL is closed</p>
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<p> <input type="checkbox"/> To be checked during the first periodic verification  <input type="checkbox"/> Appropriate action was taken  <input checked="" type="checkbox"/> Project documentation was corrected correspondingly  <input type="checkbox"/> Additional action should be taken  <input checked="" type="checkbox"/> The project complies with the requirements         </p>

Additionality (B)	CL B19
<b>Classification</b>	<p> <input type="checkbox"/> CAR             <input checked="" type="checkbox"/> CL             <input type="checkbox"/> FAR           </p>
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>Based on the document review, the chronology of the project activity is as follows:</p> <ul style="list-style-type: none"> <li>• The DPR of the project activity is prepared in June 2008</li> <li>• Letter from the technology supplier reg. project cost and heat rate 19/09/2009</li> <li>• The Management decision date 22/09/2009</li> <li>• Last date of Bid submission 09/10/2009</li> <li>• Bid awarded on 16/10/2009</li> </ul> <p>Which implies that the quoted tariff is based on the DPR and the letter from technology supplier (only for project cost and heat rate). Hence, as per annex 58, EB51, the input parameters shall be at the time of decision making. PP is requested to clarify the inconsistencies w.r.t. input parameters used in the PDD when subjected to DPR and letter from technology supplier.</p>

Additionality (B)	CL B19
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>The DPR was provided by PSEB to all prospective bidders before the time of bidding and hence has no bearing on the bids placed by individual bidders.</p> <p>The revised PDD has been made consistent with the quotations of project cost from technology supplier.</p>
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>Now that the PDD has been revised and "made consistent with the quotation of the project cost from technology supplier", clarify whether the input parameters used at the time of submission of bid were different, lest there would have been no need to revise the PDD and making it consistent with quotations. CL is open</p>
<b>Corrective Action #2</b>	<p>The PP hereby clarifies that all the input parameters used for investment analysis were available at the time of decision making (22/09/2009) as well as bid submission (09/10/2009).</p>
<b>DOE Assessment #2</b>	<p>DOE has verified and find that all input parameters used in financial indicator calculation were available at the time of decision making and hence the project conforms to guidance 6 of Annex 58, EB 51. CL is closed.</p>
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<p> <input type="checkbox"/> To be checked during the first periodic verification  <input type="checkbox"/> Appropriate action was taken  <input checked="" type="checkbox"/> Project documentation was corrected correspondingly  <input type="checkbox"/> Additional action should be taken  <input checked="" type="checkbox"/> The project complies with the requirements         </p>

Additionality (B)	CL B20		
<b>Classification</b>	<input type="checkbox"/> CAR	<input checked="" type="checkbox"/> CL	<input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>During the interview and subsequent document review (letter from technology supplier dated 19th September 2009) describes that the station heat rate considered for the project activity is 2082, however, it is clearly evident from the financial bid that quoted heat rate for the project is 2268 kcal/kWh. PP is requested to clarify the discrepancies.</p>		
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>The financial bid contains the net heat rate value while the letter from technology supplier describes gross station heat rate. This may also be confirmed from the gross heat rate value finalized as per EPC contract.</p>		



Additionality (B)	CL B20
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>If so, PP is requested to compare net heat rate by considering auxiliary consumption based on letter from technology supplier dated 19th September 2009. CL is open.</p>
<b>Corrective Action #2</b>	<p>We wish to submit that the EPC contractor has communicated a Gross SHR of 2082 kcal/kWh. As per CERC Tariff Regulation 2009, auxiliary consumption is 6% which implies a net SHR of 2215 kcal/kWh. However, as per the bid guidelines, a single heat rate value was to be quoted for a continuous period of 25 years of plant operation. Since in the later years of plant operation, the operating efficiency may not meet the initial design values, a further uncertainty margin of 2.4% was chosen and a net value of 2268 kcal/kWh was quoted in the bid.</p>
<b>DOE Assessment #2</b>	<p>The letter from the EPC contractor was checked to confirm the values, further as a single value had to be quoted for 25 years, thus the explanation is acceptable. CAR is closed.</p>
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<p> <input type="checkbox"/> To be checked during the first periodic verification  <input type="checkbox"/> Appropriate action was taken  <input type="checkbox"/> Project documentation was corrected correspondingly  <input type="checkbox"/> Additional action should be taken  <input checked="" type="checkbox"/> The project complies with the requirements         </p>

Additionality (B)	CL B21		
<b>Classification</b>	<input type="checkbox"/> CAR	<input checked="" type="checkbox"/> CL	<input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>Worksheet assumes yearly repayment of loan. Clarify whether any bank provides loan with yearly repayment and whether the company's financial closure is based on yearly repayment of loan.</p> <p>Repayment period has been 'assumed' at 10 years. Clarify the basis for this 'assumption' and furnish documentary evidence in support thereof.</p>		
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>Banks provide loans with yearly repayment. This was considered while bidding. However, the financial closure is based on quarterly repayment of loan</p> <p>The repayment period of 10 years is general consideration based on standard industry practice in the power sector. The justification of its wide acceptance may be evaluated by relevant information provided in the January 2009 newsletter of ICRA which provides an insight on the same CERC Tariff Notification that has been used in this project activity. (<a href="http://www.icra.in/Files/Articles/2009-January-Power%20Sector.pdf">http://www.icra.in/Files/Articles/2009-January-Power%20Sector.pdf</a>)</p>		



Additionality (B)	CL B21
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The statement that the banks provide loans with yearly repayment is not substantiated by evidence. particularly in the light of the fact that the financial closure is based on quarterly repayment. Statements should be evidenced, otherwise they are not acceptable. The evidence submitted for terms of loan is not acceptable. It should be either the terms of loan approved for the project activity or any project of similar size of the PP availed within the last 3 years. The response is not acceptable. CL is open
<b>Corrective Action #2</b>	Actual loan interest as evidenced by the loan contracted is now considered in interest calculations. This is in conformity with guidance 11 of Annex 58, EB 51.
<b>DOE Assessment #2</b>	Interest computation has been modified and is in conformity with guidance 11 of Annex 58, EB 51. CL is closed
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Additionality (B)	CLB22		
<b>Classification</b>	<input type="checkbox"/> CAR	<input checked="" type="checkbox"/> CL	<input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Interest on term loan has been assumed at 10.5% and on working capital at 11%. RBI PLR and SBAR as per CERC Tariff Regulation 2009 have been cited as basis for the same. Clarify to which period the RBI PLR pertains to and furnish web reference. Also furnish the interest rate at which the financial closure has been achieved		
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Web reference for RBI PLR and SBAR has been presented in revised PDD.		
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Web reference for RBI PLR and SBAR have been furnished. They correspond to the period of decision making. However, the rate of interest considered on term loan is 50 bps. Less than the lower range of the PLR. No reason or documentary evidence has been submitted in support of such assumption. CL is open		
<b>Corrective Action #2</b>	Actual loan interest as evidenced by the loan contracted is now considered in interest calculations. This is in conformity with guidance 11 of Annex 58, EB 51. Further, correct SBAR has been used in the revised submission for computation of interest on working capital.		
<b>DOE Assessment #2</b>	In the revised worksheet actual interest payable has been reckoned, which is in conformity with guidance 11 of Annex 58, EB 51. CL is closed		

Additionality (B)	CLB22
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Additionality (B)	CL B23		
<b>Classification</b>	<input type="checkbox"/> CAR	<input checked="" type="checkbox"/> CL	<input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Interest on working capital has been assumed on 100% of the current assets. Clarify whether this is in conformity with the present banking norm.		
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Corrections sought have been made in the revised PDD		
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Bank finance has been assumed at 75% of the current assets, which is in conformity with banking practice. CL is closed		
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements		

Additionality (B)	CL B24		
<b>Classification</b>	<input type="checkbox"/> CAR	<input checked="" type="checkbox"/> CL	<input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Chosen parameters have been subjected to 10% variation on either side. Explain how the parameters chosen and variation they have been subjected to conform to the guidance 17 and 18 of Annex 58, EB 51.		
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Justifications have been provided in the revised PDD		
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and</i>	PDD does not explain how the parameters chosen and the variations to which they have been subjected to conform to guidance 17 of Annex 58 EB 51. It only states why a 10% variation is unlikely. Moreover, the section does not explain at what percent		



Additionality (B)		CL B24
<i>DOE assessments (#2, #3, etc.) shall be added.</i>		variation the financial indicator will equal the benchmark and the probability of its occurrence. CL is open
<b>Corrective Action #2</b>		Corrections sought have been made in the revised PDD.
<b>DOE Assessment #2</b>		Revised PDD explains the conformity of parameters selected and the variation to which they have been subjected to guidance 17 and 18 of Annex 58, EB 51. The critical parameters included are Project cost, PLF, O&M cost, coal cost, coal transportation cost and GCV of coal. CL is closed.
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>		<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Monitoring Plan (B)		CL B25
<b>Classification</b>		<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>		PP needs to Clarify whether the source of data for the monitoring of Net electricity exported to the grid can be the invoices for sale of power?
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>		The correct source of data for the monitoring of Net electricity exported to the grid has been provided in the revised PDD
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>		PDD is revised appropriately and CL is closed.
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>		<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Crediting Period (C)		CAR C1
<b>Classification</b>		<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>		During the discussions with the PP it was conveyed that the commissioning of the second unit of the project activity shall be May 2014, in this regard the Crediting period shall be revised.





Crediting Period (C)	CAR C1
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The crediting period has been revised to start from 01/05/2011 which is the expected date of commissioning of the second unit.
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	PDD is revised appropriately, CAR is closed.
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<div> <input type="checkbox"/> To be checked during the first periodic verification  <input type="checkbox"/> Appropriate action was taken  <input checked="" type="checkbox"/> Project documentation was corrected correspondingly  <input type="checkbox"/> Additional action should be taken  <input checked="" type="checkbox"/> The project complies with the requirements </div>



## **5 VALIDATION ASSESSMENT SUMMARY**

### **5.1 General Description of the Project Activity**

#### **5.1.1 Participation**

##### **LOA**

The host country approval was obtained from Govt. of India Ministry of Environment and Forests dated 14/03/2011, which is the authorized DNA by UNFCCC for CDM projects. Ministry of Environment and Forests, Govt. of India has stipulated the social well being, economic well being, environmental well being and technological well being as the four indicators for sustainable development in the interim approval guidelines for host country approval eligibility criteria for Clean Development Mechanism (CDM) projects. PDD described all the sustainable development indicators correctly and appropriately which is sufficient to prove that project will lead to sustainable development. The Host Country approval also indicates that project will lead to sustainable development. The project title is in line with the HCA, which is entitled as "Energy Efficient Power Generation by Nabha Power Limited" The name of the project participant as mentioned in the PDD is in line with host Country approval obtained for the project activity.

Nevertheless, CAR A1 had to be raised in the course of the validation and was successfully closed.

##### **Project Participants**

Nabha Power Limited is the project participant and it has obtained the HCA<sup>/HCA/</sup> from MoEF (Govt. of India) for the proposed project activity. The project participant name is consistent internally within the PDD and is in line with the HCA. No Annex I Country is envisaged at this stage of validation.

Nevertheless, CAR A1 had to be raised in the course of the validation and was successfully closed

#### **5.1.2 Contribution to Sustainable Development**

The Host country government approved that the project will contribute to the sustainable development in India. The details were verified from the HCA and found to be correct.

The Indian DNA approval indicates that project will lead to sustainable development.

This type of project activity is in line with sustainable development policies of the country and national regulation / policy on Environmental Protection, Electricity and Non Conventional Energy. Nevertheless, in the Host Country Approval it is stated that the project participant (PP) has to comply with the following conditions:

- PP shall not sell the CERs to any agency/ company/ organization which purchases the CERs using ODA Funds
- PP shall inform the national CDM Authority regarding all transaction details of CERs including the name and address of the party to which CERs were sold within 30 days of transfer of the CERs
- PP shall furnish expeditiously any information, during the lifetime of the project as requested by the National CDM Authority.
- PP shall obtain all statutory clearances and other approvals as required from the competent authorities for setting up of the project
- All transaction shall be subject to supervision of the Executive Board of the CDM, under the authority and guidance of the COP/MOP

Further, Project participant is committed to expend 2% of sale proceeding of CERs every year for development of society and local community. This committed expenditure will be used to develop and improve education, income creation, security and healthcare in the local community. According to sustainable development various social, economic and environmental benefits are intended to be achieved. Besides GHG mitigation the project activity leads to conservation of natural resources due to advanced technology. Temporal boundaries of the project are clearly defined.

Nevertheless, CAR A1 had to be raised in the course of the validation and was successfully closed

### **5.1.3 PDD editorial Aspects**

The project participant follows the latest template for completing CDM PDD form version 3, which is the latest during the global stakeholder consultation process. The Project also used CDM –PDD filling guideline version 07, for completing all the section of the PDD, which is the latest at the time of global stakeholder consultation process. However, PDD is not addressed the respective requirements of the CDM filling guidelines, hence resulted in Corrective action request.

Thus the, CAR A2 was raised in the course of the validation and was successfully closed.

### **5.1.4 Technology to be employed**

The project activity involves installation of a new 1400 MW coal fired power plant employing super-critical technology, which would be located at Rajpura village in Punjab state of India. This project activity would comprise of two (02) units of 700 MW Power plants. The coal requirements for the project lifetime would be based on Domestic Coal, which will be used as the Primary fuel for the Plant. The coal would be supplied by South Eastern Coalfields Limited (SECL). Coal shall be transported from the mines to the Power House through rail transport.

The steam generators shall be once through, water tube, direct pulverized coal fired, top supported, balanced draft furnace, single reheat, radiant, suitable for outdoor

installation. The gas path arrangement shall be two-pass type. Boiler design shall be suitable for sliding pressure operation.

Pressure at super-heater (SH) outlet is significantly higher in case of project activity ( $257.15 \text{ kg/cm}^2$ ) and the Temperature at SH outlet and the re-heater outlet are  $568^\circ\text{C}$  and  $596^\circ\text{C}$  respectively.

Steam generators will be fed by vertical mill with circular firing and low  $\text{NO}_x$  combustion system comprising of low  $\text{NO}_x$  burners. Coal Monitoring will be carried-out by gravimetric feeders located before the coal pulveriser unit. There are 6 pulveriser units separately for each Boiler. Thus the total quantity of coal consumed for each unit is the summation of coal from the 6 pulveriser units.

The power plant consists of two Steam Turbine Generator units, each of capacity of 700 MW. Each Steam Turbine Generator (STG) is rated for 700 MW maximum continuous output at the Generator, with throttle steam conditions at Turbine of  $247 \text{ kg/cm}^2$  at  $565^\circ\text{C}$  with condenser cooling water inlet temperature of  $33^\circ\text{C}$ .

The technology (super-critical) used in the project is first-of-its-kind in India as there were no super-critical plants operational before the project was web-hosted for Global Stakeholders comments (2010-09-14 to 2010-10-13). India had no other super-critical technology based coal fired electricity generation plant under commercial operation at the time of PDD web-hosting for global stakeholder consultation process.

The efficiency of the super-critical technology is higher (project activity: 40.49%,) compared to the best operating sub-critical technology plant in India (baseline: 36.63%). This incremental efficiency gain of super critical technology will lead to reduced coal (considering same fuel type for baseline and project activity) consumption and thereby emission reductions. The project is a Greenfield project activity and the project technology is environmentally safe and sound.<sup>/EIA/</sup>

The project activity will export net electricity of 10787075.21 MWh on an 10 year average (at 93% Load factor). The estimated total amount of emission reductions over the chosen 10-year "fixed crediting period" is **9364517 tCO<sub>2</sub>e**. Nevertheless, CAR A3 and CAR A6 had to be raised during the course of validation and successfully closed.

### 5.1.5 Small Scale Projects

Not applicable for this project activity as it is a large scale project.

## 5.2 Project Baseline, Additionality and Monitoring Plan

### 5.2.1 Application of the Methodology

The project is a large scale project activity. The project applies approved baseline and monitoring methodology "Consolidated baseline and monitoring methodology for new grid connected fossil fuel fired power plants using a less GHG intensive technology"; ACM 0013, Version 03

The project correctly applies reference of tool, which the approved consolidated methodology ACM0013 drawn upon:

- "Tool for the demonstration and assessment of additionality"; Version: 5.2 approved and valid in EB 39
- "Tool to calculate the emission factor for an electricity system"; Version: 2, valid and approved in EB 50, annex 14

The applied methodology ACM0013 version 3 is approved by UNFCCC in EB 53 meeting.

The proposed project activity selected the approved consolidated baseline and monitoring methodology ACM0013 version 03 which requires mainly four applicability criteria, where first applicability criteria says regarding construction and operation of new fossil fuel fired grid connected electricity generation plant by using more efficient power generation technology. During the site visit it was found that the project is a Greenfield project activity. The project activity involves installation of a new 1400 MW coal fired Power Plant employing super-critical technology which would be located in Rajpura near Nalash village of Patiala, Punjab state of India. The generated power would be stepped up to 400 kV and evacuated through 400 kV Substation and 400 kV outgoing line gantries for further evacuation. The PP has signed the PPA with Punjab State Electricity Board (PSEB).

However, the efficiency of the subcritical unit and supercritical unit as per the requirement of methodology is not explained in the PDD. Considering this issue CARB1 was raised during the validation process. Accordingly, while converting the station heat rates from gross basis to net basis, PP has earlier netted out the Auxiliary consumption but not netted out the conversion of Gross CV to Net CV. This is due to the fact that the BTGs are designed based on GCV basis. Now the revised computations are based on net basis which is requirement of the methodology. PDD is revised to include efficiencies of both project activity (40.49%) and the best operating sub-critical technology plant in India for 2009-10 (36.63%). PDD is now internally consistent. The assessment team cross checked the calculation and respective data sources and found the same to be correct which results in the closure of CAR B1. The efficiency of the supercritical unit is determined from the manufacturer's data i.e. station heat rate, auxiliary power consumption and the validation team cross checked the EPC contract<sup>PO/</sup> and found the same to be correct. The calculation of subcritical efficiency is carried out by data published by official sources, such as CERC and CEA (version 06). Plants which fulfill requirements indicated in step 1 described under Option 2, baseline efficiency is computed using equation (5) of ACM0013, version 03. Thus the efficiency of the

supercritical unit is (40.49%) while the computed efficiency of the best operating subcritical unit in India for 2009-10 calculated as per the option 1 is (36.63%) which fulfils the most important applicability requirement of the methodology, using more efficient power generation technology than what would otherwise be used with the given fossil fuel.

The project activity does not include the construction and operation of a co-generation power plant and thus it fulfills the second methodological applicability criteria. Viewing the second applicability criteria it can be referred that the project activity will generate power using the outlet Super heater steam pressure 257.15 kg/cm<sup>2</sup> /TS/, temperature at Super heater outlet and the re-heater outlet of 568°C , 596°C/TS/ respectively. Hence, the project activity is not a co-generation project and justifies the applicability criteria of the methodology.

The third methodological requirement to be fulfilled for the project activity is the data availability about fuel consumption and electricity generation of recently constructed power plants to arrive at the baseline emission of the project. The project participant used the latest version of CEA data to arrive at baseline emission factor and baseline emission calculation. However, assessment team found that Applicability criterion 3 of the methodology is not justified fully due to the fact that the data on the fuel consumption is not being monitored by CEA at unit level. Considering this issue validation team raised CAR B2 during the validation process. In order to comply with the applicability condition (3), Unit level coal consumption is computed based on the Net electricity generation and specific emission from each unit as published by CEA at unit level which is an authentic and credible data source, in as much as CEA is a regulatory organization set-up by the Govt. of India.

The fuel consumption at unit level is arrived based on the following parameters and individual sources;

- net generation value sourced from the CEA at unit level
- specific emissions at unit level sourced from the CEA version 6 for the year 2009-10
- gross calorific value of coal at unit level as per CERC tariff orders

The fuel consumption values are derived for individual unit level data based on documents publicly available and published by Govt. of India, thus are assessed to be appropriate and authentic. Thus the methodological requirement for availability of fuel consumption and electricity generation is fulfilled.

The calculated fuel consumption has been compared with the Specific Fuel Consumption (SFC) of the unit level which is available in all respective CERC tariff orders at individual unit level power plant. The SFC is arrived based on the common assumptions i.e. SHR 2450kcal/kWh, 7.5% auxiliary consumption and 2% of secondary fuel oil consumption. However, the station level SHRs for the best plant are much lower than the SHR assumed (2450 kcal/kWh) to arrive at the SFC at unit level (NSHR varies from 2385-2819 kcal/kWh and the auxiliary consumption is as low as 5.45%). Thus, adopting SFC for unit level from CERC tariff orders would results the higher emission reductions unconsciously which are not real. Hence, assessment



team restricted the PP not to avail the emission reductions which are not real. The approach is conservative and appropriate.

The fourth applicability criteria under this applied methodology is the identified baseline fuel is used in more than 50% of total generation by utilities in the geographical area within the host country, as defined later in the methodology, or in the country. According to the requirement of the applied methodology, project proponent provided for the latest three years data (2007-08, 2008-09 and 2009-2010) all India power generation<sup>/CEA/</sup> and the proportion of power generation capacity by using Coal as the fuel is proved to be more than 50% and hence the applicability criteria is justified.

Apart from the above applicability criteria the project should also comply with the requirement that whether most plausible scenario is the construction of a new power plant using the same fossil fuel category as opposed to the fossil fuel type being currently described in the PDD. The proposed project shall be based on sub-bituminous coal type which is the same as the baseline scenario thereby fulfilling the requirement.

Thus, the proposed project activity is meeting all the applicability criterion mentioned under ACM0013 version 03, however CAR B1 to CAR B3 are raised during the validation and successfully closed out.

The project emission is calculated as per the requirement of the stipulated methodology. No other significant project emission are envisaged from the project activity. The leakage is not considered for the project activity as per the requirement of the stipulated methodology.

### **5.2.2 Project Boundary**

The project system boundary includes fuel supply point, storage and processing, boiler, steam turbine generator other power generating equipments, auxiliary consumption units located at the plant site and all the power plants considered for the calculation of the baseline CO<sub>2</sub> emission factor. The generated electricity of project activity will be evacuated to service electricity requirements of PSEB which is connected to NEWNE grid and shall operate in the base-load category. The methodology does not allow for the choice of including GHG sources/sinks and thus is not considered for the project activity. The main source of emission from the baseline and the project is CO<sub>2</sub> which is considered in the project boundary. No other source is envisaged for this project activity.

Nevertheless CAR B4 was raised during the validation process which was closed successfully.

### **5.2.3 Baseline Identification**

The project applies approved baseline and monitoring methodology "Consolidated baseline and monitoring methodology for new grid connected fossil fuel fired power plants using a less GHG intensive technology"; ACM 0013, Version 03 and adheres to Sectoral Scope 1. The baseline methodology is applicable since the proposed



project activity will implement supercritical technology which is less GHG intensive technology with respect to the subcritical power plant technology as available. The proposed technology is an efficient technology and produces thermal power with high efficiency which will in turn consume less coal as compared to the baseline scenario i.e. Power from subcritical thermal power plant. Confirmation of the baseline scenario for the project activity is discussed in detail in the below paragraph.

### **Identification of the baseline Scenario:**

As mandated by the methodology ACM0013 Version 3, the project participant has identified the baseline scenario as per the guideline mentioned under stipulated methodology:

### **Step1: Identify plausible baseline scenario (Detail Information is presented in table A-2 of the report)**

The following are identified as the alternative to select most economical baseline scenario for the project activity:

1. The project activity not implemented as a CDM project
2. Power generation using coal but with sub-critical technology – Plant located at Pit Head
3. Subcritical technology based coal fired power generation using linkage coal
4. Subcritical technology based coal fired power generation using imported coal
5. Power generation Lignite as fuel – located at Pit head (all the lignite based generation established in India at present are commissioned on the mine mouth)
6. Power generation using NG based technology
7. Power generation using Diesel/FO
8. Power generation using renewable energy sources
9. Power generation using nuclear fuels
10. Import of electricity from connected grids, including the possibility of new interconnections

The list of alternatives to supply the above mentioned results, which are also presented in the current version of the PDD, includes the project activity undertaken without being registered as CDM project activity. The remaining alternatives presented do include all the possible scenario taking into account the local and sectoral situation for the mentioned results. The list of alternative therefore considered complete are as follows:

The Alternative 1 has not been considered as the viable option due to the financial unattractiveness without considering CDM revenue (as discussed in the additionality section)

The LUCE for Pit head based sub-critical technology based power plant is the most economical option, however the alternative has been ruled out as the current project is proposed on the land allocated by PSEB for which the coal linkage is assured by SECL. Moreover Pit head based project on the allocated land is not a suitable alternative for comparison as there are no coal mines located nearby to the allocated project area. However the LUCE analysis for Pit head projects is also presented. Further the imported coal option is also ruled out as the coal linkage has been assured by SECL also the cost for coal as well as transportation of coal shall be reimbursed by PSEB in form of energy charges which forms a part in the tariff.

Options for natural gas based power plant has been considered as the plausible alternative even though there is a natural gas demand-supply gap in India. The fact was cross checked with the report of working group on petroleum and Natural gas for XIIth plan (2007-2012) and <http://petroleum.nic.in/petstat.pdf> and found satisfactory. However, NG is considered as plausible baseline alternative.

Option of renewable energy and nuclear power plant has also not been found feasible considering the power generation contribution among the Indian power sector, which is clearly observed with the power sector statistics published by Central Electricity Authority<sup>/CEA/</sup>. Furthermore, currently in India nuclear power generation is restricted to national government or Government owned agency. This fact is also found evident in the National Report on convention to Nuclear safety, fourth review meeting of the contracting parties, April 2008, Govt of India. Moreover, external reference from a credible source (Carnegie Endowment) is used to determine the efficiency of a nuclear power plant. External reference indicates the efficiency of nuclear power plants at 29%<sup>3</sup>. The Cited efficiency is substantially lesser than the project activity and hence not comparable to the project activity.

Option of diesel or fuel oil or liquid based power plant of similar large installed capacity has not been found logical with reference to higher cost of diesel or fuel oil or naphtha in comparison to coal, as information available in the power sector statistics published by Govt of India.

Option of Import of electricity from connected grids, including the possibility of new interconnections was assessed through the all India power generation data<sup>/CEA/</sup> and power import data from only existing interconnection of the neighboring countries like Bhutan, Nepal with the Indian National grid (2005-08) referring objective information sources as mentioned in section B.4 of the PDD. It was found that the import of electricity from the interconnected grid is not a possible scenario for the project size of 1400 MW. Therefore the alternative is not considered further to arrive at the baseline scenario.

**Based on the Outcome of Step 1, following alternatives are identified as plausible alternatives.**

<sup>3</sup> Source: Atoms for War? U.S.-Indian Civilian Nuclear Cooperation and India's Nuclear Arsenal , Page 20, Paragraph 2 - [www.carnegieendowment.org/files/atomsforwarfinal4.pdf](http://www.carnegieendowment.org/files/atomsforwarfinal4.pdf)

Description	Plausible Alternative
Alternative 1	The project activity not implemented as a CDM project
Alternative 2	Sub-critical technology – pithead coal
Alternative 3	Sub-critical technology – linkage coal (baseline)
Alternative 4	Power generation using NG as fuel

## **Step2: Identify economically most attractive baseline scenario**

Economically most attractive baseline scenario is identified using investment analysis. As per the guidance of the methodology, the levelised unit cost of electricity in INR/kWh has been used as financial indicator for comparison of economic attractiveness of baseline alternatives. The same is discussed in the additionality section below.

LUCE is the financial indicator for investment analysis. LUCE for all the plausible baseline scenarios are given in the following table.

Alternative		LUCE (INR/kWh)
1	The project activity not implemented as a CDM project	2.41
2	Sub-critical technology – pithead coal	1.31
3	Sub-critical technology – linkage coal (baseline)	2.27
4	Power generation using NG as fuel	3.44

As evident from the above, the levelized unit cost of generation of electricity using sub critical technology located at pithead (Alternative 2) is the lowest. Since the Methodology states,

*“The baseline scenario alternative that has the best indicator (e.g. the highest IRR) can be pre-selected as the most plausible baseline scenario”*

However, as the location of the project is pre determined (village Nalash, near Rajpura) and there are no coal mines anywhere in the proximity, validation team decided to accept *sub-critical technology based power plant with coal linkage as baseline* instead of sub critical technology based power plant located at pit head.

Thus the most attractive baseline scenario identified meets the requirement of the methodology.

The alternative excluded from the selection is considered correct and the reason is already included in the report. The baseline alternative identified using the LUCE is as per the stipulated methodology and thus is conservative.

Nevertheless CAR B1 to CAR B4 and CLB1 to CLB4 was raised during the validation process which was closed successfully.

#### 5.2.4 Calculation of GHG Emission Reductions

The baseline emissions under the adopted methodology ACM0013 version 03 is calculated by multiplying the baseline emission factor ( $EF_{BL, CO_2}$ ) and the net quantity of electricity generated in the project plant in the year  $y$  ( $EG_{PJ,y}$ ). The baseline emission factor ( $EF_{BL, CO_2}$ ) is selected between the lowest of two options computed as per ACM0013.

##### Option 1:

The main parameters included in option 1 computation are  $EF_{FF, BL, CO_2}$ ,  $EF_{FF, CO_2}$  and  $\eta_{BL}$ . The value for the  $EF_{FF, BL, CO_2}$  is sourced from IPCC as required by the methodology ACM0013 version 3. The value for the same ( $EF_{FF, BL, CO_2}$ ) is 0.0928 tCO<sub>2</sub>/GJ. The type of the fuel used is sub-bituminous coal in both the project activity and the most likely baseline scenario is within the IPCC's default for the sub-bituminous coal at the lower limit of the uncertainty at a 95% confidence interval. Hence the value of  $EF_{FF, BL, CO_2}$  and  $EF_{FF, CO_2}$  is same (0.0928 tCO<sub>2</sub>/GJ). The  $\eta_{BL}$  is energy efficiency of sub-critical power generation technology of the best operating plant for the year 2009-10 as published by CEA. The efficiency for the plants is calculated based on the specific emissions and net generation values. The best efficiency plant comes to be TORANGALLU EXT-1 which has an operating net efficiency of 36.63% which is much higher than the efficiency of 500 MW as calculated based on the SHR published by CERC for tariff regulation i.e 34.76% which is based on the design parameters i.e. SHR of 2425 kcal/kWh and auxiliary of 5.5% (similar to that of project to ensure conservativeness). The efficiency of the best operating plant has been considered for the further analysis. The value for the best plant is assessed to be appropriate and conservative. Based on the efficiency of 36.63% the computed value of  $EF_{BL, CO_2}$  according to option 1 is 0.9120 tCO<sub>2</sub>/MWh.

##### Option 2:

The main parameters included to compute  $EF_{BL, CO_2}$  under option 2 are  $FC_j$ ,  $NCV_j$ ,  $EF_{FF, CO_2}$ , and  $EG_j$ . The 'j' indicates the top 15% performing power plants among the all power plants defined in the geographical area that have similar size, those are operated at similar load and the same fuel as that of project activity. The determination of top 15% performer plants 'j', has followed the step wise approach mentioned under option 2 of the ACM0013, version 03 as follows:

The plants similar to the project activity have been selected according the criteria mentioned under Step1 followed the below steps as per the ACM0013

- The total no. of plants identified as 417 which uses the same fossil fuel type (Solid: Sub bituminous Coal) as the project activity
- Those have been constructed in the previous five years - Of the 417 units short-listed above, only 57 units have commissioned in the period of 5 years (financial years 2005-06 to 2009-10) prior to the start of the project activity (16/07/2010)
- The total no. of plants identified as 13 which are comparable to the size of the project activity as defined in the range of 50% to 150% of project power plant (700 MW)

- The total no. of plants identified as 10 which are operated in the same base load category (load factor of more than 3,000 hours per year) and operated in the year prior to the project start date.

According to step 1, the similar plants to the project activity have to be operated in the year prior to the start (16/07/2010) of the project activity. All the 10 plants identified supplied electricity to the grid in the year prior to the start of the project. Thus the project complies with Step 1 requirement of the methodology.

According to the step 2 of the option 2, the geographical area to identify similar power plants should be chosen in a manner that the total number of power plants “N” in the sample group comprises of at least 10 plants. As the project activity is supplying power to NEWNE grid of India (default grid), 9 similar plants have been identified in connected grid according to CEA. However, as the number of plants is below the minimum methodological requirement of 10 plants, geographical boundaries are extended to meet the requirements. There is only one plant in the Southern regional grid as per the methodological requirements, thus minimum requirement of 10 plants is met. Hence, India as a country is identified as the geographical area of the project activity.

According to the step 3 of the option 2, sample power plants ‘n’ (10) have been identified that are to be included in sample group. Total number ‘N’ is identified as 10 which use the same fuel as the project plant and any technology available within the geographical area. None of the projects in the sample group of 10 are registered as CDM project activities.

According to the equation 5 of step 4, the plant efficiencies have been determined for ‘10’ identified plants in step 3 based on the most recent one year data available. Bellary TPS unit no. 1 is considered for the demonstration of sample calculations with most recently published data. The best efficiency among the baseline sample group has been calculated as 36.04%.

According to step 5 of Option2, the top 15% performing plants ‘j’ is identified as BELLARY\_TPS-1 and SIPAT\_STPS-2. The detailed analysis is described in section B.6.1 of PDD. The data and assumptions used in the arriving the above conclusions have been crosschecked with the reference given by the PP and found authenticate.

The computed value of  $EF_{BL, CO_2}$  according to option 2 is 0.9298 tCO<sub>2</sub>/MWh.

#### **Computation of Baseline Emission Factor $EF_{BL, CO_2, y}$**

Minimum of the  $EF_{BL, CO_2}$  values, computed from Options - 1 and 2 described above, has to be considered as the value of  $EF_{BL, CO_2}$  as per requirements of ACM0013 Version 03. Hence, the value of  $EF_{BL, CO_2}$  is considered as 0.9120 tCO<sub>2</sub>/MWh for assessing the baseline emission.



For computation of ex-ante project emissions, the values of quantity of fuel combusted in the project plant -  $FF_{i,y}$ , weighted average net calorific value of fuel -  $NCV_{i,y}$  and  $CO_2$  emission factor of fossil fuel used in project and baseline -  $EF_{FF,CO_2}$  are being used. For computing the ex-ante  $FF_{i,y}$ , design station heat rate of the super-critical technology as guaranteed by the supplier, NCV, expected load factor of and commissioning schedules are taken into consideration.

The  $CO_2$  emission factor of for the fossil fuel use in the project and the baseline is sourced and considered as 0.0928 t $CO_2$ /GJ which is found to be OK.

Moreover, the secondary oil consumption under the baseline and project scenario remains the same thus the amount of energy supplied by the secondary oil is not considered for emission reduction calculations.

As per the methodology, no leakage emissions are to be considered. Thus the emission reductions by the project activity is calculated as the difference between baseline emission and project emissions.

Hence emission reduction is calculated as

$$ER_y = BE_y - PE_y$$

The validation team has checked the underlying input values as well as the computation in the spreadsheet<sup>/XCS/</sup>. The estimation of the baseline emission, project emission was realized in a transparent and conservative manner.

The calculation is carried out as per the applied methodology and found correct by the assessment team. The ex-ante parameters required for the calculation of emission reduction are correctly estimated in the revised PDD as per the requirement of the methodology. The estimated emission reduction is conservative and correct. However, the compliance of the same including the use of the methodological formula needs to be checked during the verification.

Nevertheless CAR B22-CAR B25 were raised during the validation process and closed successfully.

## 5.2.5 Additionality Determination

### Consideration of CDM in decision making (if project start before validation)

The Board of Directors of L&T Power Development Ltd. (LTPDL) took a decision to bid for the project<sup>4</sup> in the meeting held on September 22, 2009. While approving the participation in the bidding, the Board resolved *"...that the company will bid for Rajpura Thermal Power Project and revenue from Clean Development Mechanism (CDM) be considered while deciding bidding amount and accordingly the Board*

<sup>4</sup> Bidding process involves transfer of 100% of share capital in the Special Purpose Vehicle (SPV) - Nabha Power Ltd. (NPL) - incorporated by Punjab State Electricity Board to implement the power project - to the bidder who submits the lowest levelized tariff



*instructed Mr R. K. Sharma to proceed with bidding considering revenue from sale of Carbon Credits*". Project participant has submitted a copy of the Board resolution dated September 22, 2009. Validation Team checked the resolution and observed that the investment decision was taken by a body competent to take the decision and that the CDM benefits were the decisive factor in the investment decision

The project developer has stated the start date of the project activity is July 16, 2010 and has submitted a copy of EPC Contract between Nabha Power Ltd. and Larsen & Toubro Ltd. as evidence. The project developer had stated that no construction or any real action on the implementation of the project activity was undertaken prior to this date. Since the *real action of the programme activity* had begun on July 16, 2010, as per Glossary of CDM terms (Version 05), this date has been treated as the start date of the project activity.

The PDD was web-hosted for public comments on September 14, 2010, i.e., after the start date of the project activity. Since the start date of the project activity was after 2<sup>nd</sup> August 2008 and the PDD was web-hosted after the start date, the project activity falls under the category of *new project activity* as per paragraph 100 of VVM 01.2) and as per paragraph 2 of Annex 22, EB 49, project participant is required to inform the Host Party DNA and the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status and such notification must be made within six months of the project activity start date. However, the project developer had informed both UNFCCC and DNA as early as 21/01/2010, much before the start date of the project activity (start date being 16th July 2010), about their intention to seek CDM status. Copies of correspondence with UNFCCC have been submitted to validation team. Besides, validation team also checked the UNFCCC website<sup>5</sup> [as required vide paragraph 101 of VVM (01.2)] and satisfied itself that the project developer had informed UNFCCC and DNA.

In the light of the above, validation team concludes that investment decision was taken by an authority competent to take the decision, there was a prior consideration of CDM and CDM benefits were considered necessary in the decision to undertake the project as a CDM project activity. The bid was submitted after the Board authorised the submission of bid after taking into consideration CDM benefits. The project therefore conforms to paragraph 97 to 99 of VVM version 01.2.

### **Application of methodology / methodological tools**

The project is based on the methodology ACM 0013 (Ver 03). The methodology requires PP to use levelized cost of electricity production in \$/kWh as financial indicator for identification of most attractive baseline scenario alternative and use the latest 'Tool for the demonstration and assessment of additionality' to assess the additionality of the project activity. The methodology also requires the project developer to demonstrate that the baseline alternative is available to the project participant in case investment comparison analysis is applied.

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<sup>5</sup> <http://cdm.unfccc.int/Projects/PriorCDM/notifications/index.html> (Energy Efficient Power Generation by Nabha Power Limited)

In accordance with ACM0013, the project developer has demonstrated additionality based on the valid version of the “Tool for demonstration and assessment of additionality (Ver 05.2)” and Guidance on Investment analysis (Ver.03.1). For the above reasons, this approach has been assessed to be appropriate for the assessment of additionality for this project activity.

Project developer has used LUCE, as required by the methodology, to demonstrate the low cost option and benchmark analysis, using project IRR as financial indicator, to demonstrate additionality of the project activity. In so far as benchmark analysis is concerned, having regard to the fact that the project involves investment and is funded by a mix of debt and equity, project IRR is the most suited financial indicator for the project type and decision making context. Since in this instant case, as subsequent section would reveal, baseline is outside the direct control of the project developer, the choice of the project developer is restricted to ‘invest or not to invest’, hence, the benchmark approach is most suited as per guidance 16 of Annex 58 of EB 51.

In the above background Validation Team concludes that the additionality justification given by the project developer is in accordance with the requirements derived from the approved CDM methodology and the methodological tools referred therein and also conforms to guidance given by EB vide paragraphs 106 and 107 of VVM.

## Alternatives

Identification of alternatives: The project activity is governed by the methodology ACM 0013 (version 03). As per the methodology, the identification of alternative baseline scenarios should include all possible realistic and credible alternatives as alternative to the project activity that provide outputs or services comparable to the proposed CDM project activity (including the proposed project activity without CDM benefits). Accordingly, the project developer has considered 10 alternatives for the project activity. The alternatives considered and the credibility thereof is given in the following table:

Alt.	Description	Comment on the alternative
1*	The project activity not implemented as a CDM project	Though the alternative is realistic and credible, it faces barriers
2*	Power generation using coal but with sub-critical technology – Plant located at Pit Head	This is a realistic and credible alternative
3*	Power generation using coal, with sub-critical technology - Plant located away from Pit-Head -	This is a realistic and credible alternative

	Linkage Plant	
4	Power generation using coal, with sub-critical technology - Plant based on imported coal	This is not a realistic or credible alternative, since the cost of imported coal is much more than the domestic coal as well as the transportation of coal to such an inland location (more than 1500 km from the nearest port), the levelized cost would be higher than the previous two alternatives. Hence, this alternative is not taken up for further analysis.
5	Power generation Lignite as fuel – located at Pit head (all the lignite based generation established in India at present are commissioned on the mine mouth)	The project activity has been allocated land by PSEB and no coal/lignite are located in the vicinity. Moreover all the Lignite based power plants in the country are located at pit-head. Thus this alternative is not credible. Further, the alternative is also not credible as the GCV of lignite is lower and the price is higher than coal. Hence, this alternative is not taken up for further analysis.
6*	Power generation using NG based on CCGT technology	Though the alternative is credible in terms of technology and operational characteristics and in terms of output services, the alternative faces problems of gas availability. Nevertheless this alternative is taken up for further analysis
7	Power generation using Diesel/FO	Diesel available for non-transport sector in the country for the year 2006-07 is 26.5 Million tons <sup>6</sup> . The requirement of diesel to operate as a base-load plant in order to deliver services comparable to project activity is works out to approximately 1683 million tons (considering CEA standard values for station heat rate of 1975 kcal/kWh and GCV of diesel at 10500 kcal/m <sup>3</sup> ). As the required quantum of diesel for project activity is 64 times more than India's domestic production and with no further diesel manufacturing capacity enhancement underway, the option is not realistic and credible

<sup>6</sup> Point 8 & 10, Page II: Energy Statistics 2007 Highlights ([http://mospi.nic.in/es07\\_highlights.pdf](http://mospi.nic.in/es07_highlights.pdf))

8	Power generation using nuclear fuels	In India, at present, nuclear-based electricity generation is not available for 100% private sector ownership and hence this alternative is not realistic
9	Renewable energy - Hydro, wind, biomass and solar	Generation of power to the tune of 1400MW (which would be running on a base load) using renewable resources like small hydro, wind, biomass etc is not a technically and economically feasible proposition on account of inconsistent availability of renewable resources as wind/ river water/biomass is seasonal in nature. Hence, renewable energy as an alternative is not realistic
10	Import of electricity from connected grids, including the possibility of new interconnections	Electricity Import from other regional grids in India is not an alternative which will deliver outputs similar to the project activity, as these grids are suffering from shortages to meet their energy demand and in particular the peak demand <sup>7</sup>

\* Selected as a most plausible, credible and realistic baseline scenario for further assessment

Detailed explanations for each of the alternatives listed above and the credibility thereof has been given in the PDD.

In this context, it may be stated that the project was won by the project developer in a competitive tariff bid (lowest in terms of power tariff quoted) and the bid document clearly states, “*Procurement of Power on Long Term Basis from Coal Based Thermal Power Station to be set up at Village Nalash, near Rajpura, District Patiala, Punjab*”. Hence, the fuel has been pre-determined by the bid document and the allotment of the project to the project developer is subject to this condition only. Nevertheless since the methodology requires the project developer to take into consideration all plausible alternatives, which could be available to other stakeholders (though not available to the project developer) within the grid boundary and all relevant power plant technologies that have recently been constructed/under construction/being planned, project developer has taken into consideration all plausible alternatives. The PDD provides clear description of each baseline scenario alternative as required by the methodology.

PDD also provides appropriate reasons for exclusion of alternatives and documentary evidence to support the contention. Validation team checked the sources of information provided by the project developer as also the sources not listed by the project developer (L3 information = Background investigation) and got

<sup>7</sup> CEA published executive summary of Power Sector (2009-10)

satisfied with the explanations given and document support provided with respect to the baseline alternatives excluded. *Therefore, Validation team concludes that the project activity conforms to Step I of the Methodology ACM 0013.*

In the above background, the Validation Team has come to the conclusion that of the alternatives discussed above, four alternatives are appropriate for identifying the baseline alternative as required by the methodology, viz., implementing the project activity

1. as non-CDM activity;
2. with sub-critical technology and plant located on the pit head;
3. with sub-critical technology and plant located away from pit head; and
4. with NG as fuel

The Project developer has furnished the input values, and the documentary evidence supporting the same. Validation team assessed the appropriateness and suitability of the input values to the investment analysis and their conformity to the guidance given vide paragraphs 95 and 111 (a) & (b) of VVM Version 01.2.

Various input values considered in the financial analysis, documentary evidences verified thereof and the basis on which the input values were found to be correct, appropriate and accepted by the validation team are given in brief in the following paragraphs:

**Project Cost – Project activity:** The project cost is based on the note submitted to the Board<sup>8</sup> which includes the, land cost, EPC cost, preliminary and pre-operative expenses, IDC, contingency and margin for working capital. Land cost is based on the amount payable to Government of Punjab<sup>9</sup>; EPC contract value is based on the letter given by the EPC contractor<sup>10</sup> received by the project developer at the time of taking investment decision; Preliminary and pre-operative expenses include manpower cost, engineering fee, trial and start up expenses, insurance during construction and miscellaneous expenses and account for less than 2% of project

<sup>8</sup> At the time of taking investment decision on September 22, 2009 for submitting the bid, the project developer had prepared the financial analysis for a unit size of 660 MW (in the Note to Board dated September 21, 2009). Since the RfP provides for supplying power upto 1320 MW, after winning the bid, the project developer decided to increase the unit size from 660 MW to 700 MW. Accordingly, the project developer revised the project cost for 2X700 MW and presented a Note (dated March 15, 2010) to the NPL Board in the meeting held on March 17, 2010. On obtaining the approval of the Board, the modification in the capacity was communicated to PSEB on March 23, 2010 and the approval was accorded by PSEB for the enhanced capacity on April 13, 2010. Since the present project size is 1400 MW and necessary approval have been obtained, validation team considered it appropriate to take 700 MW unit size in the financial indicator computation.

The cost has been estimated at Rs.90 bn for 1320 MW capacity and Rs.95 bn. for 1400 MW. This is mainly on account of the increase in the EPC cost by Rs. 4 mn. and corresponding increase in IDC, margin for working capital and contingency

<sup>9</sup> Documentary evidence on the amount payable (letter from PSEB dated 08/09/2009) has been submitted to validation team

<sup>10</sup> Turnkey offer letter dated September 19, 2009 received from Larsen & Toubro Ltd. provides a total turnkey contract cost of Rs.66 bn for 1320 MW while the actual contract signed on 16/07/2010 is Rs. 69.75 bn for 1400 MW.



cost. Interest during construction has been computed based on the phasing of implementation and draw down of loan. Working capital margin have been computed based on stocking period of various current assets and the prevailing margin on current assets.

The total project cost based on the above works out to Rs.67.85 mn./MW. Project cost projected by various developers in the web hosted PDD range from Rs.40 mn./MW to Rs.60 mn./MW. Validation team observed that though there are a few projects which have projected a cost of around Rs.40 to 47 mn./MW, cost of majority of the web hosted projects ranged between Rs.50 mn to Rs.60 mn. Energy efficient power generation at Kawai in Rajasthan, India (Adani Power Rajasthan Limited), for example, has projected a cost of Rs. 53.26 mn/MW; Grid connected, energy efficient power plant in Junagadh, Gujarat by SPEPL (Shapoorji Pallonji Energy (Gujarat) Pvt. Ltd) has projected a cost of Rs.56.46 mn./MW; Energy efficient power generation by GCEPL (GMR Chattisgarh Energy Private Ltd.) has projected a cost of Rs.60.51 mn./MW and 1320 MW Coal Based Super Critical Thermal Power Plant by Jaiprakash Power Ventures Limited (JPVL) has projected a cost of Rs.61.36 mn./MW.

Validation team sought a clarification, in response to which the project developer submitted the EPC contract already signed, Project Information Memorandum (PIM) prepared by the lending bankers and a Chartered Accountant's certificate evidencing the contracts already signed, investment already made and the outstanding contingent liability as on March 31, 2011. EPC contract alone works out to Rs.69.75 bn. or Rs.50 mn/MW. Project Information Memorandum (PIM) prepared by the lending bankers estimates the cost of the project at Rs.96 bn. (in contrast to Rs.95 bn. considered in the financial indicator calculation). CA certificate reveals that the project has already made an investment of Rs.16260 mn. and the outstanding contingent liability (contract already signed but the payment not released) alone is of the order of Rs 62610 mn till March 31, 2011, resulting in a total cost of Rs.78870 mn. The scheduled date of COD of the first unit in project is January 2014. If the investment to be made during the next 3 years is taken into account, the cost would be Rs.96000 mn. (as appraised by the banks).

Validation team also observed that the cost of Boiler, Turbine Generator (BTG) have been higher in the case of projects, which have opted to source them from within the country instead of importing it. The cost of BTG in the case of Karnataka Power Corporation Ltd., for the Edlapur project, for example, is reported to be Rs.45 mn. and that of Raichur project is reported to be Rs.39.2 mn. (supplier – BHEL) and 1320 MW project of Jai Prakash Power Ventures Ltd. (supplier – L&T) is reported to be Rs.32.8 mn<sup>11</sup>.

Considering the facts that the plant and equipment are indigenous, SHR reckoned by the project is the lowest (2082 kcal/kWh - requiring more efficiently designed turbine generator leading to higher cost), EPC contract alone works out to Rs.50 mn/MW,

<sup>11</sup> The cost represents only BTG cost. This cannot be compared with EPC cost as EPC cost includes besides BTG cost, BOP cost also.



lending institutions have approved and extended financial assistance (and thereby taken direct risk) based on the firmed up cost of Rs.96 bn. and that the CA certificate reveals that the PP had already invested more than Rs.78 bn. till March 31, 2011, validation team considers the cost assumed is reasonable and appropriate for the project activity.

Project cost – Sub critical pit head and linkage plants: Project developer has assumed Rs.40.19 mn./MW for sub critical - pit head and linkage plants. The cost is based on the average cost of 3 power projects which placed order for plant and machinery in 2008 – the latest year before the decision making date. All the three projects were of 600 MW unit size. For all the projects, plant and equipment were supplied by BHEL and BGR – both local manufacturers<sup>12</sup>. Validation Team also checked the project cost assumed by other super critical projects, which webhosted the PDD for GSC and observed that out of 23 projects, only 3 projects assumed project cost of more than Rs.40 mn. /MW; 20 projects have assumed project cost of less than or equal to Rs.40 mn./MW. Since the cost assumed is based on Monthly Report published by a Government Organization, the cost pertains to projects which placed order in 2008 and the majority of super critical projects seeking CDM registration have assumed cost of less than or equal to Rs.40 mn./MW, the cost considered by the project developer appears to be reasonable, correct and appropriate.

Validation team observed that the cost difference between super critical and sub critical works out to 69%. The average cost differential between super critical and sub critical projects in the case of 23 webhosted projects works out to 51%, of which 7 projects have projected a cost differential of more 75%. Hence, the cost differential appears reasonable and acceptable.

Project cost – NG based power project: Cost of the NG based power project has been reckoned at Rs.34.64 mn./MW based on the cost of Pragati Power, which placed the order for main plant and machinery in May 2008 – the year before which the investment decision was taken by the candidate project<sup>13</sup>. The cost of Pragati Power is Rs.5195.8 mn. (for 1500 MW) yielding a cost of Rs.34.64 mn./MW. Validation team checked publication and found the value to be correct. Validation Team, therefore, considers the capital cost assumed by the PP is valid, correct and appropriate.

Financing pattern: The project is envisaged to be financed by a term loan of 75% and equity capital of 25%. The financing pattern for infrastructure projects normally range from 70:30 to 80:20. Considering the actual gearing (as per financial closure) is 75:25 and that the gearing is within the range, validation team accepted the financing pattern envisaged by the project developer at the time of decision making.

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<sup>12</sup> The plant and equipment for project activity – super critical project - is also sourced from local manufacturer and hence the comparison is appropriate

<sup>13</sup> One more project, viz., Tripura CCPP also placed order for main plant and equipment around the same time. The cost of Tripura CCPP works out to Rs.47 mn./MW. Though this increases the LUCE of gas based power plant, since it is not the base line, it does not affect the conclusion.

The same financing pattern has been assumed for all alternatives in conformity with sub-step 2c of Additionality Tool.

Input Parameters: The input parameters used in financial indicator calculations include installed capacity, PLF, auxiliary consumption, power tariff, fuel consumption, fuel cost, O&M cost, interest, depreciation and taxation.

- a Installed capacity: Installed capacity of the project activity has been considered at 1400 MW, i.e., 2 X 700 MW. The installed capacity is based on the Board Note (17/03/2010) and approval from PSEB dated 13/04/2010. At the time of taking investment decision on September 22, 2009 for submitting the bid, the project developer had considered installed capacity of 1320 MW (Note to Board dt. 21/09/2009). Since the RfP provides for supplying power upto 1320 MW, after winning the bid, the project developer decided to increase the capacity from 1320 MW to 1400 MW. Accordingly, the project developer revised the installed capacity to 1400 MW and presented a Note to the Board in the meeting held on March 17, 2010. On obtaining the approval of the Board, the modification in the capacity was communicated to PSEB on March 23, 2010 and the approval was accorded by PSEB for the enhanced capacity on April 13, 2010. Since the present project size is 1400 MW and necessary approval has been obtained, validation team considered it appropriate to consider the capacity of 1400 MW in the financial indicator computation. Validation team checked the Board Notes, RFQ, RFP, acceptance of bid, PPA and PSEB approval. All the documents are found to be authentic and credible. Validation team checked the capacity given in those documents and found them to be in agreement with the capacity assumed by the PP. The documents are authentic, input figures pertain to the candidate project only, and hence it is appropriate. However as the first decision was based on 1320 MW thus the financial viability for 1320 MW has also been assessed. The Project IRR with 1320 MW and project cost of INR 90000 Million comes to be 10.44% which is lower than the Project IRR for 1400 MW i.e 10.5% thus for further analysis the project IRR of 1400 MW has been considered as the same is appropriate as well as conservative.

For subcritical technology based power projects (pit head and linkage) installed capacity has been reckoned at 1200 MW, i.e., 2 X 600 MW<sup>14</sup> based on the details given in the Monthly Report on Broad Status of Thermal Power Projects in the Country, published by CEA (July 2009 report). As per the Report, 3 projects, viz., North Chennai TPP, Kalisindh TPP and Malwa TPP – all of which placed orders in 2008 - chose unit size of 600 MW.

In the case of NG based power plant, installed capacity has been reckoned at 1500 MW, i.e. two blocks of 750 MW (each block consisting of 3 units of 250

<sup>14</sup> As per the Monthly Report on Broad Status of Thermal Power Projects in the Country, published by CEA (July 2009 report), 3 projects, viz., North Chennai TPP, Kalisindh TPP and Malwa TPP – all of which placed orders in 2008 - chose unit size of 600 MW. Considering the fact that 600 MW unit size is common in the country and that the installed capacity reckoned is almost the same as that of the project activity, Validation Team considers the installed capacity as appropriate. The capacity assumed is in conformity with Additionality Tool (step 2c) and Methodology ACM 0013 (step 1)

MW) based on the installed capacity of Pragati Power, which placed the order for main plant and machinery in 2008.

Paragraph 9 of Sub-step 2c of Additionality Tool states that assumptions and input data for the investment analysis shall not differ across the project activity and its alternatives, unless differences can be well substantiated. Methodology ACM 0013 states the alternatives need not consist solely of power plants of the same capacity, load factor and operational characteristics (i.e. *several smaller plants*, or the share of a larger plant may be a reasonable alternative to the project activity), however they should deliver similar services (e.g. peak vs. base load power). Taking into consideration these two requirements and the normal unit size, validation team concludes that the installed capacity assumed for alternatives is appropriate and correct.

- b) PLF, Auxiliary consumption, tariff and ash sales: PLF has been assumed at 93%<sup>15</sup>; Auxiliary consumption has been assumed at 5.5%<sup>16</sup>. Other super critical power projects have assumed auxiliary consumption ranging from 6% to 7.5% and 8.90% by Grid connected energy efficient power generation in Jhajjar, Haryana (Jhajjar Power Corporation Ltd.). Hence, the auxiliary consumption is considered reasonable and appropriate. Power tariff for the project activity is based on RfP submitted by the company (based on which the project was awarded to the project developer), which is enshrined in the PPA. In the webhosted PDD, project developer had not assumed revenue from ash sale. Since the project would be generating substantial quantity of ash and it has a value, project developer was asked to reckon the revenue from ash sale and it has been taken into account in the financial indicator calculation<sup>17</sup>.

PLF, auxiliary consumption and power tariff has been reckoned at the same level as that of the project activity for sub critical pit head and linkage alternatives. This is in conformity with sub-step 2c of Additionality Tool. In the case of NG based power plant, auxiliary consumption has been taken at 3%, in conformity with the

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<sup>15</sup> Review of Performance of Thermal Power Stations – 2008-09 brought out by CEA reveals that the overall Operating Availability of Generating Stations under Private Sector Utilities was 92.73% which was the highest among different Sectors. Hence, the PLF of 93% assumed by the project developer is considered appropriate. Please see [http://www.cea.nic.in/reports/yearly/thermal\\_perfm\\_review\\_rep/0809/Highlights.pdf](http://www.cea.nic.in/reports/yearly/thermal_perfm_review_rep/0809/Highlights.pdf)

<sup>16</sup> In the webhosted PDD, Auxiliary consumption has been assumed at 6%. However, validation team observed that the signed EPC contract provides Auxiliary consumption of only 5.5%. Accordingly, the project developer was asked to reduce the auxiliary consumption. This is conservative.

<sup>17</sup> The ash percentage of coal is evidenced by the clarification letter dated 16<sup>th</sup> September 2009 issued by Nabha Power Ltd. (under PSEB), wherein the ash percentage was given as 35-40% and the average 37.5% has been taken into consideration. Saleable quantity of fly ash has been taken at 80% of generation in conformity with MOEF notification dated November 6, 2008, which requires 20% of fly ash to be given free of charge to units manufacturing fly ash bricks. The sale price is taken at Rs.341/MT, which is evidenced by ACC Annual Report. Fly ash price has been subjected to 5% escalation based on the inflation experienced by the country. Though the document is dated post decision making date, since no documentary evidence could be submitted by the project developer corresponding to the decision making period in as much as it was not considered at the time of decision making, the evidence has been accepted by the validation team.

recommended auxiliary consumption by CERC vide its Tariff Notification of January 2009<sup>18</sup>.

- c Station Heat Rate: Project assumes SHR of 2082 kcal/kWh based on the EPC contractor's offer letter dated September 19, 2009, which has been subsequently guaranteed by the EPC contractor. This is one of the lowest SHR considered by any super critical projects already webhosted. Besides the candidate project, only 3 other projects, viz., Energy efficient power generation in India, Tirora - Adani Power Maharashtra Ltd. – 2060 kcal/kWh (registered), GHG Emission Reductions through grid connected high efficiency power generation (Coastal Gujarat Power Corporation Ltd.) – 1965 kcal/kWh (rejected) and 1320 MW Coal Based Super Critical Thermal Power Plant by Jaiprakash Power Ventures Limited (JPVL) – 2065 kcal/kWh (under validation), all other projects have considered SHR of more than 2100 kcal/kWh. In the above background, validation team is convinced that the SHR considered is conservative, realistic and appropriate for the project activity.

In the case of sub critical technology alternatives (both pit head and linkage alternatives), heat rate has been taken at 2301 kcal/kWh based on best operating sub-critical plant in India, i.e. Torangallu Ext 1 calculated as per option 1 of the methodology. The SHR value has been calculated as per the data published in CEA Version 6 (net generation, specific emission) and assuming an auxiliary of 5.5% (same as that of project). This value is conservative as compared to all other operating plants in the country as well as the CERC recommended value of 2425 kcal/kWh. Validation team checked the appropriateness of the Heat Rate by comparing it with (a) Report of the Expert Committee on Fuels for Power Generation and (b) other super critical technology projects already webhosted.. It was observed that Report of the Expert Committee on Fuel has projected heat rate of 2400 kcal/kWh. Out of 23 super critical projects which have webhosted PDD for GSC, 13 projects have considered SHR of 2425 or more. Validation Team considers the heat rate (2301 kcal/kWh) assumed is conservative, correct and appropriate for the project activity as this represents the best operating sub-critical plant in India. On the other hand in the case of NG based power project alternative, heat rate has been considered at 2000 kcal/kWh based on CERC Tariff Notification dt. 19/01/2009. The heat rate given in the notification ranges from 2000 kcal/kWh to 2400 kcal/kWh. Except one plant, all other plants given in the order have operated at the heat rate ranging from 2000 kcal/kWh to 2075 kcal/kWh. Project developer had considered the most efficient plant with lowest heat rate and hence has chosen 2000 kcal/kWh, which is appropriate. Validation team checked the CERC notification and observed that the heat rate is correct. Therefore, the heat rate considered by the project developer is appropriate and correct

- d Fuel: GCV of coal is based on the information given vide email dated September 11, 2009 by Nabha Power Ltd. (then under PSEB) to all the bidders at the time of

<sup>18</sup> Ash sale revenue does not arise in the case of NG based power project. PLF and tariff has been assumed at the same level as that of the project activity and other two alternatives.

bidding. Validation team observed that the GCV assumed by other projects, based on domestic coal, has been in the range of 3300 kcal/kg to 4976 kcal/kg. The GCV assumed, therefore, is within the range. Since the GCV is based on the indication given by Nabha Power Ltd. (then under PSEB) and that the GCV is within the range assumed by other super critical power projects, validation team considers the calorific value assumed is correct and appropriate for the project activity.

Coal cost is based on the information given by Nabha Power Ltd. (then under PSEB) before bidding and is also evidenced by the coal cost published by South Eastern Coalfields Limited (a copy of which has been submitted by the PP to the DOE). Other projects based on domestic coal have assumed cost ranging from Rs.600/ MT (Sasan Power Ltd.) to Rs.723/MT (Energy Efficient Power Generation by Talwandi Sabo Power Ltd.). Therefore, the coal cost assumed by the company is the lowest.

Since it is a linkage plant (project located away from pit head), project developer has to transport the coal from pit head to the plant. The fuel cost does not include coal transportation cost. These are two different costs and hence dealt with separately in the financial indicator calculation. Validation team checked the clarification letter issued by Nabha Power Ltd. on 08/09/2009 and observed that it mentions *inter alia* about fuel transportation cost. The model calculation provided by Nabha Power Ltd. to all bidders on 11/09/2009 also provides for coal cost and coal transportation cost. Therefore, the fuel (coal) cost of Rs.520/MT does not include transportation cost.

The project is located in the State of Punjab. Neither the Punjab state, nor any of the adjoining states have coal deposits. Coal deposits in India are located in the states of Chhattisgarh, Madhya Pradesh, Maharashtra, Jharkhand, West Bengal, Orissa, Assam and Andhra Pradesh - all located in the central or eastern part of the country. Request for Proposal states that the fuel has to be transported to a distance of approximately 1600 kms. Hence, the project has to transport the coal and coal transportation cost is inevitable.

Power plants receive coal transported through rail. The model calculation provided by Nabha Power Ltd. to all bidders on 11/09/2009 considered coal transportation cost of Rs.1204, which has been adopted in the financial indicator calculation, as this was the information available to the PP at the time of decision making. The transportation cost has been given by Nabha Power Ltd. (under PSEB) before bidding vide its email dated September 11, 2009. The rate has been cross checked with CERC notification<sup>19</sup>, where the transportation cost has been given as Rs.1617.20/MT for a distance of 2000 kms.

<sup>19</sup> Revised Methodology for Determining the Escalation Factors and Other Parameters to be notified by CERC as per the Amendment to the Competitive Bidding Guidelines dated 27.3.2009 (July 2009), please see <http://www.cercind.gov.in/Escalation-rate/Revised-Methodology-dated-3.7-9.pdf> (p.4)





Validation team also checked the transportation cost independently and observed that the coal freight rates published by the Indian Railways<sup>20</sup> for a distance of 1451-1475 Kms. is Rs. 1289.70/ton and for a distance of 1475 -1500 kms. is Rs. 1310.70/ton. The transportation cost works out to ~Rs.1300/ton. Hence, transportation cost of Rs.1204/ton assumed by the project developer was found to be conservative and appropriate

Therefore, validation team is convinced about the correctness and appropriateness of the transportation cost.

Coal cost has been subjected to an escalation of 6.12% and the transportation cost to 2.39% as prescribed by PSEB communication dated 11/09/2009. Clause 3.3.1.3 of the RfP requires the bidder to adopt the rate notified by the CERC to energy charges. CERC notification dated 03/07/2009 was the latest notification available at the time of decision making. CERC prescribes separate escalation rates for projects depending on the distance between the power plant and the coal deposits. Thus, it provides escalation rate for power plants located at a distance of upto 100 kms., upto 500 kms., upto 1000 kms., upto 2000 kms. and beyond 2000 kms. For the plants located upto 2000 kms., CERC has prescribed fuel transportation cost escalation of 2.39% based on the mean escalation in the transportation cost based on 3 years moving average during the 10 years preceding 2008. Since the RfP requires the bidders to adopt this rate, project developer has to adopt this rate. Validation team checked the notification and found the rate considered is correct and appropriate. Moreover, validation team also checked the RfP and observed it states that bidder should adopt the rate notified by the CERC to energy charges. Validation team also submits that all bid based power plants in the country adopt the rates prescribed by CERC. Moreover, coal transportation cost is a “pass on” cost, in the sense that every escalation in the fuel transportation cost is matched by a corresponding escalation in the tariff. Secondary fuel consumption is based on the “Recommendations on Operation Norms for Thermal Power Stations for Tariff Period beginning 1st April, 2009”<sup>21</sup> dated November 4, 2008 issued by CERC and the price is based on fuel oil price quoted on NCDEX on September 18, 2009.

CV of fuel, fuel cost, fuel transportation cost, escalation thereon, secondary fuel consumption, cost thereof and escalation thereon have been kept constant for project activity as well as sub critical technology alternatives (pit head and linkage plant alternatives) as these parameters do not change based on technology.

However, in the case of NG based power project alternative, CV is based on the GAIL website wherein the CV has been considered at 8500 kcal/SCM for transportation. Validation team independently checked the CV and observed that

<sup>20</sup> [http://www.indianrailways.gov.in/railwayboard/uploads/directorate/traffic\\_comm/freight\\_rate-2k6/rate\\_inst\\_59-2k6-table.pdf\(class\\_150\)](http://www.indianrailways.gov.in/railwayboard/uploads/directorate/traffic_comm/freight_rate-2k6/rate_inst_59-2k6-table.pdf(class_150))

<sup>21</sup> <http://www.cercind.gov.in/October08/Report-CERC-norms-CEA-Final-04-11-08.pdf> (p.30)



the Report of the Expert Committee on Fuels for Power Generation<sup>22</sup> has assumed CV of 10,000. Gas based power projects, which have webhosted their PDDs for GSC, have assumed CV in the range from 7699 (North Delhi Power Ltd.) to 9382 (Gautami Power Ltd.). The CV assumed, therefore, falls within the range. Validation Team checked the impact on the LUCE if the CV is taken at 10,000 and observed that the LUCE goes down from Rs.3.44/kWh to Rs.3.04/kWh and does not impact the conclusion of baseline. In the above background, validation team considers the CV assumed by the project developer is appropriate and correct. Fuel cost has been sourced from the publication – The Oil & Gas Sector Overview in India 2009<sup>23</sup>. Validation Team checked the source and the calculation and found them to be correct. Validation Team, therefore, is convinced that the cost assumed by the project developer is appropriate and correct. Transportation cost is based on the GAIL website wherein the transportation cost is given as Rs.1.15/SCM for transporting NG with a Calorific Value of 8500 kcal/SCM for transportation. Validation Team checked the source and found the value to be correct. Validation Team, therefore, concludes that the cost assumed by the project developer is appropriate and correct. CERC recommended escalation factors have been considered for the fuel cost and transportation cost escalation, which is adopted by all projects.

- e O&M cost: The operation and maintenance cost and the escalation thereon are based on the communication dated September 18, 2009, received from O&M Solutions (P) Ltd<sup>24</sup>. Validation team observed that CERC has recommended O&M cost of Rs.1.46 mn./MW for thermal power projects with unit size of more than 600 MW commencing operation in 2013-14. Validation team checked the O&M cost considered by other super critical projects and observed that barring 5 projects, viz., Coastal Gujarat Power Corporation Ltd. (Rs.0.62 mn./MW) and 4 projects of Adani Power Ltd. (which assumed O&M cost ranging from 0.60 to Rs.0.80 mn) all other projects have considered O&M cost of more than Rs.1 mn./MW. Hence, the O&M cost of Rs.0.85 mn/MW considered by the developer is conservative and appropriate for the project activity. O&M cost has been escalated at 5% per annum based on O&M Solutions letter dated 18/09/2009. CERC in its order dt. 19/01/2009 has recommended escalation at 5.72% for O&M cost. Validation team also observed that other projects, which have webhosted their PDDs, have assumed escalation ranging from 4% (by projects which took investment decision prior to January 2009)<sup>25</sup> to 5.72%. The escalation considered, therefore is well within the range. In the above background,

<sup>22</sup> The Report of the Committee of Experts on Fuels for Power Generation, CERC [http://www.cea.nic.in/reports/articles/thermal/expert\\_committee\\_report\\_fuel.pdf](http://www.cea.nic.in/reports/articles/thermal/expert_committee_report_fuel.pdf) (p.5)

<sup>23</sup> The Oil & Gas Sector Overview in India – 2009, KPMG. (P.11). <http://www.kpmg.com/Global/en/IssuesAndInsights/ArticlesPublications/Documents/The%20Oil%20and%20Gas%20Sector%20Overview%20in%20India%202009.pdf>

<sup>24</sup> O&M Solutions (OMS) is a highly experienced multinational engineering service provider incorporated in Mauritius, with offices in Bangladesh, India and Pakistan. OMS specialised in management and services of Greenfield construction developer projects to long term operation and maintenance services to the power industry

<sup>25</sup> Prior to the issuance of tariff order in January 2009, CERC has recommended 4% escalation in O&M cost vide its tariff order of March 2004 (p.19 & 20)

validation team is convinced that the escalation rate considered is correct and appropriate.

The same O&M cost and escalation have been assumed for sub critical alternatives also. All super critical projects which have webhosted the PDD for GSC, have assumed same O&M cost and escalation for both super critical and sub critical projects and hence, the assumption is appropriate. This is in conformity with sub-step 2c of Additionality Tool.

- f Loan terms: Interest rate, repayment period and moratorium are based on the loan contracted by the company. Detailed computation interest forms part of the worksheet. This in line with the guidance 11 of Annex 58, EB 51 (where post tax project IRR is considered as financial indicator, actual interest should be taken into account in computing tax liability).

The same terms have been assumed for all alternatives and this is in conformity with sub-step 2c of Additionality Tool.

The Prime Lending Rate (PLR) at the time of decision making was 11% to 12%<sup>26</sup>. Since the same terms of loan have been assumed for all alternatives, change in interest rate does not affect the baseline identification

- g Depreciation rate: Project developer has adopted CERC recommended straight line method depreciation rate, (which is normal for power companies) for computing book profit and Income Tax Act stipulated written down value method depreciation for income tax calculation, which are accepted accounting practices in the country. The rates have been retained at the same level for the project activity and all alternatives. This is in conformity with sub-step 2c of Additionality Tool.

- h Taxation: Tax liability has been calculated as per the income tax rules. In computing the income tax liability, tax holiday (u/s 80IA of the Income Tax Act, 1961), which the infrastructure projects (under which the project activity falls) are entitled to for 10 consecutive years out of the first 15 years, has been taken into account. The tax rate assumed corresponds to the tax rate prevailing at the time of taking decision. As the tax computation is in conformity with IT Act, validation team is convinced about the correctness and appropriateness of tax computation.

The foregoing discussion represents a summarised version of the input values, details of which are discussed in Table A.3. Table A.3 divides the input values into 5 broad categories, viz.,

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<sup>26</sup> Weekly Statistical Supplement, Reserve Bank of India, September 18, 2009. – Please see [http://rbidocs.rbi.org.in/rdocs/Wss/PDFs/4T\\_180909.pdf](http://rbidocs.rbi.org.in/rdocs/Wss/PDFs/4T_180909.pdf). PLR remained the same for the week ended September 25, 2009 also.

- a) The input values have been broadly divided into 5 categories namely, common Input value like debt/equity ratio, loan term, loan interest rate & other financial assumptions which are common for the project activity and all the alternative scenarios (used for baseline determination).<sup>27</sup>
- b) Specific parameters relating to the project activity
- c) Specific parameters relating to sub-critical pit-head coal power plant and linkage power plant (Base line)
- d) Specific parameters relating to NG based power plant

Table A.3 presents the basis of input values (L1 information), additional documents sought for from the PP for justification of input values (L2 information), independent sources of information used by validation team (L3 information) to cross-check the information contained in the PDD, conformity of input values to the guidance given vide paragraphs 95 and 111 (a) & (b) of VVM Version 01.2, and how the validation team considered the information and the documentation assessed is authentic (conformity to paragraph 97 of VVM 01.2) are given in Table A.3 enclosed to this report.

### Baseline determination

Based on the above input parameters, the levelized unit cost of electricity of the project activity and the alternatives have been computed to determine the baseline as required by the methodology. In computing the LUCE, PP has included all relevant costs like fuel cost, secondary fuel cost, operation and maintenance cost, interest on term loans, Interest on working capital, depreciation and taxation. Sub-step 2c of Additionality Tool states, *“Assumptions and input data for the investment analysis shall not differ across the project activity and its alternatives, unless differences can be well substantiated”*. Accordingly, unless warranted, the input data for all alternatives (like PLF, tariff, working capital stocks, fuel & fuel transportation cost (for coal based alternatives), interest rates, maintenance spares, depreciation rates, taxation etc.) have been kept constant. Only the SHR, cost of fuel, O&M cost and investment cost have been changed as they differ between the project and its alternatives. The Validation Team is convinced that SHR would vary due to technology (sub-critical, super critical and CCGT), fuel cost would vary on account of the difference in fuel – coal (sources of coal - pit head and linkage) and NG; likewise, O&M cost would also vary due to difference in the fuel source – coal and NG. Since the technology is different, the investment cost would also vary and this has been substantiated by the PP with evidences. Revenue from ash sales and salvage value (in the terminal year) have been reckoned as credits in computing LUCE. All the input parameters, as mentioned in the previous paragraphs, have been sourced from RFQ and RFP submitted, EPC offers, EPC contract, correspondence from PSEB and O&M contractor, CERC reports, PPA, Acts, regulations Annual other Reports, details of which are given in Table A-3. Each of the figures used in the LUCE has been checked for its correctness and validity at the time of investment decision taking.

<sup>27</sup> As per the additionality tool, assumptions and input data for the investment analysis shall not differ across the project activity and its alternatives, unless differences can be well substantiated. Therefore the assumptions have been broadly divided into two categories, viz., those which could differ between the project activity and the alternatives and which would not. This is in conformity with the additionality tool.

LUCE has been computed for a period of 25 years (the operating life of the project) and in computing the LUCE, ash sales revenue and the salvage value (in the terminal year) have been reckoned as credit. The resultant LUCE of the project activity and the alternatives are as follows:

Alternative		LUCE (INR/kWh)
1	Project activity not implemented as CDM project	2.41
2	Sub-critical technology - Pit head	1.31
3	Sub-critical technology - Linkage (baseline)	2.27
4	Power generation using NG as fuel	3.44

As evident from the above, the levelized unit cost of generation of electricity using sub critical technology located at pithead (Alternative 2) is the lowest. Since the Methodology states,

*“The baseline scenario alternative that has the best indicator (e.g. the highest IRR) can be pre-selected as the most plausible baseline scenario”*

However, as the location of the project is pre determined (village Nalash, near Rajpura) and there are no coal mines anywhere in the proximity, validation team decided to accept *sub-critical technology based power plant with coal linkage as baseline* instead of sub critical technology based power plant located at pit head.

Sensitivity analysis: As required by the methodology, the robustness of this conclusion has been tested through a sensitivity analysis by subjecting the critical assumptions to reasonable variations. Six factors have been identified as critical, viz., PLF, fuel cost, fuel transportation cost, Gross Calorific Value, O&M cost and capital cost<sup>28</sup>. These six variables have been subjected to 10% variation on either side (independently) (refer EB 51, Annex 58, paragraph 17) and the results of the analysis are given in the following table:

i) Variation in the PLF

(LUCE in INR/kWh)

Alternatives	-10%	0%	+10%
1 Project activity not implemented as CDM project	2.51	2.41	2.32
2 Sub-critical technology - Pit head	1.38	1.31	1.25
3 Sub-critical technology - Linkage (baseline)	2.35	2.27	2.21
4 Power generation using NG as fuel	3.52	3.44	3.37

ii) Variation in the Fuel cost

(LUCE in INR/kWh)

<sup>28</sup> Tariff cannot be considered as variable factor as the objective of this analysis is to determine least cost option.

	Alternatives	-10%	0%	+10%
1	Project activity not implemented as CDM project	2.34	2.41	2.47
2	Sub-critical technology - Pit head	1.24	1.31	1.38
3	Sub-critical technology - Linkage (baseline)	2.21	2.27	2.34
4	Power generation using NG as fuel	3.21	3.44	3.67

iii) Variation in the Fuel transportation cost

(LUCE in INR/kWh)

	Alternatives	-10%	0%	+10%
1	Project activity not implemented as CDM project	2.32	2.41	2.49
2	Sub-critical technology - Pit head*	1.31	1.31	1.31
3	Sub-critical technology - Linkage (baseline)	2.18	2.27	2.37
4	Power generation using NG as fuel	3.40	3.44	3.48

\* This will not change as there is no transportation cost in the case of Pit Head based coal plant

iv) Variation in the O&M cost

(LUCE in INR/kWh)

	Alternatives	-10%	0%	+10%
1	Project activity not implemented as CDM project	2.39	2.41	2.42
2	Sub-critical technology - Pit head	1.30	1.31	1.32
3	Sub-critical technology - Linkage (baseline)	2.26	2.27	2.29
4	Power generation using NG as fuel	3.40	3.44	3.48

v) Variation in the Project cost

(LUCE in INR/kWh)

	Alternatives	-10%	0%	+10%
1	Project activity not implemented as CDM project	2.34	2.41	2.47
2	Sub-critical technology - Pit head	1.27	1.31	1.35
3	Sub-critical technology - Linkage (baseline)	2.24	2.27	2.31
4	Power generation using NG as fuel	3.41	3.44	3.48

vi) Variation in the Gross Calorific Value

(LUCE in INR/kWh)

	Alternatives	-10%	0%	+10%
1	Project activity not implemented as CDM project	2.56	2.41	2.28



2	Sub-critical technology - Pit head	1.37	1.31	1.26
3	Sub-critical technology - Linkage (baseline)	2.44	2.27	2.13
4	Power generation using NG as fuel	3.74	3.44	3.20

Worksheets providing LUCE computations are enclosed. The worksheets also provide facility to check the correctness of the sensitivity analysis carried out in a separate worksheet to check the sensitivity analysis results.

It could be seen from the data given above, even when the LUCE is subjected to sensitivity analysis, Alternative 3 – sub-critical technology – linkage remains the lowest (after sub critical technology – pit head alternative) and hence, power generation using sub-critical technology using coal linkage is the most economically attractive baseline (after sub critical technology – pit head alternative). The foregoing conclusively proves that the proposed project activity is more costly than at least one alternative – one of the requirements stipulated by the Additionality “Tool for the demonstration and assessment of additionality” (Version 05.2).

In this context brief explanation on the appropriateness of the variation considered for various parameters may be in order.

- PLF has been restricted to 10% variation because the PLF considered in calculation is already 93% and achieving more than 100% PLF is not plausible after taking into consideration the regular repairs and maintenance.
- Fuel cost has been subjected to only 10% variation because it makes no difference to the project additionality irrespective of whether the coal cost is subjected to 10% or 100% variation as it is ‘pass through’<sup>29</sup>. Though LUCE has an effect of change in coal cost; however, unless the coal costs are increased by 243% the sub-critical option remains the baseline. It may be noted that an increase in coal cost by 243% is a hypothetical case.
- Likewise, fuel transportation cost has also been subjected to only 10% variation because like fuel cost, transportation cost is also ‘pass through’. Though the LUCE has an effect of change in cost for fuel transportation, however unless the costs are increased by 168% the sub-critical option remains the baseline. It may be noted that an increase by 168% is a hypothetical case.
- Similarly the Gross calorific value of the coal has also been subjected to only 10% variation as the project has been assured ‘F’ Grade coal by South Eastern Coalfields Limited a Government Body. The likely variation in the GCV, as per the Coal Analysis results provided to all the prospective bidders by PSEB, is in the range of 3,900 - 4,260 kcal/kg. The base value of the GCV (4,080 kcal/kg) is the average of this range as provided by PSEB to all prospective bidders for

<sup>29</sup> The cost incurred by the project developer on fuel and fuel transportation will be reimbursed in full by PSEB by way of increased energy charge which is the variable component of tariff



bidding. It is observed that the likely variation on the value of 4,080 kcal/kg is only  $\pm 4.42\%$ . Thus, variation to the extent of  $\pm 10\%$  is highly unlikely. Further unless the GCV values reduce by 51% the sub-critical option remains the baseline. It may be noted that a decrease in 51% remains a hypothetical case. The GCV of NG has been sourced from the website of Gas Authority of India Limited (GAIL) which is the central authority in India for NG and its transmission.

- Project cost has been subjected to variation as the plant is still under construction. The present cost is estimated at Rs.96 bn. as against Rs.95 bn. assumed in worksheets. Therefore, the project cost coming down does not appear to be a possibility.
- O&M cost essentially represents wages and salaries, repairs and maintenance, spare parts, consumables – all of which are subject to inflationary pressure. With the country experiencing inflation of about 4.5% on an average, O&M cost reduction is highly hypothetical.

Validation team also conducted an independent evaluation of the impact of change in the interest rate on the LUCE. The interest rate of 10.5% has been assumed for term loan in the worksheet based on the interest rate on the loan contracted by the company. This is in conformity with the guidance 11 of Annex 58, EB 51, which states that “....where a post-tax benchmark is applied, the DOE shall ensure that actual interest payable is taken into account in the calculation of income tax. The Prime Lending Rate (PLR) at the time of decision making was 11 to 12%<sup>30</sup>. Validation team worked out the impact of assuming the average PLR prevailing at the time of decision making on the LUCE of the project activity and alternatives and the results are given below:

(LUCE in INR/kWh)

	Alternatives	PLR - 12%	Actual int. rate 10.5%
1	The project activity not implemented as a CDM project	2.45	2.41
2	Sub-critical technology - Pit head	1.33	1.31
3	Sub-critical technology - Linkage (baseline)	2.30	2.27
4	Power generation using NG as fuel	3.47	3.44

As could be seen from above, even if the higher end of the prevailing PLR (at the time of decision making) is taken into consideration, LUCE of the project activity would remain higher than the baseline<sup>31</sup>. This is because the interest rate will apply uniformly across all the alternatives and the project activity.

<sup>30</sup> Weekly Statistical Supplement, Reserve Bank of India, September 18, 2009. – Please see [http://rbidocs.rbi.org.in/rdocs/Wss/PDFs/4T\\_180909.pdf](http://rbidocs.rbi.org.in/rdocs/Wss/PDFs/4T_180909.pdf). PLR remained the same for the week ended September 25, 2009 also.

<sup>31</sup> In fact the gap between the baseline and the project activity will widen in view of the difference in the project cost and corresponding increase in the loan.

The foregoing investment analysis and sensitivity analysis, therefore, provides a valid argument in selecting the baseline scenario as it consistently supports (for a realistic range of assumptions) the conclusion that the pre-selected baseline scenario remains the economically and/or financially attractive than the project activity.

Based on the foregoing and considering that the

- a) list of alternatives includes as one of the options that the project activity is undertaken without being registered as a proposed CDM project activity;
- (b) list contains all plausible alternatives which the DOE, on the basis of its local and sectoral knowledge, considers to be viable means of supplying the outputs or services that are to be supplied by the proposed CDM project activity; and
- (c) alternatives comply with all applicable and enforced legislation.

*Validation team concludes that the project activity conforms to guidance given vide paragraph 106 and 107 of VVM and the Methodology ACM 0013*

## **Investment analysis**

The project activity is governed by methodology ACM 0013 (ver.3). The methodology ACM 0013 stipulates that the latest version of the “Tool for the demonstration and assessment of additionality” should be applied to assess the additionality of the proposed project activity. The methodology also states that in the case option II (Investment comparison analysis) is applied in Sub-step 2b, it should be demonstrated that the baseline alternative is available to the PP.

Originally, the PP demonstrated the additionality through investment comparison analysis using LUCE as the financial indicator. However, Clause 1.3 of RfP states, “the bidder shall consider super critical plant technology mentions with minimum steam parameters, at turbine inlet ...”. Therefore, the project developer is required to implement the project with super critical technology only. This conclusion has been further strengthened by Clause 2.7.2.4 of RfP, which states that the project might qualify for carbon finance through Clean Development Mechanism resulting in additional revenue stream in terms of Certified Emission Reductions (CERs) which the bidders might like to consider while quoting the tariff. In the above background a CAR was raised and the project developer was asked to demonstrate the additionality through benchmark analysis using the valid version of the “Tool for demonstration and assessment of additionality (Ver 05.2)”. Accordingly, the project developer has demonstrated the additionality of the project through benchmark analysis using project IRR as the financial indicator.

Considering the fact that the baseline alternative is not available to the project developer (conformity to the Methodology ACM 0013) and that the “alternative to the project activity is the supply of electricity from a grid” (conformity to guidance 16 of Annex 58, EB51), the selection of benchmark analysis adopted by the PP to demonstrate the additionality has been assessed to be appropriate. Moreover, since

the project is funded by a debt equity mix, use of project IRR as financial indicator is also considered appropriate for the project type and decision making context (conformity to paragraph 4 of sub-step 2b of Additionality Tool). Moreover, the investment comparison analysis based on LUCE has already been presented in the earlier section on alternatives. Hence, this section deals mainly with the benchmark analysis used for demonstration of additionality.

Investment analysis has been validated by adopting the following steps:

a) Suitability of financial indicator and benchmark: The project developer has demonstrated the additionality of the project through benchmark analysis using project IRR as financial indicator.

Annex 58 of EB 51 states that "Local commercial lending rates or weighted average costs of capital (WACC) are appropriate benchmarks for a project IRR". Accordingly, the project developer has chosen local commercial lending rate as the benchmark. The Prime Lending Rate of commercial banks (the rate at which the banks advance loan to clients), as published in the Weekly Statistical Supplement of the Reserve Bank of India in the issue dated September 18, 2009<sup>32</sup> (the month in which the decision was taken by the PP to submit the bid) was 11% to 12% and average of the range 11.50% has been selected as the benchmark by the PP. The lending rate considered as benchmark represents the mid rate of the PLR charged by 5 major banks in the country<sup>33</sup>. Hence, the benchmark does not represent the lending rate of any bank. Weekly Statistical Supplement (issued by the Reserve Bank of India), provides only the lower and higher end of PLR. Therefore, as a conservative approach, PP has selected the mid range. There are two reasons for selecting this source, viz., (a) it is published by the central bank of the country and hence authentic; and (b) latest lending rates of *all* banks are not available in public domain<sup>34</sup>. Since guidance 13 of Annex 58, EB 51 required the *benchmark should be based on publicly available data sources which can be clearly validated by the DOE*, DOE relied on the RBI published data, which is credible, reliable and relevant at the time of investment decision. Since project IRR has been chosen as the financial indicator, the benchmark selected by the project developer is appropriate and therefore the benchmark conforms to Paragraph 110 (a) and 112 (a) of VVM, the Additionality Tool and the Guidance 12 and 13 of Annex 58, EB 51. As risk premium is not applied in the benchmark, paragraph 112 (b) is not applicable. Considering the fact that L&T (the company is a wholly owned subsidiary of L&T) earned a return of

<sup>32</sup> Weekly Statistical Supplement, Reserve Bank of India, September 18, 2009. – Please see [http://rbidocs.rbi.org.in/rdocs/Wss/PDFs/4T\\_180909.pdf](http://rbidocs.rbi.org.in/rdocs/Wss/PDFs/4T_180909.pdf). PLR remained the same for the week ended September 25, 2009 also.

<sup>33</sup> Weekly Statistical supplement dt.18/09/2009 [http://rbidocs.rbi.org.in/rdocs/Wss/PDFs/4T\\_180909.pdf](http://rbidocs.rbi.org.in/rdocs/Wss/PDFs/4T_180909.pdf) (please see the footnote No.2 in the website)

<sup>34</sup> Moreover at the time of decision making, project developers cannot envisage from which bank the loan will be sourced, or rather which bank will lend and at what terms. Further, in projects such as these, where the credit requirements are very large, no single bank meets the entire credit requirement. It is a consortium of banks, who lend and the terms vary between the consortium members. Hence, a logical approach would be to source the commercial lending rate from a publicly available credible source

17.55% on capital employed during 2008-09<sup>35</sup>, it is reasonable to expect that the investment would not have taken place at a rate of return lower than the benchmark (conformity to paragraph 112 (c) of VVM ver.1.2). We therefore submit that the selected benchmark conforms to guidance 12 of Annex 58, EB 51 (Annex 5, EB 62) and paragraph 112 of VVM (ver.1.2)

In this context, it may be stated that interest rate differs from bank to bank based on their cost of funds and administrative cost. Therefore, the benchmark selected, being commercial lending rate will vary from project to project depending on the lending institution and hence the benchmark is not applicable uniformly to all projects with similar risks. Moreover, even within the bank, the lending rate (being the benchmark) will vary from company to company and project to project. Lending rate is a function of the time (in which the decision is taken) and the credit rating (of the project developer). Commercial lending rate varied between 11.00% and 14.00% in 2008 and 2009<sup>36</sup>. Though the interest rate progressively declined during 2009, of late, it has started moving northwards once again and the prevailing rate is ranges between 14.25% and 15.25%<sup>37</sup>. Another determinant of the lending rate is the credit rating of the project developer. After the issuance of recommendatory framework by the Basel Committee on Banking supervision in June 2004 (popularly known as Basel II), which became effective for all commercial banks with effect from March 31, 2009, banks have started rating borrowers/projects<sup>38</sup>. Project risk is assessed taking into consideration *inter alia* industry risk, business risk and management risk construction risk, funding risk, execution risk and based on the evaluation of these risks borrowers are assigned rating, which indicates the likelihood of the project meeting the debt

<sup>35</sup> Larsen & Toubro Ltd., Annual Report 2008-09. P.16. The Annual report can be accessed at [http://www.larsentoubro.com/Intcorporate/LnT\\_DWS/Downloads.aspx?res=P\\_CORP\\_CINV\\_AFNC\\_AANL\\_AL\\_NT&year=2009](http://www.larsentoubro.com/Intcorporate/LnT_DWS/Downloads.aspx?res=P_CORP_CINV_AFNC_AANL_AL_NT&year=2009)

<sup>36</sup> That the commercial lending rate does not remain constant can be appreciated from the data given below, which summarises the movement of the PLR of 5 major banks during 2008 and 2009 (as published in the Weekly Statistical supplement of RBI)

Period	Rate percent	Period	Rate percent
01/01/2008 – 15/02/2008	12.75 – 13.25	08/11/2008 – 28/11/2008	13.00 – 13.50
16/02/2008 – 22/02/2008	12.50 – 13.25	29/11/2008 – 26/12/2008	12.50 – 13.25
23/02/2008 – 29/02/2008	12.25 – 13.00	27/12/2008 – 30/01/2009	12.00 – 12.50
01/03/2008 – 20/06/2008	12.25 – 12.75	31/01/2009 – 03/04/2009	11.50 – 12.50
21/06/2008 – 27/06/2008	12.50 – 12.75	04/04/2009 – 24/04/2009	11.50 – 12.25
28/06/2008 – 08/08/2008	12.75 – 13.25	25/04/2009 – 26/06/2009	11.00 – 12.25
09/08/2008 – 19/09/2008	13.25 – 14.00	27/06/2009 – 31/12/2009	11.00 – 12.00
20/09/2008 – 07/11/2008	13.75 – 14.00		

(Source: Various issues of Weekly Statistical Supplement, Reserve Bank of India. This publication can be accessed at [http://www.rbi.org.in/scripts/BS\\_ViewWSS.aspx](http://www.rbi.org.in/scripts/BS_ViewWSS.aspx).)

<sup>37</sup> It may be stated in this context that after brief spell of southward movement, the interest rates have started moving northwards and today, lending rate of most of the banks are over 14% including the top five banks . State Bank of India and Punjab National Bank, it is 14.25% , 15% in the case of Bank of Baroda and Bank of India and 15.25% in the case of IDBI Bank. The rates were available in the following website as on 10/08/2011. See [http://www.moneycontrol.com/stocks/stock\\_market/corp\\_notices.php?autono=452436](http://www.moneycontrol.com/stocks/stock_market/corp_notices.php?autono=452436); <https://www.pnbindia.in/En/ui/Interstrates-LoansandAdvances.aspx>, <http://www.bankofindia.com/Interestrate.aspx>, [http://www.bankofbaroda.com/int\\_adv.asp](http://www.bankofbaroda.com/int_adv.asp), <http://www.unionbankofindia.co.in/BPLR.aspx>

<sup>38</sup> This is because Basel II guidelines, require banks to provide capital on the credit exposure (popularly known as capital adequacy ratio) as per credit ratings assigned. Banks rate projects if it is set up as a SPV; in case it is set up as a division of the company, the project as well as the company are rated. Since almost all power projects are set up as SPV, banks consider project risk in risk rating.

obligation in time. The rating and commercial lending rate is inversely related, in the sense that higher the rating lower is the interest rate and vice versa<sup>39</sup>. This is true not only of India, but world over. Therefore, the benchmark cannot be applied to all other projects with similar risk, as project risk is not the only sole determinant of the credit risk of a borrower.

b) Assessment of parameters and assumptions: The project concept involves installation of 2 X 700 MW turbines, generating 11406 GWh and exporting 10778 GWh (after accounting 628 GWh towards auxiliary consumption) to Punjab State Electricity Board (PSEB) as per the tariff quoted in the RfP and accepted by Punjab State Electricity Board and confirmed by Punjab State Electricity Regulatory Commission (PSERC) vide its order 14/07/2010. The important parameters, which determine the additionality of the project IRR of the project, are project cost, financing pattern, and profitability estimates.

Project Cost: The project cost is based on the note submitted to the Board<sup>40</sup> which includes the, land cost, EPC cost, preliminary and pre-operative expenses, IDC, contingency and margin for working capital. Land cost is based on the amount payable to Government of Punjab<sup>41</sup>; EPC contract value is based on the letter given by the EPC contractor<sup>42</sup> received by the project developer at the time of taking investment decision; Preliminary and pre-operative expenses include manpower cost, engineering fee, trial and start up expenses, insurance during construction and miscellaneous expenses and account for less than 2% of project cost. Interest during construction has been computed based on the phasing of implementation and draw down of loan. Working capital margin have been computed based on stocking period of various current assets and the prevailing margin on current assets.

<sup>39</sup> Bank of Baroda, for example, prescribed the following interest rate for loans:

Rating	Interest rate	Rating	Interest rate
CR1	Base Rate + 4.25%	CR2	Base Rate + 4.50%
CR3	Base Rate + 5.00%	CR4	Base Rate + 5.50%
CR5	Base Rate + 6.25%	CR6	Base Rate + 6.75%
CR 7,8,9, and 10	Base Rate + 7.00%		

Accessed on 10/08/2011 from the website [http://www.bankofbaroda.com/int\\_adv.asp](http://www.bankofbaroda.com/int_adv.asp)

<sup>40</sup> At the time of taking investment decision on September 22, 2009 for submitting the bid, the project developer had prepared the financial analysis for a unit size of 660 MW (in the Note to Board dated September 21, 2009). Since the RfP provides for supplying power upto 1320 MW, after winning the bid, the project developer decided to increase the unit size from 660 MW to 700 MW. Accordingly, the project developer revised the project cost for 2X700 MW and presented a Note (dated March 15, 2010) to the NPL Board in the meeting held on March 17, 2010. On obtaining the approval of the Board, the modification in the capacity was communicated to PSEB on March 23, 2010 and the approval was accorded by PSEB for the enhanced capacity on April 13, 2010. Since the present project size is 1400 MW and necessary approval have been obtained, validation team considered it appropriate to take 700 MW unit size in the financial indicator computation.

The cost has been estimated at Rs.90 bn for 1320 MW capacity and Rs.95 bn. for 1400 MW. This is mainly on account of the increase in the EPC cost by Rs. 4 mn. and corresponding increase in IDC, margin for working capital and contingency

<sup>41</sup> Documentary evidence on the amount payable (letter from PSEB dated 08/09/2009) has been submitted to validation team

<sup>42</sup> Turnkey offer letter dated September 19, 2009 received from Larsen & Toubro Ltd. provides a total turnkey contract cost of Rs.66 bn for 1320 MW while the actual contract signed on 16/07/2010 is Rs. 69.75 bn for 1400 MW.



The total project cost based on the above works out to Rs.67.85 mn./MW. Project cost projected by various developers in the web hosted PDD range from Rs.40 mn./MW to Rs.60 mn./MW. Validation team observed that though there are a few projects which have projected a cost of around Rs.40 to 47 mn./MW, cost of majority of the web hosted projects ranged between Rs.50 mn to Rs.60 mn. Energy efficient power generation at Kawai in Rajasthan, India (Adani Power Rajasthan Limited), for example, has projected a cost of Rs. 53.26 mn/MW; Grid connected, energy efficient power plant in Junagadh, Gujarat by SPEPL (Shapoorji Pallonji Energy (Gujarat) Pvt. Ltd) has projected a cost of Rs.56.46 mn./MW; Energy efficient power generation by GCEPL (GMR Chattisgarh Energy Private Ltd.) has projected a cost of Rs.60.51 mn./MW and 1320 MW Coal Based Super Critical Thermal Power Plant by Jaiprakash Power Ventures Limited (JPVL) has projected a cost of Rs.61.36 mn./MW.

Validation team sought a clarification, in response to which the project developer submitted the EPC contract already signed, Project Information Memorandum (PIM) prepared by the lending bankers and a Chartered Accountant's certificate evidencing the contracts already signed, investment already made and the outstanding contingent liability as on March 31, 2011. EPC contract alone works out to Rs.69.75 bn. or Rs.50 mn/MW. Project Information Memorandum (PIM) prepared by the lending bankers estimates the cost of the project at Rs.96 bn. (in contrast to Rs.95 bn. considered in the financial indicator calculation). CA certificate reveals that the project has already made an investment of Rs.16260 mn. and the outstanding contingent liability (contract already signed but the payment not released) alone is of the order of Rs 62610 mn till March 31, 2011, resulting in a total cost of Rs.78870 mn. The scheduled date of COD of the first unit in the project is January 2014. If the investment to be made during the next 3 years is taken into account, the cost would be Rs.96000 mn. (as appraised by the banks).

Validation team also observed that the cost of Boiler, Turbine Generator (BTG) have been higher in the case of projects, which have opted to source them from within the country instead of importing it. The cost of BTG in the case of Karnataka Power Corporation Ltd., for the Edlapur project, for example, is reported to be Rs.45 mn. and that of Raichur project is reported to be Rs.39.2 mn. (supplier – BHEL) and 1320 MW project of Jai Prakash Power Ventures Ltd. (supplier – L&T) is reported to be Rs.32.8 mn<sup>43</sup>.

Considering the facts that the plant and equipment are indigenous, SHR reckoned by the project is the lowest (2082 kcal/kWh - requiring more efficiently designed turbine generator leading to higher cost), EPC contract alone works out to Rs.50 mn/MW, lending institutions have approved and extended financial assistance (and thereby taken direct risk) based on the firmed up cost of Rs.96 bn. and that the CA certificate reveals that the PP had already invested more than Rs.78 bn. till March 31, 2011,

<sup>43</sup> The cost represents only BTG cost. This cannot be compared with EPC cost as EPC cost includes besides BTG cost, BOP cost also. Hence, the EPC cost of Rs.50 mn.



validation team considers the cost assumed is reasonable and appropriate for the project activity.

Financing pattern The project is envisaged to be financed by a term loan of 75% and equity capital of 25%. The financing pattern for infrastructure projects normally range from 70:30 to 80:20. Considering the actual gearing (as per financial closure) is 75:25 and that the gearing is within the range, validation team accepted the financing pattern envisaged by the project developer at the time of decision making.

Input Parameters: The input parameters used in financial indicator calculations include installed capacity, PLF, auxiliary consumption, power tariff, fuel consumption, fuel cost, O&M cost, interest, depreciation and taxation.

a Installed capacity: Installed capacity of the project activity has been considered at 1400 MW, i.e., 2 X 700 MW. The installed capacity is based on the Board Note and approval from PSEB dated 13/04/2010. At the time of taking investment decision on September 22, 2009 for submitting the bid, the project developer had considered installed capacity of 1320 MW (Note to Board dt. 21/09/2009). Since the RfP provides for supplying power upto 1320 MW, after winning the bid, the project developer decided to increase the capacity from 1320 MW to 1400 MW. Accordingly, the project developer revised the installed capacity to 1400 MW and presented a Note to the Board in the meeting held on March 17, 2010. On obtaining the approval of the Board, the modification in the capacity was communicated to PSEB on March 23, 2010 and the approval was accorded by PSEB for the enhanced capacity on April 13, 2010. Since the present project size is 1400 MW and necessary approval has been obtained, validation team considered it appropriate to consider the capacity of 1400 MW in the financial indicator computation. Validation team checked the Board Notes, RFQ, RFP, acceptance of bid, PPA and PSEB approval. All the documents are found to be authentic and credible. Validation team checked the capacity given in those documents and found them to be in agreement with the capacity assumed by the PP. The documents are authentic, input figures pertain to the candidate project only, and hence it is appropriate. However as the first decision was based on 1320 MW thus the financial viability for 1320 MW has also been assessed. The Project IRR with 1320 MW and project cost of INR 90000 Million comes to be 10.44% which is lower than the Project IRR for 1400 MW i.e 10.5% thus for further analysis the project IRR of 1400 MW has been considered as the same is appropriate as well as conservative.

b PLF, Auxiliary consumption, tariff and ash sales: PLF has been assumed at 93%<sup>44</sup>; Auxiliary consumption has been assumed at 5.5%<sup>45</sup>. Other super critical

<sup>44</sup> Review of Performance of Thermal Power Stations – 2008-09 brought out by CEA reveals that the overall Operating Availability of Generating Stations under Private Sector Utilities was 92.73% which was the highest among different Sectors. Hence, the PLF of 93% assumed by the project developer is considered appropriate. Please see [http://www.cea.nic.in/reports/yearly/thermal\\_perfm\\_review\\_rep/0809/Highlights.pdf](http://www.cea.nic.in/reports/yearly/thermal_perfm_review_rep/0809/Highlights.pdf)

<sup>45</sup> In the webhosted PDD, Auxiliary consumption has been assumed at 6%. However, validation team observed that the signed EPC contract provides Auxiliary consumption of only 5.5%. Accordingly, the project developer was asked to reduce the auxiliary consumption. This is conservative.

power projects have assumed auxiliary consumption ranging from 6% to 7.5% (and 8.90% by Grid connected energy efficient power generation in Jhajjar, Haryana (Jhajjar Power Corporation Ltd.)). Hence, the auxiliary consumption is considered reasonable and appropriate. Power tariff for the project activity is based on RfP submitted by the company (based on which the project was awarded to the project developer), which is enshrined in the PPA. In the webhosted PDD, project developer had not assumed revenue from ash sale. Since the project would be generating substantial quantity of ash and it has a value, project developer was asked to reckon the revenue from ash sale and it has been taken into account in the financial indicator calculation<sup>46</sup>.

- c Station Heat Rate: Project assumes SHR of 2082 kcal/kWh based on the EPC contractor's offer letter dated September 19, 2009, which has been subsequently guaranteed by the EPC contractor. This is one of the lowest SHR considered by any super critical projects already webhosted. Besides the candidate project, only 3 other projects, viz., Energy efficient power generation in India , Tirora - Adani Power Maharashtra Ltd. – 2060 kcal/kWh (registered), GHG Emission Reductions through grid connected high efficiency power generation (Coastal Gujarat Power Corporation Ltd.) – 1965 kcal/kWh (rejected) and 1320 MW Coal Based Super Critical Thermal Power Plant by Jaiprakash Power Ventures Limited (JPVL) – 2065 kcal/kwh (under validation), all other projects have considered SHR of more than 2100 kcal/kWh. In the above background, validation team is convinced that the SHR considered is conservative, realistic and appropriate for the project activity.
- d Fuel: GCV of coal is based on the information given vide letter dated September 11, 2009 by Nabha Power Ltd. (then under PSEB) to all the bidders at the time of bidding. Validation team observed that the GCV assumed by other projects, based on domestic coal, has been in the range of 3300 kcal/kg to 4976 kcal.kg. The GCV assumed, therefore, is within the range. Since the GCV is based on the indication given by Nabha Power Ltd. (then under PSEB) and that the GCV is within the range assumed by other super critical power projects, validation team considers the calorific value assumed is correct and appropriate for the project activity.

Coal cost is based on the information given by Nabha Power Ltd. (then under PSEB) before bidding and is also evidenced by the coal cost published by South Eastern Coalfields Limited (a copy of which has been submitted by the PP to the DOE). Other projects based on domestic coal have assumed cost ranging from

<sup>46</sup> The ash percentage of coal is evidenced by the clarification letter dated 16<sup>th</sup> September 2009 issued by Nabha Power Ltd. (under PSEB), wherein the ash percentage was given as 35-40% and the average 37.5% has been taken into consideration. Saleable quantity of fly ash has been taken at 80% of generation in conformity with MOEF notification dated November 6, 2008, which requires 20% of fly ash to be given free of charge to units manufacturing fly ash bricks. The sale price is taken at Rs.341/MT, which is evidenced by ACC Annual Report. Fly ash price has been subjected to 5% escalation based on the inflation experienced by the country. Though the document is dated post decision making date, since no documentary evidence could be submitted by the project developer corresponding to the decision making period in as much as it was not considered at the time of decision making, the evidence has been accepted by the validation team.

Rs.600/ MT (Sasan Power Ltd.) to Rs.723/MT (Energy Efficient Power Generation by Talwandi Sabo Power Ltd.). Therefore, the coal cost assumed by the company is the lowest.

Since it is a linkage plant (project located away from pit head), project developer has to transport the coal from pit head to the plant. The project is located at a distance of 1487 kms away from the coal mines. The transportation cost has been given by Nabha Power Ltd. (under PSEB) before bidding vide its letter dated September 11, 2009. The rate has been cross checked with CERC notification<sup>47</sup>, where the transportation cost has been given as Rs.1617.20/MT for a distance of 2000 kms. Therefore, validation team is convinced about the correctness and appropriateness of the transportation cost. Coal cost has been subjected to an escalation of 6.12% and the transportation cost to 2.39% as prescribed by PSEB communication dated 11/09/2009. Secondary fuel consumption is based on the "Recommendations on Operation Norms for Thermal Power Stations for Tariff Period beginning 1st April, 2009"<sup>48</sup> dated November 4, 2008 issued by CERC and the price is based on fuel oil price quoted on NCDEX on September 18, 2009.

- e O&M cost: The operation and maintenance cost and the escalation thereon are based on the communication dated September 18, 2009, received from O&M Solutions (P) Ltd<sup>49</sup>. Validation team observed that CERC has recommended O&M cost of Rs.1.46 mn./MW for thermal power projects with unit size of more than 600 MW commencing operation in 2013-14. Validation team checked the O&M cost considered by other super critical projects and observed that barring 5 projects, viz., Coastal Gujarat Power Corporation Ltd. (Rs.0.62 mn./MW) and 4 projects of Adani Power Ltd. (which assumed O&M cost ranging from 0.60 to Rs.0.80 mn) all other projects have considered O&M cost of more than Rs.1 mn./MW. Hence, the O&M cost of Rs.0.85 mn/MW considered by the developer is conservative and appropriate for the project activity. O&M cost has been escalated at 5% per annum based on O&M Solutions letter dated 18/09/2009. CERC in its order dt. 19/01/2009 has recommended escalation at 5.72% for O&M cost. Validation team also observed that other projects, which have webhosted their PDDs, have assumed escalation ranging from 4% (by projects which took investment decision prior to January 2009)<sup>50</sup> to 5.72%. The escalation considered, therefore is well within the range. In the above background, validation team is convinced that the escalation rate considered is correct and appropriate.

<sup>47</sup> Revised Methodology for Determining the Escalation Factors and Other Parameters to be notified by CERC as per the Amendment to the Competitive Bidding Guidelines dated 27.3.2009 (July 2009), please see <http://www.cercind.gov.in/Escalation-rate/Revised-Methodology-dated-3.7-9.pdf> (p.4)

<sup>48</sup> <http://www.cercind.gov.in/October08/Report-CERC-norms-CEA-Final-04-11-08.pdf> (p.30)

<sup>49</sup> O&M Solutions (OMS) is a highly experienced multinational engineering service provider incorporated in Mauritius, with offices in Bangladesh, India and Pakistan. OMS specialised in management and services of Greenfield construction developer projects to long term operation and maintenance services to the power industry

<sup>50</sup> Prior to the issuance of tariff order in January 2009, CERC has recommended 4% escalation in O&M cost vide its tariff order of March 2004 (p.19 & 20)

- f Loan terms: Interest rate, repayment period and moratorium are based on the loan contracted by the company. Detailed computation interest forms part of the worksheet. This in line with the guidance 11 of Annex 58, EB 51 (where post tax project IRR is considered as financial indicator, actual interest should be taken into account in computing tax liability).

The Prime Lending Rate (PLR) at the time of decision making was 11% to 12%<sup>51</sup>. Validation team worked out the impact of assuming the then prevailing PLR on the project IRR and observed that the project IRR goes up by 3 bps., i.e., from 10.53% to 10.57% and the project does not lose its additionality even if the higher end of the PLR range, viz., 12% is taken into account.

- g Depreciation rate: Project developer has adopted CERC recommended straight line method depreciation rate, (which is normal for power companies) for computing book profit and Income Tax Act stipulated written down value method depreciation for income tax calculation, which are accepted accounting practices in the country. The rates have been retained at the same level for the project activity and all alternatives. This is in conformity with sub-step 2c of Additionality Tool.
- h Taxation: Tax liability has been calculated as per the income tax rules. In computing the income tax liability, tax holiday (u/s 80IA of the Income Tax Act, 1961), which the infrastructure projects (under which the project activity falls) are entitled to for 10 consecutive years out of the first 15 years, has been taken into account. The tax rate assumed corresponds to the tax rate prevailing at the time of taking decision. As the tax computation is in conformity with IT Act, validation team is convinced about the correctness and appropriateness of tax computation.

Suitability of tariff for additionality determination: One issue that assumes significance in additionality determination is the suitability of tariff assumed. As stated above, power tariff for the project activity is based on PPA. Validation team is convinced that the power tariff assumed for the project activity is appropriate as the tariff is fixed by PPA, which is based on the bid document submitted by the PP and was selected by virtue of the tariff quoted being the lowest. In fact, the title of the bid document itself is "Request for Qualification for Selection of Developer through Tariff Based Bidding Process". Therefore, the tariff is fixed and the PP has quoted the tariff after taking into account the CDM benefits likely to accrue as indicated in the bid document. Validation team conducted an independent analysis and observed that the project developer should have quoted levelised tariff of Rs.3.02/kWh to render the project self sustaining (achieve IRR equal to benchmark) without CDM benefits. However, had the project developer quoted this tariff, the project would have been lost, as the next two lowest bidders had offered levelised tariff of Rs.2.94/kWh and Rs.2.98/kWh

<sup>51</sup> Weekly Statistical Supplement, Reserve Bank of India, September 18, 2009. – Please see [http://rbidocs.rbi.org.in/rdocs/Wss/PDFs/4T\\_180909.pdf](http://rbidocs.rbi.org.in/rdocs/Wss/PDFs/4T_180909.pdf). PLR remained the same for the week ended September 25, 2009 also.



(project developer had quoted Rs.2.89/kwh). Hence, there is no possibility of submitting a tariff that would have allowed the project IRR to reach the benchmark without the CDM revenues. Since entire power generated is sold to State Utilities as per Bid document and PPA entered into subsequently, the question of merchant power sale does not arise.

As mentioned earlier, the assumptions supporting each input parameters used for demonstrating the additionality and computing LUCE of the project activity and each alternative, the basis thereof, the validation method adopted, as well as their conformity with paragraphs 93, 95, 109 (a) & (b) and 112 (a) & (c) of VVM are given as Table A-3 in the annexure.

c) Cross checking parameters: As explained before, each input parameter was cross checked with sources given by the PP (L1 information), additional information sought from project developer (L2 information) and information gathered independently (L3 information) with publicly available material including projects already webhosted, the sectoral knowledge and the local expertise of the DOE. Validation team, therefore strictly adhered to directions given by EB vide paragraph 109 and 111 of VVM. The input costs considered appear to be in order and appropriate for the project activity. Almost all the data forming part of the computation are based on published sources, which are verifiable and were valid. Each of the figures used in the projections has been checked for its correctness and validity at the time of investment decision taking, justification for its usage and a summary of the assumptions used together with the basis thereof and Validation Team's comments on its appropriateness have been given in the discussion on investment comparison analysis (using LUCE) section. Thus, the guidance given by EB vide paragraph 93, 95 and 109 and 111 of VVM have been taken care of in the validation of the project.

d) Financial reports of project participant: The Validation Team requisitioned the Annual Reports of the project activity (conformity to paragraph 111 (c) of VVM). Project developer has submitted the Annual Report. As the project is under implementation, the entire investments made are in the form of pre operative expenses or capital work in progress and does not contain any other useful details from the additionality demonstration point of view. None of the input values taken in the computation is based on the Annual Report as the implementation of the project not even commenced.

e) Assessment of correctness of computation: The assessment involves checking the data input taken from documents, adoption of correct accounting principle and arithmetical accuracy based on the local knowledge, sectoral and financial expertise of Validation Team (conformity to paragraph 95 of VVM). The Validation Team checked the documents (as to its authenticity and appropriateness) and ensured that right input has been taken in the project cost and projections. The accounting principles adopted with respect to interest, depreciation and tax computation have been found to be in order. The arithmetical accuracy is also found to be correct (conformity to paragraph 111 of VVM).

As stated above, tax liability has been calculated by the project developer after taking into consideration Tax holiday (u/s 80IA of the Income Tax Act, 1961), which the infrastructure projects (under which the project activity falls) are entitled to for the 10 consecutive years out of the first 15 years. Validation team is convinced of the appropriateness of the tax computation.

The principle adopted by the project developer for computing LUCE and project IRR is in conformity with the Additionality Tool and Guidance on the Assessment of Investment Analysis issued by EB (Annex 58 of EB 51). IRR has been computed for 25 years. The salvage value has been taken 5% of project cost (which incidentally constitutes land cost) escalated at 5% for 25 years. Since the salvage value considered is Rs.16085 mn. in contrast to the written down value of assets of Rs.1290 mn, the difference represents the potential profit expected in the terminal year. Hence, the salvage value is in conformity with guidance 3 of Annex 58, EB 51. In computing the project IRR, the project developer has taken into account profit after tax, interest on term loan, depreciation and salvage value as cash inflow. The entire investment has been taken as cash outflow.

Based on the above, the project IRR works out to 10.5% in contrast to the benchmark of 11.50%. Detailed worksheets (prepared in transparent manner) are enclosed. In the above background, Validation Team is convinced that the project is additional and not a business-as-usual scenario. However, this conclusion was checked by subjecting the critical assumptions to reasonable variations.

f) Sensitivity analysis: The Guidance on Assessment of Investment Analysis (17 and 18 of Annex 58, EB 51) requires the robustness of the conclusion arrived at to be tested through a sensitivity analysis by subjecting critical assumptions to reasonable variations. It requires only those variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation ( $\pm 10\%$ ). The revenue is determined by PLF<sup>52</sup> and the most important variable other than PLF is the fuel cost and fuel transportation cost. Besides, PLF and fuel cost, project cost has also been identified as critical as the project implementation has not yet commenced and any change in the project cost would impact the profitability via interest and depreciation. That apart, O&M cost has also been considered for sensitivity analysis though it constitutes less than 10% of the project cost/revenue. Power tariff has not been subjected to variation as it is fixed by PPA, which is based on the bid (lowest) submitted by the PP. Hence, power tariff is not variable. Sensitivity analysis has been conducted to assess the impact of a change in these variables by 10% (on either side) on project IRR (sensitivity analysis results on LUCE has already been given in the earlier section on 'Baseline determination'). The results of the sensitivity analysis are given below:

Variable factors	-10%	0%	+10%
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<sup>52</sup> Tariff has not been considered in the sensitivity analysis because this project has been awarded to PP based on a competitive bid of tariff and hence tariff is fixed and not variable during the life time of the project.



1	PLF	10.03%	10.50%	10.80%
2	Fuel Cost	10.49%	10.50%	10.50%
3	Fuel transportation cost	10.49%	10.50%	10.50%
4	Gross Calorific Value	10.61%	10.50%	10.40%
5	Project cost	11.69%	10.50%	9.45%
6	O&M cost	10.64%	10.50%	10.35%
	Benchmark	11.50%		

It may be observed that variation in fuel cost and fuel transportation cost do not impact the IRR, because they are “pass through” i.e. the cost incurred by the project developer on fuel and fuel transportation will be reimbursed in full by PSEB by way of increased energy charge which is the variable component of tariff as per the signed PPA.

In this context, it may be observed that the tariff has not been subjected to sensitivity analysis. This is because, the tariff is fixed. The title of the bid document itself is “*Selection of Developer through Tariff Based Bidding Process for Procurement of Power on Long-Term Basis from domestic Coal Based Thermal Power Station to be setup at village Nalash near Rajpura, District Patiala, Punjab, India.*”. As the title of the bid document reveals, the tariff is the basis for selection of the developer. Clause 3.4.1. of RfP states, “The Levelized Tariff calculated as per Clause 3.3.2.1 shall be ranked from the lowest to the highest and the Bidder with the lowest Levelized tariff shall be declared as the Successful Bidder and the Letter of Intent shall be issued to such Successful Bidder, subject to Clause 3.4.1.2”

Hence, the project was awarded because the Levelized Tariff quoted by the project developer was the lowest. Once the tariff is submitted and accepted, the quoted tariff becomes fixed for 25 years and no change in tariff is possible as it gets incorporated as Schedule 11 in the PPA. It is for the above reasons that the tariff is not subjected to sensitivity analysis.

However, though hypothetical, tariff has also been subjected to sensitivity analysis. The results are given below:

Parameter	-10%	0%	+10%
Tariff	9.30%	10.50%	11.61%

Though the sensitivity analysis reveals that the project will become non-additional if the tariff goes up by 10%, this is hypothetical as the tariff is fixed by the PPA and not even one percent increase in the tariff is permissible or possible.

Validation Team carried out an independent assessment (conformity to paragraph 111 (e) of VVM), which reveals that the project would remain financially attractive (project IRR crosses benchmark) only if

- PLF goes up by 33%

- Project cost goes down by 8.5%
- O&M cost goes down by 71%
- GCV value goes down by 51%

Project developer had submitted that such an increase in PLF or reduction in project cost O&M cost and GCV is highly unrealistic and unlikely to happen for the following reasons:

PLF cost: A 33% increase in PLF tantamount to achieving PLF of 124% on a sustained basis for 25 years, which is hypothetical. As per the “Performance Review of Thermal Power Stations 2008-09 Section“, the maximum PLF achieved by thermal power stations is reported to be only 106%<sup>53</sup> and hence the question of even achieving 124% PLF is ruled out.

Project cost: Implementation of the project is in progress. The banks have estimated the cost at Rs.96 bn. as against which the cost has been considered at Rs.95 bn. in financial indicator calculation. The company has already entered into EPC and other contracts and already made substantial investment. With cement and steel price going up, any reduction in the project cost, even by 1%, leave alone by as much as 8.5%, is highly unlikely.

O&M Cost: O&M cost includes wages & salaries, spares and consumables – all of which are subject to inflationary pressure. With the country experiencing inflation of 4.5% on an average, the question of O&M cost coming down is ruled out.

GCV Value: The Gross calorific value of the coal has also been subjected to only 10% variation as the project has been assured ‘F’ Grade coal by South Eastern Coalfields Limited a Government Body. The likely variation in the GCV, as per the Coal Analysis results provided to all the prospective bidders by PSEB, is in the range of 3,900 - 4,260 kcal/kg. The base value of the GCV (4,080 kcal/kg) is the average of this range as provided by PSEB to all prospective bidders for bidding. It is observed that the likely variation on the value of 4,080 kcal/kg is only  $\pm 4.42\%$ . Thus, variation to the extent of  $\pm 10\%$  is highly unlikely. Further unless the GCV values reduce by 51% the sub-critical option remains the baseline. It may be noted that a decrease in 51% remains is unrealistic.

Validation team concurs with the observations made by project developer. In view of the above, the Validation Team has concludes that the project is not a business-as-usual scenario.

Nevertheless 13 CARs (CAR B10-B21 including B15A and B21A) and 24 CLs (B1 to B24) had to be raised, which were closed successfully during the Validation process.

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<sup>53</sup> It is observed that only 13 units have achieved PLF of more than 100% in 2008-09; of them Korba STPs Unit 3 achieved PLF of 105.7%; Korba STPS Unit 1 achieved PLF of 104.7%, Singrauli STPS Unit 1 and Dahanu STPS Unit No.2 achieved PLF of 103.60%.

## Barrier analysis

Project developer had not chosen barrier analysis as the additionality has been demonstrated through investment analysis

## Common practice analysis

As per Step 4 of Additionality Tool /B05/, credibility check requires to be conducted to compliment the investment analysis. As required, project developer has conducted credibility check through sub-step 4a and 4b of the Tools for the Demonstration and Assessment of Additionality, Version 05.2./B05/

Step 4 of Additionality Tool classifies activities as similar if the projects are in the same country/region and/or rely on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc. It also states that CDM project activities (registered project activities and project activities which have been published on the UNFCCC website for global stakeholder consultation as part of the validation process) are not to be included in this analysis. Project developer has taken the entire country as geographical region for the purpose of common practice analysis, which is in conformity with the guidance given vide paragraph 118 (a) of VVM.

Based on the information available, Validation team concludes that there were no super-critical power plants operational in India at the time of decision making or even at the time of web hosting the PDD<sup>54</sup> (conformity to paragraph 120 (c) of VVM). Therefore, super-critical technology is not a common practice in India.

Though it is not a requirement as per the Additionality Tool, project developer has extended the analysis to projects (based on super-critical technology) under implementation and planning stage. A total number of 52 projects have been found to be either under implementation or under planning stage. The detailed list of the projects and the sources of information are given in the PDD, which have been verified by the Validation team and found to be correct.

Of the 52 projects including the candidate project, 3 projects have been registered as CDM projects; 1 project was rejected; 17 projects are under validation; 2 projects are under completeness check; 15 projects have made prior intimation to UNFCCC and the PDD is yet to be webhosted; 8 projects have appointed CDM consultants; bid is underway in respect of 3 projects; 2 projects have made investor presentation (including CDM revenue) and no further progress seems to have been made.

Based on the foregoing, the Validation Team concludes that the project activity faces investment barrier - in as much as the LUCE of the project activity is not the lowest and that the project IRR is less than the benchmark return and continue to remain additional even when critical parameters are subjected to reasonable variation. There are no super critical projects in operation within the geographical region identified

<sup>54</sup> Only Adani Power Ltd. was synchronized and that too in December 2010

and therefore setting up of coal based power plants with supercritical technology is not a common practice in the country.

Thus, the Validation Team has arrived at the conclusion that the project activity is additional and is not a business-as-usual case. The CDM revenues are necessary to overcome the required benchmark as identified above.

Nevertheless, CAR B21 had to be raised which was closed successfully during the Validation process.

### **Summary**

In the above background, Validation Team concludes that the project is additional and is not business-as-usual scenario.

#### **5.2.6 Monitoring Methodology**

The project applies approved baseline and monitoring methodology "Consolidated baseline and monitoring methodology for new grid connected fossil fuel fired power plants using a less GHG intensive technology"; ACM0013, Version 3.

The project correctly applies reference of tool, which the approved consolidated methodology ACM0013 drawn upon Tool to calculate project or leakage CO<sub>2</sub> emissions from fossil fuel combustion"

#### **5.2.7 Monitoring Plan**

The project applies monitoring methodology of Approved consolidated methodology entitled "Consolidated baseline and monitoring methodology for new grid connected fossil fuel fired power plants using a less GHG intensive technology" - Version 3.

This methodology stipulates that monitoring shall consist of calculation of the net electricity exported ( $EG_{PJ,y}$ ) by project activity, quantity of the fossil fuel type  $i$  combusted in the project plant in the year  $y$  ( $FF_{i,y}$ ) and Weighted average net calorific value of fuel type  $i$  in year  $y$  ( $NCV_{i,y}$ ). Details of monitoring of  $EG_{PJ,y}$ ,  $FF_{i,y}$  and  $NCV_{i,y}$  are described in section B.7. of the PDD. No leakage emissions are to be considered according to the ACM0013 version 3.

Furthermore, the monitoring of sustainable development has been monitored through a parameter i.e. Revenue from sale of CERs allocated for sustainable development of the society/ community which is called as adaptation fund. Revenue from sale of 2% issued CERs will be used for health-care, education, rural development and charity.

Nevertheless, CL B8 had to be raised and was successfully closed (ref Annex: Validation Protocol - Table 3).

## 5.2.8 Project Management Planning

As per the stipulated methodology Net electricity generated from the project activity is a monitoring parameter. Two meters, Main & Check (static, tri-vector and bi-directional type) placed at the power plant switch yard with accuracy of 0.2 class will be installed on out-going points of inter-connection. Main meter and check meters are owned by the procuring utilities. Main meter will be used for accounting and billing of electricity as per the requirements of Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006. Export and Import of electricity will be measured by both main and check meters and net electricity from project activity computed. Difference between Export and import is deemed as net electricity generated by project activity. Joint reading of project participant and procuring utilities will be taken by the project participant and off-taking utility for billing purpose. The responsibilities and authorities for project management have been defined in measurement methodology along with QA/QC procedures is identified for the meters and is explained in detail in section B.7.2 of the PDD for the project activity.

Annual coal consumption will be measured by the coal gravimetric feeders installed with each pulveriser feeding point. Coal consumption data is displayed in the Main Control room. The readings are displayed continuously and can be taken at any instant. These readings are recorded on a daily basis. Coal consumption of project activity arrived by summation of all coal Gravimetric feeder meter readings. The responsibilities and authorities for project management have been defined in measurement methodology along with QA/QC procedures is identified for the meters and is explained in detail in section B.7.2 of the PDD for the project activity.

Furthermore, validation team assessment during the interview, as the fuel for project activity is procured from external suppliers, project participant intend to estimate weighted average calorific value, (for each of the fuel carrying rake received) by an independent ISO - 17025 certified laboratory or a laboratory of similar standard appointed for the purpose. Coal sampling will be done in line with the requirements of national and international protocols to ensure integrity of the data is maintained to the highest possible standards. The responsibilities and authorities for project management have been defined in measurement methodology along with QA/QC procedures is identified for the meters and is explained in detail in section B.7.2 of the PDD for the project activity.

The validation team therefore is of the opinion that the project participant through the O&M agency is capable of implementing the monitoring plan in the context of the project activity.

The responsibilities and authorities of project management, data handling and recording, measurement methods and QA/QC procedure have been systematically established and formalized and the same was verified during the site visit. It is reported that the data will be kept for 2 years following the end of the fixed crediting period.

### **5.2.9 Crediting Period**

PP has chosen fixed crediting period for the project activity i.e. 10 years which is consistent in the entire PDD. The start date of crediting period during the global stakeholder consultation process was 18/05/2014 however during the validation process the crediting period was revised to start from 01/05/2014 which is based on the commissioning of the second unit of project activity. The start date of crediting period is appropriate and acceptable to the validation team considering the implementation of the project activity. However CAR C1 has been raised for the same and closed out.

### **5.2.10 Environmental Impacts**

The Environmental Impact Assessment (EIA) is mandatory for thermal power plants under the Indian Environmental (Protection) Act 1986 and its amendments in order to receive the required environmental clearance from the Indian Ministry of Environment & Forests (MOEF).

The major potential environmental impacts of a coal fired power plant situated inland are air quality decline, greenhouse gas production, groundwater and surface water pollution and ash disposal.

The project activities will not have a significant impact on the environment due to the elaborate mitigation measures which will be implemented during construction and operation phases. These mitigation measures restrict emissions and environmental impacts within the legally binding national quality standards of India.

### **5.2.11 Comments by Local Stakeholders**

A summary of the comments received is described under the section E.2 along with the replies by the project proponent along with the conclusions of the assessment. No adverse comments were received.

A local stakeholder consultation meet was held plant site 30/03/2010. The invitation letter was sent to following and assessed the written replies from the stakeholders and assessed to be OK.

The stakeholders associated for the project are as follows;

- NPL Employees
- Employees of EPC Contractor
- Local Gram Panchayat Sarpanchs
- Local Villagers
- Punjab State Electricity Board officials
- Punjab Pollution Control Board officials
- Government officials (S.D.M., M.L.A., Tehsildar)





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A summary of the comments received is described under the section E.2 along with the replies by the project proponent along with the conclusions of the assessment. No adverse comments were received during the meet.

## 6 VALIDATION OPINION

Nabha Power Limited has commissioned the TÜV NORD JI/CDM Certification Program (CP) to validate the project: "Energy Efficient Power Generation by Nabha Power Limited" with regard to the relevant requirements of the UNFCCC for CDM project activities, as well as criteria for consistent project operations, monitoring and reporting. UNFCCC criteria include article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakech Accords) and the relevant decisions by COP/MOP and CDM Executive Board

In the course of the validation 33 Corrective Action Requests (CARs) and 25 Clarification Requests (CLs) were raised and successfully closed.

The review of the project design documentation and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and review of comments by parties, stakeholders and NGOs have provided TÜV NORD JI/CDM CP with sufficient evidence to validate the fulfillment of the stated criteria.

In detail the conclusions can be summarised as follows:

- The project is in line with all relevant host country criteria (India) and all relevant UNFCCC requirements for CDM. Project activity approval have been obtained from DNA of India vide the Letter of Approval (HCA) dated 14/03/2011.
- The project additionality is sufficiently justified in the PDD.
- The monitoring plan is transparent and adequate.
- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 9,364,517 tCO<sub>2</sub>e are most likely to be achieved within the 10 years fixed crediting period.

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

Mumbai, 2011-08-26



Manojkumar Borekar  
TÜV NORD JI/CDM CP  
Validation Team Leader

Essen, 2011-08-26



Rainer Winter  
TÜV NORD JI/CDM CP  
Final Approval

## 7 REFERENCES

**Table 7-1:** Documents provided by the project participant

Reference	Document
<b>/AR/</b>	Annual Reports
<b>/BASE/</b>	Proof to support baseline selection arguments a) Efficiency of 500 MW sub critical power plant as per CEA version 6 b) Plant lifetime of all alternative scenarios c) PLF for all alternative scenarios d) Auxiliary consumption of all alternative scenarios e) GCV and SHR of subcritical and super critical power plant f) Report of Working Group on Petroleum and Natural Gas for XIth Plan (2007-12),
<b>/BID/</b>	Certified copy of the bid submitted (RFP) – as accepted – together with financials dated 01/10/2009.
<b>/CEA/</b>	CEA Database Version 6 ( <a href="http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm">http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm</a> )
<b>/CERC/</b>	CERC Tariff Notification dated 19/01/2009 CERC Notification for Escalation of coal cost dated 27/03/2009 CERC Notification for escalation of coal transportation, NG cost and NG transportation cost dated 03/07/2009
<b>/CON-DOE/</b>	Contract with the Designated Operational Entity dated 28-05-2010
<b>/EIA/</b>	<ul style="list-style-type: none"> <li>EIA carried out for the project activity dated August 2008 by PSEB.</li> <li>Environment Clearance letter dated 15/11/2010.</li> </ul>
<b>/EPC/</b>	EPC contract signed with Larsen & Toubro Limited dated 16/07/2010
<b>/ERS/</b>	<ul style="list-style-type: none"> <li>Draft Emission Reduction computation sheet</li> <li>Final Emission Reduction computation sheet</li> </ul>
<b>/FN/</b>	Footnote references as described in the PDD in soft copy which are not web based.
<b>/HCA/</b>	<ul style="list-style-type: none"> <li>Host Country approval from MoEF dated 14-03-2011</li> </ul>
<b>/INPUT/</b>	Proof to support additionality Assumptions a) GHR (All baseline scenarios) b) Auxiliary consumption (All baseline scenarios)

Reference	Document
	<ul style="list-style-type: none"> <li>c) Calorific values of fuel (All baseline scenarios)</li> <li>d) Fuel price (All baseline scenarios)</li> <li>e) Secondary oil price (All baseline scenarios)</li> <li>f) Project cost per MW (All baseline scenarios)</li> <li>g) CERC notification and PSEB communication on Discount rate</li> <li>h) Basis for O&amp;M (all baseline scenarios)</li> </ul>
<b>/IRR/</b>	<p>Draft IRR computation sheets for financial models</p> <p>Final IRR computation sheets for financial models</p>
<b>/LOAN/</b>	Loan Sanction letter dated 11/06/2010 from Axis Bank for the project activity
<b>/LSHC/</b>	Minutes of local stake holder consultation process dated 30/03/2010.
<b>/MD/</b>	<ul style="list-style-type: none"> <li>• Management decision dated 22<sup>nd</sup> September 2009 for serious CDM consideration and proof associated with decision making process.</li> <li>• Management decision dated 17<sup>th</sup> March 2010 for change in project size from 1320 MW to 1400 MW.</li> </ul>
<b>/ORG/</b>	Operational Organisation chart of for the project activity.
<b>/PDD/</b>	<ul style="list-style-type: none"> <li>- Web hosted PDD version 01 dated 10/08/2010</li> <li>- Final PDD version 05 dated 18/08/2011</li> </ul>
<b>/PIM/</b>	Project Information Memorandum, October 2010 prepared by Axis Bank, Punjab National Bank and ICICI Bank.
<b>/PL/</b>	Plant layout for the project activity.
<b>/PPA/</b>	PPA for the project activity signed with PSEB dated 18/01/2010
<b>/PSEB/</b>	<ul style="list-style-type: none"> <li>- Letter from PSEB dated 08/09/2009 stating the land cost for the project activity.</li> <li>- Email communication from PSEB stating the details for coal GCV, coal cost, coal transportation cost, escalation of coal and transportation cost and discount rate, dated 11/09/2009</li> <li>- Email communication from PSEB dated 16/09/2009 mentioning the quantum of ash percentage in the coal assured.</li> </ul>
<b>/SC/</b>	<p>Proof of statutory clearances as per local regulation :</p> <ul style="list-style-type: none"> <li>a) Environmental clearance dated 15-11-2010</li> <li>b) Consent to establish dated 20/09/2010</li> </ul>
<b>/SD/</b>	Proof for project activity starting date (=EPC contract signed for the project activity) 16/07/2010

Reference	Document
<b>/SLD/</b>	Single line diagram for electricity generation, auxiliary consumption and export /import to/from the grid.
<b>/TD/</b>	Tender document along with terms and conditions (Request For qualification)
<b>/TS/</b>	Technical specification provided by the manufacture for a) Super critical steam conditions (temperature, pressure and steam quantity) b) Turbine output capacity c) Percentage of Auxiliary consumption as per the EPC contract dated 16/07/2010
<b>/XLS/</b>	Excel calculation sheets for emission reduction.

**Table 7-2:** Background investigation and assessment documents

Reference	Document
<b>/ACM0013/</b>	Consolidated baseline and monitoring methodology for new grid connected fossil fuel fired power plants using a less GHG intensive technology-version 3
<b>/CPM/</b>	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
<b>/CDM-GLOSS/</b>	Glossary of CDM terms- version 5
<b>/GCP/</b>	UNFCCC: Guidelines for completing CDM-PDD and CDM-NM
<b>/IPCC-GP/</b>	IPCC Good Practice Guidance & Uncertainty Management in National Greenhouse Gas Inventories, 2000
<b>/IPPC-RM/</b>	Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual
<b>/KP/</b>	Kyoto Protocol (1997)
<b>/MA/</b>	Decision 3/CMP. 1 (Marrakesh – Accords & Annex to decision (17/CP.7))
<b>/TA/</b>	- Tool for the demonstration and assessment of additionality (Ver. 05.2). - Guidance on Assessment of Investment Analysis (Ver 03) - Guidelines on the Demonstration and Assessment of Prior Consideration of CDM (Ver. 03)
<b>/VVM/</b>	Validation and Verification Manual (Version 1.2, Annex 3; EB 55)

**Table 7-3:** Websites used

Reference	Link	Organisation
<b>/cea/</b>	<a href="http://www.cea.nic.in">www.cea.nic.in</a>	Central Electricity Authority
<b>/c&amp;l/</b>	<a href="http://planningcommission.nic.in/aboutus/committee/wrkgrp11/wg11_coal.pdf">http://planningcommission.nic.in/aboutus/committee/wrkgrp11/wg11_coal.pdf</a>	Coal and Lignite report, 11 <sup>th</sup> Five year Plan
<b>/dna-i/</b>	<a href="http://www.cdmindia.in/">http://www.cdmindia.in/</a>	The Designated National Authority of India
<b>/iea/</b>	<a href="http://www.powermin.nic.in/acts_notification/electricity_act2003/preliminary.htm">http://www.powermin.nic.in/acts_notification/electricity_act2003/preliminary.htm</a>	The Indian Electricity Act 2003
<b>/nec/</b>	<a href="http://www.powermin.nic.in/whats_new/national_electricity_policy.htm">http://www.powermin.nic.in/whats_new/national_electricity_policy.htm</a>	The National Electricity policy, 12 <sup>th</sup> Feb 2005
<b>/ps/</b>	<a href="http://petroleum.nic.in/petstat.pdf">http://petroleum.nic.in/petstat.pdf</a>	Petroleum Statistics page 16
<b>/rec/</b>	<a href="http://www.cea.nic.in/reports/articles/thermal/expert_committee_report_fuel.pdf">http://www.cea.nic.in/reports/articles/thermal/expert_committee_report_fuel.pdf</a>	Report on the expert committee on fuel.
<b>/cd4cdm/</b>	<a href="http://www.cd4cdm.org">www.cd4cdm.org</a>	UNEP Riso Centre
<b>/act/</b>	<a href="http://www.incometaxindia.gov.in">www.incometaxindia.gov.in</a> <a href="http://www.mca.gov.in/Ministry/acts_bills.html">www.mca.gov.in/Ministry/acts_bills.html</a>	<ul style="list-style-type: none"> <li>Income tax department, Govt. Of India</li> <li>Company's Act 1956, Ministry of Corporate Affairs, Govt of India.</li> </ul>
<b>/rbi/</b>	<a href="http://www.rbi.org.in">www.rbi.org.in</a>	Reserve bank of India
<b>/moef/</b>	<a href="http://envfor.nic.in/">http://envfor.nic.in/</a>	Ministry of Environment and Forests, Govt of India.
<b>/unfccc/</b>	<a href="http://cdm.unfccc.int">http://cdm.unfccc.int</a>	UNFCCC



**Table 7-4:** List of interviewed persons

Reference	Mol <sup>1</sup>		Name	Organisation / Function
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Sujoy Basak	L&T Limited, DGM-Project Development
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Ravindra Kudchadkar	L&T Limited, General Manager – Project Development
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	J.S Gill	NPL, Joint General Manager
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	S. K. Narang	NPL, Project Director
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Prabhat K. Saha	L&T Power Ltd., Head Projects

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

# ANNEX

- A1:** Validation Protocol
- A2:** Assessment of Baseline Identification
- A3:** Assessment of Financial Parameters
- A4:** Assessment of Barrier analysis
- A5:** Outcome of the GSCP
- A6:** Appointment certificates of the team members

## ANNEX 1: VALIDATION PROTOCOL

**Table A-1: Requirements Checklist**

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
<b>A. General Description of Project Activity</b>				
<b>A.1. Approval</b> <i>The written approval of the parties involved is a mandatory requirement</i>				
A.1.1. Has the project provided written approvals of all parties involved? (EB 55 Annex 1, § 44) <i>Indicate whether a letter of approval has been received, with a clear reference to the supporting documentation.</i> <i>Indicate whether this letter was provided to the DOE by the project participants or directly by the DNA</i>	<p><i>Description:</i></p> <p>PP has received HCA on 14/03/2011 from India DNA and. the same is submitted to the assessment team.</p> <p><i>Justification of evidences:</i> Evidence HCA dated 14/03/2011 has been submitted to the validation team and suffices to prove that the project provided written approvals of all parties involved</p> <p><i>Conclusion:</i> CAR A1 was raised as HCA was submitted at a later stage of validation. The HCA was checked and found acceptable, thus CAR A1 was closed.</p>	/IM01/ /HCA/	CAR A1	OK
A.1.2. Are the approvals issued from organisations	<i>Description:</i> The organization issuing the host country approval is listed as Indian DNA in the UNFCCC website.	/IM01/	Pending g-CAR	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
<p>listed as DNAs on the UNFCCC CDM website?</p> <p>(EB 55 Annex 1, §§ 44, 47, 48, 49 (b), 49 (c), 53)</p> <p><i>Indicate the means of validation employed to assess the authenticity, i.e. in case of doubt whether LoA has been verified with the DNA. Further describe which entity submitted the LoA for validation.</i></p>	<p><i>Justification of evidences:</i></p> <p>Evidence <a href="http://cdm.unfccc.int/DNA/index.html">http://cdm.unfccc.int/DNA/index.html</a> is checked by the assessment team and found the same to be correct.</p> <p><i>Conclusion:</i> The name of the organization issuing the host country approval is same as listed in the UNFCCC website. Hence, Assessment team concludes that the approvals are authenticated and correct.</p>	/HCA/	A1	
<p>A.1.3. Do the written approvals confirm that the corresponding party is a Party to the Kyoto Protocol?</p> <p>(EB 55 Annex 1, § 45(a))</p>	<p><i>Description:</i></p> <p>The written approval from the Indian DNA confirms that the corresponding party is a party to Kyoto protocol</p> <p><i>Justification of evidences:</i></p> <p>The HCA dated 14/03/2011 from the Indian DNAs is cross checked by the assessment team and found the same to be correct.</p> <p><i>Conclusion:</i></p> <p>The written approval from Indian DNA confirms that the corresponding party is a party to the Kyoto protocol</p>	/IM01/ /HCA/	Pending g-CAR A1	OK
<p>A.1.4. Do the written approvals confirm that the participation is voluntary?</p> <p>(EB 55 Annex 1, § 45(b))</p>	<p><i>Description:</i></p> <p>The written approval from the Indian DNA confirms that the participation is voluntary.</p> <p><i>Justification of evidences:</i></p> <p>The HCA from Indian DNAs are cross checked by the</p>	/HCA/	Pending g-CAR A1	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
	assessment team and found the same to be correct. <i>Conclusion:</i> The participation for Indian DNA is voluntary			
A.1.5. Does the written approval from the host country confirm that the project contributes to the sustainable development in the country? (EB 55 Annex 1, § 45(c))	<i>Description:</i> The written approval from Indian DNA confirms that the project will contribute to sustainable development CAR A1 is raised. <i>Justification of evidences:</i> The HCA from Indian DNAs are cross checked by the assessment team and found the same to be correct. <i>Conclusion:</i> OK. CAR A1 is closed.	/IM01/ /HCA/	Pending CAR A1	OK
A.1.6. Do the written approvals refer to the precise project title in the PDD submitted for registration or an additional specification of the project activity, e.g. PDD version number? (EB 55 Annex 1, §§ 45(d), 50)	<i>Description:</i> The written approval from both the Indian DNA refer to the precise project title. The same title is mentioned in the PDD submitted for validation to the DOE. <i>Justification of evidences:</i> The HCA for Indian DNA is cross checked by the assessment team and found that the project title mentioned in the PDD are correct. <i>Conclusion:</i> The project title mentioned in the PDD is same as it is mentioned in the HCA of Indian DNA.	/IM01/ /HCA/	Pending CAR A1	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
A.1.7. Are the written approvals unconditional with regard to A.1.3 to A.1.6? (EB 55 Annex 1, § 46)	<p><i>Description:</i></p> <p>The written approvals from Indian DNA are unconditional.</p> <p><i>Justification of evidences:</i></p> <p>The approvals is cross checked and found correct with respect to unconditional statement</p> <p><i>Conclusion:</i></p> <p>The written approval is unconditional.</p>	/IM01/ /HCA/	Pending CAR A1	OK
A.1.8. Is the information regarding the project participants listed in section A3 and in Annex 1 of the PDD internally consistent to each other? (EB 55 Annex 1, § 51)	<p><i>Description:</i></p> <p>The project participant is Nabha Power Limited (NPL) and is consistently mentioned in section A3 and Annex 1 of the PDD.</p> <p><i>Justification of evidences:</i></p> <p>The PDD has been checked and the name of the project participant is consistent.</p> <p><i>Conclusion:</i></p> <p>The name of the project participant is consistent in the PDD.</p>	/PDD/	OK	OK
A.1.9. Are all project participants listed in the PDD approved at least by one Party involved? (EB 55 Annex 1, § 51) <i>Indicate whether the participation of the project participant(s) has been approved by a Party to the Kyoto Protocol.</i> <i>Describe the means of validation employed to draw this conclusion.</i>	<p><i>Description:</i></p> <p>The project participant is Nabha Power Limited is the project participant which is approved by Indian DNA which is the host country involved for the project activity (i.e. MoEF)</p> <p><i>Justification of evidences:</i></p>	/IM01/ /HCA/	Pending CAR A1	OK



Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
	<p>The Indian DNA approves the project participant listed in the PDD.</p> <p><i>Conclusion:</i></p> <p>The Indian DNA approves the project participants listed in the PDD.</p>			
<p>A.1.10. Are any other project participants approved but not listed in the PDD?</p> <p>(EB 55 Annex 1, § 52)</p>	<p><i>Description:</i></p> <p>The project participant listed in the PDD is approved by the DNA of Non Annex-I countries. There is no other project participant envisaged at this stage of validation.</p> <p><i>Justification of evidences:</i></p> <p>The listed project participant is approved by Indian DNA</p> <p><i>Conclusion:</i></p> <p>: No other project participant is involved at this stage of validation.</p>	<p>/IM01/ /HCA/</p>	<p>Pending CAR A1</p>	OK
<p>A.1.11. Does the DoE have a direct contractual relationship with the PP?</p> <p>(EB 55 Annex 1, § 51; EB 50 Annex 48, §§ 7–9)</p> <p><i>Check whether the PPs listed in the published PDD are still listed in the PDD going to be submitted to request for registration.</i></p>	<p><i>Description:</i></p> <p>The DOE has a direct contract with NPL.</p> <p><i>Justification of evidences:</i></p> <p>The contract with the DOE dated 28/05/2010 has been checked to confirm the same.</p> <p><i>Conclusion:</i></p> <p>The DOE has a direct contract with the project participant for providing the CDM Validation service.</p>	<p>/CON- DOE/</p>	OK	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
<b>A.2. Contribution to Sustainable Development</b>  <i>The project's contribution to sustainable development is assessed.</i>				
<p>A.2.1. Has the host country confirmed that the project assists it in achieving sustainable development?</p> <p>(EB 55 Annex 1, §§ 125–127)</p> <p><i>Contains a statement confirming whether the letter of approval by the DNA of the host party confirmed the contribution of the project to the sustainable development of the Host Party.</i></p>	<p><i>Description:</i></p> <p>The host country approval confirms that the project will assist in achieving sustainable development.</p> <p><i>Justification of evidences:</i></p> <p>Evidence HCA dated 14/03/2011 has been submitted and suffices to prove that the project contributes to the sustainable development in the country.</p> <p><i>Conclusion:</i></p> <p>The host country approval proves that the project will assist in achieving sustainable development.</p>	/PDD/ /IM01/ /HCA/	Pending g-CAR A1	OK
<p>A.2.2. Will the project create other environmental or social benefits than GHG emission reductions?</p> <p>(EB 55 Annex 1, §§ 125–127)</p> <p><i>Describe the other positive aspects not related to GHG emission reduction on the environment.</i></p>	<p><i>Description:</i></p> <p>The project is electricity generation using super critical technology, and leading to improvement in the technology in the host country. The project will assist in social and economical development of the local area in addition to reduction of GHGs.</p> <p><i>Justification of evidences:</i> During the site visit and subsequent interview with the client, it was found no other environmental benefits envisaged at this stage of validation. However,</p>	/PDD/ /IM01/	Pending g-CAR A1	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
	<p>employment opportunities to the local villagers and other stakeholders directly /indirectly will be created by the project.</p> <p><i>Conclusion:</i> Project activity will lead to many employment opportunities and economic development of the nearby villages in the region.</p>			
<b>A.3. PDD editorial aspects</b> <i>The PDD used as a basis for validation shall be prepared in accordance with the latest template and guidance from the CDM Executive Board available on the UNFCCC CDM website.</i>				
A.3.1. Has the latest version of the PDD form been applied? (EB 55 Annex 1, § 55)	<p><i>Description:</i> The project has applied CDM-PDD version 3 which is the latest at the time of Global Stake holder consultation Process.</p> <p><i>Justification of evidences:</i></p> <p><a href="https://cdm.unfccc.int/Reference/PDDs_Forms/PDDs/PDD_form02_v03.doc">https://cdm.unfccc.int/Reference/PDDs_Forms/PDDs/PDD_form02_v03.doc</a></p> <p>the web link has been cross checked by the assessment team and found that latest version of the PDD form has been applied</p> <p><i>Conclusion:</i> The latest version of CDM PDD template is used for the project activity.</p>	/UNFCCC/ C/	OK	OK

<b>Checklist Item</b> (incl. guidance for the validation team)	<b>Validation Team Comments</b> (justification and substantiation of information, data and evidences)	<b>Ref.</b>	<b>Draft Concl.</b>	<b>Final Concl.</b>
<p>A.3.2. Has the PDD been duly filled in accordance with the latest guidance(s)? (EB 55 Annex 1, §§ 56–57)</p>	<p><i>Description:</i> The PDD is duly filled as per the latest version of CDM-PDD filling guidelines version 7. However, following issues are identified;</p> <p>Section A.2 of the PDD should include the following:</p> <p>(a) The scenario existing prior to the start of the implementation of the project activity;</p> <p>PP is requested to elaborate the pre-project scenario addressing. Power generation capacity, fuel, and technology and efficiency and proposed project activity.</p> <p>-----</p> <p>Section A.2 of the PDD should include in brief how the proposed project activity reduces green house gas emissions (referring scenarios, emissions sources and gases )and also description of the sources and gases included in the project boundary)</p> <p>-----</p> <p>Section A.2 of the PDD describes that the project activity involves the installation of 2X700 MW. However, the same is not in line with the DPR and management board note where the consideration is 2X660 MW. Justify inconsistency and elaborate the same in PDD.</p> <p>-----</p> <p>Section A.4.3 of the PDD should include the following:</p>	<p>/GCP/</p>	<p>CAR A2</p> <p>CAR A3</p> <p>CAR A4</p> <p>CAR</p>	<p>OK</p>

[illegible]

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
<b>A.4. Technology to be employed</b> <i>Validation of project technology focuses on the project engineering, choice of technology and competence/maintenance needs. The DOE should ensure that environmentally safe and sound technology and know-how is used.</i>				
<p>A.4.1. Does the PDD contain a clear, accurate and complete project description?</p> <p>(EB 55 Annex 1, §§ 58–59)</p> <p><i>The PDD shall contain a clear description of the project activity which provides the reader with a clear understanding of the precise nature of the project activity and the technical aspects of its implementation.</i></p> <p><i>Pl. consider esp. chapters A.2, A.4.2 and A.4.3 (in case of LSC PDD) for assessment.</i></p> <p><i>Describe the process undertaken to validate the accuracy and completeness of the project description.</i></p> <p><i>Contain the DOE's opinion on the accuracy and completeness of the project description.</i></p>	<p><i>Description:</i> The project activity is installation and operation of Super-critical coal fired power generation plant which will have an installed capacity of 1400 MW (2x 700 MW). At supercritical condition, the fluid conditions eliminate the requirement of re-circulating boiler. Keeping the steam parameters at super-critical conditions will increase the efficiency of overall power generation cycle of the super-critical power plant over that of a sub-critical power plant. However, following issue has been raised;</p> <p>The project shall compare the net efficiency of the project activity to that of the efficiency the scenario (sub-critical technology) prior to start of the project activity (on weighted average basis and best efficient plants). Further, PP is requested to provide the technical details of the Boiler and turbine generator (BTG) with specific reference source.(in Section A.4.3)</p> <p><i>Justification of evidences:</i> The PDD contain clear and accurate description of the project activity. The project is still under construction phase. The same is confirmed during the site visit.</p>	/IM01/ /TS/ /PDD/	CAR A7	OK



<b>Checklist Item</b> (incl. guidance for the validation team)	<b>Validation Team Comments</b> (justification and substantiation of information, data and evidences)	<b>Ref.</b>	<b>Draft Concl.</b>	<b>Final Concl.</b>
	<i>Conclusion:</i> The description mentioned in the PDD is correct and accurate for the project activity.			
A.4.2. Is this description in accordance with the real situation or (in case of greenfield projects) is it most likely that the project will be implemented acc to the project description?	<i>Description:</i> The project is a Greenfield project activity. NPL has a total capacity of 2100 MW (3 x 700 MW), out of which the current project is under phase 1 (2 x 700 MW). The power generation is basically from supercritical coal based power technology. The project is still under implementation at this stage of validation.  <i>Justification of evidences:</i> The implementation of the project is envisaged to be as per the description in the registered PDD.  <i>Conclusion:</i> The green field project activity is under implementation at this stage of validation.	/TS/ /PDD/ /IM01/	OK	OK
A.4.3. In case the project involves alteration of the existing installation or process, is a clear description available regarding the differences between the project and the pre-project situation?  (EB 55 Annex 1, §§ 63–64) Describe the steps taken to validate this issue.	<i>Description:</i> The project is a green field project activity. The pre-project scenario is thus not applicable for the project. The project description is well documented and justified in the PDD.  <i>Justification of evidences:</i> The project is a green field project activity. The same is cross checked during the site visit.  <i>Conclusion:</i> The project is a green field project activity. There were no instances of alternation of existing installation or process.	/IM01/	OK	OK

<b>Checklist Item</b> (incl. guidance for the validation team)	<b>Validation Team Comments</b> (justification and substantiation of information, data and evidences)	<b>Ref.</b>	<b>Draft Concl.</b>	<b>Final Concl.</b>
<p>A.4.4. Does the project design engineering reflect current good practices?</p> <p><i>Consider the equipment specifications, literature (e.g. EU BREF papers) and professional experiences. Describe the process undertaken to assess the engineering.</i></p>	<p><i>Description:</i> The project activity is basically installation and operation of Super-critical coal fired power generation plant which will have an installed capacity of 1400 MW (2x 700 MW). No other power plant in India is commercially operated using this technology during the global stakeholder consultation process. The technology is basically improving the efficiency of the plant compared to the sub critical technology which is the common practice in Indian Industries.</p> <p><i>Justification of evidences:</i> DOE sectoral expertise is sufficient enough to prove that the project activity project design engineering reflects current good practices which is in line with VVM (Para 93 ii of VVM version 1.2) and is acceptable to the validation team.</p> <p><i>Conclusion:</i> The project activity follows the current good practice scenario in the present Indian industry.</p>	/VVM/ /IM01/ /PDD/	OK	OK
<p>A.4.5. 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?</p> <p><i>Describe the process undertaken to assess the state of the art technology.</i></p>	<p><i>Description:</i></p> <p>The project activity is installation and operation of Super-critical coal fired power generation plant which will have an installed capacity of 1400 MW (2x 700 MW). No other power plant in India is commercially operated using this technology during the global stakeholder consultation process. The technology is basically improving the efficiency of the plant compared to the sub critical technology which is the common practice in Indian Industries.</p> <p><i>Justification of evidences:</i> DOE sectoral expertise is sufficient</p>	/VVM/ /PDD/	OK	OK

<b>Checklist Item</b> (incl. guidance for the validation team)	<b>Validation Team Comments</b> (justification and substantiation of information, data and evidences)	<b>Ref.</b>	<b>Draft Concl.</b>	<b>Final Concl.</b>
	<p>enough to prove that the project activity project design engineering reflects current good practices which is in line with VVM and is acceptable to the validation team.</p> <p><i>Conclusion:</i> The technology is energy efficient than the commonly practised sub critical technology in different Indian Industries.</p>			
<p>A.4.6. Does the project make provisions for meeting training and maintenance needs?</p> <p><i>Describe the process undertaken to assess the maintenance and training needs.</i></p>	<p><i>Description:</i> The project is under construction, however the training requirements to be undertaken during the erection, construction and operation has been detailed and proper provisions are provided for the same. Further the training for operation shall be identified during actual operations.</p> <p><i>Justification of evidences:</i> During the site visit and interview with the project participant it was found that the project activity is still in the implementation stage and thus the training requirements are not identified at this stage but the compliance of the same should be checked during the verification of the project activity.</p> <p><i>Conclusion:</i> provision for training has been provided.</p>	<p>/IM01/ /PDD/</p>	<p>OK</p>	<p>OK</p>

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
<b>A.5. Small scale project activity</b> <i>It is assessed whether the project qualifies as small-scale CDM project activity</i>				
A.5.1. Does the project qualify as a small scale CDM project activity as defined in decision 4 / CMP.1 annex II? (EB 55 Annex 1, §§ 135–136 (a))	<p><i>Description:</i></p> <p>The project is a Large scale project activity, thus the section is not applicable.</p> <p><i>Justification of evidences:</i></p> <p>NA</p> <p><i>Conclusion:</i> NA</p>	NA	NA	NA
A.5.2. Does the project apply one of the approved small scale categories and any methodology and tool referred therein? (EB 55 Annex 1, § 136 (b)) <i>Check, if applicable the expiry dates of the applied methodology. Further, take into consideration the general guidance to the methodologies<sup>55</sup>, which provide guidance on equipment capacity, equipment performance, sampling and other monitoring related issues.</i>	<p><i>Description:</i></p> <p>The project is a Large scale project activity, thus the section is not applicable.</p> <p><i>Justification of evidences:</i> NA</p> <p><i>Conclusion:</i> NA</p>	NA	NA	NA
A.5.3. Is the small scale project activity not a	<i>Description:</i>	NA	NA	NA

<sup>55</sup> <http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html>

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
debundled component of a larger project activity? (EB 55 Annex 1, § 136 (c)) <i>Describe the steps taken to validate this issue. PI refer to the Compendium of guidance on debundling (EB 36, Annex 27 54, Annex 13).</i>	The project is a Large scale project activity, thus the section is not applicable. <i>Justification of evidences: NA</i>  <i>Conclusion: NA</i>			
A.5.4. Is an assessment of the environmental impacts of the proposed SSC CDM project activity required by the host Party? (EB 55 Annex 1, § 136 (d))	<i>Description:</i> The project is a Large scale project activity, thus the section is not applicable. <i>Justification of evidences: NA</i>  <i>Conclusion: NA</i>	NA	NA	NA
<b>B. Project Baseline, Additionality and Monitoring Plan</b>				
<b>B.1. Application of the Methodology</b>				
B.1.1. Does the project apply an approved and applicable CDM methodology and a valid version thereof? (EB 55 Annex 1, § 65)	<i>Description:</i> The project applies ACM0013 version 3 released in EB53 which is the valid and latest version available during the global stake holder consultation process.  <i>Justification of evidences:</i>	/UNFCC C/ /ACM001 3/ /PDD/	OK	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
<i>Describe the steps taken to validate this issue.</i>	<p>Evidence <a href="http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html?searchon=1&amp;searchmode=advanced">http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html?searchon=1&amp;searchmode=advanced</a> is cross checked by the assessment team and found the same to be correct.</p> <p><i>Conclusion:</i> The project applies ACM0013 version 3 released in EB53 which is the valid and latest version during the global stake holder consultation process.</p>			
<p>B.1.2. Is the applied CDM methodology identical with the version available on the UNFCCC website?</p> <p>(EB 55 Annex 1, §§ 65, 70)</p> <p><i>Describe the steps taken to validate this issue.</i></p>	<p><i>Description:</i> The project applies ACM0013 version 3 released in EB53 which is the valid and latest version available during the global stake holder consultation process.</p> <p><i>Justification of evidences:</i></p> <p>Evidence <a href="http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html?searchon=1&amp;searchmode=advanced">http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html?searchon=1&amp;searchmode=advanced</a> is cross checked by the assessment team and found the same to be correct.</p> <p><i>Conclusion:</i> The project applies ACM0013 version 3 released in EB53 which is the valid and latest version during the global stake holder consultation process.</p>	/UNFCC C/ /PDD/	OK	OK



Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
<p>B.1.3. Are all applicability criteria in the methodology, the applied tools or any other methodology component referred to therein fulfilled?</p> <p>(EB 55 Annex 1, §§ 66(a)–(b), 68, 71, 76)</p> <p><i>Describe for <u>each</u> applicability criterion listed in the selected approved methodology the steps taken to assess the information contained in the PDD.</i></p>	<p><i>Description:</i> The applicability criteria of the methodology is described below:</p> <p>1. The project activity is the construction and operation of a new fossil fuel fired grid-connected electricity generation plant that uses a more efficient power generation technology than what would otherwise be used with the given fossil fuel</p> <p><u>Assessment by the DOE:</u> The proposed project activity of NPL involves construction of the new super-critical coal fired power plant at Nalash village of Patiala District. The project activity uses super-critical technology which is more efficient than the conventional coal fired sub-critical power generation technology which is an established and conventional practice in the Indian scenario. However, CAR B1 was raised during the validation process as the efficiency values are not described, further it is not clear whether the efficiency is calculated on net or gross basis. .</p> <p>2. The project activity does not include the construction and operation of a co-generation power plant</p> <p><u>Assessment by the DOE:</u> The proposed project activity generates only power and is not a cogeneration power plant. A fully condensing turbine will be used in the proposed project activity. Thus the applicability condition of the methodology is satisfied.</p> <p>3. Data on fuel consumption and electricity generation of recently constructed power plants are available;</p> <p><u>Assessment by the DOE:</u> Applicability criterion 3 of the</p>	<p>/ACM001 3/ /PDD/ /TS/ /CEA/ /CERC/</p>	<p>CAR B1</p> <p>OK</p> <p>CAR B2</p>	<p>OK</p>

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
	<p>methodology is not justified fully due to the fact that the data on the fuel consumption is not being monitored by CEA at unit level. Considering this issue CAR B2 was raised during the validation process.</p> <p>4. The identified baseline fuel is used in more than 50% of total generation by utilities in the geographical area within the host country, as defined later in the methodology, or in the entire host country. To demonstrate this applicability condition data from the latest three years shall be used. Maximum value of same fossil fuel generation estimated for three years should be greater than 50%.</p> <p><u>Assessment by the DOE:</u> Background investigation of CEA database <a href="http://www.cea.nic.in/">http://www.cea.nic.in/</a> is cross checked by the assessment team and found that more than 50% of the total generation in the host country is by the identified baseline fuel i.e. Coal.</p> <p>5. The methodology is only applicable if the most plausible baseline scenario is the construction of (a) new power plant(s) using the same fossil fuel category as used in the project activity. This means that if the most likely baseline scenario identified through the baseline identification procedure is the import of electricity or the construction of a new power plant(s) that (partly) use renewable energy sources, nuclear sources or other categories of fossil fuels than the fossil fuel category fired in the project activity plant, then this methodology is not applicable."</p> <p><u>Assessment by the DOE:</u> The PDD does not justify the applicability if the most plausible scenario is the construction of a new power plant using the same fossil fuel category as opposed to the fossil fuel type being currently described in the PDD. Considering this</p>		<p>OK</p> <p>CAR B3</p>	

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
	<p>issue CAR B3 is raise.</p> <p><i>Justification of evidences:</i> To be provided after the closure of the CAR.</p> <p><i>Conclusion:</i> The revised PDD details the applicability of all the criteria and the same is acceptable.</p>			
<p>B.1.4. In case one or more applicability criteria have not been met, has the validation team requested clarification to, revision of or deviation from the methodology in accordance with the latest guidelines?</p> <p>(EB 55 Annex 1, §§ 72–75)</p>	<p><i>Description:</i> The applicability criteria of the methodology are not justified in the PDD. Hence CAR B1, CAR B2 and CAR B3 were raised during the validation process. However, the clarification/revision of the methodology is not required for the project activity.</p> <p><i>Justification of evidences:</i> The CEA and CERC data were cross checked for the baseline plant efficiency determination and manufactures data was used for the determination of project efficiency. The same is assessed correct by the assessment team.</p> <p>Specific fuel consumption (SFC) data is sourced from CERC Tariff orders which are fixed at the time of Tariff Fixation. The same is assessed correct by the assessment team</p> <p>Fossil fuel categories is being included in the revised PDD. The same is assessed correct by the assessment team</p> <p><i>Conclusion:</i> The CARs pertaining to the applicability has been closed based on the revised PDD.</p>	<p>/ACM001 3/ /PDD/ /TS/ /CEA/ /CERC/</p>	<p>Pending closure of CAR B1, CAR B2 and CAR B3</p>	<p>OK</p>

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
<p>B.1.5. Is the project in accordance with every other stipulation or requirement mentioned in all sections of the methodology and in guidances for approved methodologies provided by the CDM EB?</p> <p>(EB 55 Annex 1, § 69, 71)</p> <p><i>Describe the steps taken to check whether the proposed project activity meets <u>all the other possible stipulations and/or limitations</u> mentioned in all sections of the approved methodology selected.</i></p>	<p><i>Description:</i> The project is in line with every other requirement of the stipulated methodology</p> <p><i>Justification of evidences:</i> ACM0013 Version 3 was cross checked by the assessment team and found correct.</p> <p><i>Conclusion:</i> The proposed project activity is in line with every other requirement of the stipulated methodology.</p>	/ACM0013/	OK	OK
<p><b>B.2. Project Boundaries</b></p> <p><i>Project Boundaries are the limits and borders defining the GHG emission reduction project</i></p>				
<p>B.2.1. Are the project's spatial boundaries (geographical) clearly defined?</p> <p>(EB 55 Annex 1, §§ 67(a), 78–80)</p> <p><i>Provide information on how the validation of the geographical boundary has been performed either based on reviewed documented evidence or by describing what was observed/viewed during a site visit.</i></p>	<p><i>Description:</i> The project spatial boundary is not defined as per the methodological requirement. Considering this issue CAR B4 was raised during the validation process.</p> <p><i>Justification of evidences:</i> During the site visit and subsequent interview with the client it was found that project boundary consists of two power plants of the project activity and all the power plants considered for baseline emission factor calculation.</p> <p><i>Conclusion:</i> The project boundary includes two power plants of the project activity and all the power plants considered for baseline</p>	/IM01/ /PDD/ /ACM0013/	CAR B4	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
	emission factor calculation. The boundary described in the PDD is in line with the methodology. Hence, CAR is closed.			
<p>B.2.2. Are all sources and GHGs included in the project boundary as required in the applied methodology?</p> <p>(EB 55 Annex 1, §§ 67(a), 78–80)</p> <p><i>Provide information on how the validation of the GHGs and sources has been performed either based on reviewed documented evidence or by describing what was observed/viewed during a site visit.</i></p>	<p><i>Description:</i> The baseline GHG for the project activity is CO<sub>2</sub>. The same is considered in the project boundary.</p> <p><i>Justification of evidences:</i> The project being power generation by fossil fuel usage, the main GHG is CO<sub>2</sub>, the same is described in the PDD.</p> <p><i>Conclusion:</i> Baseline GHG is included in the project boundary as per the methodological requirement.</p>	/IM01/ /ACM001 3/ /PDD/	OK	OK
<p>B.2.3. In case the methodology allows to choose whether a source and/or gas is to be included, is the choice sufficiently explained and justified?</p> <p>(EB 55 Annex 1, §§ 67(a), 78–80)</p> <p><i>Confirm if the justification provided by the PPs is reasonable, based on assessment of supporting documented evidence provided by the PPs or by onsite observations.</i></p>	<p><i>Description:</i> The baseline GHG for the project activity is CO<sub>2</sub>. The same is considered in the project boundary.</p> <p><i>Justification of evidences:</i> The project being power generation by fossil fuel usage, the main GHG is CO<sub>2</sub>, the same is described in the PDD.</p> <p><i>Conclusion:</i> Baseline GHG is included in the project boundary as per the methodological requirement. Apart from this the methodology does not require the inclusion of any other GHG.</p>	/IM01/ /ACM001 3/ /PDD	OK	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
<b>B.3. Baseline Identification</b>  <i>The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.</i>				
B.3.1. What possible baseline scenarios have been considered?  (EB 55 Annex 1, §§ 67(b), 83) <i>Fill in all alternatives in table A-2.</i>	<p><i>Description:</i> As per the stipulated methodology the baseline identification needs to follow Step1 and Step 2 to arrive to the best possible baseline alternative.</p> <p>The identification of the baseline alternative as per Step 1 of the approved methodology should include power generation using the same fossil fuel category as in the project activity, but technologies other than that used in the project activity.</p> <p>-----</p> <p>The identification of the baseline alternative as per Step 1 of the approved methodology should include that <u>the baseline scenario candidates identified may not be available to project participants, but could be available to other stakeholders within the grid boundary</u> (e.g. other companies investing in power capacity expansions).</p> <p>-----</p> <p>The identification of baseline scenario is not as per the Step1 of the approved methodology. In establishing the baseline alternative the following points needs to be addressed with appropriate evidences:</p>	/ACM001 3/  /BASE/  /CEA/  /CERC/	CAR B5   CAR B6   CAR B7	OK



Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
	<ol style="list-style-type: none"> <li>1. The category and type of fuel that would be used in each alternative (considering the requirement of technology)</li> <li>2. Load factor and operational characteristics which delivers similar services(peak vs. base load power)</li> <li>3. Power plant technologies that have recently been constructed or are under construction or are being planned (e.g. documented in official power expansion plan)</li> <li>4. A clear description of each baseline scenario alternative, including information on the technology, such as the efficiency and technical lifetime, shall be provided in the CDM PDD.</li> </ol> <p><i>Justification of evidences:</i> ACM0013 is cross checked for the identification of the baseline scenario and found incomplete w.r.t. above issues.</p> <p><i>Conclusion:</i> The most suitable baseline scenario is identified considering the power plants of the same capacity, load factor and operational characteristics. The power plant identified as alternatives should deliver same services (i.e. peak vs. base load power). Moreover, the levelised cost of generation is used to identify the economically most attractive baseline scenario as per the methodology requirement. Further the alternatives include the scenario which are available to other project participants.</p>			
B.3.2. Is the list of alternatives complete?	<input type="checkbox"/> All plausible alternative scenarios listed in the approved methodology have been considered. In the course of	/ACM001 3/	Pending	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
(EB 55 Annex 1, §§ 67(b), 83) <i>Describe how it was validated that all alternatives are plausible and no plausible alternative is excluded from the consideration</i>	document review and site visit, it has been validated that no other alternatives which supply comparable outputs and / or services are to be taken into consideration. Thus no plausible scenario has been omitted. <input checked="" type="checkbox"/> The following alternative scenarios/options have been omitted. Corresponding CAR(s)/CL(s) has /have been issued Pending closure of CAR B5 to CAR B7	/BASE/ /CEA/ /CERC/	closure of CAR B5 to CAR B7	
B.3.3. What has been identified as the baseline scenario? (EB 55 Annex 1, §§ 81–82, 86) <i>Describe the chosen BL scenario, taking into consideration the technology that would be employed and / or the activities that would take place in the absence of the proposed CDM project activity.</i>	<i>Description:</i> Power generation using subcritical coal-fired power generation technologies is found to be most economical alternative for the project activity. However, CAR B5 to CAR B7 is raised during the validation process.  <i>Justification of evidences:</i> The LUCE is used to identify the economically most attractive baseline scenario. The Financial sheet is cross checked by the assessment team for the same.  <i>Conclusion:</i> The most suitable baseline scenario is identified considering the power plants of the same capacity, load factor and operational characteristics. The power plant identified as alternatives should deliver same services (i.e. peak vs. base load power). Moreover, the LUCE is used to identify the economically most attractive baseline scenario as per the methodology requirement. The baseline scenario identified is power generation using sub-critical coal-fired power plant with linkage coal.	/ACM0013/ /BASE/ /CEA/ /CERC/	pending closure of CAR B5	OK
B.3.4. Has the baseline scenario been determined according to the methodology?	For details of the assessment regarding the evaluation of the baseline scenario pl. refer to table A-2.	/IM01/	Pending	OK

<b>Checklist Item</b> (incl. guidance for the validation team)	<b>Validation Team Comments</b> (justification and substantiation of information, data and evidences)	<b>Ref.</b>	<b>Draft Concl.</b>	<b>Final Concl.</b>
(EB 55 Annex 1, §§ 82, 87(e)) <i>Describe how it is validated that the identification of the most plausible baseline scenario is carried out in accordance with the applied methodology and applied methodological tools. Please refer to table A-2.</i>	<input type="checkbox"/> The determination has been carried out as per the procedure contained in the applied methodology. <input checked="" type="checkbox"/> The following CARs / CLs have been identified with respect to the selection of the baseline scenario: ding closure of CAR B5 to CAR B7	/ACM001 3/ /CERC/ /CEA/	closure of CAR B5 to CAR B7	
B.3.5. Has any plausible alternative scenario been excluded? (EB 55 Annex 1, § 83) <i>Describe how it is validated that no plausible alternative scenario has been excluded.</i>	details of the assessment regarding the evaluation of the baseline scenario pl. refer to table A-2. <input type="checkbox"/> No plausible baseline scenario has been excluded. <input checked="" type="checkbox"/> The following plausible baseline scenarios have been excluded though no adequate justification has been provided for elimination. The following CARs / CLs have been issued:  PP is requested to justify appropriate explanations and documentation to support the exclusion of the scenarios, if one or more scenarios are excluded from the baseline alternative identification. The reasons shall be provided in the PDD for identification of baseline alternative and subsequent baseline determination.	/ACM001 3/ /CERC/ /CEA/	CAR B8	OK
B.3.6. Is the identified baseline scenario reasonable and has the baseline scenario been determined using conservative assumptions where possible, including relevant references and sources?	<input type="checkbox"/> The baseline scenario is reasonable and has been determined using conservative assumptions where possible. Please refer to comments in table A-2 and sections B.3.2 to B.3.5 above. <input checked="" type="checkbox"/> The following CARs / CLs have been issued because assumptions used in the baseline determination have	/IM01/ /ACM001 3/ /CERC/	Penden g closure of CAR B5 to	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
(EB 55 Annex 1, §§ 84–86(a)–(c)) <i>Describe whether the choice of the identified baseline scenario is reasonable by validating the <u>key assumptions, calculations and rationales</u> used in the PDD. Describe whether these are listed, relevant and <u>conservatively interpreted</u> in the PDD.</i>	been assessed to be not conservative  Pending closure of CAR B5 to CAR B8	/CEA/	CAR B8	
B.3.7. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?  (EB 55 Annex 1, §§ 85, 87(d)) <i>Describe whether the PP has shown that all relevant policies and circumstances have been identified and correctly considered in the PDD in accordance with the guidance by the Board. Pl. consider the guidance EB 22 annex 3 (regarding E+ and E- policies).</i>	<i>Description:</i> The National and sectoral policies with regards to the project activity is not described in the PDD. Considering this issue CAR B9 was raised during the validation process.  <i>Justification of evidences:</i> The contents of the EB meeting 22 annex 3 and EB55 para 27 are cross checked.  <i>Conclusion:</i> Relevant national & sectoral policies have been considered such as decisions of the Power financing corporation and the energy policy of the Government of India Though EB55 para 27 gives an option not to considered national and sectoral policies to demonstrate additionality. However, Relevant national & sectoral policies have been considered such as decisions of the Power financing corporation and the energy policy of the Government of India. Hence, CAR is closed.	/EB meeting 22 annex 3/  /EB meeting 55/	CAR B9	OK
B.3.8. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?  (EB 55 Annex 1, § 87(a)–(c)) <i>Describe whether the documents and sources referred to in</i>	<i>Description:</i> The available data and references are included in the PDD. However, CAR B5 is raised during the Validation process.  <i>Justification of evidences:</i> The references quoted in the PDD was cross checked by the assessment team and found the same to be	/ACM001 3/ /CERC/  /CEA/	Pendi ng closur e-of CAR	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
<i>the PDD are correctly quoted and clearly referenced.</i>	correct. Pending closure of CAR B5  <i>Conclusion:</i> The LUCE is used to identify the economically most attractive baseline scenario as per the methodology requirement. The baseline scenario identified is power generation using sub-critical coal-fired power plant with linkage coal. The data are available from government sources.		B5	
B.3.9. Does the PDD contain a <i>verifiable</i> description of the identified baseline scenario, including a description of the technology that would be employed and/or the activities that would take place in the absence of the proposed CDM project activity. (EB 55 Annex 1, § 86)	<i>Description:</i> The PDD contains the verifiable description of the identified baseline scenario. However, CAR B5 to CAR B8 were raised during the validation process.  <i>Justification of evidences:</i> ACM0013 is cross checked for the identification of the baseline scenario.  <i>Conclusion:</i> The most suitable baseline scenario is identified considering the power plants of the same capacity, load factor and operational characteristics. Moreover, the LUCE is used to identify the economically most attractive baseline scenario as per the methodology requirement. The baseline scenario identified is power generation using sub-critical coal-fired power plant with linkage coal.	/ACM0013/ /CERC/ /CEA/	Pending closure of CAR B5 to CAR B8	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
<b>B.4. Additionality Determination</b> <i>The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.</i>				
<b>B.4.1. Methodology</b>				
<p>B.4.1.1. Does the PDD describe how the project is additional and does the additionality justification follow the requirements of the applied methodology and/or methodological tools?</p> <p>(EB 55 Annex 1, §§ 67(d), 94–95)</p> <p><i>Describe how it is validated that additionality justification is carried out in accordance with the applied methodology and/or applied methodological tools. Further focus your assessment on the reliability and credibility of data, rationales and assumptions, justifications and documentations provided by the PP.</i></p>	<p><i>Description:</i> The project activity has used LUCE as the financial indicator that the project activity is not the most economically attractive alternative (as per the Methodology step 1 requirement) and using “Tool for the demonstration and assessment of additionality” version 5.2 (the latest version) that the project is not economically or financially feasible without the revenues from the sale of CERs. Clarify how LUCE is considered an appropriate financial indicator for demonstrating the additionality for the project type and decision making context considering the fact that the project is in private sector and financed by a debt equity mix. CL B1 is raised for the same.</p> <p><i>Justification of evidences:</i> Additionality Tool, Methodology ACM 0013, worksheet and PDD were checked by the validation team</p> <p><i>Conclusion:</i></p> <p>Project developer identified economically the most attractive baseline alternative through investment comparison analysis using LUCE as financial indicator as required by the Methodology and that the project is not economically and financially attractive using the benchmark analysis. Validation team checked the worksheets,</p>	/PDD/ /TA/	CLB4	OK



Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
	assumptions and input parameters incorporated therein, cross checked the input data through independent verification and the conclusions given in the PDD and found them to be correct and acceptable. Validation team therefore concludes that the project developer has followed the methodology and the methodological tools.			
<b>B.4.2. Consideration of CDM before project start</b>				
<p>B.4.2.1. Is the project starting date reported in accordance with the CDM glossary of terms?</p> <p>(EB 55 Annex 1, § 104(a))</p> <p><i>Assess why the chosen starting date can be considered as the earliest date at which either the implementation or construction or real action of a project has begun or will begin.</i></p> <p><i>Check that no other activities related to the project that happened before the identified start date can be considered as start date. In this context please also take into consideration infrastructural expenses if they are relevant (in terms of costs and importance for the project implementation) in the specific context of the project activity.</i></p>	<p><i>Description:</i> PP has stated that the starting date of the project is 16<sup>th</sup> July 2010 (sec. C.1.1. of PDD) and submitted EPC contract</p> <p><i>Justification of evidences:</i> Documentary evidence furnished in support of starting date, viz., EPC signed contract, found that as the project activity start date is 16<sup>th</sup> July 2010, which is conformity with the Glossary of CDM terms</p> <p><i>Conclusion:</i> The starting date is defined as the date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity. Since the expenditure was committed on 16<sup>th</sup> July 2010 (EPC signed), the starting date reported in the PDD is in accordance with the CDM Glossary of Terms</p>	<p>/PDD/ /MD/ /EPC/ /CDM-Gloss/</p>	OK	OK
<p>B.4.2.2. In case the project start date is on or after 2<sup>nd</sup> August 2008 has the PP informed the DNA and UNFCCC about the intension to seek CDM status?</p>	<p><i>Description:</i></p> <p>Chronology of events does not include the date of the Board meeting in which CDM was considered and date of allotment of the project to the project developer. The chronology does not conclude how the project is in conformity with Annex 22, EB 49.</p>	<p>/EB49, Annex22/</p>	<p><del>CAR</del> B49</p>	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
<p>(EB 55 Annex 1, §§ 99–101)</p> <p><i>Describe whether such a notification has been provided by the project participants within six months of the project activity start date; if NOT it shall be determined that the CDM was not seriously considered.</i></p>	<p>Further information is required when the DNA was notified.</p> <p><i>Justification of evidences:</i></p> <p>The PP had intimated the UNFCCC and DNA of India via email dated 21/01/2010 and has received an acknowledgement on 8<sup>th</sup> February 2010, while the acknowledgement by DNA was received on 25<sup>th</sup> January 2010.</p> <p><i>Conclusion:</i> The intimation to UNFCCC and host country DNA has been checked and confirmed. Thus CDM consideration is assessed to be serious.</p>			
<p>B.4.2.3. In case the project start date is before commencing of validation and 2<sup>nd</sup> August 2008, was the incentive from the CDM seriously considered and are details given in the PDD?</p> <p>(EB 55 Annex 1, §§ 100, 102)</p> <p><i>Describe whether the evidence to support such consideration is adequately and transparently described in the PDD.</i></p>	<p><i>Description:</i> The start date of the project activity is after 2<sup>nd</sup> August 2008.</p> <p><i>Justification of evidences:</i> Serious CDM consideration EB49 Annex 22, version 03 is cross checked by the assessment team.</p> <p><i>Conclusion:</i> The intimation to UNFCCC and host country DNA has been checked and confirmed. Thus CDM consideration is assessed to be serious.</p>	/EB49, Annex22/	Pending-CAR B40	OK
<p>B.4.2.4. How and when was the decision to proceed with the project taken?</p> <p><i>Describe the steps taken to validate the starting date.</i></p>	<p><i>Description:</i> The decision was taken by the Board of L&amp;T Power Development Ltd. on 22<sup>nd</sup> September 2009</p> <p><i>Justification of evidences:</i> Management decision has been verified and found to be OK.</p>	/PDD/ /MD/ /EB 49 Annex 22/	Pending-CAR B40	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
	<p><i>Conclusion:</i> The decision was taken by Board of L&amp;T Power Development Ltd. on 22<sup>nd</sup> September 2009 and the relevant resolution passed by the board has been checked to confirm the same.</p>			
<p>B.4.2.5. Is the project start date consistent with the available evidences? (EB 55 Annex 1, § 102)</p> <p><i>Describe the evidence assessed regarding the prior consideration of the CDM (if necessary). Describe whether the evidence to support such consideration is adequately and transparently described in the PDD.</i></p>	<p><i>Description:</i> As per the guidance, the CDM EB has been notified, however the communication details with the DNA has not been described thus CAR B10 has been raised</p> <p><i>Justification of evidences:</i> Documentary evidence furnished in support of starting date, viz., EPC signed contract, found that as the project activity start date is 16<sup>th</sup> July 2010, which is conformity with the Glossary of CDM terms</p> <p><i>Conclusion:</i> The starting date is defined as the date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity. Since the expenditure was committed on 16<sup>th</sup> July 2010 (EPC signed), the starting date reported in the PDD is in accordance with the CDM Glossary of Terms. Further, the PP had intimated UNFCCC and the host country DNA to demonstrate the serious CDM consideration for the project.</p>	<p>/PDD/ /MD/ /EPC/ /CDM-Gloss/</p>	<p>Pending CAR B10</p>	<p>OK</p>
<p>B.4.2.6. Was the decision to proceed with the project taken by a person which has the authority to do so? (EB 55 Annex 1, § 102(a))</p> <p><i>Describe the steps taken to validate this issue.</i></p>	<p><i>Description:</i> Yes, the decision to proceed with the project was taken by a person who has been given the authority</p> <p><i>Justification of evidences:</i> Validation team checked the Management decision and found that the decision to proceed with the project was taken by the Board.</p> <p><i>Conclusion:</i> The decision to proceed with the project has been taken by a person who has been given the authority</p>	<p>/PDD/ /MD/ /EB 49 Annex 22/</p>	<p>Pending CAR B10</p>	<p>OK</p>

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
<p>B.4.2.7. How was the CDM involved in the decision making process?</p> <p>(EB 55 Annex 1, § 102)</p> <p><i>Describe why CDM was a decisive factor in the decision making process.</i></p>	<p><i>Description:</i> The PDD does not describe how the decision was taken to proceed with the project, thus CAR B10 has been raised.</p> <p><i>Justification of evidences:</i> Board Resolution reveals that CDM play a critical role, as it allows improvement of financial returns rendering the project financially viable and investment grade.</p> <p><i>Conclusion:</i> The CDM benefit was a decisive factor in the decision making. Validation team checked the above documents and observed that the CDM revenues were decisive factor in decision making as it improves the financial returns rendering the project financially viable and investment grade.</p>	<p>/PDD/ /MD/ /EB 49 Annex 22/</p>	<p>Pending CAR B10</p>	<p>OK</p>
<p>B.4.2.8. Do the evidences provided doubtlessly prove that continuous and real actions were taken in order to secure the CDM status?</p> <p>(EB 55 Annex 1, § 102; EB 49 Annex 22 § 7)</p>	<p><i>Description:</i> The PDD does not describe how the decision was taken to proceed with the project, thus CAR B10 has been raised.</p> <p><i>Justification of evidences:</i> The intimation to UNFCCC and host country DNA was sent before the start date on 21/01/2010.</p> <p><i>Conclusion:</i> The project conforms to paragraph 2 to 4 of Annex 22, EB 49</p>	<p>/PDD/ /MD/ /EB 49 Annex 22/</p>	<p>Pending CAR B10</p>	<p>OK</p>
<p>B.4.2.9. Is the gap of documented evidences to secure the CDM status less than 3 years and are the evidences relevant for substantiating the action taken, credible, reliable and complete?</p> <p>(EB 49 Annex 22 § 8)</p>	<p><i>Description:</i></p> <p>The start date is based on the EPC contract date and is appropriate.</p> <p>As per the guidance, the CDM EB has been notified, however the communication details with the DNA has not been described thus CAR B10 has been raised.</p> <p><i>Justification of evidences:</i></p>	<p>/PDD/ /MD/ /EB 49 Annex 22/</p>	<p>Pending CAR B10</p>	<p>OK</p>

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
	The intimation to UNFCCC and host country DNA was sent before the start date on 21/01/2010. <i>Conclusion:</i> The project conforms to paragraph 2 to 4 of Annex 22, EB 49			
B.4.2.10. Did implementation of the project ceased after its commencement and did implementation recommence after consideration of the CDM?  (EB 51 Annex 58, § 7) <i>Describe the reasons for ceasing the project and explain why the incentive from CDM was necessary to recommence the implementation.</i>	<i>Description:</i> No  <i>Justification of evidences:</i> Not applicable  <i>Conclusion:</i> Not applicable	/PDD/ /MD/ /EB 49 Annex 22/	OK	OK
B.4.2.11. Can the CDM involvement in the decision assessed as serious?  (EB 55 Annex 1, § 104(b)–(c)) <i>Describe whether or not the project would have been undertaken without the incentive of the CDM.</i>	<i>Description:</i> The PDD does not describe how the decision was taken to proceed with the project, thus CAR B10 has been raised <i>Justification of evidences:</i> Management decision has been cross checked and found to be correct.  <i>Conclusion:</i> CDM was a decisive factor in decision making the same has been detailed in section B.5 of the revised PDD.	/PDD/ /MD/ /EB 49 Annex 22/	Pending-CAR B10	OK
<b>B.4.3. Identification of alternatives Step 1</b> (in case of SSC projects pl. skip steps 1 and 2 if appropriate)				
B.4.3.1. Does the list of alternatives contain the status-quo situation, the project not	<i>Description:</i> Alternatives chosen include status-quo situation and the project not undertaken as a CDM project as well as other viable	/PDD/	Pending-CAR	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
undertaken as a CDM project as well as all other viable means of supplying the outputs or services that are to be supplied by the proposed CDM project activity?  (EB 55 Annex 1, §§ 105–107) <i>Describe the steps taken to validate this issue on the basis of your local and sectoral knowledge.</i>	means of supplying the outputs that are to be supplied by the proposed CDM activity. Pending closure of CAR B5 to B9 and CL B2  <i>Justification of evidences:</i> PDD has been checked and found to be OK  <i>Conclusion:</i> In response to the CARs raised, project developer had revised the PDD which incorporates efficiencies of all plausible alternatives, justification and conclusion of output services.	/ACM0013/	B5 to B9 and CL B2	
B.4.3.2. Have all realistic alternatives been identified to the project?  (EB 55 Annex 1, §§ 105–107) <i>Describe whether the list of alternatives is credible and complete. Describe how it is validated that the alternatives are realistic.</i>	<i>Description:</i> The list of alternatives considers the alternative of the project not implemented as a CDM project activity. Pending closure of CAR B5 to B9 and CL B2. Also power generation using sub critical technology with coal as fuel and power generation with natural gas as fuel are the only two alternatives that have been considered. Clarify the reasons for not considering other alternatives  <i>Justification of evidences:</i> PDD and ACM0013 has been checked and found to be OK  <i>Conclusion:</i>  Validation team analysed the reasons furnished for exclusion of other alternatives, like biomass, wind, hydropower, solar power, diesel and nuclear power, based on the information gathered independent of the project developer and concurred with the project developer.	/PDD/ /ACM0013/	Pending CAR B5 to B9  CL B2	OK
B.4.3.3. Do all identified alternatives comply with	<i>Description:</i> Yes, all identified alternatives comply with enforced	/PDD/	OK	OK



<b>Checklist Item</b> (incl. guidance for the validation team)	<b>Validation Team Comments</b> (justification and substantiation of information, data and evidences)	<b>Ref.</b>	<b>Draft Concl.</b>	<b>Final Concl.</b>
<p>enforced legislations?</p> <p>(EB 55 Annex 1, §§ 106(c))</p> <p><i>Describe the steps taken to validate this issue. Refer to the legislations.</i></p>	<p>legislation.</p> <p><i>Justification of evidences:</i> Validation team checked the Electricity Act. At present there are no rules or legislations restricting the project developer to choose a particular technology or fuel barring the restriction on the entry of private sector in the nuclear fuel based power plants. Therefore, all the alternatives, except nuclear power projects, are in conformity with the extant rules and regulations.</p> <p><i>Conclusion:</i> All identified alternatives comply with legislation .</p>			
<p><b>B.4.4. Investment analysis Step 2</b></p> <p><i>In case the investment analysis as per step 2 is chosen to justify the additionality Annex 2 "Assessment of Financial Parameters" has to be used to provide additional details of the the calculation parameters.</i></p>				
<p>B.4.4.1. Does the PDD provide evidence that the project would not be the most economically or financially attractive alternative or economically / financially feasible without the revenues from the sale of CERs?</p> <p>(EB 55 Annex 1, § 108)</p>	<p><i>Description:</i> The LUCE is used as a financial indicator to prove that project would not be the most economically or financially attractive alternative or economically / financially feasible without the revenues from the sale of CERs.</p> <p>The following issues are raised w.r.t additionality;</p> <p>RoE has been taken at 19.28% for MAT years and 24.24% beyond MAT years and CERC order has been cited as the basis. CERC order does not appear to recommend this rate. Moreover, considering the fact that the project has been awarded to the project developer based on international competitive bid, it is not only inappropriate, but also vitiates the additionality as the</p>	<p>/PDD/ /IRR/ /TA/ /ACM001 3/</p>	<p>CAR B14</p>	<p>OK</p>

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
	<p>difference between the cost of sub-critical and super critical plant is very high. Hence, reckoning RoE is not acceptable</p> <p>-----</p> <p>The opening sentence of Global invitation for RFQ states, "Punjab State Electricity Board (PSEB) has launched an initiative for development of <i>coal based environment friendly Power Project</i>, with a contracted capacity of 1200 MW <math>\pm 10\%</math> (1080 – 1320 MW) at Village Nalash near Rajpura, District Patiala, Punjab, India". In the light of the above, clarify whether sub-critical technology alternative is available to the project developer.</p> <p>-----</p> <p>Clarify how the LUCE of sub critical plant represents the acceptable cost, above which the investment would not have been made by the project developer</p> <p><i>Justification of evidences:</i> Additionality Tool, Methodology ACM 0013, worksheet and PDD</p> <p><i>Conclusion:</i> The revised PDD demonstrates the additionality based on the benchmark analysis, while the LUCE is presented to selected the baseline scenario. The same is in-line with the methodology and Additionality tool version 5.2.</p>		CL-B3	
			CL-B4	
B.4.4.2. Is an appropriate analysis method chosen for the project (simple cost analysis, investment comparison analysis or benchmark analysis)?	<p><i>Description:</i> The project participant is earning revenue out of the project activity. Hence, simple cost analysis cannot be applied for the project activity. LUCE has used as the financial indicator.</p> <p>However, PDD states, "Thus, the indicator selected for benchmark analysis is the levelized tariff for power generation". Neither</p>	/PDD/ /IRR/ /TA/	CAR B12	OK

<b>Checklist Item</b> (incl. guidance for the validation team)	<b>Validation Team Comments</b> (justification and substantiation of information, data and evidences)	<b>Ref.</b>	<b>Draft Concl.</b>	<b>Final Concl.</b>
(EB 55 Annex 1, § 108; EB 39 Annex 10) <i>Describe why the selected analysis method is appropriate under consideration of potential revenues and costs, potential project alternatives and potential available benchmark values.</i>	<p>Additionality Tool nor Annex 58, EB 51 seem to recommend this benchmark (P.16). Moreover, clarify whether the presented analysis in Sec. B.5. is investment comparison analysis or benchmark analysis as per Additionality Tool. Thus CAR is raised.</p> <p><i>Justification of evidences:</i> Additionality Tool, Methodology ACM 0013, worksheet and PDD</p> <p><i>Conclusion:</i> Project developer has proved through benchmark analysis as the financial indicator that the project activity is not economically the most attractive alternative as required by the Methodology and that the project is not economically/financially feasible without the revenues from sale of CERs. Validation team checked the worksheets, assumptions and input parameters incorporated therein, cross checked the input data through independent verification and the conclusions given in the PDD and found them to be correct and acceptable.</p>	/ACM0013/		
B.4.4.3. Is a clear, viewable and unprotected Excel spreadsheet available for the investment calculation?  (EB 55 Annex 1, § 110; EB 51, Annex 58, §8) <i>Describe the steps taken to validate this issue.</i>	<p><i>Description:</i> Yes, a clear, viewable and unprotected excel sheet has been submitted</p> <p><i>Justification of evidences:</i> IRR worksheet has been cross checked and found to be OK.</p> <p><i>Conclusion:</i> A clear, viewable and unprotected worksheet has been submitted. Project developer had submitted worksheets incorporating LUCE and IRR calculations. The worksheets were examined and found that they are clear (with assumptions and workings in conformity), unprotected and viewable. No figures, rows and columns have been hidden nor any worksheet has been password protected.</p>	/IRR/	OK	OK

<b>Checklist Item</b> (incl. guidance for the validation team)	<b>Validation Team Comments</b> (justification and substantiation of information, data and evidences)	<b>Ref.</b>	<b>Draft Concl.</b>	<b>Final Concl.</b>
<p>B.4.4.4. Does the period chosen for the investment analysis reflect the technical lifetime of the project activity or in case a shorter period is chosen, is the fair value of the project activity's assets at the end of the investment analysis period (as a cash inflow) included?</p> <p>(EB 55 Annex 1, § 109; EB 51 Annex 58 § 3 – 4)</p> <p><i>Describe how the technical lifetime / period chosen for calculating financial parameter(s) is reviewed and which documents were utilised in the course of review. Describe furthermore the approach used to check the inclusion of a potential fair value.</i></p>	<p><i>Description:</i> The investment analysis reflects the technical lifetime of the project activity (25 years). Project developer has depreciated the entire asset value (after exclusion of land cost) at the end of the technical lifetime.</p> <p><i>Justification of evidences:</i> IRR Worksheet has been cross checked.</p> <p><i>Conclusion:</i> The technical lifetime has been applied correctly.</p>	/IRR/ /TS/	OK	OK
<p>B.4.4.5. Is the (remaining) technical lifetime of existing or project equipment defined in accordance with the guidance of the <i>Tool to determine the remaining lifetime of equipment?</i></p> <p>(EB 50 Annex 15)</p>	<p><i>Description:</i> The project is a green field project activity. There was no instance of any retrofit or modification so that remaining lifetime can be estimated for the project activity.</p> <p><i>Justification of evidences:</i> Not applicable</p> <p><i>Conclusion:</i> Not applicable</p>	/IM01/	OK	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
<p>B.4.4.6. Is the fair value calculated in accordance with local accounting regulations (where available) or international best practice?</p> <p>(EB 55 Annex 1, § 109; EB 51 Annex 58, § 4)</p> <p><i>State the accounting regulations applied for calculating the fair value and describe why these are applicable under the project specific circumstances. Describe potential mismatches between regulations and the approach applied for calculating the fair value.</i></p>	<p><i>Description:</i> Fair value calculated in the financial indicator calculation has not been reckoned in the computation of LUCE, thus CL B16 is raised.</p> <p><i>Justification of evidences:</i> IRR Worksheet has been cross checked.</p> <p><i>Conclusion:</i> As per international norms, the salvage value is considered at 5 to 10% of the investment cost<sup>56</sup>. Project developer has considered 5% of the cost of the project escalated at 5% per annum for 25 years, which is conservative compared to local and international accounting standards</p>	/IRR/	<del>CL</del> B16	OK
<p>B.4.4.7. Is the book value as well as the expectation of the potential profit or loss included in the fair value calculation?</p> <p>(EB 55 Annex 1, § 109; EB 51 Annex 58, § 4)</p>	<p><i>Description:</i> Yes, fair value has been included, which includes book value and potential profit however pending CL B16</p> <p><i>Justification of evidences:</i> IRR worksheet</p> <p><i>Conclusion:</i> Fair value has been computed at 5% of the value of assets escalated at 5% per annum for 25 years, which is conservative compared to local an international accounting standards</p>	/IRR/	Pending closure of CL B16	OK
<p>B.4.4.8. Are depreciation and other non-cash related items added back to net profits for the purpose to calculate the financial</p>	<p><i>Description:</i> The depreciation and other non cash items are added back to Net profit.</p> <p>However, Clarify the basis for restricting the depreciable value of</p>	/IRR/		OK

<sup>56</sup> [http://www.marshall-stevens.com/pdf/pub\\_ValueCurves.pdf](http://www.marshall-stevens.com/pdf/pub_ValueCurves.pdf)

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
indicator? (EB 55 Annex 1, § 109; EB 51 Annex 58, § 5)	<p>the asset to 95%. Also, clarify whether the depreciation should be provided <i>up to</i> 95% of the value of the assets or <i>on</i> 95% of the value of the assets. Furnish supporting evidence for the assumption</p> <p><i>Justification of evidences:</i> The non-depreciable item includes the land cost which has been included in the project financials.</p> <p><i>Conclusion:</i> The depreciation and other non cash benefits are added back while calculation of the project IRR.</p>		CL B5	
B.4.4.9. Is taxation excluded in the investment analysis or is the benchmark intended for post tax comparisons? (EB 55 Annex 1, § 109; EB 51 Annex 58, § 5)	<p><i>Description:</i> Additionality has been demonstrated using LUCE, which is not acceptable. However Pending closure of CAR B11, CAR B12, B13 and CL B15, B16</p> <p><i>Justification of evidences:</i> PDD,IRR worksheet have been cross checked and found not in line. Hence, the below findings have been raised.</p> <p><i>Conclusion:</i> Pending closure of CAR B8, B9, B10, B11, B12, B16 and CL B3-B7</p>	/PDD/ /IRR/ /TA/	Pending closure of CAR B11, CAR B12, CAR B13 CL B15 and CL B16.	OK
B.4.4.10. Were the input values used in the	<i>Description:</i> The Financial input values considered for the project activity were valid and applicable at the time of the investment	/PDD/	Pending	OK



Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
investment analysis valid and applicable at the time of the investment decision?  (EB 55 Annex 1, § 109,112; EB 51 Annex 58, § 6) <i>In case the basis for input values is a Feasibility Study Report (FSR) describe how it has been ensured that the period in time between the finalisation of the FSR and the investment decision is sufficiently short so that it is unlikely that input values would have materially changed. Further confirm the consistency of values in FSR and PDD.</i>	decision (22/09/2009). However, discrepancies were observed in the input values  <i>Justification of evidences:</i> PDD,IRR worksheet have been cross checked and found not in line. Hence, the below findings have been raised.  <i>Conclusion:</i> Pending closure of CARs B8-18 and CL B1-B7	/IRR/	ng closur e-of CARs B8- B18 and CL B1-B7	
B.4.4.11. Is the plant load factor (PLF) chosen in a conservative manner, taking into account that the PLF may be different in the framework of demonstrating additionality and calculating the ex-ante ER?  (EB 48, Annex 11)	<i>Description:</i> Project activity assumes actual availability of 85%. Further CL B17 has been raised as the project size has been changed from 2X660 MW to 2X 700 MW. <i>Justification of evidences:</i> IRR worksheet, CEA has been cross checked and found to be OK.  <i>Conclusion:</i> The revised PDD considers a PLF value of 93% based on the CEA performance review of sub-critical plants of 2008-09.	/PDD/ /IRR/ /TA/	CL B17	OK
B.4.4.12. In case of project IRR: Are the costs of financing expenditures (loan repayments and interests) excluded from the calculation of project IRR?  (EB 55 Annex 1, § 109; EB 51 Annex 58, § 9)	<i>Description:</i> Additionality has been demonstrated using LUCE, which is not acceptable. Pending CAR B15, CL B9, CL B21 and CL B22 <i>Justification of evidences:</i> PDD,IRR worksheet have been cross checked and found not in line. Hence, the below findings have been raised.  <i>Conclusion:</i> The revised PDD demonstrates the financial calculation based on project IRR. The calculations for project IRR does not include loan repayments and interests.	/PDD/ /IRR/ /TA/	Pendi ng closur e-of CAR B8- B12- B16 and CL	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
			B3-B7	
<p>B.4.4.13. In cases where a post-tax benchmark is applied please ensure that actual interest payable is taken into account in the calculation of income tax.</p> <p>(EB 51 Annex 58, § 11)</p> <p><i>As per the guidance it is recommended to select a pre tax benchmark in order to Describe the steps taken in assessing this requirement.</i></p>	<p><i>Description:</i> Additionality has been demonstrated using LUCE, which is not acceptable. Pending CAR B15, CL B9, CL B21 and CL B22</p> <p><i>Justification of evidences:</i> PDD,IRR worksheet have been cross checked and found not in line. Hence, the below findings have been raised.</p> <p><i>Conclusion:</i> The revised PDD demonstrates the financial calculation based on project IRR. The calculations for project IRR do not include loan repayments and interests.</p>	<p>/PDD/ /IRR/  /TA/</p>	<p>Pending closure of CAR B15, CL B19, CL B21 and CL B22</p>	OK
<p>B.4.4.14. In case of equity IRR: Is the part of the investment costs, which is financed by equity considered as net cash outflow and is the part financed by debt excluded in net cash outflow?</p> <p>(EB 55 Annex 1, § 109; EB 51 Annex 58, § 10)</p>	<p><i>Description:</i> Additionality has been demonstrated using LUCE, which is not acceptable. Equity IRR has not been demonstrated for the project.</p> <p><i>Justification of evidences:</i> PDD,IRR worksheet have been cross checked and found not in line. Hence, the below findings have been raised.</p> <p><i>Conclusion:</i> The revised PDD applies project IRR, equity IRR has not been demonstrated for the project.</p>	<p>/PDD/ /IRR/  /TA/</p>	OK	OK
<p>B.4.4.15. Is the type of benchmark chosen appropriate for the type of IRR calculated (e.g. local commercial lending rates or weighted average costs of capital for</p>	<p><i>Description:</i> Additionality has been demonstrated using LUCE, which is not acceptable. Further CAR B12, CAR B21 and CL B4 have been raised.</p> <p><i>Justification of evidences:</i> PDD,IRR worksheet have been</p>	<p>/PDD/ /IRR/  /TA/</p>	<p>Pending CAR B12,</p>	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
<p>project IRR; required/expected returns on equity for equity IRR)?</p> <p>(EB 55 Annex 1, § 111; EB 51 Annex 58, §§12 – 15)</p> <p><i>In case risk premiums are applied precisely describe its suitability to reflect the risks associated with the project activity, considering the project type and market situation.</i></p>	<p>cross checked and found not in line. Hence, the below findings have been raised.</p> <p><b>Conclusion:</b> The revised PDD applies the PLR applicable at the time of investment decision as the benchmark.</p>		CAR B21 and CL-B4	
<p>B.4.4.16. Is the benchmark value suitable for the project activity and is it reasonable to assume that no investment would be made at a rate of a lower return than the benchmark?</p> <p>(EB 55 Annex 1, § 109; EB 51 Annex 58, §§13 – 15)</p> <p><i>Describe whether it is reasonable to assume that a lower rate of return would consequently result in the baseline scenario.</i></p>	<p><b>Description:</b> Additionality has been demonstrated using LUCE, which is not acceptable. Further CAR B12, CAR B21 and CL B4 have been raised.</p> <p><b>Justification of evidences:</b> PDD,IRR worksheet have been cross checked and found not in line. Hence, the below findings have been raised.</p> <p><b>Conclusion:</b> The revised PDD applies the PLR applicable at the time of investment decision as the benchmark.</p>	/PDD/ /IRR/ /TA/	Pending CAR B12, CAR B21 and CL-B4	OK
<p>B.4.4.17. Is it ensured that the project cannot be developed by other developers than the PP?</p> <p>(EB 55 Annex 1 § 109; EB 51 Annex 58, §§ 13 – 14)</p> <p><i>Describe why the benchmark does not include the subjective profitability expectations or risk profile of the project developer. If applicable assess the past financial behaviour of the entity during at least the last 3 years in relation to similar projects.</i></p>	<p><b>Description:</b> The project can be developed by other project developers.</p> <p><b>Justification of evidences:</b> PDD, Request for Qualification documents</p> <p><b>Conclusion:</b> The State Government of Punjab invited international bid and hence, any project developer can develop this project.</p>	/TD/ /PDD/	OK	OK
<p>B.4.4.18. Was the benchmark consistently used in the past for similar projects with similar</p>	<p><b>Description:</b> Not applicable</p>	/PDD/ /TD/	OK	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
risks? (EB 55 Annex 1, § 112(c))	<i>Justification of evidences:</i> Not applicable  <i>Conclusion:</i> Not applicable			
B.4.4.19. Does the PDD and related spreadsheets contain a sensitivity analysis and does the same contain variation of parameters which may vary throughout the project lifetime, (EB 55 Annex 1, §§ 109–110(e); EB 51 Annex 58, § 17–18) <i>Describe relevance of parameters used in the sensitivity analysis as well as their likeliness to vary during the project's lifetime. Parameters which are fixed on the basis of contracts, PPAs etc. may not be subject to variation and not adequate.</i>	<i>Description:</i> PDD and related spread sheets contain sensitivity analysis however the PDD does not explain how the parameters chosen and variation they have been subjected to conform to the guidance 17 and 18 of Annex 58, EB 51, thus CL B24 is raised. <i>Justification of evidences:</i> PDD,IRR worksheet have been cross checked and found not in line. Hence, CL is raised. <i>Conclusion:</i> The revised PDD under section B.5 describes the sensitivity analysis.	/IRR/ /PDD/	CL B24	OK
B.4.4.20. Were only variables that constitute more than 20% of either total project costs or total project revenues subjected to reasonable variation? (EB 55 Annex 1, § 109; EB 51 Annex 58, § 17)	<i>Description:</i> Yes, variables which constitutes more than 20% of project costs or revenue are subjected to reasonable variation, however pending CL B24. <i>Justification of evidences:</i> PDD,IRR worksheet have been cross checked and found not in line.  <i>Conclusion:</i> The revised PDD under section B.5 describes the sensitivity analysis for the parameters which constitute 20% of either project cost or revenue.	/PDD/ /IRR/	Pendi ng closur e of CL 24	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
<p>B.4.4.21. Have parameters, constituting less than 20% of total project costs or revenues, been identified with potential material impact on the financial parameter?</p> <p>(EB 55 Annex 1, § 109; EB 51 Annex 58, § 17)</p> <p><i>Describe whether those parameters are considered in the sensitivity analysis?</i></p>	<p><i>Description:</i> No, parameters constituting less than 20% of project cost or revenue have not been selected, however pending CL B24.</p> <p><i>Justification of evidences:</i> PDD,IRR worksheet have been cross checked and found not in line. Hence, the below findings have been raised.</p> <p><i>Conclusion:</i> The revised PDD under section B.5 describes the sensitivity analysis for the parameters which constitute 20% of either project cost or revenue.</p>	/PDD/ /IRR/	Pending closure of CL B24	OK
<p>B.4.4.22. Is the range of variation reasonable in the specific context of the project activity, taking into consideration historic trends in the business sector?</p> <p>(EB 55 Annex 1, § 109; EB 51 Annex 58, § 18)</p> <p><i>Describe whether the range of variation is appropriate with focus on historic developments, e.g. price of oil / labour etc., energy potential in the region in question.</i></p>	<p><i>Description:</i> Range of variation considered for sensitivity analysis is reasonable based on historic trends and reality</p> <p><i>Justification of evidences:</i> PDD,IRR worksheet have been cross checked and found not in line. Hence, the below findings have been raised.</p> <p><i>Conclusion:</i> The revised PDD under section B.5 describes the sensitivity analysis for the parameters which constitute 20% of either project cost or revenue.</p>	/PDD/ /IRR/	Pending closure of CL B24	OK
<b>B.4.5. Barrier analysis Step 3 or SSC additionality assessment</b>				
<p>B.4.5.1. Are there any barriers given which have a clear and direct impact on the financial returns of the project?</p> <p>(EB 55 Annex 1, §§ 115, 134, 137)</p>	<p><i>Description:</i> Project developer has not chosen barrier analysis</p> <p><i>Justification of evidences:</i> Not applicable</p>	/PDD/	OK	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
<i>In case of LSC projects those issues cannot be considered as barriers and shall be assessed in the investment analysis. In case of SSC projects the same fundamentals as for LSC projects shall apply, i.e. the assessment of the investment barrier according to EB 51 Annex 58.</i>	Conclusion: Not applicable			
B.4.5.2. Are the barriers described risk related (e.g. technology failure, other performance related risks)? (EB 55 Annex 1, §§ 116, 134, 137) <i>Are there other barriers or barriers due to prevailing practice existent which would have led to higher emissions?</i>	Description: Not applicable  Justification of evidences: Not applicable  Conclusion: Not applicable	/PDD/	OK	OK
B.4.5.3. Has the unavailability of means of finance for the project been described and adequately substantiated? Do evidences doubtlessly prove that the financing of the project was assured only due to the benefit of the CDM? (EB 55 Annex 1, §§ 116, 137, EB 50 Annex 13, § 9)	Description: Not applicable  Justification of evidences: Not applicable  Conclusion: Not applicable	/PDD/	OK	OK
B.4.5.4. How is it justified and evidenced that the barriers given in the PDD are real? (EB 55 Annex 1, § 116(a))	Description: Not applicable  Justification of evidences: Not applicable  Conclusion: Not applicable	/PDD/	OK	OK



<b>Checklist Item</b> (incl. guidance for the validation team)	<b>Validation Team Comments</b> (justification and substantiation of information, data and evidences)	<b>Ref.</b>	<b>Draft Concl.</b>	<b>Final Concl.</b>
<p>B.4.5.5. How is it justified that one or a set of real barriers prevent(s) the implementation of the project activity and do not prevent the implementation of at least one of the alternatives?</p> <p>(EB 55 Annex 1, § 116(b))</p>	<p><i>Description:</i> Not applicable</p> <p><i>Justification of evidences:</i> Not applicable</p> <p><i>Conclusion:</i> Not applicable</p>	<p>/PDD/</p>	<p>OK</p>	<p>OK</p>
<p>B.4.5.6. Does the review of relevant background information on the nature of the company(ies) and entity(ies) involved in the financing and implementation of the project sufficiently justify that the barriers related to the lack of access to capital, technologies and skilled labour are real?</p> <p>(EB 50 Annex 13, § 4)</p>	<p><i>Description:</i> Not applicable</p> <p><i>Justification of evidences:</i> Not applicable</p> <p><i>Conclusion:</i> Not applicable</p>	<p>/PDD/</p>	<p>OK</p>	<p>OK</p>
<p>B.4.5.7. Has it been demonstrated in an objective way how the CDM alleviates each of the identified barriers to a level that the project is not prevented anymore from occurring by any of the barriers?</p> <p>(EB 50 Annex 13, § 5)</p>	<p><i>Description:</i> Not applicable</p> <p><i>Justification of evidences:</i> Not applicable</p> <p><i>Conclusion:</i> Not applicable</p>	<p>/PDD/</p>	<p>OK</p>	<p>OK</p>
<p>B.4.5.8. Would provision of additional financial means lead to the mitigation of the barrier(s) demonstrated?</p>	<p><i>Description:</i> Not applicable</p> <p><i>Justification of evidences:</i> Not applicable</p>	<p>/PDD/</p>	<p>OK</p>	<p>OK</p>

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
(EB 50 Annex 13, § 7) <i>Describe why provision of additional financial means would not lead to mitigation of the barrier(s) demonstrated and hence analysing the project's additionality within the framework of an investment analysis is inappropriate. .</i>	Conclusion: Not applicable			
<b>B.4.6. Common practice analysis Step 4</b> (in case of SSC projects skip this step)				
B.4.6.1. Is the defined region for the common practice analysis appropriate for the technology/industry type?  (EB 55 Annex 1, § 120(a)) <i>Describe why the project activity is not common practice in a transparent and unambiguous manner. If a region other than the entire host country is chosen, describe why this region is more appropriate.</i>	<i>Description:</i> The common practice analysis does not conform to step 4 of the Tool for demonstration and assessment of additionality The common practice analysis is carried out for the proposed project activity. However, the same is not in line with step 4 of the Tool for the demonstration and assessment of additionality version 5.2. Considering this issue CAR B21 was raised during the validation process.  <i>Justification of evidences:</i> Tool for the demonstration and assessment of additionality version 5.2 is cross checked by the assessment team.  <i>Conclusion:</i> Revised PDD demonstrates the common practice analysis in line with the requirements of the additionality tool.	/PDD/ /TA/	CAR B21	OK
B.4.6.2. To what extent similar projects have been undertaken in the relevant region?  (EB 55 Annex 1, § 120(b))	<i>Description:</i> The common practice analysis does not conform to step 4 of the Tool for the demonstration and assessment of additionality The common practice analysis is carried out for the proposed project activity. However, the same is not in line with step 4 of the Tool for demonstration and assessment of additionality version 5.2. Considering this issue CAR B21 was raised during the validation process.	/PDD/ /TA/	Pending closure of CAR B21	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
	<p><i>Justification of evidences:</i> Tool for the demonstration and assessment of additionality version 5.2 is cross checked by the assessment team.</p> <p><i>Conclusion:</i> Revised PDD demonstrates the common practice analysis in line with the requirements of the additionality tool.</p>			
<p>B.4.6.3. In case similar projects are identified, are there any key differences between the proposed project and existing or ongoing projects and what kind of differences are observed?</p> <p>(EB 55 Annex 1, § 120(c))</p>	<p><i>Description:</i> The common practice analysis does not conform to step 4 of the Tool for the demonstration and assessment of additionality The common practice analysis is carried out for the proposed project activity. However, the same is not in line with step 4 of the Tool for demonstration and assessment of additionality version 5.2. Considering this issue CAR B21 was raised during the validation process.</p> <p><i>Justification of evidences:</i> Tool for the demonstration and assessment of additionality version 5.2 is cross checked by the assessment team.</p> <p><i>Conclusion:</i> Revised PDD demonstrates the common practice analysis in line with the requirements of the additionality tool.</p>	/PDD/ /TA/	Pendi ng closur e of CAR B21	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
<b>B.5. Ex-Ante Calculation of GHG Emission Reductions</b>  <i>It is assessed whether the ex-ante calculations of project emissions, baseline emissions, leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified. Furthermore calculation of emission reductions shall be assessed.</i>				
<p>B.5.1. Are the equations applied correctly according to the applied approved methodology? (EB 55 Annex 1, §§ 67(c), 89–90, 92)</p> <p><i>Describe clearly the steps taken to assess whether the methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions. Further take into consideration that all estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.</i></p>	<p><input type="checkbox"/> The equations applied for calculation are correctly applied according to the approved methodology.</p> <p><input checked="" type="checkbox"/> The following mistakes have been identified in this context:</p> <p><i>Description:</i></p> <p>The equation is correctly applied as per the stipulated methodology. However, the calculation of baseline energy efficiency is not as per the stipulated methodology.</p> <p>The selection of similar plants to the project activity under Step1 of Option 2 is not addressed as per the stipulated methodology.</p> <p>Moreover, SIPAT STPS 2 is commissioned on 27<sup>th</sup> December 2008 and the data published considering the period April 2009–March 2009. In this regard, the operating hours for the plant is less than 3000 hours. The net electricity exported to the grid is also questionable and does not seem to correct. PP is requested to justify the compliance with Step1 of the stipulated</p>	<p>/ACM001 3/ /PDD/ /ERS/</p>	<p>CAR B22</p>	<p>OK</p>

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
	<p>methodology (i.e. compliance of the project plant with peak and base load plant selection in the baseline).</p> <p><i>Justification of evidences:</i> ACM0013 was cross checked by the assessment team and found it correct.</p> <p><i>Conclusion:</i> The equation applied has been corrected as per the methodology ACM0013 version 3.</p>			
<p>B.5.2. In case the methodology allows for different methodological choices, are the equations applied properly justified and have they been used reflecting the other methodological choices (i.e. baseline identification)?</p> <p>(EB 55 Annex 1, §§ 90–91)</p> <p><i>Assess the correct selection and application of methodological choices. Describe whether proper justification has been provided (based on the choice of the baseline scenario, context of the project activity and other evidence provided) and whether the correct equations have been used reflecting the relevant methodological choices.</i></p>	<p>Description: the following issues are raised w.r.t justification of applied equations.</p> <p>The adopted specific fuel consumption is arrived from tariff orders of respective power plant which considered 2450 kcal/kWh of heat rate for all. However, DOE's sectoral expertise and background investigation reveals the design and actual station heat rates are much less than the 2450 kcal/kg. In this regard, how the fuel consumption computation is in compliance with ACM0013. Furthermore, conservativeness is questionable.</p> <p>Moreover, PP is requested to consider the AM_CLA_188 for consideration of base line data.</p> <p><i>Justification of evidences:</i> ACM0013 was cross checked by the assessment team and found it correct.</p> <p><i>Conclusion:</i> The revised PDD calculates the fuel consumption as per the published CEA data for generation and emissions for the</p>	/ACM001 3/ /PDD/	CAR B23	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
	power plants. Thus the fuel consumption is calculated from publicly available sources and is assessed to be in line with the methodology ACM0013.			
<p>B.5.3. Have conservative assumptions been used when calculating the project emissions? (EB 55 Annex 1, §§ 90–91)</p> <p><i>Describe clearly the steps taken to assess whether all the assumptions and data used by the PP are listed in the PDD including references and sources and are conservatively interpreted in the PDD.</i></p>	<p>Description: The project activity has considered all the conservative assumptions as projected in the stipulated methodology. However, following discrepancies are found regarding the assumptions for the calculation of estimated CERs are as follows:</p> <p>The baseline energy efficiency under option1 is calculated based on the average gross SHR for the 10 numbers of 500 MW subcritical units identified as per Option 2.</p> <p>The methodology under option1 stipulates “energy efficiency of the power generation technology that has been identified as the most likely baseline scenario”. In this regard PP needs to justify why the value of Gross Station Heat Rate has been considered as 2425 kcal/kWh and the auxiliary consumption as 6%.</p> <p>-----</p> <p>The adopted Gross station heat rate for the project and baseline are based on the GCV value of the coal. The net efficiency calculation should not only based on net of auxiliary consumption but also based on net calorific value. Appropriate correction is sought in this regard.</p> <p>Justification of evidences: ACM0013 was cross checked by the assessment team.</p>	<p>/ACM0013/ /ERS/ /PDD/ /CEA/ /CERC/</p>	<p>CAR B24</p> <p>CAR B25</p>	<p>OK</p>



Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
	Conclusion: The revised PDD calculates the fuel consumption as per the published CEA data for generation and emissions for the power plants. Thus the fuel consumption is calculated from publicly available sources and is assessed to be in line with the methodology ACM0013. The gross station heat rate for the baseline plant is as per the CERC tariff notification.			
B.5.4. Does the implementation of the project activity lead to GHG emissions within the project boundary which are expected to contribute more than 1% of the overall expected average annual emission reductions, which are not addressed by the methodology?  (EB 55 Annex 1, § 77)	<p><i>Description:</i> The Project activity will not contribute more than 1% of the total GHG emission within the project boundary.</p> <p><i>Justification of evidences:</i> The same is cross checked during the site visit</p> <p><i>Conclusion:</i> The GHG emission within the project boundary is considered in project emission and the same is correct.</p>	/ACM001 3/ /ERS/ /PDD/ /CEA/ /CERC/	OK	OK
B.5.4.1. Has a plant load factor (PLF) been defined ex-ante and considered for determination of baseline emissions?  (EB 48 Annex 11, §§ 1, 3–4) <i>Describe why the PLF is conservative in the framework of calculating emissions reductions and whether the PLF is the same in the framework of demonstrating additionality by applying the investment analysis. Note, in order to be conservative in both cases the PLF may be different.</i>	<p><i>Description:</i> The PLF for the capacity is considered as 85%. Based on the CERC tariff guideline.</p> <p><i>Justification of evidences:</i> the CERC guidelines are published and has been confirmed, however the PLF has been revised to be sourced from the thermal performance review of 2008-09 which mentions the average PLF of all private sector thermal power plants is 92.73%. Thus the PLF considered for the project is 93% which is acceptable.</p>	/PDD/ /CERC/	OK	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
	<i>Conclusion:</i> the PLF is as per the CEA published performance review report for the year 2008-09.			
<p>B.5.5. Are all data sources and assumptions appropriate and parameters which remain fixed throughout the crediting period correct, applicable to the project and will lead to a conservative estimation of emission reductions?</p> <p>(EB 55 Annex 1, § 91)</p> <p><i>Describe clearly the steps taken to assess whether the values used for the fixed parameters are considered reasonable, correct and applicable in the context of the project activity. Check esp. chapter 6.2 of the PDD.</i></p>	<p><i>Description:</i></p> <p>The data and assumption are appropriate for the entire crediting period. However CAR B22 – CAR B25 have been raised.</p> <p><i>Justification of evidences:</i> Assessment team has cross checked the emission reduction calculation sheet</p> <p><i>Conclusion:</i> The values for the fixed parameters are sourced from the publicly available and published sources i.e. CEA, CERC.</p>	<p>/XCS/ /CEA/ /CERC/</p>	<p>Pending closure of CAR B22-CAR B25</p>	OK
<p>B.5.6. Are all ex-ante calculation values for monitoring parameters (as defined as per chapter B.7.1) reasonable?</p> <p>(EB 55 Annex 1, § 91)</p> <p><i>Describe clearly the steps taken to assess whether the values used for the monitoring parameters are considered reasonable, applicable and conservative in the context of the project activity</i></p>	<p><input checked="" type="checkbox"/> All “Values of data to be applied for the purpose of calculating expected emissions reductions” are considered to be reasonable, applicable and conservative.</p> <p><input type="checkbox"/> The following mistakes have been identified in this context:</p>	<p>/ACM0013/ /PDD/ /ERS/</p>	OK	OK
<p>B.5.7. Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.</p>	<p><i>Description:</i> Emission reduction is considered to be real, measurable at this stage of validation. However, CARs/CLs have been raised during the validation process.</p>	<p>/IM01/</p>	<p>Pending closure</p>	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
<i>Describe the steps taken to validate this issue.</i>	<p><i>Justification of evidences:</i> During the site visit it was found that the emission is real and long term at this stage of validation.</p> <p><i>Conclusion:</i> The emission reduction calculations are as per the methodology and the emission reductions are real, measurable and shall give long-term benefits.</p>		e of CARs/ GLs	
<b>B.6. Monitoring of Emission Reductions</b> <i>It is assessed whether the monitoring plan is appropriate for the project activity and in line with the applied methodology.</i>				
<p>B.6.1. Are all monitoring parameters required by the applied methodology contained in the monitoring plan?</p> <p>(EB 55 Annex 1, §§ 67(e), 121, 123(a), 124)</p> <p><i>Assess whether all applicable parameters listed in the methodology are included in the monitoring plan.</i></p> <p><i>Pl. check further whether the selection of parameters not to be monitored (section B.6.2) is appropriate and in line with the applied methodology.</i></p> <p><i>In case of different approaches can be chosen acc. to the methodology assess whether the selection of parameters is justified and correct.</i></p>	<p><i>Description:</i></p> <p>The monitoring parameters as stipulated in the methodology are addressed in the PDD.</p> <p><i>Justification of evidences:</i> ACM0013 is cross checked by the assessment team</p> <p><i>Conclusion:</i> the monitoring parameters are in-line with the methodology.</p>	/ACM001 3/ /PDD/ /IM01/	OK	OK

<b>Checklist Item</b> (incl. guidance for the validation team)	<b>Validation Team Comments</b> (justification and substantiation of information, data and evidences)	<b>Ref.</b>	<b>Draft Concl.</b>	<b>Final Concl.</b>
<p>B.6.2. Are the means of monitoring of all parameters contained in the monitoring plan feasible and in accordance with the requirements of the applied methodology?</p> <p>(EB 55 Annex 1, § 123(a)–(b), 124)</p> <p><i>Assess whether the provided information for all parameters w.r.t.</i></p> <ul style="list-style-type: none"> <li>a) <i>Label (name of the data / parameter)</i></li> <li>b) <i>data unit</i></li> <li>c) <i>description</i></li> <li>d) <i>source of data</i></li> <li>e) <i>measurement equipment / method / procedure</i></li> <li>f) <i>monitoring frequency</i></li> <li>g) <i>QA/QC procedures</i></li> </ul> <p><i>are appropriately described and in compliance with the requirements of the methodology.</i></p>	<p><i>Description:</i> The means of monitoring of all the parameters, the responsible person, the measurement methods, and the calibration frequency and calibration agency are addressed in the PDD. However, following issue has been raised;</p> <p>Clarify whether the source of data for the monitoring of Net electricity exported to the grid can be the invoices for sale of power?</p> <p><i>Justification of evidences:</i> ACM0013 is cross checked by the assessment team</p> <p><i>Conclusion:</i> The PDD has been revised, the net electricity shall be calculated net of electricity exported and imported.</p>	/ACM001 3/  /PDD/  /IM01/	CL B25	OK
<p>B.6.3. Have all means of implementing the monitoring plan, e.g. equations necessary for ex-post emission reduction calculation, been described clearly and in line with the methodology?</p> <p>(EB 55 Annex 1, §§ 123(b), 124)</p>	<p><i>Description:</i> All the equation required for the calculation of ex-post emission is included in the PDD. However, CL B25 was raised during the validation process.</p> <p><i>Justification of evidences:</i> ACM0013 is cross checked by the assessment team</p>	/ACM001 3/  /PDD/  /IM01/	Pending closure of CL B25	OK

<b>Checklist Item</b> (incl. guidance for the validation team)	<b>Validation Team Comments</b> (justification and substantiation of information, data and evidences)	<b>Ref.</b>	<b>Draft Concl.</b>	<b>Final Concl.</b>
<p><i>Check whether all necessary equations have been provided in the PDD. Pl. consider that ex-post and ex-ante calculations might be different.</i></p> <p><i>Please consider that additional equations might be necessary to calculate auxiliary parameters.</i></p>	<p><i>Conclusion:</i> The PDD has been revised, the net electricity shall be calculated net of electricity exported and imported.</p>			
<p>B.6.4. Is it likely that the monitoring arrangements described in the PDD can properly be implemented in the context of the project activity?</p> <p>(EB 55 Annex 1, § 124(c))</p> <p><i>Assess whether the described monitoring arrangements are sufficient and realistic to enable a thorough monitoring. Pl. consider also special monitoring conditions, e.g. downtimes of monitoring equipment etc.</i></p>	<p><i>Description:</i> The monitoring parameters addressed in the PDD are as per the stipulated methodology. However, CL B25 was raised during the validation process.</p> <p><i>Justification of evidences:</i> During the site visit it was confirmed that the monitoring arrangements shall be in line with the description in the PDD.</p> <p><i>Conclusion:</i> The monitoring arrangement described in the PDD is proper at this stage of validation. The PDD has been revised, the net electricity shall be calculated net of electricity exported and imported.</p>	/ACM001 3/ /PDD/ /IM01/	Pending closure of CL B25	OK
<p>B.6.5. Are the QA/QC procedures appropriate sufficient to ensure the emission reductions achieved from the project activity can be reported ex-post and verified?</p> <p>(EB 55 Annex 1, § 124(b))</p> <p><i>Please consider the description given in section B.7.2. Describe which QA/QC provisions are considered. Address Quality Management System provisions, calibration and</i></p>	<p><i>Description:</i> The QA/QC procedures for the monitoring parameters are addressed correctly in the PDD. However, CL B25 was raised during the validation process.</p> <p><i>Justification of evidences:</i> During the site visit it was confirmed that the monitoring arrangements shall be implemented as per the information in the PDD. .</p>	/ACM001 3/ /PDD/ /IM01/	Pending closure of CL B25	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
<i>maintenance of equipment. Address further any review procedures.</i>	<i>Conclusion:</i> The monitoring arrangement described in the PDD is proper at this stage of validation. The PDD has been revised, the net electricity shall be calculated net of electricity exported and imported.			
<p>B.6.6. Are procedures identified for data management?</p> <p>(EB 55 Annex 1, § 124(b))</p> <p><i>Check whether appropriate provisions are considered for data management including responsibilities, what records to keep, storage area of records and how to process performance documentation</i></p> <p><i>Check further the data archiving provisions for the project activity and ensure that provisions are made to archive data for the whole crediting period + 2 years.</i></p>	<p><i>Description:</i> The data management procedures are identified for the project activity. The data for the monitoring parameters will be recorded in paper/electronic format and will be stored for the entire crediting period + 2 years.</p> <p><i>Justification of evidences:</i> During the site visit it was conformed that the data storage and archiving is shall per the stipulated PDD.</p> <p><i>Conclusion:</i> The project is still under construction, however proper data management system shall be in place for data monitoring.</p>	<p>/ACM001 3/ /PDD/ /IM01/</p>	OK	OK
<p><b>C. Duration of the Project/ Crediting Period</b></p> <p><i>It is assessed whether the temporary boundaries of the project are clearly defined.</i></p>				



Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
<p>C.1. Is the project's starting date clearly defined and evidenced?</p> <p>(EB 55 Annex 1, § 99)</p> <p><i>Check whether the starting date is correct. Apply the definition of the project starting date as per the "Glossary of CDM terms".</i></p>	<p><i>Description:</i></p> <p>The starting date of the project activity is described as 16/07/2010 based on the EPC contract signed for the project activity.</p> <p><i>Justification of evidences:</i></p> <p>The EPC contract has been checked and the date is confirmed.</p> <p><i>Conclusion:</i> the start date of the project activity is 16/07/2010 and is based on the EPC contract.</p>	/EPC/, /PDD/	OK	OK
<p>C.2. Is the project's operational lifetime clearly defined and evidenced?</p> <p><i>Check whether the project lifetime is correctly defined. Consider the guidance on the assessment of investment analysis (annex to the additionality tool).</i></p> <p><i>Check in case of phased implementation this has been reflected throughout the whole PDD incl. the financial assessment, if applicable.</i></p>	<p><i>Description:</i></p> <p>The operational lifetime of the project is clearly defined as 25 years.</p> <p><i>Justification of evidences:</i></p> <p>The operational life time of project was checked with the technical specifications provided by the technology supplier, also based on the local expertise of DOE, the life time of 25 years has been accepted.</p> <p><i>Conclusion:</i></p> <p>The operational life time of the project activity is 25 years.</p>	/PDD/, /TS/	OK	OK
<p>C.3. Is the start of the crediting period clearly defined and reasonable?</p> <p><i>Check whether the envisaged starting date of the crediting period is realistic, taking into consideration the times needed for validation and registration.</i></p>	<p><i>Description:</i> The start date of the crediting period is considered as 18/05/2014 which is appropriate as per the validation progress of the project activity.</p> <p>However later during discussions with the PP a different commissioning date was expected, thus CAR C1 has been raised.</p>	/PDD/ /IM01/	CAR C 4	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
	<p><i>Justification of evidences:</i> The PDD is cross checked by the assessment team</p> <p><i>Conclusion:</i> During the discussion with the project participant it was observed that the second unit under the project shall be commissioned by 01/05/2014 thus the start date of crediting period has been revised accordingly. The start date of crediting period is realistic and acceptable.</p>			
<p><b>D. Environmental Impacts</b></p> <p><i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the DOE.</i></p>				
<p>D.1.1. Are there any Host Party requirements for an Environmental Impact Assessment (EIA)? (EB 55 Annex 1, §§ 131–133) <i>Check the host party regulations, regarding EIA.</i></p>	<p><i>Description:</i> The EIA assessment is required by the Host country for the proposed project activity. The EIA assessment was carried out for 1200 ± 10% MW power plant. The MoEF clearance for the project activity is also submitted to the validation team considering 1400MW as the project activity.</p> <p><i>Justification of evidences:</i> The guideline for EIA is based on the published guidelines on the following web-link; <a href="http://envfor.nic.in/legis/eia/so1533.pdf">http://envfor.nic.in/legis/eia/so1533.pdf</a></p> <p><i>Conclusion:</i> The host country India has mandated an EIA study for power generation projects above 50 MW capacities. The MoEF clearance is also cross checked by the assessment team for the project activity and found correct.</p>	/moef/ /EIA/	OK	OK

<b>Checklist Item</b> (incl. guidance for the validation team)	<b>Validation Team Comments</b> (justification and substantiation of information, data and evidences)	<b>Ref.</b>	<b>Draft Concl.</b>	<b>Final Concl.</b>
<p>D.1.2. In case an Environmental Impact Assessment (EIA) is requested by the host party, has it been carried out and if applicable duly approved?</p> <p>(EB 55 Annex 1, §§ 131–133)  <i>Check the EIA and its approval, if applicable.</i></p>	<p><i>Description:</i> The EIA assessment is required by the Host country for the proposed project activity. The EIA assessment was carried out for 1200 ± 10% MW power plant. The MoEF clearance for the project activity is also submitted to the validation team considering 1400MW as the project activity in the letter dated 15.11.2010 by MoEF.</p> <p><i>Justification of evidences:</i> The guideline for EIA is based on the published guidelines on the following web-link;  <a href="http://envfor.nic.in/legis/eia/so1533.pdf">http://envfor.nic.in/legis/eia/so1533.pdf</a></p> <p>The Environmental clearance letter received by MoEF dated 15-11-2010 has been checked and is acceptable.</p> <p><i>Conclusion:</i> The host country India has mandated an EIA study for power generation projects above 50 MW capacities. The MoEF clearance is also cross checked by the assessment team for the project activity and found correct.</p>	/moef/ /EIA/	OK	OK
<p>D.1.3. Has an analysis of the environmental impacts of the project activity been sufficiently described and in line with the host party environmental legislation?</p> <p>(EB 55 Annex 1, §§ 130–132)  <i>Check the PDD (section D). Check whether the project will create any adverse environmental effects.</i>  <i>Check the relevant national environmental legislation.</i></p>	<p><i>Description:</i></p> <p>The project has received an Environmental clearance from Ministry of Environment &amp; Forest dated 15-11-2010.</p> <p>No adverse impacts envisaged.</p> <p><i>Justification of evidences:</i></p> <p>The environmental clearance received for the project has been checked and is found acceptable.</p> <p><i>Conclusion:</i></p> <p>The Ministry of Environment &amp; Forest has granted environmental</p>	/SC/	OK	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
	clearance to the project activity on 15-11-2010.			
<p>D.1.4. Are transboundary environmental impacts considered in the analysis?</p> <p>(EB 55 Annex 1, §§ 131–133)</p> <p><i>Check the documents and local official sources / expertise regarding transboundary environmental impacts.</i></p>	<p><i>Description:</i></p> <p>The project has received an Environmental clearance from Ministry of Environment &amp; Forest dated 15-11-2010.</p> <p>No adverse impacts envisaged.</p> <p><i>Justification of evidences:</i></p> <p>The environmental clearance received for the project has been checked and is found acceptable.</p> <p><i>Conclusion:</i></p> <p>The Ministry of Environment &amp; Forest has granted environmental clearance to the project activity on 15-11-2010.</p>	/SC/	OK	OK
<p><b>E. Stakeholder Comments</b></p> <p><i>The DOE should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.</i></p>				

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<p>E.1. Have relevant local stakeholders been invited to consultation prior to the publication of the PDD?</p> <p>(EB 55 Annex 1, § 128)</p> <p><i>Check by means of document review and interviews with local stakeholders if and when a local stakeholder consultation process has been carried out.</i></p>	<p><i>Description:</i></p> <p>The local stakeholders identified for the project includes NPL Employees, Employees of EPC Contractor, Local Gram Panchayat Sarpanchs, Local Villagers, Punjab State Electricity Board officials, Punjab Pollution Control Board officials and Local Government officials (S.D.M., M.L.A., Tehsildar)</p> <p>The local stakeholder consultation was carried on 30/03/2010 which is prior to the publication of the PDD for GSC comments (14-09-2010 to 13-10-2010).</p> <p><i>Justification of evidences:</i> During the site visit discussions with the local stakeholders was carried out to confirm the comments. The LSC process was carried out and the comments are under consideration by the project proponent.</p> <p><i>Conclusion:</i> The LSC was carried out on 30/03/2010.</p>	/LSHC/	OK	OK
<p>E.2. Can the local stakeholder consultation process be assessed as adequate?</p> <p>(EB 55 Annex 1, § 129(a)–(c))</p> <p><i>Describe what assessment steps have been undertaken to assess the adequacy of the stakeholder consultation process. Give a final opinion on the adequacy.</i></p> <p><i>Please consider the following requirements in this context:</i></p> <p><i>(a) Comments by local stakeholders that can reasonably be considered relevant for the proposed CDM project activity,</i></p>	<p><i>Description:</i></p> <p>The comments from the stakeholders were received and the comments have been addressed by the project proponents.</p> <p><i>Justification of evidences:</i></p> <p>During the site visit discussions with the local stakeholders was carried out to confirm the comments. The LSC process was carried out and the comments are under consideration by the project proponent.</p> <p><i>Conclusion:</i> The LSC was carried out on 30/03/2010 and the comments of the local stakeholders are considered.</p>	/LSHC/, /IM01/	OK	OK



<b>Checklist Item</b> (incl. guidance for the validation team)	<b>Validation Team Comments</b> (justification and substantiation of information, data and evidences)	<b>Ref.</b>	<b>Draft Concl.</b>	<b>Final Concl.</b>
<p><i>have been invited;</i></p> <p><i>(b) The summary of the comments received as provided in the PDD is complete;</i></p> <p><i>(c) The project participants have taken due account of any comments received and have described this process in the PDD.</i></p>				



## ANNEX 2: ASSESSMENT OF BASELINE IDENTIFICATION

**Table A-2:** Assessment of Baseline Identification (EB 51 Annex 3, §§ 82 – 85)

<input type="checkbox"/>	Baseline is not identified
<input checked="" type="checkbox"/>	Assessment of baseline see below

Baseline Alternatives identified	Inline with the Methodology?	Eliminated	Reasons for elimination / non-elimination from list of alternatives	Evidence used	DOE Assessment	
					Appropriateness of elimination	Assessment of validation team (results and means of assessment)
Alternative 1. The project activity not implemented as a CDM project	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The project faces barrier as the investment analysis depict that the project without CDM benefits is economically not the most attractive scenario.	/ADD/	<input type="checkbox"/>	The investment analysis has been checked and it is observed that this scenario is not economically most attractive.
Alternative 2. Power generation using coal-fired sub-critical power generation technologies located at pit-head	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The alternative is realistic and credible in terms of regulatory requirement of the host country, output service, fuel used, technical lifetime, the efficiency and the several smaller plants, or the share of a larger plant to arrive at a similar capacity as the project activity.	/NEC /CERC/ /IEA/ /CEA/	<input type="checkbox"/>	The assessment team cross checked the reports on Indian Electricity Act 2003 which do not prohibit the implementation of the alternative. The assessment team also cross checked the CEA database which shows that the plants considered in the project boundary delivers output for meeting the base-load requirements >3000 hrs. /year or > 34.25% Load factor as indicated in the Methodology. Highest net efficiency observed in sub-

						critical technology, as part of determination of “n” plants is 36.04%. Moreover, report on National electricity policy clearly states that Coal is the fuel used for the majority of Indian power generation. The technical lifetime i.e. 25 years is also in conformity with CERC order. The standard unit size of subcritical coal power plant currently installed in India is 500 MW. Thus alternative is the most attractive baseline scenario based on levelized cost of electricity generation as per the stipulated methodology. However as the project is located inland on the land allocated by PSEB the question of putting up a plant at pit-head is not realistic, thus the same has not been considered as the baseline alternative.
Alternative 3. Power generation using coal-fired sub-critical power generation technologies based on linkage	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The alternative is realistic and credible in terms of regulatory requirement of the host country, output service, fuel used, technical lifetime, the efficiency and the several smaller plants, or the share of a larger plant to arrive at a similar capacity as the project activity.	/NEC /CERC/ /IEA/ /CEA/	<input type="checkbox"/>	The assessment team cross checked the reports on Indian Electricity Act 2003 which do not prohibit the implementation of the alternative. The assessment team also cross checked the CEA database which shows that the plants considered in the project boundary delivers output for meeting the base-load requirements >3000 hrs. /year or > 34.25% Load factor as indicated in the Methodology. Highest net efficiency observed in sub-critical technology, as part of determination of “n” plants is 36.04%. Moreover, report on National electricity policy clearly states that Coal is the fuel used for the majority of Indian power generation. The technical lifetime i.e. 25 years is also in conformity with CERC order. The standard unit size of subcritical coal power plant currently installed in India is 500 MW. This alternative is not the most attractive baseline scenario based on levelized cost of electricity generation as per the stipulated methodology. However as pit-head is not the option for such projects located inland where the land is allocated inland by PSEB as well as the coal cost and coal transportation costs are being passed on to the procurer

						of electricity thus the alternative is the most likely baseline scenario for the project activity.
Alternative 4. Subcritical technology based coal fired power generation using imported coal	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	The alternative is realistic and credible in terms of regulatory requirement of the host country, output service, fuel used, technical lifetime, the efficiency and the several smaller plants, or the share of a larger plant to arrive at a similar capacity as the project activity.	/NEC/ /CERC/ /IEA/ /CEA/	<input checked="" type="checkbox"/>	<p>The assessment team cross checked the reports on Indian Electricity Act 2003 which do not prohibit the implementation of the alternative. The assessment team also cross checked the CEA database which shows that the plants considered in the project boundary delivers output for meeting the base-load requirements &gt;3000 hrs. /year or &gt; 34.25% Load factor as indicated in the Methodology. Highest net efficiency observed in sub-critical technology, as part of determination of “n” plants is 36.04%. Moreover, report on National electricity policy clearly states that Coal is the fuel used for the majority of Indian power generation. The technical lifetime i.e. 25 years is also in conformity with CERC order. The standard unit size of subcritical coal power plant currently installed in India is 500 MW.</p> <p>However a sub-critical plant on imported coal is not the option for such projects located inland where the land is allocated inland by PSEB as well as the coal cost and coal transportation costs are being passed on to the procurer of electricity, further the cost of imported coal is much more than the domestic coal thus the levelized cost would be higher than the previous two alternatives. Hence, this alternative is not taken up for further analysis.</p>
Alternative 5. Subcritical technology based lignite fired power generation located at pit-head	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	The alternative is realistic and credible in terms of regulatory requirement of the host country, output service, fuel used, technical lifetime, the efficiency and the several smaller plants, or the share of a larger plant to arrive at a similar	/C&L/ /CERC/ /IEA/ /CEA/	<input checked="" type="checkbox"/>	<p>The assessment team cross checked the reports on Indian Electricity Act 2003 which do not prohibit the implementation of the alternative. The assessment team also cross checked the CEA database which shows that the plants considered in the project boundary delivers output for meeting the base-load requirements &gt;3000 hrs. /year or &gt; 34.25% Load factor as indicated in the</p>

			capacity as the project activity.			<p>Methodology. The Validation team cross checked the report of the working group on coal and lignite for formulation of 11<sup>th</sup> Five year plan which states that lignite supply-demand scenario is excepted to exceed the demand. The technical lifetime i.e. 25 years is also in conformity with CERC order. Efficiency of lignite based generation stations, based on moisture content present, are in the range of 31-33%. The standard unit size of subcritical coal power plant currently installed in India is 500 MW.</p> <p>Further all Lignite based power plant are located on pit-head however for the current project the land has been allocated by PSEB while the coal cost and the coal transportation costs are reimbursed by the power procurer thus the Lignite based pit-head plant is not a feasible alternative and hence not considered for further analysis.</p> <p>Adding to that it can be noted that there is no difference of capital costs between setting up a thermal power plant based on coal or lignite as both are based on subcritical technology. However, considering the lower GCV &amp; the higher price of lignite compared to coal, it is concluded that lignite will not be source of power cheaper than coal. Hence, this alternative is not undertaken for further analysis.</p>
Alternative 6. Power generation Natural Gas based technology	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The alternative is realistic and credible in terms of regulatory requirement of the host country, output service, fuel used, technical lifetime, the efficiency and the several smaller plants, or the share	/IEA/ /CEA/ /CERC/	<input type="checkbox"/>	The assessment team cross checked the reports on Indian Electricity Act 2003 which do not prohibit the implementation of the alternative. The assessment team also cross checked the CEA database which shows that the CCGT Plants considered in the project boundary delivers output for meeting the base-load requirements

			of a larger plant to arrive at a similar capacity as the project activity.			>3000 hrs. /year or > 34.25% Load factor as indicated in the Methodology. However as NG based power plant has been considered as an alternative even though there is natural gas demand supply gap in India. Net Efficiency of best operating NG plant, as per the Central Electricity Regulatory Commission approved tariff notification, is 46.34%. Technical lifetime of the alternative is 25 years. The alternative is not the most attractive baseline scenario based on levelized cost of electricity generation as per the stipulated methodology.
Alternative 7. Power generation using energy sources (diesel/ fuel oil/naphtha) other than coal	☒	☒	The alternative is not realistic and credible in terms of output service, fuel used, technical lifetime, the efficiency and the several smaller plants, or the share of a larger plant to arrive at a similar capacity as the project activity.	/IEA/ /CEA/  /CERC/ /ES/	☒	The assessment team cross checked the reports on Indian Electricity Act 2003 which do not prohibit the implementation of the alternative. The assessment team also cross checked the CEA database which shows that the plants considered in the project boundary delivers output for meeting the base-load requirements <3000 hrs. /year or < 34.25% Load factor as indicated in the Methodology. Efficiency of the plants is in the range of 35-40%. Assessment team also cross checked the energy statistics 2007 report and found that as the required quantum of diesel for project activity is nearly equivalent to the India's domestic production and with no further diesel manufacturing capacity enhancement underway, the option is not realistic and credible. The technical lifetime of the plant is 25 years as per the CERC norms. Clustering of diesel based generation projects is technically possible, it is not realistic as it is more than the total fuel oil/ diesel based generation. Since the alternative is not in compliance with all the requirement of stipulated methodology, thus alternative is not identified as credible and realistic baseline scenario and is not further considered for the determination of most economical baseline scenario using levelized cost of generation as per the stipulated methodology.

Alternative 8. Power generation using energy sources (renewable energy sources) other than coal  8-a) Hydro	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	The alternative is not realistic and credible based on cluster several smaller plants, or the share of a larger plant to arrive at a similar capacity as the project activity	/CEA/ /CERC/	<input checked="" type="checkbox"/>	Clustering of small hydro -power projects cannot be a comparable alternative to the project activity because of the load services and delivered output. Since the alternative is not in compliance with all the requirement of stipulated methodology, thus alternative is not identified as credible and realistic baseline scenario and is not further considered for the determination of most economical baseline scenario using levelized cost of generation as per the stipulated methodology.
8-b) Wind	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	The alternative is not realistic and credible based on load factor, efficiency and cluster several smaller plants, or the share of a larger plant to arrive at a similar capacity as the project activity	/IEA/ /CEA/ /MERC/	<input checked="" type="checkbox"/>	The assessment team cross checked the reports on Indian Electricity Act 2003 which do not prohibit the implementation of the alternative. The load factor achieved by the wind turbine in India is 33%. The same is cross checked from MERC norms and found correct. Intermittent nature of wind power technology restricts it from delivering the base load power which is provided by the project activity. Clustering of wind turbines to the extent of 1.4 GW is not practical considering the technical issues involved. Since the alternative is not in compliance with all the requirement of stipulated methodology, thus alternative is not identified as credible and realistic baseline scenario and is not further considered for the determination of most economical baseline scenario using levelized cost of generation as per the stipulated methodology.
8-c) Solar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	The alternative is not realistic and credible based on load factor, efficiency determined, technical lifetime and the several smaller plants, or the share of a larger plant to arrive at a similar capacity as the project activity.	/IEA/ /CEA/ /UPERC/ /	<input checked="" type="checkbox"/>	The assessment team cross checked the reports on Indian Electricity Act 2003 which do not prohibit the implementation of the alternative. The assessment team cross checked the Uttar Pradesh regulatory commission report which states that average load factor achieved is 18.26%. The assessment team cross checked the report on the Overview of technologies, opportunities and challenge, TERI which is available in the public domain and found that the sunny weather is estimated between



						250 and 300 days of the calendar year. Thus it clearly indicates that the fuel is not available in plenty to be used in the power plant of this capacity of the project activity. The assessment team also cross checked the report on Advanced Industrial Science & technology, Flexible CIGS Photovoltaic Cell which clearly indicates the efficiency as 17.7% which is much less than the efficiency of the project activity. The technical lifetime of solar is 25 years. The assessment team cross checked the same from UPERC norms and found correct. Clustering of solar photovoltaic panels to the extent of 1.4 GW is not practical to serve the base-load. Since the alternative is not in compliance with all the requirements of stipulated methodology, thus alternative is not identified as credible and realistic baseline scenario and is not further considered for the determination of most economical baseline scenario using levelized cost of generation as per the stipulated methodology.
Alternative 9. Power generation using energy sources (nuclear) other than coal	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	The alternative is not realistic and credible based on fuel used and the efficiency.	/IEA/ /RWP/ /CEA/	<input checked="" type="checkbox"/>	The assessment team cross checked the reports on Indian Electricity Act 2003 which do not prohibit the implementation of the alternative. The assessment team also cross checked the CEA database which shows that the plants considered in the project boundary delivers output for meeting the base-load requirements <3000 hrs. /year or < 34.25% Load factor as indicated in the Methodology. The Report of The Working Group on Power for Eleventh Plan - 2007 -12 is cross checked by the assessment team and found that Nearly 2,000 MW of commissioned nuclear capacity is non-operational because of lack of nuclear fuel. The assessment team found that efficiency of nuclear power plants is 29% from the U.S.-Indian Civilian Nuclear Cooperation and India's Nuclear Arsenal, Page 20, Paragraph 2. Cited efficiency is substantially lesser than the project activity and hence

						not comparable to the project activity. The technical lifetime of the alternative is 60 years as per the Indian nuclear sector expert report. Clustering nuclear power projects is a comparable alternative to the project activity. Since the alternative is not in compliance with all the requirement of stipulated methodology, thus alternative is not identified as credible and realistic baseline scenario and is not further considered for the determination of most economical baseline scenario using levelized cost of generation as per the stipulated methodology.
Alternative 10. Import of electricity from connected grids, including the possibility of new interconnections	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	The alternative is not realistic and credible based on load factor as compared to the project activity.	/IEA/	<input checked="" type="checkbox"/>	The assessment team cross checked the reports on Indian Electricity Act 2003 which do not prohibit the implementation of the alternative. The assessment team also cross checked the article Jung - Economics of energy supply and demand –which is correct and available in the public domain which clearly states that India is currently facing peak demand deficit and energy deficits. Moreover, the import of power from neighbouring countries like Bangladesh and Pakistan is highly unrealistic considering the generation from 1.4 GW proposed power plant. Since the alternative is not in compliance with all the requirement of stipulated methodology, thus alternative is not identified as credible and realistic baseline scenario and is not further considered for the determination of most economical baseline scenario using levelized cost of generation as per the stipulated methodology.

### ANNEX 3: ASSESSMENT OF FINANCIAL PARAMETERS

**Table A-3:** Assessment of Financial Parameters (EB 51 Annex 3, §§110, 111, 113/ in case financial parameters stem from FSR §112,)

[Input parameters are given under the head of (a) Common parameters, (b) Parameters pertaining to the Project Activity, (c) Parameters pertaining to sub-critical project with domestic and pit-head coal and (d) Parameters pertaining to NG based power project]

#### A. Common Parameters

<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
Normative Availability	85	Percent	RFP dt. 10/06/2009 and PPA dt. 18/01/2010	/RFP/ /PPA/	<input checked="" type="checkbox"/>	Draft Power Purchase Agreement forming part of Request for Proposal states that the full Capacity Charges shall be payable based on the Contracted Capacity at Normative Availability and Incentive shall be provided for Availability beyond 85% as provided in this Schedule shall be given, which is confirmed by draft PPA issued along with RFP and also subsequently signed by the project developer with PSEB. Therefore, the assumption of normative availability at 85% is correct. Since it is based on RfP and subsequently confirmed by PPA, the document is reliable

<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						and credible; since it pertains to the candidate project it is appropriate for the project activity
Load Factor	93	Percent	Review of Performance of Thermal Power Stations 2008-09 <sup>57</sup>	/CEA/	<input checked="" type="checkbox"/>	Review of Performance of Thermal Power Stations – 2008-09 brought out by CEA reveals that the overall Operating Availability of Generating Stations under Private Sector Utilities was 92.73% which was the highest among different Sectors. Hence, the PLF of 93% assumed by the project developer is considered appropriate. Validation team also checked the load factor assumed by other super critical projects, which have webhosted the PDD and found that all the projects except Sasan Power Ltd. (which assumed load factor of 90%) have assumed load factor of 85% only. In the above background assumption of 93% actual plant load factor is considered conservative, appropriate and correct. The data has been sourced from CEA Performance review and the document has been verified by the Validation Team. Since Central Electricity Authority is a Government of India organization, the document is credible and reliable;

<sup>57</sup> Please see [http://www.cea.nic.in/reports/yearly/thermal\\_perfm\\_review\\_rep/0809/Highlights.pdf](http://www.cea.nic.in/reports/yearly/thermal_perfm_review_rep/0809/Highlights.pdf)



<input type="checkbox"/> No financial parameters are used for additionality justification						
<input checked="" type="checkbox"/> Assessment of all financial parameters see below						
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						as the document pertains to thermal power projects, it is appropriate for the project activity
Tariff	Varying	INR/kWh	Financial Bid dated 01/10/2009 and PPA signed on dated 18/01/2010	/RFP/ /PPA/	<input checked="" type="checkbox"/>	Tariff is based on the bid submitted by the project developer. The bid submitted by the project, being the lowest, was accepted and it was confirmed vide letters dated 19/11/2009. The tariff was approved by PSERC vide its letter dated 14/07/2010. As per the bid submitted and approved by PSERC, the tariff varies from year to year for all the 25 years. The Bid documents (and the PPA entered into subsequently) have been checked by the Validation Team and the found the tariff assumed as correct. The documents are authentic and the values are appropriate for the project activity.
Secondary Fuel Oil	23.94	INR/Litre	NCDEX spot price for Furnace Oil on 18/09/2009	/INP/	<input checked="" type="checkbox"/>	The price of FO has been sourced from NCDEX spot price as on 18/09/2009. Relevant web shot has been submitted by the project developer and the values are found to be correct. The data has been sourced from the web. The document is credible and reliable and authentic; The price was valid at the time of decision making and is appropriate



<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						for the project activity as the data pertains to 18/09/2009
Escalation in secondary cost fuel	6.78	Percent	Office of the Economic Advisor, Govt. of India <sup>58</sup>	/INP/	<input checked="" type="checkbox"/>	The escalation rate assumed is based on the inflation in furnace oil price as published by the Office of the Economic Advisor, Government of India. The index of Furnace Oil price in 2005 was 127.32 and in 2009 it was 165.5 resulting in a CAGR of 6.78%. PP has furnished web shots of relevant pages and the calculation of CAGR. Validation team checked the website and the calculation and found the data and calculations to be correct. The escalation rate has been taken upto 2009. In case it is restricted to 2008, the escalation rate would be much higher. Hence, the values taken are correct, conservative and appropriate for the project activity.
Ash selling price	341	INR/MT	ACC Ltd. – Annual Report for the year 2009-10 <sup>59</sup>	/INP/	<input checked="" type="checkbox"/>	Fly ash sale revenue was not originally considered by the project developer. However, at the time of validation, project developer was asked to reckon this cost. The selling

<sup>58</sup> Office of the Economic Advisor to Government of India; see <http://eaindustry.nic.in/> (Select Furnace Oil from the list to get the indices)

<sup>59</sup> ACC Ltd., Annual Report 2009-10, [http://www.acclimited.com/newsite/finance/annual\\_report\\_2010.pdf](http://www.acclimited.com/newsite/finance/annual_report_2010.pdf)



<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						price has been sourced from ACC Ltd. - Annual Report for the year 2009-10. Fly ash price has been subjected to 5% escalation based on the inflation experienced by the country <sup>60</sup> . Though the document is post decision making date, since no documentary evidence could be submitted by the project developer corresponding to the decision making period in as much as it was not considered at the time of decision making, the evidence has been accepted by the validation team. In case, the fly ash sales is not reckoned, IRR would come down and render the project all the more additional. There are no other methods of independently checking the cost as such a large plant has not become operational so far. Hence, the value is considered appropriate for the project activity
Debt : Equity	75:25	Ratio	Letter from Axis Bank dt. 26/04/2011	/LOAN/	<input checked="" type="checkbox"/>	The financing pattern for infrastructure projects normally range from 70:30 to 80:20. The gearing is based on the loan sanctioned for the project by a consortium of banks.

<sup>60</sup> Wholesale Price Index in 2005 was 104.04 and in 2009, it was 127.47. Hence, the CAGR works out to 5.20%, which has been rounded off to 5%. The data can be sourced from <http://eaindustry.nic.in/>



<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						This is in conformity with guidance 11 of Annex 58, EB 51, which states that where post tax project IRR is considered as financial indicator, actual interest should be taken into account. Since it represents the real gearing and that the gearing is within the range, validation team accepted the financing pattern. Validation team has checked the sanction letter and found to be correct; the value is therefore considered appropriate for the project activity.
Loan Period Tenure	12	In years	Letter from Axis Bank dt. 26/04/2011	/LOAN/	<input checked="" type="checkbox"/>	The tenure for the loan sanctioned by the bankers is 12 years. This is in conformity with guidance 11 of Annex 58, EB 51, which states that where post tax project IRR is considered as financial indicator, actual interest should be taken into account. Since it represents the actual repayment period and that the repayment period is comparable to the normal repayment period stipulated by banks for infrastructure projects, validation team accepted the repayment period. Validation team has checked the sanction letter and found the value to be correct; the value is appropriate for the project activity.

<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
Interest Rate on term loan	10.50	Percent	Letter from Axis Bank dt. 26/04/2011	/LOAN/	<input checked="" type="checkbox"/>	Interest rate, like repayment period, is also based on the loan contracted by the company. This in line with the guidance 11 of Annex 58, EB 51 (where post tax project IRR is considered as financial indicator, actual interest should be taken into account in computing tax liability). The Prime Lending Rate (PLR) at the time of decision making was 11% to 12% <sup>61</sup> . Validation team worked out the impact of assuming the then prevailing PLR on the project IRR and observed that the project IRR goes up by 8 bps., i.e., from 10.50% to 10.57% and the project does not lose its additionality even if the higher end of the PLR range, viz., 12% is taken into account. Validation team has checked the sanction letter and found the value to be correct; the value is appropriate for the project activity.

<sup>61</sup> Weekly Statistical Supplement, Reserve Bank of India, September 18, 2009. – [http://rbidocs.rbi.org.in/rdocs/Wss/PDFs/4T\\_180909.pdf](http://rbidocs.rbi.org.in/rdocs/Wss/PDFs/4T_180909.pdf). PLR remained the same for the week ended September 25, 2009 also.

<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
Working Capital Interest	11.75%	Percent	PLR of SBI since 01/01/2009 <sup>62</sup>	/INP/	<input checked="" type="checkbox"/>	The interest is based on the Prime Lending Rate of SBI. The rate has been sourced from the Reuters web site. PP has submitted a copy of the web shot. DOE also verified the web site and found the rate to be correct. The interest rate assumed was valid at the time of decision making, is evidenced by a published source and hence, the input parameter is correct, appropriate and valid for this project activity and is in conformity with CERC regulations.
Terminal Value (as percent of total Project Cost)	5	Percent	-	-	<input checked="" type="checkbox"/>	Land cost constitutes approximately 5% of the project cost. Hence, 5% of the project cost, which represents the land cost has been considered as salvage value and the cost has been escalated by 5% per annum for 25 years. Validation team observed that the salvage value so arrived at is much more than the written down value of all assets

<sup>62</sup> Table – India Prime Lending Rates (PLR) of Banks; <http://in.reuters.com/article/2011/02/28/india-plr-idINSGE71R06L20110228>. Though the interest rate had gone up to 12.25% in June 2009, as per CERC tariff Order of January 2009, rate of interest on working capital shall be on normative basis and shall be equal to the short-term Prime Lending Rate of State Bank of India as on 1.4.2009 or on 1st April of the year in which the generating station or a unit thereof or the transmission system, as the case may be, is declared under commercial operation, whichever is later. Since the decision was taken in September 2009, Interest rate prevailing as on April 1, 2009 has been considered. Assumption of higher interest rate will bring down the IRR by 3 bps and make the project all the more additional

<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						put together in the terminal year. Hence, the salvage value takes into account not only the un-depreciated value of assets but also potential profit expected. Therefore, it conforms to guidance 4 of Annex 58, EB 51
Book Depreciation Rate (SLM)	5.28 and 2.05	Percent	CERC tariff order dt. 19/01/2009 <sup>63</sup>	/CERC/	<input checked="" type="checkbox"/>	CERC order states, that depreciation shall be calculated annually based on Straight Line Method and at rates specified in Appendix-III (5.28%) of the regulations for the assets of the generating station and transmission system, provided that, the remaining depreciable value as on 31st March of the year closing after a period of 12 years from date of commercial operation shall be spread over the balance useful life of the assets. Depreciation has been computed in accordance with the order. Validation team checked the order and the Appendix and found that the rate considered and the methodology adopted for depreciation calculation is in conformity with the tariff order. The depreciation rate is therefore correct, valid and appropriate
Depreciation Rate	15	Percent	Income Tax Rules	/ACT/	<input checked="" type="checkbox"/>	Appendix I of IT Rules prescribes the depreciation rates

<sup>63</sup> [http://www.cercind.gov.in/2009/Whats-New/tariff-pdf/CERC-\(Terms-and-Conditions-of-Tariff\)-Regulations-2009-14.pdf](http://www.cercind.gov.in/2009/Whats-New/tariff-pdf/CERC-(Terms-and-Conditions-of-Tariff)-Regulations-2009-14.pdf)

<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
(WDV) for IT Purpose			and Income Tax Act <sup>64</sup>			allowable for computing tax liability by assesses. Besides Sec. 32 of Income Tax Act permits additional depreciation of 20% in the first year of operation. Validation Team checked the IT Rules and IT Act and found the rate to be correct. The rate is valid, correct and appropriate for the project activity
Income Tax	33.99	Percent	Finance Act, 2009 (sourced from Indian Tax guide)	/ACT/	<input checked="" type="checkbox"/>	The Finance Act stipulates the tax rate, surcharge and education cess. The rate assumed is correct, was valid at the time of decision making and appropriate for the project activity.
Income Tax (MAT)	16.995	Percent	Finance Act, 2009 (sourced from Business Line dt.27/07/2009)	/ACT/	<input checked="" type="checkbox"/>	The Finance Act stipulates the tax rate, surcharge and education cess. The rate assumed is correct, was valid at the time of decision making and appropriate for the project activity
Section 80IA	10	Years	Income Tax Act	/ACT/	<input checked="" type="checkbox"/>	As per Sec. 80IA of the Income Tax Act, 1961,

<sup>64</sup> <http://law.incometaxindia.gov.in/DIT/income-tax-rules.aspx> See New Appendix I, and <http://law.incometaxindia.gov.in/DIT/Income-tax-acts.aspx> see Sec. 32

<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						infrastructure projects are eligible for tax holiday any 10 consecutive years in the first 15 years of operation. The period is correct, was valid at the time of decision making and appropriate for the project activity.
Discounting Factor	10.19	%	Central Electricity Regulatory Commission <sup>65</sup>	/CERC/	<input checked="" type="checkbox"/>	CERC notifies periodically the discount factor to be considered by power projects. The data has been sourced from the web. Validation team has checked, the document and found the discount factor to be correct and appropriate for the project activity
Benchmark	11.50	Percent	Weekly Statistical Supplement dt. 18/09/2009	/RBI/	<input checked="" type="checkbox"/>	Benchmark has been sourced from Weekly Statistical Supplement of the Reserve Bank of India in the issue dated September 18, 2009 <sup>66</sup> (the month in which the decision was taken by the PP to submit the bid) was 11% to 12% and average of the range 11.50% has been selected as the benchmark by the PP. Since project IRR has been chosen as the financial indicator, the benchmark selected by the

<sup>65</sup> CERC Notification No. ECO1/2009-CERC dated 27/03/2009 <http://www.cercind.gov.in/Escalation-rate/Notification-dated-27-3-09.pdf>

<sup>66</sup> Weekly Statistical Supplement, Reserve Bank of India, September 18, 2009. – Please see [http://rbidocs.rbi.org.in/rdocs/Wss/PDFs/4T\\_180909.pdf](http://rbidocs.rbi.org.in/rdocs/Wss/PDFs/4T_180909.pdf). PLR remained the same for the week ended September 25, 2009 also.



<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						project developer is appropriate and therefore the benchmark conforms to Paragraph 110 (a) and 112 (b) of VVM, the Additionality Tool and the Guidance 12 and 13 of Annex 58, EB 51.

## B. Input Parameters pertaining to project activity not implemented as CDM project activity

<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment



<input type="checkbox"/> No financial parameters are used for additionality justification						
<input checked="" type="checkbox"/> Assessment of all financial parameters see below						
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
Project Capacity	1,400	MW	Board Notes dt. 22/09/2009 and 17/03/2010 Request for Proposal Power Purchase Agreement and PSEB letter dt. 13/04/2010	/MD/ /RFP/ /PPA/ /INP/	<input checked="" type="checkbox"/>	Installed capacity of the project activity has been considered at 1400 MW, i.e., 2 X 700 MW. The installed capacity is based on the Board Note and approval from PSEB dated 13/04/2010. At the time of taking investment decision on September 22, 2009 for submitting the bid, the project developer had considered installed capacity of 1320 MW (Note to Board dt. 21/09/2009). Since the RfP provides for supplying power upto 1320 MW, after winning the bid, the project developer decided to increase the capacity from 1320 MW to 1400 MW. Accordingly, the project developer revised the installed capacity to 1400 MW and presented a Note to the Board in the meeting held on March 17, 2010. On obtaining the approval of the Board, the modification in the capacity was communicated to



<input type="checkbox"/> No financial parameters are used for additionality justification						
<input checked="" type="checkbox"/> Assessment of all financial parameters see below						
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						PSEB on March 23, 2010 and the approval was accorded by PSEB for the enhanced capacity on April 13, 2010. Since the present project size is 1400 MW and necessary approval has been obtained, validation team considered it appropriate to consider the capacity of 1400 MW in the financial indicator computation. Validation team checked the Board Notes, RFQ, RFP, acceptance of bid, PPA and PSEB approval. All the documents are found to be authentic and credible. Validation team checked the capacity given in those documents and found them to be in agreement with the capacity assumed by the PP. The documents are authentic, input figures pertain to the candidate project only, and hence it is appropriate. However as the first decision was based on 1320 MW thus the financial



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<input checked="" type="checkbox"/> Assessment of all financial parameters see below						
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						viability for 1320 MW has also been assessed. The Project IRR with 1320 MW and project cost of INR 90000 Million comes to be 10.44% which is lower than the Project IRR for 1400 MW i.e 10.5% thus for further analysis the project IRR of 1400 MW has been considered as the same is appropriate as well as conservative.
Unit Size	700	MW	Board Notes dt. 22/09/2009 and 17/03/2010, Company letter dt. 23/03/2010 and	/MD/ /INP/	<input checked="" type="checkbox"/>	The input parameter is based on the Board Note of PP, PP's communication to PSEB and PSEB approval thereof. At the time of taking investment decision on September 22, 2009 for submitting the bid <sup>67</sup> , the project developer had assumed a unit size

<sup>67</sup> This is evidenced by the Board Note dated September 22, 2009

<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
			- PSEB approval letter dt. 13/04/2010			of 660 MW. Since the RfP provides for supplying power up to 1320 MW <sup>68</sup> , and the same is allowed by the PPA also. The PP observed that the EPC contractor had vast experience (25%) for implementation of a standard 700 MW unit size project, also as the capacity was allowed by the PPA the project proponent went ahead to implement a 700 MW unit size project activity. Accordingly, the project developer revised the unit size to 2X700 MW and presented a Note <sup>69</sup> to the Board for the meeting to be held on March 17, 2010. On obtaining the approval of the Board, the modification in the capacity was communicated to

<sup>68</sup> RfP states, "The Project will have a Contracted Capacity of minimum of 1080 MW and maximum of 1320 MW in accordance with the terms of the PPA". After reckoning for auxiliary consumption, installed capacity of 1400 MW would enable the project to export 1320 MW to PSEB in contrast to 1234.2 MW assumed earlier.

<sup>69</sup> This is evidenced by the Note to Board dated March 15, 2010

<input type="checkbox"/> No financial parameters are used for additionality justification						
<input checked="" type="checkbox"/> Assessment of all financial parameters see below						
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						<p>PSEB on March 23, 2010 and the approval was accorded by PSEB for the enhanced capacity on April 13, 2010. Since the present unit size is 700 MW and necessary approval has been obtained, validation team considered it appropriate to take 700 MW unit size in the financial indicator computation. Validation team checked the Board Note and PSEB approval and found them to be authentic. The value is therefore appropriate for the project activity</p> <p>Further to that, as the earliest decision was based on 1320 MW project size the financial analysis for the same has also assessed. The project IRR for 1320 MW keeping all the parameters common except for the project cost (INR 90000 million) is 10.44% as compared to the Project IRR of 1400</p>

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					Correctness of value applied	Comment
						MW, which is 10.5%. Thus for financial analysis the project size of 1400 MW is considered as it is appropriate (as it has already received the approval and EPC contract is signed) and conservative (higher project IRR).
Station Heat Rate	2082	kCal /kWh	EPC contract dated 16/07/2010 with L&T Limited. Offer Letter dt.19/09/2009 from Larsen & Toubro Ltd.	/INP/	<input checked="" type="checkbox"/>	SHR is based on the letter issued by Larsen & Toubro Ltd. on SHR and the subsequent EPC contract. Validation team checked the letter and found the letter states that the Station Heat Rate shall be 2082 kcal/kWh. The document has been checked and found to be authentic, credible and the values are found to be correct. The value is therefore correct and appropriate for the project activity. Validation team also checked the PDDs of other super critical projects and found that the projects have considered SHR ranging from 1965

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<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						kcal/kWh (Coastal Gujarat Power Corporation Ltd.) to 2245 kcal/kWh (Coastal Andhra Power Ltd.). Validation team observed that out of 23 PDDs webhosted for GSC, 18 projects have assumed SHR of more than 2100. Therefore, the SHR assumed is conservative, correct and appropriate for this project activity
Auxiliary Consumption	5.5	Percent	<ul style="list-style-type: none"> <li>- EPC Contract dated 16/07/2010 with L&amp;T Limited</li> <li>- CERC Tariff Notificatoin No.L-7/145(160)</li> </ul>	/CERC/ /INP/	<input checked="" type="checkbox"/>	Auxiliary consumption is based on actual EPC contract signed on 16/07/2010. In the web hosted PDD, project developer had assumed auxiliary consumption of 6% based on the CERC Tariff Notification dated 19/01/2009. However, during validation, DOE observed that the EPC contractor provides a value of 5.5%. Though the EPC



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<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
			/2008-CERC dt. 19/01/2009 <sup>70</sup> , and -			contract is dated July 2010, i.e., post decision making period, project developer was asked to modify the auxiliary consumption to 5.5%, as it is conservative <sup>71</sup> . Other super critical projects (which have webhosted the PDD for GSC) have assumed auxiliary consumption ranging from 6 to 8.5%. Therefore, the Auxiliary consumption assumed by the candidate project is less than that of other projects and hence conservative. Validation Team checked and CERC Tariff Notification and EPC contract; the documents are authentic and credible and the values have been checked and found to be correct. The value is therefore correct and appropriate

<sup>70</sup> CERC Tariff Order No. L-7/145(160)/2008-CERC dt. 19/01/2009, see [http://www.cercind.gov.in/2009/Whats-New/tariff-pdf/CERC-\(Terms-and-Conditions-of-Tariff\)-Regulations-2009-14.pdf](http://www.cercind.gov.in/2009/Whats-New/tariff-pdf/CERC-(Terms-and-Conditions-of-Tariff)-Regulations-2009-14.pdf) (p. 48). The auxiliary consumption given therein has been reduced by 0.5% to be in conformity with the auxiliary consumption assumed by the EPC contractor.

<sup>71</sup> Paragraph 31 of VVM (01.2) states, "In assessing evidence, the DOE shall not omit evidence that is likely to alter the validation Opinion". Since higher auxiliary consumption impacts additionality, it was considered appropriate to ask the PP to reduce the auxiliary consumptions in line with what the institutions have assumed as it is conservative

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<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						for the project activity
Calorific Value of Fuel	4,080	kCal/kg	Email communication from Nabha Power Ltd. (then under PSEB) dt. 11/09/2009	/INP/	<input checked="" type="checkbox"/>	The calorific value (CV) is based on the email communication dt. 11/09/2009 issued by Nabha Power Ltd. (then under PSEB). This information was furnished by PSEB (through Nabha Power Ltd.) to all the bidders to finalise the bids. Project developer has also submitted a copy of the letter dt. 11/12/2008 issued by South Eastern Coalfields Ltd. (SECL) to Nabha Power Ltd. (NPL), wherein SECL has assured to supply 'F' grade coal to the project. Validation team checked the calorific value of 'F' grade coal and observed that CV ranges between 3600 kcal/kg to 4201 kcal/kg <sup>72</sup> . The CV assumed by all other projects (which have web hosted their PDDs for GSC) based on domestic coal have assumed CV ranging between 3300 kcal/kg. and 4500 kcl/kg. Hence,

<sup>72</sup> Coal India Ltd. website, <http://www.coalindia.in/Business.aspx?tab=2&AspxAutoDetectCookieSupport=1> - See Products and Services section

<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						the CV assumed is well within the range. In the light of the above, validation team considers the CV assumed is correct and appropriate for the project activity
Ash content	37.50	Percent	Clarification email dt. 16/09/2009 from Nabha Power Ltd. (then under PSEB)	/INP/	<input checked="" type="checkbox"/>	The ash percentage of coal is evidenced by the clarification email dated 16 <sup>th</sup> September 2009 issued by Nabha Power Ltd. (then under PSEB), wherein the ash percentage was given as 35-40% and the average 37.5% has been taken into consideration. Validation team checked the ash content independently and observed publicly available information estimate the ash content between 35 and 50% <sup>73</sup> . Coal India Ltd, estimates the range between 15% to 35% <sup>74</sup> . In the above background, the ash content assumed in the financial indicator

<sup>73</sup> See <http://flyashbricksinfo.com/construction/source-of-fly-ash-ash-content-in-indian-coal.html>

<sup>74</sup> Coal India Ltd. website; <http://www.coalindia.in/Business.aspx?tab=2&AspxAutoDetectCookieSupport=1> - see Products & Services section

<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						calculation appears to be correct and appropriate.
Fuel Price	520	INR	Communication from Nabha Power Ltd. (under PSEB) dt. 11/09/2009	/INP/	<input checked="" type="checkbox"/>	Fuel cost is based on the communication dt. 11/09/2009 issued by Nabha Power Ltd. (Under PSEB). This information was furnished by PSEB (through Nabha Power Ltd.) to all the bidders to finalise the bids. Validation Team requisitioned price list of South Eastern Coalfields Ltd. (SECL) and the project developer submitted the same which supports the cost assumed. Validation team independently checked the cost and observed from Coal India's website that the present cost is Rs.570/MT <sup>75</sup> . It was also observed that the cost assumed by the project activity is the lowest compared to all other super critical power projects, which have webhosted their PDDs for GSC. Hence, the cost

<sup>75</sup> Coal India Ltd. website; <http://www.coalindia.in/Business.aspx?tab=2&AspxAutoDetectCookieSupport=1> - see Pricing section. The price has been revised to Rs.570 per ton with effect from 27/02/2011

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Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						assumed is correct, conservative and appropriate for the project activity
Escalation in coal cost	6.12	Percent	Communication from PSEB dated 11/09/2009. CERC Notification No. Eco 1/2009-CERC dt. 27/03/2009 <sup>76</sup>	/CERC/	<input checked="" type="checkbox"/>	The escalation is based on the email communication from PSEB dated 11/09/2009 which confirms to CERC Notification dated 27/03/2009. CERC issues notification providing the escalation factor to be considered for determination of Tariff by bidding process for procurement of power by Distribution Licensees. The escalation considered is based on the notification for the relevant period. Validation team checked the relevant guidelines and found the rate considered to be correct. Validation team also observed that the escalation considered by other super critical projects is in the range of 2% to 10%. Hence, 6.12% escalation per annum is within the range and reasonable, correct and appropriate

<sup>76</sup> CERC Notification No. ECO1/2009-CERC dated 27/03/2009 <http://www.cercind.gov.in/Escalation-rate/Notification-dated-27-3-09.pdf>

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<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						for the project activity.
Coal Transportation cost	1204	INR	Communication from PSEB dated 11/09/2009. Explanation to CERC Notification dated 03/07/2009 <sup>77</sup>	/CERC/	<input checked="" type="checkbox"/>	The coal transportation cost is based on the email communication from PSEB dated 11/09/2009 which confirms to CERC Notification dated 03/07/2009. The cost has been computed based on the transportation cost given by CERC in its revised notification issued in July 2009. As per the notification, the transportation cost of coal for 2000 KMs is Rs.1617.20. Since the distance between the coalfields and the plant is 1487 KMs, the pro rata cost works out to Rs.1204 per ton (1617.20 X 1487/2000). Validation team checked the notification and the calculation and found them to be correct. Therefore, the input parameter is correct and appropriate for the project activity.

<sup>77</sup> Revised Methodology for Determining the Escalation Factors and Other Parameters to be notified by CERC as per the Amendment to the Competitive Bidding Guidelines dated 27.3.2009 (July 2009), <http://www.cercind.gov.in/Escalation-rate/Revised-Methodology-dated-3.7-9.pdf> (see p.4)

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Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
Escalation in coal transportation cost	2.39	Percent	Communication from PSEB dated 11/09/2009. CERC Notification dt. No. Eco 1/2009-CERCdt 03/07/2009 <sup>78</sup>	/CERC/	<input checked="" type="checkbox"/>	The escalation is based on the email communication from PSEB dated 11/09/2009 which confirms to CERC Notification dated 03/07/2009. Periodically, CERC issues notification providing the escalation factor to be considered for determination of tariff by bidding process for procurement of power by distribution licensees. The escalation considered is based on the notification for the relevant period. Validation team checked the relevant guidelines and found the rate considered to be correct. Hence, 2.39% escalation per annum is correct and appropriate for the project activity.
Secondary fuel oil consumption	0.28	MI/kWh	Recommendations on Operation Norms for Thermal Power Stations for Tariff	/CERC/	<input checked="" type="checkbox"/>	Consumption of secondary fuel oil has been sourced from the recommendations on the operation norms for thermal power stations for tariff period beginning 01/04/2009 published by CERC. Average consumption

<sup>78</sup> CERC Notification No. ECO1/2009-CERC dated 03/07/2009 <http://www.cercind.gov.in/Escalation-rate/Notification-dated-3.7-9.pdf>



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Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
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			Period beginning 1st April, 2009 <sup>79</sup>			of secondary fuel by NTPC units in the 5 year period (2002-03 to 2006-07) was in the range of 0.2 to 0.3 ml/kWh. CERC has recommended secondary fuel consumption of 0.75 ml/kWh. Other super critical projects have assumed secondary fuel consumption ranging from 0.15 ml/kWh to 2 ml./kWh. In the above background, Validation team considers the data to be correct and appropriate for the project activity. Project developer has considered the same value for the project activity and sub critical–imported coal alternative
O&M Cost for power plant	0.85	INR in Mn./MW	Letter from O&M Solutions dt. 18/09/2009	/INP/	<input checked="" type="checkbox"/>	O&M cost is based on the communication dt. 18/09/2009 received from O&M Solutions (P) Ltd <sup>80</sup> . Validation team observed that CERC has recommended O&M cost of

<sup>79</sup> CERC Recommendation dated 04/11/2008, see <http://www.cercind.gov.in/October08/Report-CERC-norms-CEA-Final-04-11-08.pdf> (see p.30 , 33 and 35)

<sup>80</sup> O&M Solutions (OMS) is a highly experienced multinational engineering service provider incorporated in Mauritius, with offices in Bangladesh, India and Pakistan. OMS specialised in management and services of Greenfield construction developer projects to long term operation and maintenance services to the power industry

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Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
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						Rs.1.46 mn./MW for thermal power projects with unit size of more than 600 MW commencing operation in 2013-14. Validation team checked the O&M cost considered by other super critical projects and observed that barring 5 projects, viz., Coastal Gujarat Power Corporation Ltd. (Rs.0.62 mn./MW) and 4 projects of Adani Power Ltd. (which assumed O&M cost ranging from 0.60 to Rs.0.80 mn) all other projects have considered O&M cost of more than Rs.1 mn./MW. Hence, the O&M cost of Rs.0.85 mn/MW considered by the developer is conservative and appropriate for the project activity
O&M cost escalation	5.00	Percent	Letter from O&M Solutions dt. 18/09/2009	/INP/	<input checked="" type="checkbox"/>	Escalation in O&M cost is based on the letter dt.18/09/2009 issued by O&M Solutions. CERC in its order dt. 19/01/2009 has recommended escalation at 5.72% for O&M cost. Validation team also observed that other projects, which have webhosted their PDDs have assumed escalation ranging from 4% (by projects which

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					Correctness of value applied	Comment
						took investment decision prior to January 2009 <sup>81</sup> to 5.72%. The escalation considered, therefore is well within the range. In the above background, validation team is convinced that the escalation rate considered is correct and appropriate.
Working capital stocking period	2.00	Months	Paragraph 18, page 24, CERC Tariff Notification dated Jan 2009 <sup>82</sup>	/CERC/	<input checked="" type="checkbox"/>	Working capital norms are based on CERC Tariff Notification of January 2009. Project developer had considered receivables for only 30 days as the consumer (State Utility) will be opening LCs and hence the payment period is assured within 30 days after the submission of bill. The calculations conform to CERC Notification. The values are
- Fuel	1.00	Month				
- Receivables	1.00	Month				
- O&M cost	2.00	Month				
- Secondary fuel						

<sup>81</sup> Prior to the issuance of tariff order in January 2009, CERC has recommended 4% escalation in O&M cost vide its tariff order of March 2004

<sup>82</sup> CERC Tariff Order No. L-7/145(160)/2008-CERC dt. 19/01/2009, see [http://www.cercind.gov.in/2009/Whats-New/tariff-pdf/CERC-\(Terms-and-Conditions-of-Tariff\)-Regulations-2009-14.pdf](http://www.cercind.gov.in/2009/Whats-New/tariff-pdf/CERC-(Terms-and-Conditions-of-Tariff)-Regulations-2009-14.pdf) (p.24& 25)

<input type="checkbox"/>	No financial parameters are used for additionality justification					
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Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
oil						therefore appropriate for the project activity.
Project cost	67.85	INR Mn. /MW	<ul style="list-style-type: none"> <li>- Note to Board dt.21/09/2009</li> <li>- Note to Board dt. 15/03/2010</li> <li>- EPC contracts dt. 16/07/2010</li> </ul>	/INP/ /EPC/ /CA/	<input checked="" type="checkbox"/>	The project cost is based on the note submitted to the Board <sup>83</sup> which includes the, land cost, EPC cost, preliminary and pre-operative expenses, IDC, contingency and margin for working capital. Land cost is based on the amount payable to Government of Punjab <sup>84</sup> ; EPC contract value is based on the letter given

<sup>83</sup> At the time of taking investment decision on September 22, 2009 for submitting the bid, the project developer had prepared the financial analysis for a unit size of 660 MW (in the Note to Board dated September 21, 2009). Since the RfP provides for supplying power upto 1320 MW, after winning the bid, the project developer decided to increase the unit size from 660 MW to 700 MW. Accordingly, the project developer revised the project cost for 2X700 MW and presented a Note (dated March 15, 2010) to the NPL Board in the meeting held on March 17, 2010. On obtaining the approval of the Board, the modification in the capacity was communicated to PSEB on March 23, 2010 and the approval was accorded by PSEB for the enhanced capacity on April 13, 2010. Since the present project size is 1400 MW and necessary approval have been obtained, validation team considered it appropriate to take 700 MW unit size in the financial indicator computation.

The cost has been estimated at Rs.90 bn for 1320 MW capacity and Rs.95 bn. for 1400 MW. This is mainly on account of the increase in the EPC cost by Rs. 4 mn. and corresponding increase in IDC, margin for working capital and contingency

<sup>84</sup> Documentary evidence on the amount payable (letter from PSEB dated 08/09/2009) has been submitted to validation team



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Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
			<ul style="list-style-type: none"> <li>- Project Information Memorandum dt. October 2010</li> <li>- Chartered Accountant's Certificate dt.26/04/2011</li> </ul>			<p>by the EPC contractor<sup>85</sup> received by the project developer at the time of taking investment decision; Preliminary and pre-operative expenses include manpower cost, engineering fee, trial and start up expenses, insurance during construction and miscellaneous expenses and account for less than 2% of project cost. Interest during construction has been computed based on the phasing of implementation and draw down of loan. Working capital margin have been computed based on stocking period of various current assets and the prevailing margin on current assets.</p> <p>The total project cost based on the above works out to</p>

<sup>85</sup> Turnkey offer letter dated September 19, 2009 received from Larsen & Toubro Ltd. provides a total turnkey contract cost of Rs.66 bn for 1320 while the actual contract signed on 16/07/2010 is Rs. 69.75 bn for 1400.

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Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						Rs.67.85 mn./MW. Project cost projected by various developers in the web hosted PDD range from Rs.40 mn./MW to Rs.60 mn./MW. Validation team observed that though there are a few projects which have projected a cost of around Rs.40 to 47 mn./MW, cost of majority of the web hosted projects ranged between Rs.50 mn to Rs.60 mn. Energy efficient power generation at Kawai in Rajasthan, India (Adani Power Rajasthan Limited), for example, has projected a cost of Rs. 53.26 mn/MW; Grid connected, energy efficient power plant in Junagadh, Gujarat by SPEPL (Shapoorji Pallonji Energy (Gujarat) Pvt. Ltd) has projected a cost of Rs.56.46 mn./MW; Energy efficient power generation by GCEPL (GMR Chattisgarh Energy Private Ltd.) has projected a cost of Rs.60.51 mn./MW and 1320 MW Coal Based Super Critical Thermal Power Plant by Jaiprakash Power Ventures Limited (JPVL) has projected a cost of Rs.61.36 mn./MW.

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Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						<p>Validation team sought a clarification for the high cost, in response to which the project developer submitted the EPC contract already signed, Project Information Memorandum (PIM) prepared by the lending bankers and a Chartered Accountant's certificate evidencing the contracts already signed, investment already made and the outstanding contingent liability as on March 31, 2011. EPC contract alone works out to Rs.69.75 bn. or Rs.50 mn/MW. Project Information Memorandum (PIM) prepared by the lending bankers estimates the cost of the project at Rs.96000 mn. (in contrast to Rs.95000 mn. considered in the financial indicator calculation). CA certificate reveals that the project has already made an investment of Rs. 16260 mn and the outstanding contingent liability alone is of the order of Rs 62610 mn as on March 31, 2011.</p> <p>Validation team also observed that the cost of Boiler,</p>



<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						<p>Turbine Generator (BTG) have been higher in the case of projects, which have opted to source them from within the country instead of importing it. The cost of BTG in the case of Karnataka Power Corporation Ltd., for the Edlapur project, for example, is reported to be Rs.45 mn. (supplier – BHEL) and that of Raichur project is reported to be Rs.39.2 mn. and 1320 MW project of Jai Prakash Power Ventures Ltd. (supplier – L&amp;T) is reported to be Rs.32.8 mn<sup>86</sup>.</p> <p>Considering the facts that the SHR reckoned by the project is the lowest (2082 kcal/kWh - requiring more efficiently designed turbine generator leading to higher cost), that the plant and machinery is sourced from within the country, that EPC contract alone works out to Rs.50 mn/MW, lending institutions have sanctioned</p>

<sup>86</sup> The cost represents only BTG cost. This cannot be compared with EPC cost as EPC cost includes besides BTG cost, BOP cost also. Hence, the EPC cost of Rs.50 mn.

<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						financial assistance (and thereby taken direct risk) based on the firmed up cost of Rs.96000 mn. and that the CA certificate reveals that the an investment of Rs. 78870 mn. has already been made, validation team considers the cost assumed is reasonable and appropriate for the project activity.

**C. Input Parameters pertaining to the Sub-critical Project with Pit Head coal and Linkage Coal (the only difference between Pit Head and Linkage alternatives is the absence of coal transportation cost)**

<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source Information of (please indicate document page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
Project Capacity	1,200	MW	Comparable project activity to	/RFP/	<input checked="" type="checkbox"/>	The project activity (super critical project) is for an installed capacity of 1400 MW. Paragraph 9 of Sub-step 2c of Additionality Tool states that assumptions and input data from the investment analysis shall not differ across the project activity and its alternatives, unless differences can be well substantiated. As per the Monthly Report on Broad Status of Thermal Power Projects in the Country, published by CEA (July 2009 report), 6 projects, viz., Rajiv Gandhi TPP, Anpara TPP, Raghunathpur TPP, North Chennai TPP, Kalisindh TPP and Malwa TPP – all of which placed orders in 2007 and 2008 - chose unit size of 600 MW. Considering the fact that 600 MW unit size is common in the country and that the installed capacity reckoned is almost the same as that of the project activity, Validation Team considers the installed capacity as appropriate. This is in conformity

<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source Information of (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						with Additionality Tool and Methodology ACM 0013
SHR	2301	kCal /kWh	Calculated from specific emissions as published in CEA Version 6 for the year 2009-10	/INP/	<input checked="" type="checkbox"/>	The heat rate is based on the best operating sub-critical plant as calculated based on Option 1 of the methodology. The CEA database publishes the net generation and absolute emissions for all each power plant in India, while the specific emissions for all the power plants selected in the build margin calculation. CERC tariff order. Validation team checked the appropriateness of the Heat Rate considered with (a) Report of the Expert Committee on Fuels for Power Generation and (b) other super critical technology projects already webhosted.. It was observed that Report of the Expert Committee on Fuel has projected heat rate of 2400 kcal/kWh. Out of 23 super critical projects which have webhosted PDD for GSC, 13 projects have considered SHR of 2425 or more. Considering the fact that the Government appointed committee (which is credible and authentic) has projected heat rate of 2400 kcal/kWh, that more than 50% of web hosted projected have assumed heat rate of 2425 or more and that the assumption of a lower heat



<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source Information of (please indicate and document page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						rate would render the project all the more additional, Validation Team considers the heat rate assumed is conservative, correct and appropriate for the project activity.
Auxiliary Consumption	5.5	Percent	Comparable to the project activity	/INP/	<input checked="" type="checkbox"/>	Auxiliary consumption is taken at the same level as the project activity. This is conservative because a lower auxiliary consumption would bring down the LUCE of sub critical plant (which is the base line) further and render the project all the more unattractive. Other super critical projects (which have been webhosted) have assumed auxiliary consumption ranging from 6 to 7.5% for sub-critical projects. Moreover, all of them have assumed the same auxiliary consumption for project activity and sub critical plant. Since the auxiliary consumption assumed for the project activity is at the lower end, Mott Macdonald's report has recommend auxiliary consumption of 6% and since all other super critical projects whose PDD have been web-hosted have assumed same auxiliary consumption for both project activity and sub-critical, the value is considered appropriate. The value is therefore correct and

<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source Information of (please indicate and document page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						appropriate for the project activity. This is in conformity with sub-step 2c of Additionality Tool.
Calorific Value of Fuel	4,080	kCal/kg	Same as the project activity	/INP/	<input checked="" type="checkbox"/>	Calorific value has been reckoned at the same level as that of the project activity. Since the coal source will remain the same, irrespective of the technology used, assumption of same calorific value is appropriate. As mentioned in project activity section, the calorific value (CV) is based on the letter dt. 11/09/2009 issued by Nabha Power Ltd. (Under PSEB). This information was furnished by PSEB (through Nabha Power Ltd.) to all the bidders to finalize the bids. Project developer has also submitted a copy of the letter dt. 11/12/2008 issued by South Eastern Coalfields Ltd. (SECL) to Nabha Power Ltd. (NPL), wherein SECL has assured to supply 'F' grade coal to the project. Validation team checked the calorific value of 'F' grade coal and observed that CV ranges between 3600 kcal/kg to 4201 kcal/kg <sup>87</sup> . The CV assumed by all other projects (which have web hosted their PDDs for GSC) based on domestic coal have

<sup>87</sup> Coal India Ltd. website, <http://www.coalindia.in/Business.aspx?tab=2&AspxAutoDetectCookieSupport=1> - See Products and Services section

<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source Information of (please indicate and document page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						assumed CV ranging between 3300 kcal/kg. and 4500 kcal/kg. Hence, the CV assumed is well within the range. In the light of the above, validation team considers the CV assumed is correct and appropriate for the project activity. This is in conformity with sub-step 2c of Additionality Tool.
Ash content	37.50	Percent	Same as the project activity	/INP/	<input checked="" type="checkbox"/>	Ash content has been reckoned at the same level as that of the project activity. Since the ash content is dependent on coal and the coal source will remain the same, irrespective of the technology used, assumption of same ash content is appropriate. As mentioned in project activity section, the ash percentage of coal is evidenced by the clarification letter dated 16 <sup>th</sup> September 2009 issued by Nabha Power Ltd. (under PSEB), wherein the ash percentage was given as 35-40% and the average 37.5% has been taken into consideration. Validation team checked the ash content independently and observed publicly available



<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source Information of (please indicate and document page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						information estimate the ash content between 35 and 50% <sup>88</sup> . Coal India Ltd, estimates the range between 15% to 35% <sup>89</sup> . In the above background, the ash content assumed in the financial indicator calculation appears to be correct and appropriate. This is in conformity with sub-step 2c of Additionality Tool.
Fuel Price	520	INR	Same as the project activity	/INP/	<input checked="" type="checkbox"/>	Fuel cost has been reckoned at the same level as that of the project activity. Coal source and cost will remain the same, irrespective of the technology used and hence assumption of same cost is appropriate. As mentioned in project activity section, coal cost is based on the letter dt. 11/09/2009 issued by Nabha Power Ltd. (Under PSEB). This information was furnished by PSEB (through Nabha Power Ltd.) to all the bidders to finalize the bids. Validation Team requisitioned price list of South Eastern Coalfields Ltd. (SECL) and the project developer submitted the same which supports the cost assumed. Validation team independently checked the cost and

<sup>88</sup> See <http://flyashbricksinfo.com/construction/source-of-fly-ash-ash-content-in-indian-coal.html>

<sup>89</sup> Coal India Ltd. website; <http://www.coalindia.in/Business.aspx?tab=2&AspxAutoDetectCookieSupport=1> - see Products & Services section

<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source Information of (please indicate and document page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						observed from Coal India's website that the present cost if Rs.570/MT <sup>90</sup> . It was also observed that the cost assumed by the project activity is the lowest compared to all other super critical power projects, which have webhosted their PDDs for GSC. Hence, the cost assumed is correct, conservative and appropriate for the project activity. This is in conformity with sub-step 2c of Additionality Tool.
Coal Transportation cost	1204	INR	Same as the project activity	/CERC/	<input checked="" type="checkbox"/>	Fuel transportation cost has been reckoned at the same level as that of the project activity. Coal transportation cost will remain the same, irrespective of the technology used and hence assumption of same cost is appropriate. As mentioned in project activity section, the coal transportation cost is based on the email communication from PSEB dated 11/09/2009 which confirms to CERC Notification dated 03/07/2009. As per the notification, the transportation cost of coal for 2000 KMs is Rs.1617.20. Since the distance between the coalfields and the plant is 1487 KMs, the pro rata cost works out to Rs.1204 per

<sup>90</sup> Coal India Ltd. website; <http://www.coalindia.in/Business.aspx?tab=2&AspxAutoDetectCookieSupport=1> - see Pricing section

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<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source Information of (please indicate and document page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						ton (1617.20 X1487/2000). Validation team checked the notification and the calculation and found them to be correct. Therefore, the input parameter is correct and appropriate for the project activity. This is in conformity with sub-step 2c of Additionality Tool
Escalation in coal cost	6.12	Percent	Same as the project activity	/CERC/	<input checked="" type="checkbox"/>	As mentioned in the project activity section periodically, CERC issues notification providing the escalation factor to be considered for determination of tariff by bidding process for procurement of power by Distribution Licensees. The escalation considered is based on the notification for the relevant period. Validation team checked the relevant guidelines and found the rate considered to be correct. Validation team also observed that the escalation considered by other super critical projects is in the range of 2% to 10%. Hence, 6.12% escalation per annum is within the range and reasonable, correct and appropriate for the project activity. This is in conformity with sub-step 2c of Additionality Tool.
Escalation in coal	2.39	Percent	Same as the project activity	/CERC/	<input checked="" type="checkbox"/>	As mentioned in the project activity section periodically, CERC issues notification providing the escalation factor



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<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source Information of (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
transportation cost						to be considered for determination of Tariff by bidding process for procurement of power by Distribution Licensees. The escalation considered is based on the notification for the relevant period. Validation team checked the relevant guidelines and found the rate considered to be correct. Hence, 2.39% escalation per annum is correct and appropriate for the project activity. This is in conformity with sub-step 2c of Additionality Tool
Secondary fuel oil consumption	0.28	MI/kWh	Same as the project activity	/CERC/	<input checked="" type="checkbox"/>	Secondary fuel oil consumption has been reckoned at the same level as that of the project activity. As mentioned in project activity section, consumption of secondary fuel oil has been sourced from the recommendations on the operation norms for thermal power stations for tariff period beginning 01/04/2009 published by CERC. Average consumption of secondary fuel by NTPC units in the 5 year period (2002-03 to 2006-07) was in the range of 0.2 to 0.3 ml/kWh. CERC has recommended secondary fuel consumption of 0.75 ml/kWh. Other super critical projects have assumed secondary fuel consumption ranging from 0.15 ml/kWh

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<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source Information of (please indicate and document page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						to 2 ml./kWh. In the above background, Validation team considers the data to be correct and appropriate for the project activity. Project developer has considered the same value for the project activity and sub critical–imported coal alternative. This is in conformity with sub-step 2c of Additionality Tool/
O&M Cost	0.85	INR in Mn./MW	Same as the project activity	/INP/	<input checked="" type="checkbox"/>	O&M cost has been reckoned at the same level as that of the project activity. Other projects, which have webhosted the PDD for GSC, have assumed same O&M cost for both super critical and sub critical projects and hence, the assumption is appropriate. As mentioned in project activity section, O&M cost is based on the communication dt. 18/09/2009 received from O&M Solutions (P) Ltd <sup>91</sup> . Validation team observed that CERC has recommended O&M cost of Rs.1.46 mn./MW for thermal power projects with unit size of more than 600 MW commencing operation in 2013-14. Validation team checked the O&M cost considered by other super

<sup>91</sup> O&M Solutions (OMS) is a highly experienced multinational engineering service provider incorporated in Mauritius, with offices in Bangladesh, India and Pakistan. OMS specialised in management and services of Greenfield construction developer projects to long term operation and maintenance services to the power industry



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<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source Information of (please indicate and document page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						critical projects and observed that barring 5 projects, viz., Coastal Gujarat Power Corporation Ltd. (Rs.0.62 mn./MW) and 4 projects of Adani Power Ltd. (which assumed O&M cost ranging from 0.60 to Rs.0.80 mn) all other projects have considered O&M cost of more than Rs.1 mn./MW. Hence, the O&M cost of Rs.0.85 mn/MW considered by the developer is conservative and appropriate for the project activity. This is in conformity with sub-step 2c of Additionality Tool.
O&M cost escalation	5.00	Percent	Same as the project activity	/INP/	<input checked="" type="checkbox"/>	As stated in the Project activity section, escalation in O&M cost is based on the letter dt.18/09/2009 issued by O&M Solutions. CERC in its order dt. 19/01/2009 has recommended escalation at 5.72% for O&M cost. Validation team also observed that other projects, which have webhosted their PDDs have assumed escalation ranging from 4% (by projects which took investment decision prior to January 2009) <sup>92</sup> to 5.72%. The escalation considered, therefore is well within the range. In the above background, validation team is convinced

<sup>92</sup> Prior to the issuance of tariff order in January 2009, CERC has recommended 4% escalation in O&M cost vide its tariff order of March 2004 (p.19 & 20)

<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source Information of (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						that the escalation rate considered is correct and appropriate. This is in conformity with sub-step 2c of Additionality Tool.
Working capital stocking period  - Fuel (Linkage) - Fuel (Pit Head) - Receivables - O&M cost - Secondary fuel oil	2.00 1.00 1.00 1.00 2.00	Months Month Month Months	Same as the project activity	/CERC/	<input checked="" type="checkbox"/>	As stated in the Project activity section, working capital norms are based on CERC Tariff order of January 2009. While CERC permits 2 months stock for <i>linkage plant</i> , it provides for only 1 month stock of fuel for <i>pit head plant</i> . Stocking period has been assumed accordingly. Project developer had considered receivables for only 30 days as the consumer (State Utility) will be opening LCs and hence the payment period is assured within 30 days after the submission of bill. The calculations conform to CERC order. The values are therefore appropriate for the project activity. This is in conformity with sub-step 2 (c) of Additionality Tool
Project cost	40.19	INR in Mn./ MW	Monthly Report on Broad Status of Thermal Power Projects in the	/CEA/	<input checked="" type="checkbox"/>	The cost is based on the average cost of 3 power projects which placed order for plant and machinery in 2008 – the latest year before the decision making date. All the three projects were of 600 MW unit size. For all





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<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source Information of (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
			Country, July 2009			<p>the projects, plant and equipment were supplied by BHEL and BGR – both local manufacturers<sup>93</sup>. Validation Team also checked the project cost assumed by other super critical projects, which webhosted the PDD for GSC and observed that out of 23 projects, only 3 projects assumed project cost of more than Rs.40 mn./MW; 20 projects have assumed project cost of less than or equal to Rs.40 mn./MW. Since the cost assumed is based on Monthly Report published by a Government Organization, the cost pertains to projects which placed order in 2008 and the majority of super critical projects seeking CDM registration have assumed cost of less than or equal to Rs.40 mn./MW, the cost considered by the project developer appears to be reasonable, correct and appropriate.</p> <p>Validation team observed that the cost difference between super critical and sub critical works out to 69%. The average cost differential between super critical and sub critical projects in the case of 23 webhosted</p>

<sup>93</sup> The plant and equipment for project activity – super critical project - is also sourced from local manufacturer and hence the comparison is appropriate



<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source Information of (please document indicate and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						projects works out to 51%, of which 7 projects have projected a cost differential of more 75%. Hence, the cost differential appears reasonable and acceptable.

## D. Input Parameters pertaining to NG based power project

<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
Project Capacity	1500	MW	Comparable to project activity	/INP/	<input checked="" type="checkbox"/>	The project activity is for an installed capacity of 1500 MW involving a cluster of 6 X 250 MW units. Paragraph 9 of Sub-step 2c of Additionality Tool states that assumptions and input data for the investment analysis shall not differ across the project activity and its alternatives, unless differences can be well substantiated. Methodology ACM 0013 states the alternatives need not consist solely of power plants of the <u>same capacity</u> , load factor and operational characteristics (i.e. <i>several smaller plants</i> , or the share of a larger plant may be a reasonable alternative to the project activity), however they should deliver similar services (e.g. peak vs. baseload power). Taking into consideration these two requirements and the unit size, project developer has taken into account a cluster of 6 units of 250 MW each resulting in an installed capacity of 1500 MW based on the project for which orders were placed in 2008 – a year before the decision making date. Validation team checked the requirements of Additionality Tool as well as Methodology ACM 0013.

<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						Considering the fact that the basis is derived from the Tool and Methodology, Validation Team considered the installed capacity assumed as an alternative to the project activity is appropriate. This value is almost the same as the value used for other alternatives
SHR	2000	kCal/kWh	CERC Notification 19/01/2009 <sup>94</sup>	Tariff dt. /CERC/	<input checked="" type="checkbox"/>	Heat rate is based on CERC Tariff Notification dt. 19/01/2009. The heat rate given in the Notification ranges from 2000 kcal/kWh to 2400 kcal/kWh. Except one plant, all other plants given in the Notification have operated at the heat rate ranging from 2000 kcal/kWh to 2075 kcal/kWh. Project developer had considered the most efficient plant with lowest heat rate and hence has chosen 2000 kcal/kWh, which is appropriate. Validation team checked the Notification and observed that the heat rate is based on the Notification. Therefore, the heat rate considered by the project developer is appropriate and correct
Auxiliary Consumption	3.00	Percent	CERC Notification	Tariff dt. /CERC/	<input checked="" type="checkbox"/>	Auxiliary consumption is based on CERC tariff Notification. Validation team checked the Notification

<sup>94</sup> CERC Tariff Order No. L-7/145(160)/2008-CERC dt. 19/01/2009, see [http://www.cercind.gov.in/2009/Whats-New/tariff-pdf/CERC-\(Terms-and-Conditions-of-Tariff\)-Regulations-2009-14.pdf](http://www.cercind.gov.in/2009/Whats-New/tariff-pdf/CERC-(Terms-and-Conditions-of-Tariff)-Regulations-2009-14.pdf) (p.45)

<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
			19/01/2009 <sup>95</sup>			and the found the value to be correct. Validation team observed that CO2 data base of CEA has also considered 3% auxiliary consumption for CC Gas plants. In the above background, Validation Team concludes that the auxiliary consumption assumed by the project developer is appropriate and correct
Calorific Value of Fuel	8500	kCal/SCM.	GAIL Website	/INP/	<input checked="" type="checkbox"/>	Calorific Value (CV) is based on the GAIL website wherein the CV has been considered at 8500 kcal/SCM for transportation. Validation team independently checked the CV and observed that the Report of the Expert Committee on Fuels for Power Generation <sup>96</sup> has assumed CV of 10,000. Gas based power projects, which have webhosted their PDDs for GSC, have assumed CV in the range from 7699 (North Delhi Power Ltd.) to 9382 (Gautami Power Ltd.). The CV assumed, therefore, falls within the range. Validation Team checked the impact on the LUCE if the CV is taken at 10000 and observed that the LUCE goes down from

<sup>95</sup> CERC Tariff Order No. L-7/145(160)/2008-CERC dt. 19/01/2009, see [http://www.cercind.gov.in/2009/Whats-New/tariff-pdf/CERC-\(Terms-and-Conditions-of-Tariff\)-Regulations-2009-14.pdf](http://www.cercind.gov.in/2009/Whats-New/tariff-pdf/CERC-(Terms-and-Conditions-of-Tariff)-Regulations-2009-14.pdf) (p.49)

<sup>96</sup> The Report of the Committee of Experts on Fuels for Power Generation, CERC [http://www.cea.nic.in/reports/articles/thermal/expert\\_committee\\_report\\_fuel.pdf](http://www.cea.nic.in/reports/articles/thermal/expert_committee_report_fuel.pdf) (p.5)

<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						Rs.3.44/kWh to Rs.3.04/kWh and does not impact the conclusion of baseline. In the above background, validation team considers the CV assumed by the project developer is appropriate and correct
Fuel Price	7.99	INR/SCM	The Oil & Gas Sector Overview in India 2009 <sup>97</sup>	/INP/	<input checked="" type="checkbox"/>	Fuel cost has been sourced from the publication – The Oil & Gas Sector Overview in India 2009. The then ruling exchange rate has been used to convert the price into Indian Rupees. Validation Team checked the source and the calculation and found them to be correct. Validation Team, therefore, concludes that the cost assumed by the project developer is appropriate and correct
Gas transportation cost	1.15	INR/SCM	GAIL Website	/INP/	<input checked="" type="checkbox"/>	Transportation cost is based on the GAIL website wherein the transportation cost is given as Rs.1.15/SCM for transporting NG with a Calorific Value of 8500 kcal/SCM for transportation. Validation Team checked the source and found the value to be correct. Validation Team, therefore, concludes that the cost assumed by the project developer is appropriate and correct
Escalation in fuel	1.31	Percent	CERC Notification dt.	/CERC/	<input checked="" type="checkbox"/>	CERC issues notification providing the escalation factor

<sup>97</sup> The Oil & Gas Sector Overview in India – 2009, KPMG. (P.11).

<http://www.kpmg.com/Global/en/IssuesAndInsights/ArticlesPublications/Documents/The%20Oil%20and%20Gas%20Sector%20Overview%20in%20India%202009.pdf>



<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
cost			03/07/2009 <sup>98</sup>			to be considered for determination of tariff by bidding process for procurement of power by Distribution Licensees. The escalation considered is based on the notification for the relevant period. Validation team checked the relevant guidelines and found the rate considered to be correct. Hence, 1.31% escalation per annum assumed is correct and appropriate for the project activity.
Escalation in gas transportation cost	3.13	Percent	CERC Notification dt. 03/07/2009 <sup>99</sup>	/CERC/	<input checked="" type="checkbox"/>	CERC issues notification providing the escalation factor to be considered for determination of tariff by bidding process for procurement of power by Distribution Licensees. The escalation considered is based on the notification for the relevant period. Validation team checked the relevant guidelines and found the rate considered to be correct. Hence, 3.13% escalation per annum assumed is correct and appropriate for the project activity.
O&M Cost	1.849	INR in Mn./	CERC Notification Tariff dated	/CERC/	<input checked="" type="checkbox"/>	CERC in its January 2009 Notification has recommended O&M cost of Rs.1.849 mn./MW for

<sup>98</sup> CERC Notification No. Eco 1/2009-CERC dt. 03/07/2009; <http://www.cercind.gov.in/Escalation-rate/Notification-dated-3.7-9.pdf> (p.1)

<sup>99</sup> CERC Notification No. Eco 1/2009-CERC dt. 03/07/2009; <http://www.cercind.gov.in/Escalation-rate/Notification-dated-3.7-9.pdf> (p.1)





<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
		MW	Jan. 2009 <sup>100</sup>			combined cycle Gas turbines. Validation team checked the CERC Notification and found that the value is correct. The cost assumed is therefore considered correct and appropriate.
Working capital stocking period						
- Fuel	1	Month	CERC Tariff	/CERC/	<input checked="" type="checkbox"/>	Working capital norms are based on CERC Tariff Notification of January 2009. Project developer had considered receivables for only 1 month as the consumers (State Utilities) will be opening LCs and hence the payment period is assured within 30 days after the submission of bill. The calculations conform to CERC Notification. The values are therefore appropriate for the project activity.
- Receivables	1	Month	Notification dated Jan.			
- O&M cost	1	Month	2009 <sup>101</sup>			
- Maint.spares (as percent of capex)	30	Percent				
Project cost	34.64	INR in Mn./MW	Monthly Report on Broad Status of Thermal Power Projects in the	/INP/	<input checked="" type="checkbox"/>	Project developer has selected the project (Pragati Power) for which the order for main plant and machinery was placed in 2008. Pragati Power placed order for main plant and equipment in May 2008. One more project,

<sup>100</sup> CERC Tariff Order No. L-7/145(160)/2008-CERC dt. 19/01/2009, see [http://www.cercind.gov.in/2009/Whats-New/tariff-pdf/CERC-\(Terms-and-Conditions-of-Tariff\)-Regulations-2009-14.pdf](http://www.cercind.gov.in/2009/Whats-New/tariff-pdf/CERC-(Terms-and-Conditions-of-Tariff)-Regulations-2009-14.pdf) (p.28)

<sup>101</sup> CERC Tariff Order No. L-7/145(160)/2008-CERC dt. 19/01/2009, see [http://www.cercind.gov.in/2009/Whats-New/tariff-pdf/CERC-\(Terms-and-Conditions-of-Tariff\)-Regulations-2009-14.pdf](http://www.cercind.gov.in/2009/Whats-New/tariff-pdf/CERC-(Terms-and-Conditions-of-Tariff)-Regulations-2009-14.pdf) (p.25)



<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
			Country, July 2009			viz., Tripura CCPP also placed order for main plant and equipment around the same time. The cost of Tripura CCPP works out to Rs.47 mn./MW. Though this increases the LUCE of gas based power plant, since it is not the base line, it does not affect the conclusion. The cost of Pragati Power has been estimated at Rs.5195.8 mn. for 1500 MW. Validation team checked publication and found the value considered is correct. Validation Team, therefore, considers the capital cost assumed by the PP is valid, correct and appropriate.

## ANNEX 4: ASSESSMENT OF BARRIER ANALYSIS

**Table A-4:** Assessment of Barrier Analysis (EB 51 Annex 3, § 117)

<input checked="" type="checkbox"/>		No barrier parameters are used for additionality justification		
<input type="checkbox"/>		Assessment of barriers see below		
Kind of Barrier (invest, tech, other)	Description of Barrier	Evidence used	Assessment of validation team	
			Appropriateness of information source	Explanation of final result
			<input checked="" type="checkbox"/>	
			<input checked="" type="checkbox"/>	
			<input checked="" type="checkbox"/>	
			<input checked="" type="checkbox"/>	
			<input checked="" type="checkbox"/>	
			<input checked="" type="checkbox"/>	
			<input checked="" type="checkbox"/>	
			<input checked="" type="checkbox"/>	

## ANNEX 5: OUTCOME OF THE GSCP

**Table A-5:** Outcome of the Global Stakeholder Consultation Process

(§§ 40-42, VVM Version 1.2)

Comments: Justin	Response of the PP	Response of the DOE
1. Punjab State Electricity Board (PSEB) has incorporated a company under the name Nabha Power Limited, which is operating as a Special Purpose Vehicle (SPV) and is domiciled for this Project. To facilitate tie-up of inputs and clearances for the project, a Special Purpose Vehicle (SPV), Nabha Power Ltd. (NPL), registered under The Co.'s Act, 1956, has been set up as a wholly owned company of PSEB. NPL has undertaken preliminary studies and obtain necessary clearances including water, land, fuel, power selling tie-ups (if required) etc. prior to award of the project to the successful Developer. NPL shall also facilitate the process of obtaining environmental clearance from SPCB/MoEF. But NPL is wrongly addressed as subsidiary company of L&T in the pdd. (Refer: <a href="http://www.psebindia.org/docs/pdf/Request_for_qualification.pdf">http://www.psebindia.org/docs/pdf/Request_for_qualification.pdf</a> ). Pls clarify.	As a part of the bidding process, the bid winner is to purchase 100% shares of NPL from PSEB. Since, L&T Power Development Ltd. (L&TPDL) is the bid winner, it has purchased 100% shares of NPL from PSEB. Thus, NPL now is a 100% subsidiary of L&T Power Development Ltd.	The observations made by the GS is correct. However, once the bid is invited and awarded, as per the system, the winner of the bid is required to purchase 100% of the investment made by PSEB in the SPV. Accordingly, L&TPDL, who is the successful bidder, purchased the entire shares from PSEB and therefore, NPL has become a subsidiary of L&TPDL.
2. The attendance sheet during the prebid	The present bid was invited in June 2009, while the	GS seems to have referred to the

conference is not showing L&T. (Refer: <a href="http://www.psebindia.org/docs/nabha_expression_of_interest.htm">http://www.psebindia.org/docs/nabha_expression_of_interest.htm</a> ). Pls clarify.	weblink provided by the GS refers to the pre-bid meeting of 2007. L&T name figures in the pre-bid meeting held subsequent to June 2009.	attendance sheet pertaining to the pre-bid meeting held in 2007. Subsequently, PSEB called for another pre-bid meeting, the attendance sheet of which is not available on the web. Therefore, the PP's explanation is in order.
3. As per (http://www.taaza.com/stocks/news/l_ts_spv_nabha_power_ltd_in_talks_to_raise_bn--214917), the project will require Rs. 9,000 crore in investments and is expected to be complete by January 2014. But PDD mentions Rs. 9,500 crore investments for the project. Pls clarify.	The news article mentions project cost for 1320 MW. The webhosted PDD mentions the cost for 1400 MW	The GS's comments are correct; however, the news article clearly specifies 1320 MW, while the PDD also specifically mentions 1400 MW. Therefore, the explanation given by the PP is appropriate.
4. PDD does not transparently describe whether the project construction started or not. If yes, it is doubtful that CDM revenue is not considered during the construction period/ at the time of investment decision.	The Board of L&TPDL in its meeting held on 22/09/2009 considered CDM benefits and a copy of the board resolution has been submitted to the DOE for validation. The project activity has started in as much as Section C.1.1 provides the start date.	The Board Resolution for serious consideration of CDM benefits has been submitted and found to be in order. The project developer has also intimated UNFCCC & DNA even before the start date of the project about the intention to seek registration of the project as a CDM activity which conforms to paragraph 2 of EB 49, Annex 22

5. The EOI, RFQ, proposal submitted by the original party should be provided to the DOE for validation.	The same has been provided	The RfQ & RfP have been submitted by the PP.
6. In India, according to publically available reports of manufacturers of boiler units 660 MW units and above are available only with supercritical and ultra-supercritical technology. It seems that PP has considered only supercritical power plant. India has adopted a “mega power project policy” that waives import duties on equipment purchases and provides income tax incentives for new coal-fired power plants of 1000 MW and larger. While this policy could theoretically incentivize efficiencies of scale with any technologies, it may be easier to reach these incentives with supercritical and eventually ultra-supercritical units, which can operate at higher capacities than subcritical units. Further, India is now considering whether to explicitly restrict “mega power project” benefits to supercritical plants. From the website, it is also found that the proposed project is termed as ultra-mega project. In order to ensure efficient energy resource use, India is also considering new policies that would give supercritical generators	We agree with the statements of the GS and the project does take into consideration all the mega power project benefits which the project is entitled to.	The financial indicator calculation takes into account all the fiscal benefits which the project can avail.

priority access to scarce coal supplies and may ban subcritical plants altogether.		
7. Why PP not documented the technical specifications of boiler, turbine and balance of plant which is the requirements of CDM requirements.	<p>The technical specifications of the boiler and turbine have been included in the revised PDD.</p> <p>The technical specifications of the balance of plant have been shared with the DOE.</p>	<p>The revised PDD contains the technical specifications of boiler &amp; turbine - major plant &amp; equipment as required by CDM-PDD filling guidelines.</p> <p>The PP has also submitted technical specifications of the BOP.</p>
8. For a larger project like this, Government will allow merchant power of 10% of power to sell to private parties which is not mentioned in the PDD. How DOE will ascertain this merchant power in the addtionality argument claimed by PP. What is the contract agreement between the concerned parties? It may be available in the tender document which DOE should validate.	As per PPA, 100% of power generated will be sold to PSEB	The DOE has verified the RfQ, RfP and the PPA and found that 100% of the power generated has to be supplied to PSEB only. Hence, the question of merchant power sale does not arise.
9. PP fails to demonstrate how sub critical (Coal based) have been considered as only realistic alternative in the PDD. It seems from the hindsight that PP decided to take subcritical system as baseline and arrived at the plausible alternatives. PP has not demonstrated why it is not considering renewable energy sources.	Section B.4 of the revised PDD explains in detail various alternatives considered and the reasons for acceptance for further analysis/rejection of the same, as required by the methodology by ACM0013. In so far as renewable energy alternatives are concerned, Section B.4 provides adequate reasoning for not considering the same.	Section B.4 of the revised PDD incorporates the reasons for the alternatives selected for further analysis as also the reasons for rejection of the rest of the alternatives. The alternatives of subcritical plant - pit-head & linkage have been considered as required by the methodology



		ACM0013.
10. The PDD fails to provide data during investment decision date to reject imported electricity as a project alternative. The PDD only cites information available at the later date (2009)	The revised PDD provides information on power exchanged between India and other connected countries for previous 3 years	The PDD has been suitably revised and incorporates 3 years data on the power exchanged with the grid-connected neighbouring countries.
11. PP does not state the investment decision date explicitly and DOE has to validate when the supercritical PP option was considered.	The revised PDD contains investment decision date as 22/09/2009	The PDD has been revised and provides not only the investment decision making date (22/09/2009), intimation to UNFCCC & DNA and also other relevant events to be in conformity with EB 49 Annex 22.
12. As per PDD the required Coal for the project would be supplied by SECL. Letter of Assurance for long-term coal linkage received from SECL vide letter dated December 11, 2008. But PDD does not mention about coal allocation is only for supercritical. Coal allocation for supercritical system would not suffice for sub critical system. Pls. clarify.	It is submitted that the Letter of Allocation, issued by SECL, does not impose any restriction based on the technology adopted for power generation.	The DOE has verified the coal allotment letter and did not find any clause restricting the use of coal based on technology of power generation employed.
13. The PDD does not explain about identified training, monitoring and maintenance as per the Technology requirements for contractors / engineers by the client. There is no mention of field quality Assurance systems & procedures that are available at site, field quality plans and	The CDM-PDD filling guidelines does not require explanation on training. Monitoring and QA/QC procedures are detailed under Section B.7 of the PDD	The DOE is in agreement with the PP in so far as the training is concerned. However, the DOE has checked the EPC contract and it provides for operational training & maintenance. The

their approval.		revised PDD includes detailed explanation on monitoring and QA/QC procedures.
14. If we consider RFQ period as investment decision, then how PP has taken some values available at the later date (2009). While calculating levelised cost of generation all input values should be taken at the investment decision but PP have taken some values like coal price available at the time of RFP (i.e during October 2008). And other values like return on equity available during Jan 2009 (CERC values). DOE has the responsibility to check the authenticity of values and justification.	The RfQ & RfP date is June 2009 and not October 2008 (both were issued at the same time). All the input parameters taken in LUCE computation were available at the time of decision making.	DOE has verified the input parameters and found that all of them were available at the time of decision making.
15. Capacity of the baseline scenarios was not given transparently in the relevant sections (which, I feel, done on purpose). To make the supercritical PP less financially attractive, PP has escalated the project cost to 95000 Million (Rs.67 Mn/MW) but in actual it is estimated to be around Rs. 40 Million/MW). From hindsight, it seems that PP has decided and concluded it is taking sub critical coal based PP as baseline and then making other alternatives less attractive to argue the additonality. Pls. clarify.	The selection of subcritical technology based power plant as baseline is based on the methodology requirements which has been explained in detail in Section B.4. The revised PDD provides the capacity of all the alternatives. The project cost is based on the information available to the PP at the time of investment decision. The correctness of the project cost has been further substantiated by the letter issued by the bank which clearly states that the project cost is INR 96000 million for 1400 MW capacity. Further, the DOE has also been given the EPC contract and a certificate from a chartered accountant evidencing the contract already entered into, investment made	The selection of baseline is as per the requirements of the methodology. The revised PDD incorporates installed capacities of all the alternatives. PP has submitted a letter from the bank, all EPC Contracts entered into till date and also a chartered accountant certificate evidencing the investment made. The DOE has verified the documents and observed that the cost of the project is indeed INR 96000 million. Therefore the cost of INR

	till March 31, 2011 and the contingent liability. These documents prove that the cost of the project is INR 96000 million which is more than the cost given in the webhosted PDD.	95000 million considered in the additionality demonstration is conservative and appropriate.
16. Debt: Equity value considered is not justified	CERC Tariff notification dated 19/01/2009 allows a debt/equity ratio of 70:30. However, for the present project activity, a debt/equity ratio of 75:25 had been considered based on the financial closure which is in conformity with guidance 11 of EB 51, Annex 58, which requires reckoning of actual interest in computation of tax liability in cases where post-tax project IRR is used.	DOE has verified the sanction letter and find the debt:equity ratio assumed is in conformity with the sanction letter and therefore, considered appropriate, as it is also in compliance with guidance 11 of EB 51, Annex 58. In this context, DOE would like to observe that should the debt:equity ratio be taken at 70:30, the financial indicator will come down and hence, the project will become all the more additional.
17. Supercritical plants are expected to provide long-term economic benefits by reducing variable costs by 10% as per Government body ruling during 2007 even though raising upfront construction costs by 10 to 15 percent. Kindly clarify in the PDD	As per the calculations submitted, the savings in the variable cost works out to 15% which is more than what the GS has projected.	DOE has checked the calculations and finds that the variable costs of the subcritical technology based power plant is INR 1.72/kWh and that of the project activity (supercritical power project) is INR 1.47/kWh resulting in a net saving of INR 0.25/kWh in the variable cost which works out to savings of

		15%. As observed by the GS, the cost of supercritical power plant is higher than the subcritical technology based power plant.
18. The investment analysis is neither transparent nor reproducible and therefore does not support the selection of subcritical coal-fired power plants as the Project's baseline. Furthermore, project participants fail to include required elements under ACM0013, such as calculation of the levelized cost of electricity and the tariff rate used to calculate the Project's internal rate of return	The revised PDD provides all the details, including tariff, in a transparent manner and hence, it conforms to the CDM-PDD guidelines.	The PDD has been revised and it provides all the input parameters, including the tariff, generation of ash, revenue from ash sales, and salvage value. LUCE calculations have also been modified to take credit of revenue from ash sales and salvage value. The worksheets are given in a transparent manner along with assumptions using which anybody can reproduce the worksheet and obtain the same results.
19. Supercritical PP has been proved less attractive than other alternatives. But additionality should be based on project is not viable without CDM revenue. This aspect is not argued at all. How DOE has allowed this. Pls. clarify.	The additionality of the project has been demonstrated using benchmark analysis. The benchmark chosen is 11.50%, which is the average of the Prime Lending Rate of RBI prevailing at the time of decision making. The project IRR with CDM benefits works out to 11.11%. If the likely increase in the CER price and the variation of INR/Euro exchange rate are considered, the IRR with CDM would cross the	The explanation of the PP appears to be satisfactory. If the escalation in CER price on account of the volumes and exchange rate fluctuations (which are difficult to estimate as the benefits are spread over a period of 10 years commencing 3 years from now) are taken into consideration, the project IRR

	benchmark.	could breach the benchmark.
<p>20. As per methodology ACM 13, the investment analysis should be presented in a transparent manner and all the relevant assumptions should be provided in the CDM-PDD, so that a reader can reproduce the analysis and obtain the same results. Critical techno-economic parameters and assumptions (such as capital costs, fuel price projections, lifetimes, the load factor of the power plant and discount rate or cost of capital) should be clearly presented. Justify and/or cite assumptions in a manner that can be validated by the DOE. In calculating the financial indicator, the risks of the alternatives can be included through the cash flow pattern, subject to project specific expectations and assumptions (e.g. insurance premiums can be used in the calculation to reflect specific risk equivalents). Where assumptions, input data, and data sources for the investment analysis differ across the project activity and its alternatives, differences should be well substantiated. The CDM-PDD submitted for validation shall present a clear comparison of the financial indicator for all scenario alternatives. The baseline scenario alternative that has the best indicator (e.g. the highest IRR) can be pre-selected as the most plausible</p>	<p>The revised PDD provides all input parameters, and relevant assumptions in a transparent manner along with the source. The worksheet is also enclosed to the PDD which provides the financial indicator calculations.</p>	<p>The revised PDD incorporates all the input parameters and assumptions. Worksheet has been presented in a transparent manner so that any reader can reproduce the same and get similar results.</p>

baseline scenario". But PDD does not include these aspects at all.		
21. Common practice analysis: PP fails to establish how many supercritical PP is running in India and then they should argue about their viability. Their argument misleading that the project is of first of this magnitude which is wrong as far as the fact is concerned. The PDD does not fulfill the requirements of the common practice analysis, which compares the proposed Project to similar activities occurring without CDM funds in order to check the credibility of additionality claims. The project participants do not substantiate their claim that construction of supercritical coal plants is not a common practice in India	The common practice analysis has been revised and the section incorporates all the supercritical power plants which have been registered, under validation or under planning stage. The information given conforms to Step 4 of the additionality tool.	The PDD has been revised and Step 4 provides all the projects which have been registered, under validation or under implementation. The explanation conforms to the requirements of Step 4 of the additionality tool.
22. From the website, it is found that most new planned and under-construction coal-fired power plants have adopted more efficient supercritical technology without CDM consideration. Under ACM0013, "if the type of power plant identified as the baseline scenario is different from the power plant technologies that have recently been constructed or are under construction or are being planned (e.g. documented in official power expansion plans), the project participants shall provide explanations to this apparent discrepancy	As per the publicly available data on Programmed / Commissioned Thermal Power projects during 11th Five Year Plan of India (2007-12), 6620 MW of power plants have been added in 2007-08 of which 5620 MW (approx. 85%) is based on subcritical technology running on coal. Similarly in the year 2008-09, 2484.7 MW has been added of which 2102.2 MW (approx. 84.5%) is also based on subcritical technology fired by coal. In 2009-10, a total of 6790 MW (approx. 75%) is based on subcritical coal-fired technology out of the total addition of 9106 MW. The remaining installed	The GS has not given the website based on which he has arrived at the conclusion that most of the newly planned and under-construction coal-fired power plants have adopted more efficient super critical technology. However, based on the explanation given by the PP as also the published documents verified by the DOE, it appears that the sub critical technology is

between observations and what should be considered as rational economic behavior.”. Kindly clarify	capacity is attributed to gas based projects. As far as the installations planned in 2010-11 is concerned, 17793 MW of capacity addition is planned of which 15188 MW (approx. 85%) will be coal based using subcritical technology.	still favoured by power plant developers.
23. While PP argument that not many supercritical PP available that is operational in India, they seem to hide the fact that the majority of <i>new</i> coal fired power plants are expected to use this technology. News reports suggest that at least 35 supercritical plants, in addition to the proposed Project, are at various stages of planning and implementation in India. The PP may argue at the later stages that based on project information listed on the CDM website to argue that all other supercritical coal plants( may be 4 or 5 ) are in CDM development. DOE has to validate	It is submitted that there are not 35 but 52 supercritical power projects (including the candidate project) the details of which have been given in the common practice analysis section (Section B.5). Many of these projects are either registered, or under validation. Some of them have already intimated UNFCCC about their intentio to get registered as CDM activity. The details have been given in the PDD.	The common pratice analysis section of the PDD has been revised and the DOE has observed that of the 52 projects (for which details are available in the public domain), 3 projects have been registered as CDM projects; 17 are under validation; 2 are under completeness check; 15 have prior intimation to UNFCCC; 8 have appointed CDM consultanats; bid is underway for 3 projects and 2 projects have investor presentation. 1 project has been rejected.
24. Moreover, the PDD conveniently suppress the facts of incentives for plant load factor. PP has to explain how these incentives affected the baseline scenarios and technology choice	In the revised PDD, PLF has been considered at 93% and the incentive available (INR 0.25/kWh) for generation in excess of 85% has been considered.	The revised worksheet presented takes into consideration the incentive available for plant load factor.
25. Sensitivity analysis is not done properly. The purpose of sensitivity analysis is not documented properly	Sensitivity analysis has been properly described in the revised PDD. Section B.5 also explains the variation % in the chosen parameters at which the	The PP has chosen 5 critical parameters (in conformity with paragraph 17 of EB51, Annex 58)



	financial indicator will cross the benchmark.	which have been subjected to reasonable variations as per paragraph 18 of EB 51, Annex 58. The sensitivity analysis has also been explained in some detail in the PDD.
26. What is the basis of calculating levelised cost of generation is not documented in the PDD	Assumptions and input parameters based on which the levelised cost of generation has been computed are given in the revised PDD	The revised PDD incorporates all the input parameters and assumptions (along with the sources) which support the LUCE computation.
27. The Serious consideration of CDM is not documented in the PDD at all. Since some input values have been taken from RFP, so this is taken as investment decision time. What PP is doing from 2008 to 2009 in intimating to UNFCCC if it is serious in securing CDM revenue? Chronology of events is not sufficiently documented in the PDD	The RfP date is June 2009 and not October 2008. The Board of L&TPDL in its meeting held on 22/09/2009 considered CDM benefits and a copy of the board resolution has been submitted to the DOE for validation. The intimation to UNFCCC & DNA (21/01/2010) was made even before the start date of the project activity (16/07/2010).	The Board Resolution for serious consideration of CDM benefits has been submitted and found to be in order. The project developer has also intimated UNFCCC & DNA even before the start date of the project about the intention to seek registration of the project as a CDM activity which conforms to paragraph 2 of EB 49, Annex 22
28. PP fail to include all required information like CO <sub>2</sub> emisissions, Coal consumed of similar coal-fired power plants in India. This information is needed to verify the emission reduction calculations claimed by PP	Detailed emission reduction calculation procedure has been presented in the PDD. The coal consumption data has been calculated based on published gross generation and specific emission from similar coal fired plants in India.	The revised PDD provides the coal consumption data from similar coal-fired plants in India to facilitate CO <sub>2</sub> emissions claculations.
29. Section B.6.2 mentions of IPCC value for	As per ACM0013 version 3, $EF_{FF,BL,CO_2y}$ specifically	The PDD is in conformity with the

sub-bituminous coal. Justification is needed why it is taking this value, when national data is publicly available	sources the data from <i>IPCC default values for the respective fuel type at the lower limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories</i>	requirements of ACM0013 version 3.
30. Method of Monitoring of coal consumed is not explicitly stated. Moisture loss, carpet loss should be monitored	Monitoring procedures, as per ACM0013, have been presented in the PDD. Coal consumed will be monitored using gravimetric feeders at the pulveriser feeding.  Further, monitoring of moisture loss and/or carpet loss are not required by the methodology and is thus, not discussed in the PDD.	The revised PDD explicitly states the monitoring of coal which shall be monitored by gravimetric feeders located before the pulveriser feeding. Further, the methodology ACM0013 version 3 does not require the monitoring of moisture loss or carpet loss. Thus, the same need not be monitored.
31. EIA does not speak about SOX emissions which is very critical aspect as far as environmental well being is concerned	The EIA report contains provisions on SOx emissions. Presently the emission guidelines for SOx, as provided in NAAQS, are met	The EIA report has been checked and estimated SOx emission are within the specified limits. The Environment Clearance for the project was received on 15/11/2010 from MoEF.
32. The PDD fails to fully demonstrate amount of ash that will be generated, utilized, and disposed. Although Indian coal may have fewer heavy metals than coal from other areas, fly ash can still be hazardous and still contain heavy	Ash sales have been considered in the assessment of baseline and demonstration of additionality. Ash dykes will be made as per provisions in Environmental Clearance	Revenue from ash sales has been reckoned in the financial indicator calculations. EIA report provides the method to be adopted for storage and disposal

metals. Dry storage of ash would be better than wet storage for utilization purposes		of ash which will be complied with by the PP
33. PDD does not clearly describe the stakeholders involved in Project or the information provided to them. The PDD mentions "identified stakeholders," but does not detail which of these stakeholders actually participated in the process. The PDD does not describe the information provided to stakeholders with sufficient clarity, such as whether adverse environmental impacts were described along with the benefits that were mentioned.	<p>The revised PDD mentions the identified stakeholders as follows:</p> <ol style="list-style-type: none"> <li>1. NPL Employees</li> <li>2. Employees of EPC Contractor</li> <li>3. Local Gram Panchayat Sarpanchs</li> <li>4. Local Villagers</li> <li>5. Punjab State Electricity Board officials</li> <li>6. Punjab Pollution Control Board officials</li> <li>7. Government officials (S.D.M., M.L.A., Tehsildar)</li> </ol> <p>All the identified stakeholders' had participated in the meeting and the invitation letters, attendance sheet, meeting presentation and the minutes of the meeting have been submitted to the DOE.</p> <p>The presentation shown to all of the above during the meeting described the environmental impacts along with the benefits to the stakeholders.</p>	Section E.2 of the revised PDD describes the stakeholders' consultation process adopted along with all other relevant details.



## ANNEX 6: STATEMENTS OF COMPETENCE OF ALL INVOLVED PERSONNEL



**CERTIFICATE OF APPOINTMENT**

**Mr. Manojkumar Borekar**  
born on 1979-10-14  
satisfies the requirements as specified in the TÜV NORD  
JI/CDM CP directives and is hereby appointed as

**TÜV NORD CDM Senior Assessor**

The present appointment will terminate on 2012-12-03  
Certification registration No. 09 12 02 38  
Essen, 2009-12-04



Head of TÜV NORD JI/CDM Certification Program  
of TÜV NORD CERT GmbH



**CERTIFICATE OF APPOINTMENT**

**Mr. Jakkaraju Prasad**  
born on 1982-01-07  
satisfies the requirements as specified in the TÜV NORD  
JI/CDM CP directives and is hereby appointed as

**TÜV NORD CDM Lead Assessor**

The present appointment will terminate on 2014-02-02  
Certification registration No. 11 02 04 – 103 rev1  
Essen, 2011-02-02



Head of TÜV NORD JI/CDM Certification Program  
of TÜV NORD CERT GmbH



**CERTIFICATE OF APPOINTMENT**

**Mr. Shah Hemang**  
born on 1966-08-16  
satisfies the requirements as specified in the TÜV NORD  
JI/CDM CP directives and is hereby appointed as

**TÜV NORD CDM Assessor**

The present appointment will terminate on 2012-11-10  
Certification registration No. 09 11 03 – 87 rev1  
Essen, 2009-11-11



Head of TÜV NORD JI/CDM Certification Program  
of TÜV NORD CERT GmbH



### CERTIFICATE OF APPOINTMENT

**Mr. Sukanta Das**


born on 1983-12-10

satisfies the requirements as specified in the TÜV NORD  
JI/CDM CP directives and is hereby appointed as

**TÜV NORD CDM Lead Assessor**

The present appointment will terminate on 2014-03-08  
Certification registration No. 11 03 01 – 89 rev1

Essen, 2011-03-09

  
Head of TÜV NORD JI/CDM Certification Program  
of TÜV NORD CERT GmbH



### CERTIFICATE OF APPOINTMENT

**Mr. Jimmy Sah**

born on 1984-12-21

satisfies the requirements as specified in the TÜV NORD  
JI/CDM CP directives and is hereby appointed as

**TÜV NORD CDM Lead Assessor**

The present appointment will terminate on 2014-02-03  
Certification registration No. 11 02 03 – 91 rev1

Essen, 2011-02-04

  
Head of TÜV NORD JI/CDM Certification Program  
of TÜV NORD CERT GmbH



### CERTIFICATE OF APPOINTMENT

**Mr. Lars Kirchner**


born on 1968-03-17

satisfies the requirements as specified in the TÜV NORD  
JI/CDM CP directives and is hereby appointed as

**TÜV NORD JI/CDM Assessor**

The present appointment will terminate on 2012-01-19  
Certification registration No. 09 01 02 – 58 rev2

Essen, 2009-01-20

  
Head of TÜV NORD JI/CDM Certification Program  
of TÜV NORD CERT GmbH



### **CERTIFICATE OF APPOINTMENT**

**Mr. Rami Kunal**

born on 1976-10-15

satisfies the requirements as specified in the TÜV NORD  
JI/CDM CP directives and is hereby appointed as

**TÜV NORD CDM Assessor**

The present appointment will terminate on 2014-03-15

Certification registration No. 11 03 02 – 224

Essen, 2011-03-16

Head of TÜV NORD JI/CDM Certification Program  
of TÜV NORD CERT GmbH



### **CERTIFICATE OF APPOINTMENT**

**Mr. Dipl.-Ing. Rainer Winter**

born on 1963-02-21

satisfies the requirements as specified in the TÜV NORD  
JI/CDM CP directives and is hereby re-appointed as

**TÜV NORD JI/CDM Senior Assessor**

The present appointment will terminate on 2013-07-03

Certification registration No. 04 02 154-03

Initial appointment Assessor: 2004-03-01

Senior Assessor: 2007-07-07

Essen, 2010-07-04

Deputy of TÜV NORD JI/CDM Certification Program  
of TÜV NORD CERT GmbH



**Statement of Competence**

Appointment and authorization according to the procedures  
of the TÜV NORD JI/CDM Certification Program

**Mr. Rainer Winter**

SCHEME	STATUS	VALID UNTIL
CDM Validation, Verification	Senior Assessor	2013-07-03
JI	Senior Assessor	2013-07-03
VCS	Senior Assessor	2013-07-03

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal Energy Generation
1.2	Renewable Energies
4.1	Cement Sector
4.3	Iron and Steel
5.1	Chemical Process Industries
9.1	Metal Production
11.1	Chemical Process Industries
12.1	Chemical Process Industries
13.1	Waste Handling and Disposal

003 – Rev. 1, Date: 2011-03-31

**Statement of Competence**

Appointment and authorization according to the procedures  
of the TÜV NORD JI/CDM Certification Program

**Mr. Hemang Shah**

SCHEME	STATUS	VALID UNTIL
CDM Validation, Verification	Assessor	2012-11-10
VCS	Assessor	2012-11-10

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal Energy Generation
1.2	Renewable Energies
2.1	Electricity Distribution
2.2	Heat Distribution
3.1	Energy Demand
13.1	Waste handling and disposal

087 – Rev. 0, Date: 2011-04-06