

VALIDATION REPORT

M/S TORRENT POWER LIMITED

UNOSUGEN NATURAL GAS BASED GRID
CONNECTED COMBINED CYCLE POWER
GENERATION PROJECT

Report No: 8108905291-12/199

Date: 29/12/2012

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Validation Report:	Report No.	Rev. No.	Date of 1st issue:	Date of this rev.
	8108905291-12/199	1	26/10/2012	29/12/2012
Project:	Title:	Initial PDD Version:	Final PDD Version	
	UNOSUGEN Natural gas based grid connected Combined cycle power generation project	30/03/2012	27/12/2012	
Client:	M/s Torrent Power Limited	Client ref:	Mr. Ashok Modi	
Project Participant(s):	Host Party:	Other involved parties:		
	India	NA		
Applied methodology/ies:	Title:	No.:	Scope / TA:	
	Baseline Methodology for Grid Connected Electricity Generation Plants using Natural Gas	AM0029 ver. 3.0	1/1.1	
Validation team / Technical Review and Final Approval	Validation Team:	Technical review:	Final approval:	
	Pankaj Patel (TL) Hemang Shah (TM/TE) Saroj Sahoo (TM) Indrapal Parmar (TM)	B J M Amarnath (OR) Stefan Winter (TR)	Stefan Winter	
Expected Emission reductions: [t CO₂e]	Expected emission reductions over the first crediting period:	(Expected) project starting date:		
	12,705,971 t CO ₂ e	02/07/2010 ¹		
Confidential content:	<input type="checkbox"/> Yes		<input checked="" type="checkbox"/> No	
Summary of Validation Opinion:	<input checked="" type="checkbox"/> Positive validation opinion		<input type="checkbox"/> Negative validation opinion	
	<p>In detail the conclusions can be summarised as follows:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> 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) no.4/10/2012-CCC dated 27/06/2012. <input checked="" type="checkbox"/> The project additionality is sufficiently justified in the PDD. <input checked="" type="checkbox"/> The monitoring plan is transparent and adequate. <input checked="" type="checkbox"/> The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 12,705,971 tCO₂e are most likely to be achieved within the fix 10 year crediting period. <input checked="" type="checkbox"/> 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. 			
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¹ Start of project activity of the project activity is the Notice to Proceed under the Engineering Procurement and Construction (EPC) Contract issued by project proponent for main plant construction to the equipment supplier.

Abbreviations

APR	Annual Performance Report
ARR	Annual Revenue Requirement
BAU	Business as usual
BHEL	Bharat Heavy Electricals Ltd.
BSE	Bombay Stock Exchange
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CAPM	Capital Asset Pricing Model
CCPP	Combined Cycle Power Plant
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CER	Certified Emission Reduction
CL	Clarification Request
CO₂	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
CP	Certification Program
DNA	Designated National Authority
EB	CDM Executive Board
EIA	Environmental Impact Assessment
EPC	Engineering Procurement and Construction
FAR	Forward Action Request
GCV	Gross Calorific Value
GHG	Greenhouse gas(es)
GPCB	Gujarat Pollution Control Board
GSA	Gas Supply Agreement
GSPL	Gujarat State Petronet Limited
GTA	Gas Transportation Agreement
HSDO	High Speed Diesel Oil
IDCT	Induced Draft Cooling Tower
IDFC	Infrastructure Development Finance Company Limited
IEA	International Energy Agency
INR	The Indian Rupee
IRR	Internal Rate of Return
LNG	Liquefied natural gas
LUCE	Levelized Unit Cost of Electricity
IPCC	Intergovernmental Panel on Climate Change

MAT	Minimum Alternative Tax
MMBTU	Million Metric British Thermal Units
MMSCMD	Million Metric Standard Cubic Meter Per Day
NCV	Net Calorific Value
NDCT	Natural Draft Cooling Tower
NEWNE	North Eastern Western and North Eastern
NTP	Notice to Proceed
PLF	Plant Load Factor
PDD	Project Design Document
PPA	Power Purchase Agreement
QC/QA	Quality control/Quality assurance
SLM	Straight Line Method
TPL	Torrent Power Limited
UNCTAD	United Nations Conference on Trade and Development
UNFCCC	United Nations Framework Convention on Climate Change
WDV	Written-Down Value
VVM	Validation and Verification Manual

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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^{VVM}, carried out a full assessment of all evidences to assess the compliance of the project with the key areas as outlined in 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.

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	UNOSUGEN Natural gas based grid connected Combined cycle power generation project
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	AM0029 ver.3.0 (Baseline Methodology for Grid Connected Electricity Generation Plants using Natural Gas)
Technical Area(s)	1.1 (Thermal energy generation)
Crediting period	<input type="checkbox"/> Renewable Crediting Period (7 y) <input checked="" type="checkbox"/> Fixed Crediting Period (10 y)
Start of crediting period	Later of 02/04/2013 or a date not earlier than the date of request for registration

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	M/s Torrent Power Limited
Other involved party/ies	NA	NA

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:	Kamrej Taluka, Surat district
Project location address:	Gujarat State
Latitude:	21°20'25.995"N
Longitude:	72°59'26.125"E

2.4 Technical Project Description

The proposed project activity entails the installation and operation of natural gas (including LNG) fired power plant consisting of one block of 382.5 MW based on combined cycle technology with single shaft configuration. The following are main features of the technology employed by the project activity –

1. Advance class (F Class) gas turbine (SGT5 4000F) with several advanced technologies namely:
 - a) Special metallurgy of vanes and blades
 - b) Fuel Burners of special advanced design
 - c) A special hydraulically controlled axial positioning device for axially positioning the gas turbine rotor
2. Matching triple pressure Heat Recovery Steam Generator (HRSG)
3. Steam Turbine and Generator

Due to the above features including the transfer of advanced class power generation technology and the usage of only clean and less carbon intensive fuel i.e. natural gas (including LNG) in the power plant, the project activity causes use of an environmentally safe and sound technology which would control GHG emissions as well as mitigate to a great extent regulated emissions such as SPM, NO_x and SO₂ from power generation.

The plant will predominantly operate in base load mode. The generator's electrical output is at 20 kV. The evacuation to grid will be at 400 kV switch-yard of the project activity. The auxiliary consumption for the plant is estimated to be around 3%.

The detailed description of the technology employed in the project activity as given in section A.4.3 of the PDD is verified by validation team from the technical specification supplied by technology provider i.e. Siemens.

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

Table 2-4: Technical data of the project activity

Parameter	Unit	Value
Installed Capacity	MW	382.5
No of units	Number	One
Plant efficiency	%	57 (at 100 % load)
Guaranteed Plant Availability Factor	%	93
Gas turbine	-	SGT5-4000F – “F” class turbines (Siemens), matching triple pressure heat recovery steam generator, Steam Turbine and Generator
Generator Type	-	Hydrogen cooled, static excitation system, automatic voltage regulator. Gas Turbine and Steam Turbine would have a common Electric Generator coupled on the same shaft.
Generator Electrical Output	kV	20
Gross Station Heat rate based on GHV	Kcal/kWh	1663.71

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	30/03/2012
Submission of PDD for global stakeholder commenting process	11/04/2012
On-site visit date	17-18/05/2012
Draft reporting finalised	22/05/2012
Final reporting finalised	29/12/2012
Technical review on final reporting finalised	29/12/2012

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, consisting of one team leader and 03 additional team members, as well as the Technical Review personnel were appointed.

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 ¹⁾	Qualification Status ²⁾	Scheme competence ³⁾	Technical competence ⁴⁾	Host country Competence	On-site visit
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Pankaj Patel	TUV India Pvt. Ltd	TL	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 ^{A)}	LA/TE	<input checked="" type="checkbox"/>	1.1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Saroj Sahoo	TUV India Pvt. Ltd	TM ^{A)}	LA	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Indrapal Parmar	TUV India Pvt. Ltd	TM ^{A)}	A	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	B J M Amarnath	TUV India Pvt Ltd	OR ^{B)}	LA	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	-
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Stefan Winter	TNCERT	TR / FA ^{B)}	SA	<input checked="" type="checkbox"/>	1.1	<input type="checkbox"/>	-

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

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

³⁾ GHG auditor status (at least Assessor)

⁴⁾ As per S01-MU03 or S01-VA070-A2 (such as 1.1, 1.2 ...)

⁵⁾ In case of verification projects

A) Team Member: GHG auditor (at least Assessor status), Technical Expert (incl. Host Country Expert or Verification Expert), not ETE

B) No team member

All team members contributed to the review of documents, the assessment of the project activity and to the preparation of this report under the leadership of the team leader.

Technical Experts contributed to the assessment of special aspects of the project activity, e.g. technical or host country aspects.

In order to qualify further personnel the project team was accompanied by observers and/or trainees as indicated in the table above. They are usually not considered as team members.

Statements of competence 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.

Stakeholder 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.

Validation Protocol Table A-1: Requirement checklist				
Checklist Item	Validation Team Comment	Reference	Draft Conclusion	Final Conclusion
<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 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 Site Visit and Follow-up Interviews

The validation team has carried out a site visit 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.

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
1. Project proponent representatives ^{/IM01/} : M/s Torrent Power Limited	- Chronological description of the project activity with documents of key steps of the implementation. - Current status of plant design

Interviewed Persons / Entities	Interview topics
2. Project consultant ^{/IM02/} 3. Local Stakeholder ^{/IM03/}	<ul style="list-style-type: none"> - Technical details of the project realization, project feasibility, designing, operational life time, monitoring of the project - Host Government Approval - Approval procedures and status - Monitoring and measurement equipment and system. - Financial aspects - Crediting period - Project activity starting date - CER allocation / ownership - Baseline study assumptions - Additionality - Sustainable development issues - Monitoring - Analysis of local stakeholder consultation - Roles & responsibilities of the project participants w.r.t. project management, monitoring and reporting - National Legislation - Editorial issues of the PDD

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.

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 ¹⁾	No. of CAR	No. of CL	No. of FAR
General description of project activity (A) <ul style="list-style-type: none"> - Project specification - Technical project description - Participation - Contribution to sustainable development - PDD editorial aspects - Technology to be employed 	05	00	00
Project Baseline, Additionality and Monitoring Plan (B) <ul style="list-style-type: none"> - Application of the Methodology - Project Boundary - Baseline identification - Calculation of GHG emission reductions <ul style="list-style-type: none"> Project emissions Baseline emissions Leakage - Additionality determination - Monitoring Methodology - Monitoring Plan - Project management planning 	17	19	00
Duration of the Project / Crediting Period (C)	00	00	00
Environmental impacts (D)	00	00	00
Stakeholder Comments (E)	00	00	00
SUM	22	19	00

¹⁾ The letters in brackets refer to the validation protocol

Table 4-2: PDD versions used for assessments

Version Nr.	Assessment Round
PDD v. 1 (Published)	Findings i.e. CARs/CLs from the desk review of the published PDD, visits, interviews and supporting documents.
PDD v. 2 dated 18/07/2012	DOE Assessment #1
PDD v. 3 dated 28/08/2012	DOE Assessment #2
PDD v. 4 dated 26/10/2012	Since the some of the links used in the PDD were not working, hard copy or soft pdf files of the said reference is submitted by PP to DoE.
PDD v. 5 dated 27/12/2012	PDD is revised after receiving the incompleteness comments from UNFCCC secretariate under information and reporting check (IRC).

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.

Finding	A1		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	HCA for the project activity is not submitted to DOE		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The HCA approval has been received. The same is submitted herewith.		
DOE Assessment #1 <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>	Name of the PP i.e. "Torrent Power Limited" as presented in the PDD under section A.3 and Annex-1 is not matching exactly with Host Country Approval. CAR is open.		
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The name of PP is amended under section A.3 and Annex-1 in PDD version 03 to match exactly with Host Country Approval.		

Finding	A1
DOE Assessment #2 <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>HCA dated 27/06/2012 is received by DOE. Validation team has reviewed the same and found to be correct with respect to following aspects</p> <ol style="list-style-type: none"> 1. The project has received the approval from the host party (India) involved. 2. The HCA has been issued by Ministry of Environment and Forestry (MoEF)^{/MOEF/} which is listed as the DNA on the UNFCCC CDM website. 3. The host country approval^{/HCA/} confirms that the corresponding party is a Party to the Kyoto Protocol. 4. The host country approval^{/HCA/} confirms that the participation is voluntary. 5. The host country approval^{/HCA/} confirms that the project contributes to the sustainable development in the country. 6. The host country approval^{/HCA/} refers to the precise project title in the PDD submitted for registration. 7. The host country approval^{/HCA/} is unconditional with regard to the checklist questions, A.1.3 to A.1.6 in the validation protocol of the FVR. 8. The host county approval^{/HCA/} has been issued in the name of project proponent (PP) which is listed as the project proponent in section A3 and annex 1 of the PDD. <p>CAR is closed.</p>
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding	A2
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<ol style="list-style-type: none"> 1. Headings of Appendixes and Annex-4 provided on content page does not match with headings provided in the PDD – Editorial 2. Date format is not presented in dd/mm/yyyy in the PDD consistently – Editorial
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<ol style="list-style-type: none"> 1. The headings of Appendixes and Annexures have been corrected in PDD version 02. 2. The date format has also been changed in PDD version 02 as per DD/MM/YYYY format.
DOE Assessment #1 <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"> 1. Headings of Appendixes and Annex-4 are now made consistent in the PDD. CAR is closed. 2. Date format is revised in the PDD. CAR is closed.

Finding	A2
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding	A3
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Details provided under section A.2 under Para 1 (a) and section A.4.3 (a) is not in line with the guidelines for completing CDM-PDD for this project activity.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	As per the CP guidelines for completing CDM-PDD for the project activity, the section A.2 under Para 1 (a) and section A.4.3 (a) are revised in PDD version 02.
DOE Assessment #1 <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>	Details of information regarding pre project scenario is now described appropriately as per guidelines for completing CDM-PDD under section A.2 under Para 1 (a) and section A.4.3 (a). CAR is closed.
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding	A4
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Auxiliary consumption specified under section A.2 and A.4.3 is not consistent with details provided under table 2 (B) under section B.4 of the PDD.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The auxiliary consumption has been considered 3% as per applicable Central Electricity Regulatory Commission of India (CERC) Terms and Conditions of Tariff Regulations, 2009 (page 49). Based on the same, the auxiliary consumption specified under section A.2 and A.4.3 is changed in PDD version 02 to be consistent with the value under table 2 (B) under section B.4.
DOE Assessment #1 <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 auxiliary consumption is correctly sourced from CERC guideline ^{/CERC/} as 3 % and now made consistent in the PDD under section A.2, A.4.3 and B.4. Same is verified by the validation team and found to be correct. CAR is closed.
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding	A5		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>Value of plant efficiency is stated as 57 % under section A.4.3 which is not consistent with the value stated as 58 % under table 1 - (A) of section B.4.</p> <p>Further basis / reference provided for capacity and efficiency of the project activity under section B.4 , step -1, table-1 (A) vide foot note No 29, and Table 2 (D) is not relevant.</p>		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>The value of plant efficiency and capacity are considered 57% and 382.5 MW respectively based on EPC contract. The typographical error under table 1-(A) of section B.4 has been corrected in PDD version 02.</p> <p>The foot note No. 29 (refer to foot note no 17 in PDD version 02) and Table 2(D) source have been modified accordingly in PDD version 02. The documentary evidence i.e. relevant extract of EPC contract (technical specification) for the same is also submitted.</p>		
DOE Assessment #1 <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>Plant capacity and efficiency of the project activity as 382.5 and 57% is verified from the EPC contract^{EPC/} signed by the PP with M/s Siemens. Same is now made consistent in Section A.4.3 and B.4 of the revised PDD. Foot note 29 is also now revised accordingly.</p> <p>However Documentary evidence submitted does not confirm to guideline 6 of EB 62, Annex 05 i.e. documentary evidences available at the time of decision making is not submitted to DOE.</p> <p>CAR is open.</p>		
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>The PP was operating another natural gas based Power Plant (SUGEN Mega Power Project) having same block configuration and technology at the time of decision making for the project activity. The plant capacity and efficiency for SUGEN was available through the EPC contract which was signed in 2005 (source: http://articles.economictimes.indiatimes.com/2005-07-05/news/27508272_1_torrent-group-torrent-power-generation-siemens-india). The date of decision making is 28/01/2010 (Date of Board Meeting for approval of Project). The documentary evidence providing the capacity and efficiency of SUGEN is submitted which is conforming to guideline 6 of EB 62 Annex 5.</p>		

Finding	A5
DOE Assessment #2 <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 has already registered project (UNFCCC Ref. No 1116 ²) of the 1147.5 MW capacity consisting of the 3 units of the similar capacity. As the values are sourced from the EPC contract ^{/EPC-O/} of the earlier project having same configuration is accepted. Same is also verified from the EPC contract actually signed by the PP for this project activity named as SUGEN natural gas based Power Plant. Therefore, values considered are acceptable. CAR is closed.
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding	B1
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<ol style="list-style-type: none"> Justification provided against applicability Main condition 1 states that the project activity will be connected to the national grid of Power Grid corporation of India (PGCIL) which is not consistent with the details provided in justification provided against applicability main condition no 2 which refers to supply of power to NEWNE grid. Justification provided against applicability main condition no 3 does not cover the future NG based power capacity additions, comparable in size to the project activity and are not constrained by the use of NG in the project activity.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<ol style="list-style-type: none"> The project exports power to the NEWNE (Northern, Eastern, Western, and North-Eastern) grid only. PDD version 02 now clearly indicates that the power is being supplied to NEWNE grid in Main Condition 1. The applicability of main condition 3 is amended in PDD version 02 to cover the future NG based power capacity addition upto 2022 and the NG requirement of such expected future capacity addition. Based on the same, it is justified that the future NG based power capacity additions (irrespective of its size being comparable to the project activity), are not constrained by the use of NG in the project activity. The documentary evidences for the same are submitted.
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure,</i>	<ol style="list-style-type: none"> Net electricity exported from the project activity will be delivered to the NEWNE (Northern, Eastern, Western, and North-Eastern) grid. Justification provided against applicability criteria 1 is now

² <http://cdm.unfccc.int/Projects/DB/RWTUV1178549495.9/view> (Project activity titled: 1147.5 MW Natural gas based grid connected Combined cycle power generation project by M/s Torrent Power Limited)

Finding	B1
<p><i>additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i></p>	<p>clearly specified the NEWNE grid where project activity is connected. Validation team has verified the same during site visit and by referring central electricity Authority web site. Project activity is connected to the Northern grid of the North-East-West-North-East Grid (NEWNE). CAR is closed.</p> <p>2. Justification provided against applicability of main condition no 3 now cover the information regarding natural gas requirement from the future NG based power capacity addition. As verified natural gas is sufficiently available in the region and future NG based power capacity addition is not constrained by the use of NG in the project activity. Details regarding future NG based power projects is verified from the CEA (Central Electricity Authority)^{/CEA/}. Summary of likely capacity addition during 11th plan dated 31/10/2009 and A Presentation by BHEL on equipment supply to Power Project – National Power Conference dated 04/12/2009 is also verified by validation team to confirm that the future NG based power capacity additions, comparable in size to the project activity are not constrained by the use of NG in the project activity CAR is closed.</p>
<p>Conclusion <i>Tick the appropriate checkbox</i></p>	<p><input type="checkbox"/> To be checked during the first periodic verification</p> <p><input type="checkbox"/> Additional action should be taken (finding remains open)</p> <p><input checked="" type="checkbox"/> The finding is closed</p>

Finding	B2
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<p>Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i></p>	<p>1. Potential baseline scenario identified under the head “Power generation using natural gas but technologies other than the project activity” does not include open cycle NG based power plants.</p> <p>2. Potential baseline scenario identified under the head “power generation technologies using energy sources other than Natural gas” does not include naphtha based power plants.</p> <p>3. Potential baseline scenario identified in Table -1 under section B.4 at Sr. no 12 and 13 does not include import of electricity from connected grid of neighboring countries other than Pakistan and possibility of new interconnections as required by applied methodology</p> <p>4. Alternatives provided does not include sub-critical/super critical power projects with coal linkage, which is more appropriate for this project activity which is located in west coast, where there</p>

Finding	B2
	are no coal deposits
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<ol style="list-style-type: none"> 1. As per the methodology AM0029 Version 03, EB 39, the alternative should be selected based on fuel (energy source), technology and services. However, such selection of alternatives should also ensure that all relevant power plant technologies that have recently been constructed or are under construction or are being planned are included. Open cycle NG plants have neither been recently constructed nor are planned to be constructed. However, the same has now been included in the plausible alternatives analysis under Table 1 Section B.4 PDD version 02. 2. Further, the naphtha based power plants have neither been recently constructed nor are planned to be constructed. However, the same has now been included in the plausible alternatives analysis under Table 1 Section B.4 PDD version 02. 3. The table 1 under section B.4 has been amended in PDD version 02 for import of electricity from other Indian grids and from existing & possible interconnection from the neighbouring countries. 4. The alternative power plants could be constructed anywhere in the grid boundary as per the methodology (i.e. not limited to the west coast). However, the pit head or non-pit head represent the differentiation based on the location only (not in terms of technology, fuel or service) and the major differentiation factor between pit-head and non-pit head plants would be additional fuel transportation cost to be incurred for non pit head plants. In this context, it is submitted that in the levelised cost analysis for Pit-head alternative under section B.4, the fuel cost is inclusive of the fuel transportation cost (for being conservative). Hence, such alternative is not separately identified (i.e. already covered under the pit-head alternative).
DOE Assessment #1 <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"> 1. Potential baseline scenario identified under the head "Power generation using natural gas but technologies other than the project activity" now include open cycle NG based power plants. CAR is closed. 2. Potential baseline scenario identified under the head "power generation technologies using energy sources other than Natural gas" now include naphtha based power plants. CAR is closed. 3. Potential baseline scenario of "import of electricity from other Indian grids and from existing & possible interconnection from the neighbouring countries" is now considered in Table-1 under

Finding	B2
	<p>section B.4 of the PDD. CAR is closed.</p> <p>4. The CAR was raised because the shortage and stocking period for coal assumed for working capital (1.5 months), signify pithead plant. The petition of Mejia TPS, which was cited as the source for coal cost, reckons 2 months stock implying that it is a linkage plant. Even in the revised version of worksheets submitted (conventional and supercritical), shortage is reckoned at 0.2% and coal stock has been reckoned at 1.5 months implying that they are pithead plants. Though it may not make much difference in the calculation, the cost reckoned and the shortage and coal stocking period considered are contradictory and hence principally wrong. CAR is open</p>
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>4. The worksheets have been amended considering 2 months of stocking period and 0.8% of shortage. Further, the freight (transportation) distance of 500 km has been considered based on average distance travelled by coal in India (source: Report of McKinsey & Company on logistic infrastructure page 30). The amendments have also been incorporated in PDD version 03 accordingly.</p>
DOE Assessment #2 <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>4. Worksheet was revised accordingly considering 2 months of stock and shortage of 0.8 % representing linkage power plants.</p> <p>All other issues are closed in earlier assessment.</p> <p>CAR is closed.</p>
Conclusion <i>Tick the appropriate checkbox</i>	<p><input type="checkbox"/> To be checked during the first periodic verification</p> <p><input type="checkbox"/> Additional action should be taken (finding remains open)</p> <p><input checked="" type="checkbox"/> The finding is closed</p>

Finding	B3
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>Latest reference is not given for prior consideration of CDM benefits under section B.5 of the PDD</p>
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>The same has been modified as per the latest guidelines on the demonstration and assessment of prior consideration of the CDM in PDD version 02.</p>

Finding	B3
DOE Assessment #1 <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>	Revised PDD uses latest version, viz., Annex 13, EB 62. CAR is closed
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding	B4
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	While the start date 2 nd July 2010 is given as the date on which Notice To Proceed (NTP) was issued in Sections A.2 and C.1.1., it is stated to be the date on which the EPC contract was signed under section B.5 of the PDD.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The signing of EPC contract and issuance of Notice to Proceed both happened on 02/07/2010. However, the reference has been changed to Notice to Proceed under section B.5 in PDD version 02.
DOE Assessment #1 <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. Copy of Notice to Proceed (dt. 02/07/2010), which incidentally incorporates the date on which the contract was signed (02/07/2010) has been submitted. CAR is closed
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding	B5
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The justification given for using investment comparison analysis to demonstrate additionality is not in conformity with the rationale given for guidance 19 of Annex 5, EB 62 in as much as there seems to be no compulsion on the part of the investor to set up the project.

Finding	B5
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>As per the rationale of Guidance 19 of Annex 5, EB 62, the purpose of an investment analysis in the context of the CDM is to determine whether the project is less financially attractive than at least one alternative in which the project participants could have invested. In this context, it is submitted that the project participant being in electricity generation business has to make an investment in order to be in the market. Hence, the project participant has no choice to invest or not to invest for electricity supply to the grid. However, the project participant can select any available alternatives to supply electricity to the grid (e.g. coal, natural gas, wind, hydro etc.) as there is no restriction on the investors in India for selecting fuels and technology for supply of electricity to the grid. However, the financial analysis (i.e. levelised cost for supply of electricity) compels to opt for least cost alternative vis-a-vis alternatives available (i.e. developed by any investors) in the grid (i.e. no compulsion to set up gas based power generation project and opt for coal based power generation project without consideration of environmental and efficiency benefits over the long run)</p>
DOE Assessment #1 <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 response to CL B1 and B2 PP has presented benchmark analysis using project IRR as financial indicator, Kindly refer the CL B1 and CL B2 for further assessment. Nevertheless in the revised submission additionality has been demonstrated with benchmark analysis using project IRR as financial indicator. CAR is closed</p>
Conclusion <i>Tick the appropriate checkbox</i>	<p> <input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed </p>

Finding	B6
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>Sensitivity analysis section does not explain the conformity of the parameters selected for sensitivity analysis and the variation to which they have been subjected to guidance 20 and 21 of Annex 5, EB 62.</p>
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>The levelized cost of generation for all alternatives has been calculated as per the Central Electricity Regulatory Commission of India Terms and Conditions of Tariff Regulations, 2009. The variables in the cost as per said regulations are fuel cost and PLF while all other values remain fixed (i.e. once approved by Central Electricity Regulatory Commission of India or as per the norms specified in the regulations). Thus PDD version 01 has considered PLF and Fuel Price (for increase or decrease of 10%) for sensitivity analysis for each plausible alternative. However, the project cost, O&M cost and heat rate (for increase or decrease of 10%) being important parameters have also been considered in PDD version</p>

Finding	B6																								
	02 for sensitivity analysis. The same will cover important variables of cost and revenue as per guidance 20 and 21 of Annex 5, EB 62.																								
DOE Assessment #1 <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>	Sensitivity analysis section does not explain the selection of parameters and impact of the same as per the guidance 20 and 21 of Annex 5, EB 62. CAR is open																								
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>The impact of individual parameters on total project revenues has now been mentioned in PDD version 3. As per guidance 20 of Annex 5 EB 62, all parameters having an impact of more than 20% on total revenue and other important parameters which can have significant impact on revenue have been subjected to sensitivity analysis of +/-10%. Further the project cost itself has been subjected to a sensitivity analysis of +/- 10%.The same has also been incorporated in PDD version 03. Thus the Sensitivity analysis section in the PDD Version 03 has been amended to explain the conformity of the parameters selected for sensitivity analysis and the variation to which they have been subjected to in accordance to guidance 20 and 21 of Annex 5, EB 62.</p> <p>Further, to examine the threshold level for each parameter where it causes the IRR to exceed the benchmark, each parameter was subjected to a variation of +/- 50%, The results are as Under:-</p> <table><tr><td></td><td>Fuel Price</td><td>PLF</td><td>Project Cost</td><td>O&M Cost</td><td>Heat Rate</td></tr><tr><td>+50%</td><td>11.07%</td><td>11.07%</td><td>10.91%</td><td>11.10%</td><td>11.07%</td></tr><tr><td>0</td><td>11.02%</td><td>11.02%</td><td>11.02%</td><td>11.02%</td><td>11.02%</td></tr><tr><td>-50%</td><td>10.96%</td><td>10.96%</td><td>11.21%</td><td>10.91%</td><td>10.96%</td></tr></table> <p>Hence it can be seen that even with a sensitivity of +/- 50% for each parameter, the project remains additional.</p>		Fuel Price	PLF	Project Cost	O&M Cost	Heat Rate	+50%	11.07%	11.07%	10.91%	11.10%	11.07%	0	11.02%	11.02%	11.02%	11.02%	11.02%	-50%	10.96%	10.96%	11.21%	10.91%	10.96%
	Fuel Price	PLF	Project Cost	O&M Cost	Heat Rate																				
+50%	11.07%	11.07%	10.91%	11.10%	11.07%																				
0	11.02%	11.02%	11.02%	11.02%	11.02%																				
-50%	10.96%	10.96%	11.21%	10.91%	10.96%																				
DOE Assessment #2 <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>	Sensitivity analysis now covered +/-10% variation in the parameters PLF, Project cost, O&M cost, Heat rate and Fuel price to check the robustness of the project activity. As verified it does not cross the benchmark value. CAR is closed.																								
Conclusion <i>Tick the appropriate checkbox</i>	<div><input type="checkbox"/> To be checked during the first periodic verification</div> <div><input type="checkbox"/> Additional action should be taken (finding remains open)</div> <div><input checked="" type="checkbox"/> The finding is closed</div>																								

Finding	B7
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR

Finding	B7
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Only load factor and fuel price have been subjected to sensitivity analysis; Project cost and O&M cost have not been subjected to sensitivity analysis
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Please refer the above-mentioned corrective actions for B6. Further, the O&M cost is considered as prescribed by Central Electricity Regulatory Commission of India (CERC) Terms and Conditions Tariff Regulations, 2009 (page 28), as applicable to the project activity. The O&M cost represents average 14% of total cost (i.e. fixed and variable) over the period of assessment and it is subject to escalation (fixed) which is already considered in levelised cost calculation of all plausible alternatives. However, the O&M cost (for increase or decrease of 10%) has now been considered in PDD version 02 for sensitivity analysis.
DOE Assessment #1 <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>	Besides load factor and fuel price, heat rate, project cost, O&M cost have also been subjected to sensitivity analysis. CAR is closed
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding	B8
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Appendix 5 (list of plants for common practice analysis) does not provide the installed capacity of the projects; the website address given as source does not open; Common practice analysis section or the Appendix does not list the CDM projects, which are stated to have been excluded.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The Appendix 5 (list of plants for common practice analysis) has been changed in PDD version 02 for providing installed capacity of the projects. The common practice analysis has been modified in PDD version 02 for listing CDM projects also which are then subsequently excluded. Further, the web-site address has also been modified in PDD version 02.
DOE Assessment #1 <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 entire list of projects^{ICPA} has been given to DOE in a separate worksheet. CDM projects have also been highlighted. The presentation of common practice analysis section has been suitably modified. CAR is closed</p> <p>However, during the course of validation process there is revision in the additionality tool and common practice guideline So, CAR is reopened by validation team to update PDD as per latest EB guideline i.e. annex 8 & 20 of EB 69. CAR is reopened</p>

Finding	B8
Corrective Action #2	Common Practice analysis amended in the PDD Version 4 to conform to latest EB guideline i.e. annex 8 & 20 of EB 69
DOE Assessment #2	Section B.5 of the revised PDD ver.4.0 is now revised by PP. Common practice analysis is now updated as per latest version of the EB decision given vide annex 8 and annex 20 of the EB 69 i.e. Guidelines on common practice (version 02.0) and methodological tool "Tool for the demonstration and assessment of additionality" respectively. In the revised common practice analysis case 1 (i.e. considering all the power plant irrespective of the type of fuel being used for generation of electricity) and case 2 (i.e. considering only Natural Gas Based Power plant) are presented by PP for demonstration of the common practice analysis. Both the scenarios are verified by validation team and results of the common practice are checked to confirm that the proposed project activity is not a common practice in the host country i.e. India. Thus, it is concluded by validation team that the project is not a common practice as per annex 8 & 20 of the EB 69. CAR is closed.
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding	B9
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	While the worksheet gives the source for input parameters, the date and the relevant page number of the document/ CERC (Terms & Conditions of Tariff) Regulations are not given.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The worksheets are updated with the relevant page number of the document/CERC regulation for input parameters. Such updated worksheets are also submitted.
DOE Assessment #1 <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>	Relevant page numbers of the sources from which the input parameters have been sourced is given in the revised worksheet. CAR is closed
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding	B10
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR

Finding	B10
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Guidelines for completing PDD require the format used for <i>presentation of values</i> in the PDD should be in an internationally recognized format. Though the values are given in million in the PDD, in the worksheet it is given in crore.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The worksheets have been modified for providing values in million. Such updated worksheets are also submitted.
DOE Assessment #1 <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>	Worksheets have been modified and the figures are given in million in the revised worksheets. CAR is closed
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding	B11
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Heat rate for the <u>project activity</u> is given as 1663.714525 kcal/kWh based on a formula, constituents of which have not been explained anywhere. Moreover, it is not clear whether the EPC contract provides heat rate in this format (extending to 5 digits).
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>To be conservative, the PP has used the heat rate as provided in EPC contract under optimum conditions which is in kJ/kWh with zero decimal and the same has then been converted into kCal/kWh with standard conversion parameters resulting into 5 decimal digits. The heat rate figure is now rounded off to two decimal digits in the worksheet and the calculation was also explained during the site-visit.</p> <p>However, the heat rate of a plant is dependent on many factors including ambient conditions, grid frequency, fuel quality, load factor, EOH (equivalent operating hours) consumed of the plant etc. Based on the same, it is clarified that the actual heat rate of the project may be higher depending upon the actual operating conditions.</p>
DOE Assessment #1 <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>	Heat rate figure is given rounded off to 2 digits in the revised worksheet. Please clarify what the multiplication factors 1.1 and 0.97 represent. CAR is open
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The heat rate given in the EPC contract is Net Station heat rate on NCV basis. This is to be converted to Gross station heat rate on GCV basis. The multiplication factor 1.1 is the conversion factor

Finding	B11
	from GCV to NCV (source: CO2 Baseline Database January, 2012 issued by CEA, Ministry of Power, and Government of India.). The factor of 0.97 represents the Auxiliary Consumption of 3% (source: Central Electricity Regulatory Commission (Terms & Conditions of Tariff) Regulations, 2009 dated 19/01/2009 – Page no. 49) to convert Net Station Heat Rate to Gross Station Heat Rate.
DOE Assessment #2 <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>	Heat rate considered by the PP is the Net station heat rate based on the NCV of the fuel. Value of 1.1 is used for the conversion of GCV to NCV and 0.97 for 3 % of auxiliary consumption is correct. Same is verified from the EPC contract ^{/EPC/} . CAR is closed.
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding	B12
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Working capital borrowing has been considered at 100% of current assets. Please clarify whether this is in conformity with accepted banking norms.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The levelised cost has been calculated based on Central Electricity Regulatory Commission of India (CERC) Terms and Conditions of Tariff regulations, 2009 (page 25). The working capital has been considered based on norms prescribed by CERC and it is applied consistently for all plausible alternatives.
DOE Assessment #1 <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 it is not in conformity with accepted banking norms and regulations, since CERC Terms and Conditions of Tariff Regulations, 2009 dated 19/01/2009 ^{/CERC/} considers 100% current assets financing and the principle has been adopted uniformly across all alternatives, the explanation is accepted. CAR is closed
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding	B13
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The start date of the project is stated as 02/07/2010 and the first year of operation is reckoned as 02/04/2013 resulting in the implementation period of 33 months for the <u>project activity</u> while the CERC prescribes much lesser implementation period for <i>expansion gas turbine projects above 100 MW</i> .

Finding	B13
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>The EPC contract provides for completion date after 33 months of Zero Date for the project activity. The project completion time is dependent on many aspects including availability / manufacturing time of main equipment, civil works at site, whether NDCT (Natural Draft Cooling Tower) or IDCT (Induced Draft Cooling Tower) is being implemented, etc. The project is located in an area of black cotton soil where foundation work of all buildings is based on piling which requires much longer time period for completion. Similarly the project has NDCT where the construction time is significantly higher than IDCT. There is a long lead time for manufacture and availability of high technology machines for the project. Based on above the EPC contract specifies a time of 33 months after Zero date for completion.</p> <p>Further, the project completion period of 33 months has also been considered in the Board approval^{/MD/} of the project activity dated 28/01/2010.</p>
DOE Assessment #1 <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>As the implementation period is evidenced by EPC contract^{/EPC/}, it is accepted. Further for gas based power plant consists of advance class gas turbines and Natural Draft Cooling Tower (NDCT) which requires more time for the construction. Nevertheless, the Board resolution^{/MD/} passed by the management of the company is verified by the validation team to confirm the same. Hence, it is concluded by the validation team that the construction period of 33 months considered by the PP is appropriate.</p> <p>CAR is closed</p>
Conclusion <i>Tick the appropriate checkbox</i>	<p><input type="checkbox"/> To be checked during the first periodic verification</p> <p><input type="checkbox"/> Additional action should be taken (finding remains open)</p> <p><input checked="" type="checkbox"/> The finding is closed</p>

Finding	B14
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>Though the worksheet contains sensitivity analysis results, it does not contain any provision to check the correctness of results. The worksheet also does not contain any provision to check the impact of CDM benefits on the levelised cost of generation</p>
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>The worksheets are modified to provide check for the the correctness of results.</p> <p>AM0029 version 03 requires the project activity to be analysed without CDM benefits. Hence, the impact of CDM benefits is not required to be provided in the calculation of levelised cost of generation.</p>

Finding	B14
DOE Assessment #1 <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>	Revised worksheet contains provisions to check the correctness of the sensitivity results. As regards impact of CDM benefits, DOE requires the same to ascertain the conformity of the project activity to paragraph 112 (c) of VVM. CAR is open
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The impact of CDM benefits has been incorporated in the worksheet of IRR calculation.
DOE Assessment #1 <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>	Check for the impact of the CDM benefits is now included in the IRR worksheet the same is verified by the validation team and found to be correct and appropriate. Thus, it is concluded by validation team that the impact of the CDM benefit will alleviate the investment barrier faced by the project proponent. CAR is closed.
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding	B15
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	1. Equations used for the calculation of the emission reductions are not presented under section B.6.1 of the PDD. 2. "Justification of the choice of data...applied " for parameter η_{BL} is not properly specified in the PDD under section B.6.2
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	1. The section B.6.1 is modified in PDD version 02 by providing equations used for the calculation of the emission reductions. 2. The justification is provided in the PDD version 02
DOE Assessment #1 <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>	1. Equations used for the calculations of the emission reductions are now included under section B.6.1 of the PDD as per the applied methodology AM 0029. CAR is closed. 2. Basis of choice of data applied for parameter η_{BL} is now specifically mentioned in section B.6.2 of the revised PDD. CAR is closed.
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding	B16
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the</i>	1. Under Section B.7.1 for parameter EF CO _{2,f,y} (Parameter B3), details provided under the head "Source of data to be used" is

Finding	B16
<i>context (e.g. section)</i>	<p>not specified clearly whether Supplier data / transporter data / local data / country specific data / IPCC values are used .</p> <p>2. Type of fuel “f” is not stated under the head “Description” in the table for parameter EF CO₂,f,y (Parameter B3), and FC f,y (Parameter B1).</p> <p>3. Ex-ante calculation of Emission reduction are not carried out conservatively specifically with respect to value of plant availability / plant load factor considered for additionality determination.</p>
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>1. The same has been amended in PDD version 02.</p> <p>2. The description of parameter EF CO₂,f,y (Parameter B3), and FC f,y (Parameter B1) is modified in PDD version 02.</p> <p>3. The EPC contract provides 93% availability of machines for a limited period. Further this availability is without considering constraints, if any, due to fuel, water, transmission etc. for the project activity. However, the PLF 85% is considered for the entire life cycle of the project activity based on Central Electricity Regulatory Commission of India (CERC) norms for tariff determination (page 42) applicable to all which is after considering the availability of fuel, water, transmission etc. However, the ex-ante calculation of Emission Reduction has now been done conservatively at 85% PLF in PDD version 02.</p>
DOE Assessment #1 <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>1. Under Section B.7.1 for parameter EF CO₂,f,y (Parameter B3), details provided under the head “Source of data to be used” is now specified clearly and values are sourced from IPCC. CAR is closed.</p> <p>2. Type of fuel “f” i.e. natural gas is now stated under the head “Description” in the table for parameter EF CO₂,f,y (Parameter B3), and FC f,y (Parameter B1). CAR is closed.</p> <p>3. Ex-ante emission reduction calculations are now revised considering 85 % of PLF which is based on the CERC guideline for gas based power projects and is now conservative. CAR is closed.</p>
Conclusion <i>Tick the appropriate checkbox</i>	<p><input type="checkbox"/> To be checked during the first periodic verification</p> <p><input type="checkbox"/> Additional action should be taken (finding remains open)</p> <p><input checked="" type="checkbox"/> The finding is closed</p>

Finding	B17
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>As per information and reporting check (IRC) query raised by CDM executive board, PP is requested to clarify the calculation and the conservativeness of the parameter EF_{BL, upstream, CH4} as it is not clear</p>

Finding	B17
	<p>if the absolute emissions of the secondary pant is also included in the calculation of the absolute emissions as per the CEA database. If the same is included, the PP is requested to justify the conservativeness of the provided ex-ante calculation.</p>
<p>Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i></p>	<p>As per methodology AM0029 version 03, $EF_{BL,upstream,CH4}$ is determined based on the build margin or the combined margin, however the calculation should be consistent with the calculation of CO₂ emissions in the build margin and the combined margin, i.e. the same cohort of plants and data on fuel combustion and electricity generation should be used, and the values for Fossil Fuel and Electricity Generation should be those already determined through the application of “Tool to calculate emission factor for an electricity system”.</p> <p>The build margin approach has been used in order to calculate the baseline grid emission factor (conservatively selected in line with the AM0029, version 03) and the same cohort of plants and data on fuel combustion and electricity generation should be used in calculation of $EF_{BL,upstream,CH4}$.</p> <p>Based on the same, the parameter $EF_{BL,upstream,CH4}$ has been calculated in line with Build margin emission factor. It is submitted that the build margin emission factor has been directly sourced from CEA CO₂ baseline database version 07, January, 2012. As per user guide of CO₂ baseline database 2012 for the Indian power sector published by CEA, the following equation has been used for calculation of absolute emission of power plants (page 11 http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm)</p> <p>CO₂ emissions of thermal stations were calculated using the formula below:</p> $AbsCO_2(station)_y = \sum_{i=1}^2 FuelCon_{i,y} \times GCV_{i,y} \times EF_i \times Oxid_i \quad (1)$ <p>Where:</p> <p>$AbsCO_{2,y}$ Absolute CO₂ emission of the station in the given fiscal year ‘y’</p> <p>$FuelCon_{i,y}$ Amount of fuel of type i consumed in the fiscal year ‘y’</p> <p>$GCV_{i,y}$ Gross calorific value of the fuel i in the fiscal year ‘y’</p> <p>EF_i CO₂ emission factor of the fuel i based on GCV</p> <p>$Oxid_i$ Oxidation factor of the fuel i</p> <p>Based on the above it is evident that the absolute CO₂ emission of station is summation of CO₂ emission of fuel type i, where i assumes the value 1 (For primary fuel) & 2 (for secondary fuel).</p>

Finding	B17
	<p>The applied approved methodology AM0029, version 03 has provided the default emission factor for fugitive upstream Methane emission for various fuel types under table 2 of the methodology. Based on these factors the fugitive Methane emissions from the use of each type of fuel can be directly calculated. However, this calculation requires the amount of each type of fossil fuel used in the baseline plants.</p> <p>Since, there is no publically available data for the total fuel consumption in the identified baseline grid power plants; the amount of fuel consumption has been calculated through use of absolute emission factor as provided in the CEA data base.</p> <p>The mentioned absolute emissions in the database have been calculated by consideration of the both primary and secondary fuels and directly provided in the CEA database. From the absolute emissions, the amount of fuel consumed has been calculated with consideration of GCV and emission factor of the each type of fuel.</p> <p>However, in order to be conservative, the following changes have been done in calculation of $EF_{BL,upstream,CH_4}$:</p> <ul style="list-style-type: none"> • As per the database, the secondary fuel used in coal and lignite based plants is oil. The absolute emission of coal and lignite based plants as given in the CEA database has been reduced to such extent of emission due to the use of secondary fuel (i.e. oil) in order to be conservative • The secondary fuel mentioned for Naphtha based power plant is natural gas. As the Fugitive Methane emission factor of natural gas (160 tCH₄ /PJ) is higher than that of Naphtha (4.1 tCH₄/PJ), to be conservative the entire fuel consumption (including secondary fuel) has been considered as Naphtha only for the calculation of absolute emission of Naphtha based plants (i.e. lower value of $EF_{BL,upstream,CH_4}$ will result in lower baseline leakage emission resulting in higher leakage emission by the project activity. Thus there will be lower emission reduction by the project activity). <p>Based on the above, the revised PDD version 05 dated 27/12/2012 and revised ER calculation sheet is submitted.</p>
DOE Assessment #1 <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>Revised PDD and emission reduction sheet is verified to confirm that the absolute emissions of the secondary FUEL is also included in the calculation of the absolute emissions as per the CEA CO₂ baseline database version 07 and the emission reduction has been calculated on conservative basis.</p>
Conclusion <i>Tick the appropriate checkbox</i>	<p><input type="checkbox"/> To be checked during the first periodic verification</p> <p><input type="checkbox"/> Additional action should be taken (finding remains open)</p> <p><input checked="" type="checkbox"/> The finding is closed</p>

Finding	B1		
Classification	<input type="checkbox"/> CAR	<input checked="" type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>Clarify how the levelised cost of generation considered appropriate financial indicator for the project type and decision making context, particularly in the light of the fact that the approved methodology requires the use of Benchmark analysis for additionality demonstration and the additionality tool does not prescribe any benchmark for levelised cost of generation</p>		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<ol style="list-style-type: none"> 1. As per the requirement of methodology AM0029 version 03, the assessment of additionality is to be demonstrated by applying option III (Apply Benchmark analysis) of sub-steps 2(b) of latest version of Tool for the demonstration and assessment of additionality. Further, as per the requirement of Tool for the demonstration and assessment of additionality version 06.1.0 (EB 69), the sub-step 2b: Option III provides to select the financial indicator, such as IRR, most suitable for the project type and decision-making context. Based on the same, the Tools provide for selecting appropriate financial indicator for benchmark analysis. However, such financial indicator should be most suitable for the project activity and decision-making. Further, the mention of IRR along with "such as" phrase is to provide example to facilitate the selection of suitable financial indicator and hence, it may not be considered as the only financial indicator for benchmark analysis. 2. It is also mentioned in the Tools (Point 29) that when applying Option II or Option III, the financial/economic analysis shall be based on parameters that are standard in the market, considering the specific characteristics of the project type, but not linked to the subjective profitability expectation or risk profile of a particular project developer. The levelised tariff (cost) is a standard indicator being used in Indian power sector. 3. Further, if such calculations are done based on regulatory guidelines (CERC tariff regulations) then it also removes the subjective profitability / risk expectation of a particular project developer from the assessment. 4. Hence, the levelised cost (tariff) is most suitable financial indicator for the project activity in compliance of the methodology and Tools. 5. Further, as per the Guidelines on the Assessment of Investment Analysis version 5 dated 15th July 2011 (EB 62), if the proposed baseline scenario leaves the project participant no other choice than to make an investment to supply the same (or substitute) products or services, a benchmark analysis is not appropriate and an investment comparison analysis shall be used (Point 19). 		

Finding	B1
	<p>Based on the above, the project activity is for supply of power to the grid and the project proponent could supply the same product i.e. base load power by investing in least costly (lower tariff) power generation option i.e. pit-head based subcritical power generation leading to competitive advantages for sale / offtake of power generated against the other more costly (higher tariff) options like the project activity.</p> <p>6. Further, the two recently registered projects (i.e. Project Ref No. 4828 and Project Ref. No. 4334) have considered levelised cost as financial indicator for demonstrating additionality.</p> <p>Hence, the levelised cost is an appropriate indicator for demonstration of additionality irrespective of whether the benchmark analysis or investment analysis is to be done for demonstration of additionality.</p> <p>However, the IRR calculation is submitted as an additional measure for demonstration of additionality. The same has also been included in PDD version 02.</p>
DOE Assessment #1 <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>Revised worksheet and PDD include benchmark analysis using project IRR as financial indicator. IRR sheet along with WACC calculation sheet is now submitted by project proponent to DOE. Same is verified by validation team to confirm that the input values used in the project IRR calculation are correct and confirms to the para 6, EB 62 Annex 5. Hence, CL is closed</p>
Conclusion <i>Tick the appropriate checkbox</i>	<p><input type="checkbox"/> To be checked during the first periodic verification</p> <p><input type="checkbox"/> Additional action should be taken (finding remains open)</p> <p><input checked="" type="checkbox"/> The finding is closed</p>

Finding	B2
Classification	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>While the approved methodology requires the PP to demonstrate additionality by using benchmark analysis (Step 1 of Methodology), clarify the appropriateness of using the investment comparison analysis. Also clarify how the selected investment analysis conforms to guidance 19 of Annex 5, EB 62.</p>
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>Please refer response for CL B1.</p>

Finding	B2
DOE Assessment #1 <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 revised submission additionality has been demonstrated with benchmark analysis using project IRR as financial indicator. IRR calculation sheet is also verified by validation team to confirm that the input values used in project IRR calculation are correct and appropriate. And hecen confirms to the para 6, EB 62 Annex 5. CL is closed</p>
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding	B3
Classification	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>In the case of non-gas based alternatives, "Compensatory allowance" is reckoned as cost while computing the unit cost of generation. Clarify whether this is correct and also the reasons for not reckoning this allowance in the PL worksheet.</p>
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>As per Central Electricity Regulatory Commission of India (CERC) Terms and Conditions Tariff regulations, 2009 (page no. 28-29), the compensation allowance is allowed to meet expenses on new assets of capital nature including in the nature of minor assets. Hence, the same is not an operating expense to be covered under the P&L. Further, the same is applicable for coal based power plants only as per the norms. Further, it is conservative to be included only in the revenue and not in the expenses.</p>
DOE Assessment #1 <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>Since the compensatory allowance constitutes negligible percent of projected turnover, reckoning the cost as revenue expenditure is accepted. But there is a mistake in the calculation. Further, though it has been reckoned in LUC worksheet, it is not reckoned in PL, which is not appropriate. Either it is a revenue expenditure (not revenue as stated in the response) or capital expenditure. Since it has been treated as revenue expenditure in the LUC calculation, it is but appropriate that this cost should be treated as such in the P&L account. CL is open</p>
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>The "Compensatory Allowance" is now treated as expenditure and included in P&L account. Revised worksheets are submitted herewith.</p>
DOE Assessment #1 <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>Necessary corrections are done in the P&L account in the revised worksheet.</p> <p>CL is closed.</p>
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding	B4		
Classification	<input type="checkbox"/> CAR	<input checked="" type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Depreciation has been provided at 5.28% for computing book depreciation as per Companies Act and the depreciable value of assets has been restricted to 95% in all cases. Please clarify whether the Companies Act restricts the depreciable value to 95% when Schedule XIV depreciation rates are used.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	As per the Companies Act, 1956, the Schedule XIV specifies the rate of depreciation. However, the methodology (procedure) is specified in section 205 and section 350. Based on the same, the depreciation is restricted to 95% as per the Companies Act.		
DOE Assessment #1 <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>	Please read the sec. 205 carefully. The option chosen in this instant case is depreciation to the extent specified in sec. 350, which is sch. XIV rate. 95% restriction is given for option (b) and (c) only. In the above background clarify whether the 95% restriction is applicable to the depreciation when sch. XIV rates (as specified in sec. 350) is used. CL is open		
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The depreciation is now considered for full 100% for all alternatives as no restriction has been specified for depreciation in sec 205 when option chosen is depreciation to the extent specified in sec. 350, which is sch. XIV rate. The revised worksheets have been submitted herewith.		
DOE Assessment #2 <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>	Depreciation is now considered for full 100 % and is in conformity with the applicable guidelines of the Act ^{ACT/} . CL is closed.		
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

Finding	B5		
Classification	<input type="checkbox"/> CAR	<input checked="" type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	In this context, please clarify the reasons for not reckoning additional depreciation as per Sec. 32 of IT Act and Sec. 80-IA benefits while computing tax liability.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>The additional depreciation was not applicable to power generating companies under section 32 of Income tax act 1961 as amended by Finance Act 2009.</p> <p>Further, 80 IA benefits including MAT rate as applicable for the assessment year 2010-11 (Finance Act 2009) have now been considered in PDD version 02.</p>		

Finding	B5
DOE Assessment #1 <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>Since one of the tax publications has categorically stated that additional depreciation is not available to power generating companies, PP's response is accepted. Revised worksheets are verified by validation to confirm that the Sec. 80-IA benefits are now considered correctly. CL is closed</p>
Conclusion <i>Tick the appropriate checkbox</i>	<p> <input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed </p>

Finding	B6
Classification	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>Total depreciation provided together with the salvage value exceeds the original cost in all cases. Moreover, the salvage value is an artificially created value by restricting the depreciable value to 95%. Hence, the salvage value does not conform to guidance 4 of Annex 5, EB 62. It is observed that salvage value has not been reckoned as credit in the terminal year in computing the LUC</p>
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>The salvage value is linked with calculation (i.e. Total depreciation plus salvage value equals the total project cost). The revised worksheets are submitted with such changes.</p> <p>As per guidance 4 of Annex 5, EB 62 the fair value of any project activity assets at the end of the assessment period should be included as a cash inflow in the final year. The fair value should be calculated in accordance with local accounting regulations where available, or international best practice. The salvage value has been provided as per the Companies Act (i.e. 5% of asset value) of India. Hence, the value is in accordance with the guidance 4 of Annex 5, EB 62. Further, the same is not relevant for levelised cost calculation (i.e. unit cost of power generation (for the reasonable period of assessment) as it is not a cost of generation. The same principle has been applied consistently for levelized cost calculation for all plausible alternatives.</p>
DOE Assessment #1 <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>Guidance 4 of Annex 5, EB 62 states, "It is expected that such fair value calculations will include both the book value of the asset and the reasonable expectation of the potential profit or loss on the realization of the assets". Salvage value provided is only book value and not reasonable expectation of the potential profit.</p> <p>PP is correct that the salvage value is not a cost of generation, but it is an income and should be credited in the terminal year. To that extent the cost of generation in the terminal year would come down. Consistency means adopting the correct principle across alternatives. CL is open</p>
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the cor-</i>	<p>Please refer to response to CL B4 above. Assets are now being depreciated to 100% of book value and this is being achieved in the</p>

Finding	B6
<p>corrective action taken in details.</p>	<p>19th year of operations. The residual value is being considered at the end of useful life i.e. 25 years. A 10% salvage value is now being considered for all alternatives which are a reasonable expectation of the potential profit or loss on the realization of the assets. (Source: http://energytechnologyexpert.com/financial-models/how-to-evaluate-economic-feasibility-of-a-power-plant-project-use-project-finance-model/). The salvage value has now been added to last year of all alternatives to reduce the cost of generation. The same has also been recognised as revenue in the last year in the PL sheet for all alternatives. The revised worksheets are submitted herewith.</p>
<p>DOE Assessment #2 <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>Salvage value^{/S-VAL/} is now appropriately considered as 10 % of the project cost for all alternatives and is in line with the guidance 4 of EB 62, Annex 05. CL is closed.</p>
<p>Conclusion <i>Tick the appropriate checkbox</i></p>	<p><input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed</p>

Finding	B7
Classification	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
<p>Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i></p>	<p>Interest has been calculated assuming half yearly repayment in all cases. Clarify whether the banks accept half yearly repayments</p>
<p>Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i></p>	<p>Quarterly repayment of debt has been considered for calculating debt outstanding at the end of each year and the interest has been calculated for the average debt outstanding for the year.</p>
<p>DOE Assessment #1 <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 response and worksheet are at variance. The implication of dividing the sum of opening and closing balance by 2 is half yearly repayment and not quarterly repayment. CL is open</p>
<p>Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i></p>	<p>The calculations have been amended to show quarterly repayment. The revised worksheets are submitted herewith.</p>
<p>DOE Assessment #2 <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>Calculation in the revised worksheet for interest has been applied considering quarterly repayment. CL is closed.</p>
<p>Conclusion <i>Tick the appropriate checkbox</i></p>	<p><input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed</p>

Finding	B8		
Classification	<input type="checkbox"/> CAR	<input checked="" type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>In the PL worksheet of all cases, unit cost of generation is reckoned as the tariff. The project developer distributes power to customers annually in Ahmedabad, Gandhinagar and Surat and the power generated by the project is sold to the consumers in these cities. In the above background clarify the appropriateness of considering unit cost of generation as tariff.</p>		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>As per the Electricity Act of India, generation and distribution are separate activities. The generation of power is a non-licensed activity whereas the distribution of power is a licensed activity. Further, the project activity is an inter-state generating station having other beneficiaries (i.e. other than distribution licensee for Ahmedabad and Surat) and its tariff will be determined by Central Electricity Regulatory Commission of India. The purchase of power by TPL distribution activity from the grid is approved by the State Electricity Regulatory Commission of Gujarat (Gujarat Electricity Regulatory Commission (Multi Year Tariff Framework) Regulation, 2007 and GERC (Terms and Conditions of Tariff) Regulation) including purchase of power from the project activity and subject to merit order dispatch based on cost. Hence the levelized cost (tariff) for project activity is to be determined and recovered as per the regulation of Central Electricity Regulatory Commission of India. The relevant extract of PPA has been submitted (i.e. the applicability of tariff as per the regulation of Central Electricity Regulatory Commission of India). Hence, the unit cost of generation as tariff is appropriate for the project activity.</p>		
DOE Assessment #1 <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>Generation and distribution are separate activities if the generation company and distribution company is different. Project proponent is to clarify how the segregation of annual account for both generation and distribution is done in this instant case. Having said that, it is observed from the Annual Report 2011-12 that out of 382.5 MW, 278 MW is proposed for meeting the additional demand of Ahmedabad and Surat Distribution and long term PPA has been signed with PTC India for sale of 35 MW only. Sale of 278 MW in Ahmedabad and Surat, where the PP is a distributor, PP to clarify on the tariff to be charged in this instance for power sold. Further to this PP is to clarify, why the tariff has not been subjected to escalation. Please submit the PPA signed for the project, there is a GSC also on this issue. CL is open</p>		
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>In this regard we would like to submit that:-</p> <ol style="list-style-type: none"> 1. As per the Electricity Act 2003 of India (http://www.cercind.gov.in/08022007/Act-with-amendment.pdf), generation and distribution are separate activities. 2. The generation of power is a non-licensed activity (Section 7 (page 13) of the Electricity Act 2003 of India) whereas the distribution of power is a licensed activity (Section 12 (page 16)) 		

Finding	B8
	<p>of the Electricity Act 2003 of India).</p> <ol style="list-style-type: none"> 3. The project activity is an inter-state generating station having other beneficiaries (i.e. other than distribution licensee for Ahmedabad and Surat) and its tariff will be determined by Central Electricity Regulatory Commission of India as per the functions of Central Electricity Regulatory Commission (Point (b) of Section 79 (page 65) of the Electricity Act 2003 of India) . 4. However, the electricity purchase and procurement of distribution licensee is to be regulated by the State Electricity Regulatory Commission as per the functions of State Electricity Regulatory Commission (Point (a) & (b) of Section 86 (page 70-71) of Electricity Act 2003 of India). Based on the same, the purchase of power by TPL distribution activity from the grid is approved by the State Electricity Regulatory Commission of Gujarat under Gujarat Electricity Regulatory Commission (GERC) (Multi Year Tariff Framework Regulation, 2007 (http://www.gercin.org/regulationspdf/en_1301051611.pdf). As per the said regulations, the tariff for sale of electricity by the distribution licensee is to be determined by GERC (Point (d) of section 3.1 page 5). 5. The above mentioned can be evidenced from the same principle being followed for the existing power plant (SUGEN Mega Power Project) of the PP. SUGEN is an IPP supplying power to distribution arms of TPL as also to others. In its order for tariff for the distribution arms of TPL, the GERC has <ol style="list-style-type: none"> a. asked TPL to maintain separate book of accounts for generation and distribution (Refer page 25 of APR FY 2008-09 and ARR FY 2009-10 of Petition dated 9th December, 2009 for TPL-Ahmedabad and TPL-Surat Distribution). b. specified that the price as given by CERC will be the cost of power purchase to the distribution arms (Refer page 107 of APR FY 2008-09 and ARR FY 2009-10 of Petition dated 9th December, 2009 for TPL-Ahmedabad and TPL-Surat Distribution). 6. Further, the actual invoices raised by SUGEN plant on TPL-Ahmedabad and TPL-Surat (DISCOMs) for the month of December 2009 has also been submitted in conformity of the above-mentioned. It can be clearly seen that the tariff being charged in the invoices is based on CERC terms and Condition of Tariff Regulations 2009 as considered for the project activity. 7. Further, the PPA between Ahmedabad Distribution and SUGEN (Article 5 and Article 20.7) are submitted showing that the tariff as specified by CERC will be applicable. 8. The PPA between PTC and SUGEN is submitted showing that the tariff as specified by CERC will be applicable (Schedule E). 9. The PPAs as mentioned above were available to PP at the time of decision making (28th January 2010) and were the basis of subsequent decisions which implies that the tariff as specified by CERC is applicable.

Finding	B8
	<p>10. Further, the PPA between UNOSUGEN and PTC has also been submitted for applicability of CERC Tariff (Schedule E). Thus the cost of generation as determined by CERC Terms and Condition of Tariff, 2009 is an appropriate tariff for the Project activity. Further the tariff as provided for by CERC is based on CERC Terms and Condition of Tariff, 2009. The parameters on which the tariff is defined can be varied as provided in the Regulations. The escalation as provided for in the Regulations has been applied in the calculations for Tariff.</p>
<p>DOE Assessment #2 <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>Explanation submitted by project participant (PP) is accepted by the validation team. Relevant references^{/PPA/INV/} as cited by PP is crosschecked by validation team to confirm that the levelized cost of generation used in investment comparison analysis for all the alternative and benchmark is valid and appropriate. Relevant sections of the Electricity Act 2003 of India and Gujarat Electricity Regulatory Commission^{/GERC/} (GERC) Multi Year Tariff Framework Regulation, 2007 is cross checked to confirm that the generation and distribution are separate activities and are regulated differently i.e. Electricity Act 2003 of India and relevant State Electricity Regulatory Commission in this instant case. As per norms specified by GERC, PP is required to maintain separate book of accounts for generation and distribution as specified in page 25 of APR FY 2008-09 and ARR FY 2009-10 of Petition dated 9th December, 2009. Nevertheless, the contention is further consolidated by validation team from the review of the PPA^{/PPA/} signed for existing power plant (SUGEN Mega Power Project) of project proponent; relevant copies of the invoices for sale of electricity^{/INV/} to the said distribution network (i.e. Ahmedabad and Surat city) available to the PP at the time of investment decision making to confirm that the tariff charged in the invoices (for existing SUGEN power project) is based on CERC terms and Condition of Tariff Regulations 2009 as considered for the project activity (i.e. proposed project activity UNOSUGEN Power project which is expected to be commissioned by April 2013). Thus, it is concluded by validation team the approach adopted by PP is in line with the CERC tariff regulation for 2009^{/CERC/} for the determination of the levelised cost for the project activity. Also for determining the levelized cost of generation all the expenses and the electrical losses which are considered are up the point of delivery of the generated power to the grid only . CAR is closed.</p>
<p>Conclusion <i>Tick the appropriate checkbox</i></p>	<p> <input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed </p>

Finding	B9
Classification	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding	The project cost is stated to be excluding land cost in all cases.

Finding	B9
<i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Clarify the basis for such a statement
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The project cost of all plausible alternatives is inclusive of land cost. The same was typographical error in the worksheet which is now corrected. The documentary evidence is provided for the same.
DOE Assessment #1 <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>	Typographical error is accepted. However, it is observed that working capital margin is included in the case of project activity. Besides the fact that the basis of working capital margin is not known, it is not included in the case of alternatives, implying that the cost considered for all alternatives is without margin for working capital, which is not correct. Further, when the margin for working capital is not reckoned for financial indicator calculation at all, the reason for this addition in the IRR worksheet is not clear. CL is open
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The working capital margin is removed from project cost of the project activity including in IRR calculation. The revised worksheets are submitted herewith.
DOE Assessment #2 <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 working capital margin is now removed from the IRR sheet and in project activity worksheet. Revised worksheet submitted by PP are verified by validation team to confirm that the project cost considered for all the baseline alternative scenario is correct and appropriate. CL is closed.
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding	B10
Classification	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	In coal and lignite based power plant alternatives, HSDO price has been sourced from Basic Statistics on Petroleum and Natural Gas published by the Ministry of Petroleum and Natural Gas in <i>October 2011</i> . Please clarify how 01/04/2009 price of HSDO and the source of data conform to guidance 6 of Annex 5, EB 62
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The HSDO price is changed to Rs. 30.60 per Litre for HSDO as per the draft order of Central Electricity Commission of India (CERC) in September 2009. The documentary evidence is also submitted for the same.
DOE Assessment #1 <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 source does not disclose the price of HSD pertains to which place. HSD prices vary from State to State depending on the local taxes. However, the impact of HSD price on the LUC is negligible as the consumption is only 1 ml./kWh. Even if the price is increased to Rs.42.00 per Litre, LUCE goes up by only Re. 0.02/kWh and does not affect the additionality of the project. Hence, the cost is accepted. CL is closed

Finding	B10
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding	B11
Classification	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Project Activity worksheet <ol style="list-style-type: none"> Capital cost for project activity has been sourced from EPC contract which is stated to have been signed on 2nd July 2010. Clarify how this cost conforms to guidance 6 of Annex 5, EB 62. The cost works out to Rs.48 mn. /MW which is very high compared to Lanco Kondapalli project webhosted a few days back and also other projects already registered. Moreover, the cost considered in the EIA report^{/EIA/} is much less (Rs.1700 crore). When the EPC provides for a guaranteed Plant Availability Factor of 93% (p.13 of PDD), clarify the reasons for restricting the PLF to 85% based on CERC regulations. NG price has been given as USD 6.34741654519704. Clarify whether there can be so many decimal digits when the price is in USD and whether the price is correct. Moreover, it is observed that the NG cost considered in project activity and NG (conventional technology) worksheet differs (albeit in decimals), for reasons not clear. Anyway, documentary evidence to be submitted for the cost. In the case of the project activity, PP may clarify how the CDM revenues were considered essential to overcome the investment barrier to this project activity, in particular that the LUC of baseline represents the tariff above which the investment could not be made.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<ol style="list-style-type: none"> As per the Board note, the project cost was expected to be Rs. 19500 Million. However, after discussion and negotiation with the bidders, the project cost has come to Rs. 18330 Million which is conservative compared to the estimated project cost in the Board note and the same has also been used for demonstration of additionality. Lanco Kondapalli project is based on different technology and equipment is from a different supplier. However, the project cost for Konaseema Gas Power Limited (located in the same region of Lanco Kondapalli project) comes to Rs. 45.7 Million per MW which has the same supplier of gas turbine (i.e. Siemens) and having an earlier make (V94.2) of Gas Turbine than the project activity (V94.3 A). The project cost in EIA report is an estimated figure given in August 2009 for pre-project activity for getting environmental clearance.

Finding	B11
	<p>Further, the value of parameters like Interest Rate of Working Capital, Minimum Alternate Tax (including 80IA applicability), Interest Rate and Tenure of long Term Loan, Rate of Rupee Depreciation and Discounting Rate has been changed to conform to the guidance 6 of Annex 5, EB 62 in PDD version 02.</p> <p>2. The EPC contract provides 93% availability of machines for a limited period. Further this availability is without considering constraints, if any, due to water, transmission etc. for the project activity. However, 85% PLF is considered for the entire life cycle of the project activity based on Central Electricity Regulatory Commission of India (CERC) norms (page 42) (finalised based on studies conducted by CERC) for tariff determination applicable to all.</p> <p>3. The NG price has been calculated as a weighted average price of two major sources of gas supply in India (i.e. domestic from RIL- KG D6 and RLNG from Petronet LNG). The documentary evidence has also been submitted.</p> <p>4. The mitigation cover of CDM revenue and environmental benefits over the long run has been considered to overcome the investment barrier to the project activity. The Board had also taken into account the benefits accruing from CDM revenue prior to approval of the project investment.</p>
<p>DOE Assessment #1 <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>1. The input parameters have been modified. Depreciation rate of INR against USD is not correct based on the rates available in RBI website. The reason for choosing the 01/04/2000 resulting in duration of 9.75 years - as the start date for computing rupee depreciation is also not clear.</p> <p>PLR has been chosen as interest rate, which is acceptable; but SBI^{/LS/} (or IDFC) sanction letter^{/IDFC/}, on which the repayment period is based upon, has not been submitted.</p> <p>MAT rate, reckoned at 11.33%, was not the rate prevailing in FY 2009-10, the year in which investment decision is reported to have been taken.</p> <p>No documentary evidence has been submitted for Calorific value of gas. In this context it is observed that Hazira project has considered the CV at 9880 kcal/SCM. Clarify the reasons for lower CV in this instant case</p> <p>Explanation on project cost is reasonable. However, it is observed that the project cost is twice the cost of Hazira project which has been given as the representative plant for conventional NG project, is only 50% of the cost of the candidate project. The fuel consumption in the case of Hazira</p>

Finding	B11
	<p>project is 0.1974 SCM/kWh as against 0.1859 SCM/kWh in the case of candidate project. Clarify why a publicly listed company would opt for project which costs twice the conventional project cost with no savings in the fuel or other costs.</p> <p>Heat rate, project cost and even gas price are based on documents post dated to decision making. Clarify how they are in conformity with guidance 6 of Annex 5, EB 62. CL is open</p> <p>2. Since the entire EPC contract has not been submitted, DOE is unable to conclude on the PLF assumed. The reasons given for restricting the capacity utilisation are not convincing. CL is open</p> <p>3. The gas price details have been furnished along with documents. The gas price pertains to March 2010. Though it is post dated to decision making, since the cost in January 2010 was higher and the same cost has been given in the webhosted PDD, the cost reckoned is conservative and hence accepted. However, in this context it is observed that while O&M cost has been subjected to escalation, fuel cost (not only in the case of project activity, but also in the case of all alternatives) has not been subjected to escalation. Clarify the reasons for the same. CL is open</p> <p>4. The response is qualitative and not quantitative. CL is open</p>
<p>Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i></p>	<p>1. Input parameters are modified as given below:</p> <ul style="list-style-type: none"> • INR depreciation rate has been calculated for the period of 10 years (i.e. 03/01/2000 to 31/12/2009) based on the rate available for such dates on RBI web-site (http://www.rbi.org.in/scripts/ReferenceRateArchive.aspx). The modified calculation is submitted. • The relevant extract of sanction letter of loan is submitted for the repayment period. • MAT rate is modified as applicable to FY 2009-10 • The calorific value considered by Hazira project is based on RLNG supply only which is also in line with the calorific value considered by the PP for RLNG supply. However, the calorific value of domestic gas supply is lower (approx. 10%) compared to RLNG which is also considered by the PP. Hence, the weighted average of calorific value is lower than Hazira project. Documentary evidence for same is submitted herewith. • Hazira project selected as the representative plant has the investment decision date of 2005 (i.e. approx. 5 years before the investment decision date of the project activity). Further the plant is based on a lower technology. Thus the cost of the power plant is lower. It is conservative to select a project with lower project cost for the alternative under power generation using natural gas, but technologies other than the project activity as it increases the likelihood of its

Finding	B11
	<p>identification as the likely baseline scenario.</p> <ul style="list-style-type: none"> The conformity of project cost and fuel price guidance 6 of Annex 5, EB 62 is already provided separately (please refer Point 1 of CL B11 and Point 3 of CL B11). Further, the conformity of heat rate guidance 6 of Annex 5, EB 62 has been also provided in CAR A5. <p>2. EPC contract provides for internal factors only which are in control of the plant operator and specific to the plant availability. The availability mentioned in the EPC contract is applicable for the limited period of warranty i.e. first two years of operations and not for the plant life cycle. CERC norms provides for external factors which are not in direct control of the plant operator but impact the plant operations. Further, CERC norms are developed based on the reasonable expectations of operation level including the operating experience of the power plants in India which cannot be considered hypothetical as such. The higher PLF mentioned in the EPC contract for first two years gets covered in the sensitivity analysis.</p> <p>3. The O&M cost has been escalated as provided in Central Electricity Regulatory Commission of India (CERC) norms. However, the fuel supply tie-up for power plants is generally done on long term basis and such long term fuel supply provides stable price. In this regard the Fuel supply contract of the project activity is submitted. Further, the variation in fuel supply price has been considered in sensitivity analysis.</p> <p>4. The IRR working sheet has been amended for consideration of CDM benefits.</p>
<p>DOE Assessment #2</p> <p><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>1. Various input values are sourced correctly as verified below.</p> <ul style="list-style-type: none"> Depreciation rate against USD is now calculated correctly based on the values sourced from the RBI web site. Period considered is now for 10 years representing long term variation. Finding is closed. PLR rate is appropriately considered for the interest rate. As this is sourced from the publicly available document it is accepted. Repayment period is verified from the extract of the sanction letter of the loan and correctly applied in the calculations. Finding is closed. MAT rate is corrected to 16.995 % appropriately for the respective year. Finding is closed. Calorific value of the NG is considered based on NG supply from RLNG from Reliance and Petronet LNG. CV is calculated based on the weighted average of the calorific value of the respective gas supplier hence same is acceptable. Finding is closed.

Finding	B11
	<ul style="list-style-type: none"> Explanation provided by the PP in support of the comparison of the project cost for Hazira plant is acceptable. As project activity consists of Advance class gas turbines which is latest technology project cost considered is appropriate. Finding is closed. Necessary supporting documents available at the time of decision making is submitted by the PP. same is verified and assessment is included in Table-3 of this report. Finding is closed. <p>2. Plant Load factor is appropriately considered based on the CERC guideline for the NG based thermal power plant. Value of 93 % as specified in the EPC contract is the availability of the machine to deliver the power and does not represent the plant load factor. Validation team has also verified the values considered by the other registered projects and convinced that the value is correct and appropriate. Finding is closed.</p> <p>3. Input values considered by the PP for O&M escalation is sourced from CERC guidelines correctly. For power sector, fuel linkage is generally tied up for the entire life time of the power plant to ensure the reliable fuel supply. Hence this is acceptable. Same is uniformly applied in all the other alternatives. Finding is closed.</p> <p>4. IRR worksheet is provided with the provision to check the results of the CDM benefits. Finding is closed.</p>
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding	B12
Classification	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<u>Natural Gas (Conventional Technology) worksheet</u> <p>Input parameters of registered project - 340 MW Gas based combined cycle power project expansion at Hazira – have been selected as the representative plant for this alternative. Clarify the reasons for selecting this project as the representative project for demonstrating additionality of the project activity. Considering the fact that the investment decision for this project was taken in 2004/5, please clarify how this project conforms to guidance 6 of Annex 5, EB 62</p>
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>The Methodology requires PP to consider power generation using natural gas, but technologies other than the project activity. The Project is based on F Class (advance class) gas turbine from Siemens. The project selected as representative project employs E class (conventional class) gas turbine from other technology</p>

Finding	B12
	provider (i.e. other than Siemens). Further, there was no power plant under construction having different technology provider with E class machine. The documentary evidence is submitted for the same. It is further submitted that the natural gas conventional technology will have lower carbon emissions when compared to other technologies (i.e. coal). Hence, it is conservative to select a project with lower project cost for the alternative under power generation using natural gas, but technologies other than the project activity as it increases the likelihood of its identification as the likely baseline scenario.
DOE Assessment #1 <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 reasonable and appropriate. Further the heat rate has been escalated in the LUC worksheet, which is at variance with the worksheets (of the project) available in the UNFCCC website. Application of escalation to the heat rate not only for this project activity, but all other alternatives as well, is not in conformity with CERC tariff order. Though the interest rate has been sourced properly in the 'term loan' worksheet, interest rate given in Cell E3 and K3 are incorrect. CAR is open
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The heat rate as provided in the registered PDD of the alternative is now used for the calculations. The revised worksheet is submitted herewith. The cell E3 and K3 in worksheet has been amended.
DOE Assessment #2 <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>	As the referred project in CEA monitoring sheet is different from the one considered by the PP in the alternative, clarification provided by the PP is acceptable. Heat rate value for the alternative is now corrected based on the registered PDD. Also cell E3 and K3 in the worksheet of the alternative is corrected. CL is closed.
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding	B13
Classification	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<u>Lignite worksheet</u> 1. Input parameters of <i>Jallipa-Kapurdi TPL by Raj West Power Limited (JSW) in Rajasthan</i> have been selected as the representative plant for this alternative. Clarify the reasons for selecting this project as the representative project for demonstrating additionality of the project activity. Considering the fact that the start date of this project is 03/07, i.e., 3 years

Finding	B13
	<p>before the decision making date of the project activity, please clarify how this project conforms to guidance 6 of Annex 5, EB 62.</p> <ol style="list-style-type: none"> Heat rate has been assumed at 2276 kcal/kWh, which is the same as that of Coal based power plant. Clarify whether the heat rate can be the same for coal based and lignite based power plants. Also clarify whether the assumed heat rate is in agreement with CERC tariff order. Clarify whether the CERC <i>margin on heat rate</i> assumed at 5% is in conformity with CERC tariff order. Losses have been assumed at 0.2% implying that the alternative represents a pit head power plant. Clarify whether this is correct and appropriate.
<p>Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i></p>	<ol style="list-style-type: none"> The representative project selected has the latest zero date (i.e. 1st March 2007) of all the three lignite based power plants (both Public and Private) under construction in India as per the Monthly Report on Broad Status of Thermal Power Project in the country December 2009 by Central Electricity Authority of India. The documentary evidence is submitted for the same. The heat rate has been taken from Central Electricity Regulatory Commission of India (CERC) Terms and Conditions of Tariff Regulations, 2009 (page 46) which provides same heat rate to be taken for lignite and coal based power generation. The documentary evidence is submitted for the same. As per Central Electricity Regulatory Commission of India (CERC) Terms and Conditions of Tariff Regulations, 2009 (page no. 46), the margin of 6.5% is to be considered for lignite based power generation in line with coal based power generation. The earlier considered (inadvertently) 5% margin is changed to 6.5% in PDD version 02. The losses are taken as prescribed by Central Electricity Regulatory Commission of India (CERC) Terms and Conditions of Tariff Regulations, 2009 (page 35) which provides normative transit and handling losses for pit-head generating stations @ 0.2% and for non-pit head generating stations @ 0.8%. Further, all under construction lignite based power plants are pit-head plants.
<p>DOE Assessment #1 <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>	<ol style="list-style-type: none"> The explanation given for choosing <i>Jallipa-Kapurdi TPL by Raj West Power Limited (JSW) in Rajasthan</i> is accepted considering the fact that it had the latest zero date. The cost works out Rs.47 mn. /MW, which is marginally more than the domestic coal based subcritical plant, which is appropriate. CL is closed.

Finding	B13
	<p>2. The response is incorrect. PP may further clarify. CAR is open</p> <p>3. Response is not correct. PP may further clarify. This comment holds good for project activity and all alternatives as well. CAR is open</p> <p>4. Since the cost does not include transportation cost and all lignite based power plants are pithead plants, the handling loss of 0.2% is accepted. CL is closed</p> <p>5. CV of lignite has been taken as 4000 kcal/kg in the LUC worksheet. The reference cited was released in 1998 and estimates the CV at 3000-3500 kcal/kg., though in the end of the report, the CV is stated to range from 3500 to 4500. Industries ministry of Gujarat estimates the CV at 3200 kcal/kg. In the above background, the CV considered does not seem reasonable</p> <p>6. The multiplier used in row 25 of 'fuel' worksheet is incorrect</p>
<p>Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i></p>	<p>2. The impact of moisture content has also been considered in heat rate as per CERC Terms and Conditions of Tariff Regulations (Page no. 45). The revised worksheet has been submitted herewith.</p> <p>3. The CERC Terms and Condition of Tariff allows a margin on the Design Heat Rate (5% for Gas based plants and 6.5% for coal and Lignite based plants). It may be noted that the design heat rate is for optimum operating conditions including grid frequency, load factor, ambient conditions etc. As these conditions are not achievable in actual plant operations, a margin on the design heat rate is permissible to cater for less than optimum conditions. Thus consideration of the margin provided for by CERC on Heat rate is appropriate.</p> <p>5. The CV and Moisture content has been considered as given in the Report. However, the CV of 3500 kCal/kg (lower) has now been considered being conservative.</p> <p>6. The multiplier used is amended</p>
<p>DOE Assessment #2 <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>1. CL is already closed.</p> <p>2. Moisture content in the Heat rate of the alternative is now considered as per CERC tariff regulations. CL is closed.</p> <p>3. Margin of 5 % for gas based plants and 6.5 % for coal and lignite based alternative is appropriate based on the CERC guidelines. CL is closed.</p>

Finding	B13
	<p>4. CL is already closed.</p> <p>5. Value of the CV/Lignite-P/ for the alternative is considered appropriately from the report. CL is closed.</p> <p>6. Multiplier used in "fuel" worksheet is corrected. CL is closed.</p>
Conclusion <i>Tick the appropriate checkbox</i>	<p><input type="checkbox"/> To be checked during the first periodic verification</p> <p><input type="checkbox"/> Additional action should be taken (finding remains open)</p> <p><input checked="" type="checkbox"/> The finding is closed</p>

Finding	B14
Classification	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p><u>Supercritical - Imported Coal worksheet</u></p> <p>1. Input parameters of Tirora TPP- Phase I have been used as the representative plant for this alternative. Clarify the reasons for selecting this project as the representative project for demonstrating additionality of the project activity. Considering the fact that the zero date of this project is 09/07, i.e., 3 years before the decision making date of the project activity, please clarify how this project conforms to guidance 6 of Annex 5, EB 62.</p> <p>2. As per the document submitted, the cost of imported coal is USD 76. Clarify how the cost of USD 85.74 was arrived at. It is also observed that the cost is given as USD 85.7368308351178. Clarify whether there can be so many decimal digits when the price is in USD and whether the price is correct</p>
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>1. The representative project selected has the latest zero date (i.e. 28th February 2008) of all planned supercritical (with standard configuration of 660 MW) imported coal based power generation plants (both Public and Private) as per the Monthly Report on Broad Status of Thermal Power Project in the country December 2009 by Central Electricity Authority of India. The documentary evidence is submitted for the same.</p> <p>2. The landed cost of imported coal including railway freight has been calculated (hence it is having so many decimal digits) and the component wise calculation has also been submitted.</p>
DOE Assessment #1 <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>1. The Monthly Report on Broad Status of Thermal Power Project in the country December 2009 by Central Electricity Authority^{/CEA/} of India is verified by the validation team. Hence, the explanation given for choosing Tirora TPP is accepted. The cost works out Rs.47 mn. /MW, which is about 17% more than</p>

Finding	B14
	<p>the subcritical plant cost assumed and hence it is reasonable. CAR is closed</p> <p>2. The details of coal cost and the documentary evidence have been submitted^{/COAL-P/}. The same is verified by the validation team. However, the transportation cost is understated and is not in conformity with the documentary evidence. CAR is open</p>
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>2. The freight (transportation) distance of 500 km has been considered based on average distance travelled by coal in India (source: Report of McKinsey & Company on logistic infrastructure page 30). Based on the same, the transportation cost for 500 km as given in the document i.e. Rs. 455.10 per tonne is considered.</p>
DOE Assessment #2 <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>1. As per DOE Assessment #1 CL is already closed.</p> <p>2. Transportation cost for this alternative is now reasonably considered based on the Report of McKinsey & Company on logistic infrastructure page 30. CL is closed.</p>
Conclusion <i>Tick the appropriate checkbox</i>	<p><input type="checkbox"/> To be checked during the first periodic verification</p> <p><input type="checkbox"/> Additional action should be taken (finding remains open)</p> <p><input checked="" type="checkbox"/> The finding is closed</p>

Finding	B15
Classification	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p><u>Conventional – Imported Coal worksheet</u></p> <p>1. Explain the reasons for selecting Mundra TPP as representative project, particularly in the light of the fact that the zero date of this project is given as 03/07, i.e., 3 years before the decision making date of the project activity. Clarify how this project conforms to guidance 6 of Annex 5, EB 62.</p> <p>2. Difference in the project cost (based on imported coal) between conventional and super critical technology works out to 50%. Clarify whether such a difference is evidenced by any published literature.</p> <p>3. As per the document submitted, imported coal cost is USD 76. Clarify how the cost of USD 85.74 was arrived at. It is also observed that the cost is given as USD 85.7368308351178. Clarify whether there can be so many decimal digits when the price is in USD and whether the price is correct</p> <p>4. In 'tax' worksheet, book depreciation reckoned for tax computation is not correct</p>
Corrective Action #1	<p>1. The selected power plant has been changed in PDD version 02</p>

Finding	B15
<p><i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i></p>	<p>and the representative project selected i.e. Coastal Energen is having latest zero date (i.e. 6th August 2009) of all under construction projects (both Public and Private) with conventional technology as per the Monthly Report on Broad Status of Thermal Power Project in the country December 2009 by Central Electricity Authority of India. The documentary evidence is provided for the same.</p> <ol style="list-style-type: none"> Based on the above-mentioned change, the difference is now approx. 14% The landed cost of imported coal including railway freight has been calculated (hence it is having so many decimal digits) and the component wise calculation has also been submitted. The worksheet is modified for tax calculation by correctly linking book depreciation
<p>DOE Assessment #1 <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>	<ol style="list-style-type: none"> The Monthly Report on Broad Status of Thermal Power Project in the country December 2009 by Central Electricity Authority^{/CEA/} of India is verified by the validation team. Hence, the explanation given for choosing Coastal Energen as the representative plant instead of Mundra TPP is accepted. The cost works out Rs.40 mn. /MW, which is the same as the cost recommended by Expert Committee. CL is closed The difference between subcritical and supercritical power plants now works out to about 17%, which is reasonable. CL is closed The details of coal cost and the documentary evidence have been submitted. However, the transportation cost is understated and is not in conformity with the documentary evidence. CL is open Adding back CERC depreciation in row 3 of 'tax' worksheet is incorrect as the profit before tax sourced from PL worksheet is after providing depreciation as per Companies Act. CL is open Though it does not make any difference, the divisor for row 6 in 'Fixed Cost' worksheet is not correct.
<p>Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i></p>	<ol style="list-style-type: none"> In the document, the transportation cost for 100 km is given as Rs. 125.10 per tonne which is added in import / FOR price of Rs. 3878.91 per tonne (i.e. landed price of Rs. 4003.91 per tonne). However, it may be noted that the documents also provides landed price in Rs. Per Million kCal just below it which is Rs. 657.43 per Million kCal at 5900 kCal/Kg GCV (i.e. $4003.91/5900 \times 1000$).

Finding	B15
	<p>4. The reference in row 3 of 'tax' worksheet has been amended</p> <p>5. The divisor for row 6 in 'Fixed Cost' worksheet has been changed to row 71 of Fuel worksheet</p>
DOE Assessment #2 <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>1. CL is already closed as per DOE Assessment #1.</p> <p>2. CL is already closed as per DOE Assessment #1.</p> <p>3. Explanation provided by the PP is acceptable. Value considered for transportation cost is appropriate^{/COAL-P/}. CL is closed.</p> <p>4. Worksheet is now corrected. CL is closed.</p> <p>5. Worksheet is now corrected appropriately. CL is closed.</p>
Conclusion <i>Tick the appropriate checkbox</i>	<p><input type="checkbox"/> To be checked during the first periodic verification</p> <p><input type="checkbox"/> Additional action should be taken (finding remains open)</p> <p><input checked="" type="checkbox"/> The finding is closed</p>

Finding	B16
Classification	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p><u>Supercritical - Domestic Coal worksheet</u></p> <p>1. Explain the reasons for selecting Amravati TPP – Indiabulls Power Ltd. as representative project. The cost works out to Rs.5.22 crore/MW as against Rs. 4,68 crore/MW in the case of super critical power plant based on imported coal. Please clarify whether the project cost difference can be as high as 11% due to coal source. Please furnish documentary evidence to support the difference</p> <p>2. Domestic coal cost has been sourced from Tariff order issued by CERC for Mejia TPS Unit 5 and 6 in December 2009. Clarify the reasons for choosing coal cost reckoned by this project as representative coal cost.</p> <p>3. Also clarify the reasons for considering the coal cost from Mejia TPS Unit 5 and the CV from CO2 Baseline Data.</p> <p>4. Clarify whether the heat rate of super critical power project based on domestic coal with CV of 3755 kcal/kg can be 2176 kcal/kWh. Barring a stray case, none of the registered/under validation super critical power projects seem to have considered heat rate of 2176 kcal/kWh with such low CV value for coal</p>
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>1. The representative project selected is having latest zero date (i.e. 1st July 2009) of all planned supercritical (with standard configuration of 660 MW) domestic coal based power generation plants (both Public and Private) as per the Monthly Report on Broad Status of Thermal Power Project in the country</p>

Finding	B16
	<p>December 2009 by Central Electricity Authority of India. Further, the source of project cost (including other information) on supercritical domestic and imported coal based alternative is from the same source as mentioned above.</p> <p>2. The tariff order was issued just before the investment decision date of the project activity. Hence, the same was considered. However, the price of coal has now been considered from UNSTARRED QUESTION NO 2628 ANSWERED ON 14.12.2009 for Coal Price in Rajya Sabha by Government of India (Ministry of Coal) in PDD version 02. The documentary evidence (with calculation) is provided for the same.</p> <p>3. The CV is taken from CO2 Baseline data representing standard CV of coal being used for power generation in India. The same is also verified with the coal price source (as mentioned above) which provides CV of 3865 kcal/kg.</p> <p>4. The heat rate is considered as per Central Electricity Regulatory Commission of India (CERC) Terms and Conditions of Tariff Regulations, 2009 (page 46). The same is design heat rate which is to be multiplied with the factor of 1.065. The same translates to 2317.44 kCal/kWh</p>
<p>DOE Assessment #1</p> <p><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>1. The Monthly Report on Broad Status of Thermal Power Project in the country December 2009 by Central Electricity Authority^{/CEA/} of India is verified by the validation team. Hence, the explanation is accepted. Though the cost difference between supercritical plants based on imported and domestic coal is not convincing, since the cost is based on CEA monitoring report^{/CEA/}, the cost is accepted. Moreover, this does not affect the additionality of the project. CL is closed</p> <p>2. In the revised version, coal cost has been sourced from the answer given by the Minister in the Parliament on coal cost. Documentary evidence has been submitted^{/COAL-P/}. However, clarify the reasons for assuming a distance of 500 kms from the pithead. Moreover, consideration of shortage and the stock of fuel for working capital signify that the project is a pithead plant while it is a linkage plant. CAR is open</p> <p>3. CV of coal has been reckoned at 3755 kcal/kg. As per public domain documents, calorific value of 'E' grade coal, which is normally used in power plants ranges from 3780 to 4638 kcal/kg. Considering 3755 kcal/kg is therefore conservative as this is the baseline alternative. CL is closed</p> <p>4. Explanation is accepted^{/CERC/}. CL is closed</p>
<p>Corrective Action #2</p> <p><i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i></p>	<p>2. Please refer corrective action #2 for CAR B2</p>

Finding	B16
DOE Assessment #2 <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"> 1. CL is already closed as per DOE Assessment #1. 2. Consideration of shortage and the stock of fuel for working capital is now considered appropriately by the PP. CL is closed. 3. CL is already closed as per DOE Assessment #1. 4. CL is already closed as per DOE Assessment #1.
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding	B17
Classification	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<u>Conventional - domestic Coal worksheet</u> <ol style="list-style-type: none"> 1. Explain the reasons for selecting BALCO TPS as representative project. 2. Domestic coal cost has been sourced from Tariff order issued by CERC for Mejia TPS Unit 5 and 6 in December 2009. Clarify the reasons for choosing coal cost of Mejia TPS as representative coal cost. 3. Also clarify the reasons for considering the cost of coal from Mejia TPS Unit 5 and the CV from Co2 Baseline Data. 4. Clarify whether the heat rate of super critical power project based on domestic coal with a CV of 3755 kcal/kg can be 2276 kcal/kWh. None of the registered super critical power projects seem to have considered heat rate of 2276 kcal/kWh with such low CV value for coal.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<ol style="list-style-type: none"> 1. The selected power plant has been changed in PDD version 02 and the representative project is changed to Kamalanga TPP having latest zero date (i.e. 27th May 2009) of all under construction projects with conventional technology (both Public and Private) as per the Monthly Report on Broad Status of Thermal Power Project in the country December 2009 (http://www.cea.nic.in/archives/thermal/bs/dec09.pdf) by Central Electricity Authority of India. The documentary evidence is provided for the same. 2. The order was issued just before the investment decision date of the project activity. Hence, the same was considered. However, the price of coal has now been considered from UNSTARRED QUESTION NO 2628 ANSWERED ON

Finding	B17
	<p>14.12.2009 (http://164.100.47.5:8080/members/website/quest.asp?qref=149034) for Coal Price in Rajya Sabha by Government of India (Ministry of Coal) in PDD version 02. The documentary evidence (with calculation) is provided for the same.</p> <p>3. The CV is taken from CO₂ Baseline data representing standard CV of coal being used for power generation in India. The same is also verified with the coal price source (as mentioned above) which provides CV of 3865 kcal/kg.</p> <p>4. The heat rate is considered as per Central Electricity Regulatory Commission of India (CERC) Terms and Conditions of Tariff Regulations, 2009 (page 46). The same is design heat rate which is to be multiplied with the factor of 1.065. The same translates to 2423.94 kCal/kWh which is considered for calculating levelised cost</p>
<p>DOE Assessment #1 <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>1. The Monthly Report on Broad Status of Thermal Power Project in the country December 2009 by Central Electricity Authority^{/CEA/} of India is verified by the validation team. Hence, the explanation given for choosing Kamalanga TPP is accepted. CAR is closed</p> <p>2. In the revised version, coal cost has been sourced from the answer given by the Minister in the Parliament on coal cost. Documentary evidence has been submitted^{/COAL-P/}. However, clarify the reasons for assuming a distance of 500 kms from the pithead. Moreover, consideration of shortage and the stock of fuel for working capital signify that the project is a pithead plant while it is a linkage plant. CAR is open</p> <p>3. CV of coal has been reckoned at 3755 kcal/kg^{/CEA/}. As per public domain documents, calorific value of 'E' grade coal, which is normally used in power plants ranges from 3780 to 4638 kcal/kg. Considering 3755 kcal/kg is therefore conservative as this is the baseline alternative. CL is closed</p> <p>4. The CERC reference cited by PP is verified by the validation team. Hence, the explanation and the heat rate are accepted. CL is closed</p>
<p>Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i></p>	<p>2. Please refer corrective action #2 for CAR B2</p>
<p>DOE Assessment #2 <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>1. CL is already closed as per DOE Assessment #1.</p> <p>2. Consideration of shortage and the stock of fuel for working capital is now considered appropriately by the PP. CL is closed.</p> <p>3. CL is already closed as per DOE Assessment #1.</p> <p>4. CL is already closed as per DOE Assessment #1.</p>

Finding	B17
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding	B18
Classification	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Following documents/documentary evidence should be submitted a) Board resolution on serious consideration of CDM benefits b) Copies of correspondence with UNFCCC and DNA in conformity with Annex 13, EB 62 c) Offer letter from the manufacturer with technical specifications d) EPC contract e) IDFC sanction letter/indicative terms of loan f) Price of natural gas (considered at USD 6.35/mmbtu) g) Calorific value of NG & LNG (considered at 9395 kcal by assuming 50% of NG and 50% of LNG) h) PPA
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	a) The copy of Board resolution on serious consideration of CDM benefits has been provided b) The Copies of correspondence with UNFCCC and DNA in conformity with Annex 13, EB 62 has been provided c) Technical Brochure as recieved from the supplier is provided. d) The relevant extract of EPC contract has been provided e) The relevant extract of IDFC sanction letter/indicative terms of loan has been provided f) The details of calculation for Price of natural gas (considered at USD 6.35/mmbtu) has been provided. Further, copy of the supporting invoices has also been shared during the site visit for verification g) The public information on Calorific value of NG & LNG (considered at 9395 kcal by assuming 50% of NG and 50% of LNG) has been provided. Further, the same has also been verified with the actual invoices h) The copy of executed PPA has been shown during the site-visit and the relevant extract of PPA has been provided.
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure,</i>	a) Board resolution has not been received b) Copies of correspondence with UNFCCC and DNA have not been received

Finding	B18
<p><i>additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i></p>	<p>c) Technical brochure have not been received</p> <p>d) Select pages of EPC contract has been submitted, which is not adequate for DOE to draw any meaningful conclusion</p> <p>e) IDFC sanction letter has not been furnished</p> <p>f) Documentary evidence for NG price has been submitted.</p> <p>g) Calorific value of NG has not been submitted</p> <p>h) Only one page of PPA has been submitted, which is not sufficient for DOE to draw any meaningful conclusion.</p> <p>CL is open</p>
<p>Corrective Action #2</p> <p><i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i></p>	<p>a) The copy of Board resolution on serious consideration of CDM benefits has been submitted</p> <p>b) The Copies of correspondence with UNFCCC and DNA in conformity with Annex 13, EB 62 has been submitted</p> <p>c) Technical Brochure as recieved from the supplier has been submitted</p> <p>d) The relevant extract of EPC contract has been submitted</p> <p>e) The relevant extract of IDFC sanction letter/indicative terms of loan has been sbumitted</p> <p>f) The details of calculation for Price of natural gas (considered at USD 6.35/mmbtu) has been provided.</p> <p>g) The public information on Calorific value of NG & LNG (considered at 9395 kcal by assuming 50% of NG and 50% of LNG) has been submitted.</p> <p>h) The copy of executed PPA has been provided.</p>
<p>DOE Assessment #2</p> <p><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>i) The copy of Board resolution on serious consideration of CDM benefits has been submitted</p> <p>j) The Copies of correspondence with UNFCCC and DNA in conformity with Annex 13, EB 62 has been submitted</p> <p>k) Technical Brochure as received from the supplier has been submitted</p> <p>l) The relevant extract of EPC contract has been submitted</p> <p>m) The relevant extract of IDFC sanction letter/indicative terms of loan has been submitted</p> <p>n) The details of calculation for Price of natural gas (considered at USD 6.35/mmbtu) has been provided.</p> <p>o) The public information on Calorific value of NG & LNG (considered at 9395 kcal by assuming 50% of NG and 50% of</p>

Finding	B18
	LNG) has been submitted. p) The copy of executed PPA has been provided.
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding	B19
Classification	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>As per information and reporting check (IRC) query raised by CDM executive board, Project Proponent is requested to clarify the change of the fuel cost, O&M cost, PLF or heat rate resulting in the tariff change in the actual situation during the project operation. Furthermore, how the sensitivity analysis considering the change of fuel cost, O&M cost, PLF or heat rate is appropriate as the tariff also changes with the change of aforementioned parameters.</p>
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>The tariff of a thermal power station in India is determined by CERC as per CERC Terms and Conditions of Tariff Regulations 2009. As per Regulation 13 (1) of the said Regulations, the tariff for supply of electricity from a thermal generating station shall comprise two parts, namely, capacity charge (for recovery of fixed cost) and energy charge (for recovery of fuel cost). Thus, the tariff of a thermal power plant, is a derived value based on primarily Project cost, Fuel cost, O&M cost, PLF etc. The Tariff will change with a variation in any of the factors. Thus there are only minor changes in the IRR with the change in parameters. This is mostly attributable to the following reasons</p> <ul style="list-style-type: none"> • Tariff for IRR computation has been derived from the annual levelised cost of generation. • Cost elements as considered for computing the project IRR have been estimated following the fixed and variable cost as determined to compute levelised cost of generation <p>Further, the PDD has been revised to substantiate the change of the fuel cost, O&M cost, PLF, heat rate and Project Cost resulting in the tariff change in the actual situation during the project operation. In addition to the same, it is submitted that the tariff of our existing power plant has also been approved by CERC as per CERC Terms and Conditions of Tariff Regulations 2009. Based on the same, the actual invoices raised by such existing power plant of the PP on its beneficiaries for the months of August, September, November 2009 and January and March 2010 are submitted herewith. It is evident from such invoices that the tariff changes in actual operation also.</p> <p>However, the sensitivity analysis has been carried out as per the</p>

Finding	B19
	guidance 20 & 21 of EB 62 Annex 5 even though the change in fuel cost O&M cost, PLF or heat rate will result in tariff change leading to very marginal variation in the project IRR as it is based on the levelised cost of generation.
DOE Assessment #1 <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 justification provided by the PP in the revised PDD to substantiate the change of the fuel cost, O&M cost, PLF or heat rate resulting in the tariff change in the actual situation during has been verified and accepted. However, the validation team has independently verified the sensitivity analysis with increase or decrease of 50% in the parameters to ensure that the result of additionality test is robust.</p> <p>The validation team would like to state here that since the tariff is based on cost plus basis i.e. (a) the tariff for IRR computation has been derived from the annual levelised cost of generation and (b) Cost elements as considered for computing the project IRR have been estimated following the fixed and variable cost as determined to compute levelised cost of generation. Hence, the sensitivity analysis does not make any difference (except to the extent of impact on tax due to marginal modification in working capital loans).</p> <p>Further, the PP has also submitted the invoices^{/INV/} raised by the PP's existing power plant, whose tariff has also been determined by CERC under the CERC Tariff Regulations 2009^{/CERC/}, for August, September and November of 2009 and January and March of 2010^{/INV/} and observes the variation in the tariff. Invoices submitted by PP are verified by validation team to confirm that the change in the fuel cost, O&M cost, PLF or heat rate will result in tariff change in the actual situation of the plant operation.</p> <p>In addition to the above, the validation team has also reviewed recently registered project (4419) & (5554) and observed the similar results of sensitivity analysis on project IRR is obtained as the project activity. Thus, it is concluded by validation team that the parameters used in the financial analysis confirm the para 114 (a) of VVM ver.1.2. CL B19 is closed</p>
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

5 VALIDATION ASSESSMENT SUMMARY

5.1 General Description of the Project Activity

5.1.1 Participation

LOA

Host Party for this project activity is India. India has ratified the Kyoto protocol in August 2002. Same has been confirmed from the UNFCCC web site link http://unfccc.int/kyoto_protocol/status_of_ratification/items/2613.php.

Host country approval (HCA) letter^{/HCA/} no.4/10/2012-CCC dated 27/06/2012 issued by DNA of India confirm voluntary participation by M/s Torrent Power Limited in proposed CDM project activity entitle “UNOSUGEN Natural gas based grid connected Combined cycle power generation project” in Surat district of Gujarat state of India.

Host country approval (HCA) was checked by DOE and found that it confirms the EB guidelines and contributes sustainable development in India.

Project Participants

Project participant M/s Torrent Power Limited is correctly specified in section A.3, annex-I of the PDD as per Host Country Approval^{/HCA/} received from DNA of India (party to Kyoto protocol). Host country approval was checked by DOE and found that it confirms the EB guidelines.

Nevertheless, during the course of validation process CAR A1 was raised regarding its host country approval (HCA) and closed successfully by validation team.

5.1.2 Contribution to Sustainable Development

Host Government i.e. DNA of India vide Host Country Approval (HCA)^{/HCA/} letter no.4/10/2012-CCC dated 27/06/2012 approved that the project will contribute to sustainable development in India.

5.1.3 PDD editorial Aspects

Latest version 03 of large scale CDM -PDD format is used by Project Participant and filled up as per the guidelines for completing CDM-PDD version 07 dated 02/08/2008, EB 41, and Annex 12.

However, during the course of validation process CAR A2, CAR A3 were raised by validation report regarding editorial aspect and closed successfully.

5.1.4 Technology to be employed

Based on site visit and document review, validation team confirms that the project activity is the installation and operation of a new natural gas based grid connected Combined Cycle Power Plant (CCPP) of 382.5 MW installed capacity at Kamrej Taluka, Surat district of Gujarat state of India and thus to reduces GHG emission.

As per the scopes of the project activity listed in the “List of Sectoral scopes” (Document CDM-ACCR-06 Version 04)□, the project activity falls under scope number 1, sectoral scope – Energy industries (non-renewable sources) being a Grid-connected electricity generating project using non-renewable fuel in energy industries. This power plant, operating on a cleaner fuel natural gas and LNG will lead to lower carbon dioxide emissions for producing equivalent amount of power using carbon intensive fossil fuels like coal and will help in reducing the carbon intensity and power deficiency of the NEWNE regional grid of India.

The description of the project is complete and accurate as described in section A.4.3 of the PDD. As project activity is a green field natural gas based grid connected Combined Cycle Power Plant (CCPP) of 382.5 MW capacities so, it doesn't involve the alteration of an existing installation or process and the same is confirmed by the validation team during site visit and document review. The project employs state of the art technology which is safe environmentally safe and sound.

The proposed CDM project activity does not involve any alteration of existing installations and processes. The project activity is currently under construction stage and is expected to be commissioned by April 2013 as per the contract with the EPC contactor. This has been checked during site visit conducted by the assessment team to the project activity location in accordance with Para 60 of VVM, version 01.2. The Greenfield nature of the project activity is confirmed.

During the site visit and subsequent document review, validation team verified the technical specification as per the provided EPC contract^{/EPC/} and Power purchase agreement^{/PPA/} with the description given in the PDD. Based on this review validation team concludes that the project will be implemented as described in the PDD.

However, during the course of validation process CAR A4, CAR A5 were raised by validation report regarding editorial aspect and closed successfully.

5.1.5 Small Scale Projects

In accordance with decision 17/CP.7 as project activity is a new grid connected natural gas based power project and total installed capacity is 382.5 MW which is greater than 15 MW and does not fall under small scale CDM project activity.

5.2 Project Baseline, Additionality and Monitoring Plan

5.2.1 Application of the Methodology

The selected baseline methodology for the project activity is the approved baseline methodology “Baseline Methodology for Grid Connected Electricity Generation Plants using Natural Gas” (AM0029: Version 3.0: EB 39).

All applied methodological tools i.e. Tool to calculate emission factor for an electricity system” and “Tool for the demonstration and assessment of additionality” are valid and approved and the applied methodology and methodological tools are derived from UNFCCC CDM website. All applicability conditions as mentioned in the methodology are clearly defined and justified in section B.2 of the PDD and the project is in line with all requirements and stipulations mentioned in all sections of the applied methodology AM0029, version 3.0. As per the methodology the project emissions, includes only CO₂ emissions from fossil fuel combustion at the project plant. In the calculation of baseline emissions, only CO₂ emissions from fossil fuel combustion in power plant in the baseline are considered. For leakage, emissions due to fugitive upstream CH₄ emissions and CO₂ emissions from associated fuel combustion and flaring are considered for the Project activity. There are no significant emissions, due to project activity related to project and leakage, other than those listed in the methodology.

Applicability criteria as described in the methodology are fulfilled and discussed below.

Table : Applicability criteria assessment :

Applicability criteria-1: The project activity is the construction and operation of a new natural gas fired grid-connected electricity generation plant;³

Assessment: The project activity is the installation construction and operation of a green field natural gas and LNG fired combined cycle power plant (CCPP), of 382.5 MW (i.e. one block of 382.5MW) for electricity generation and connected to the NEWNE grid of India.

In the course of validation, validation team is convinced that the project activity is a green field combined cycle power project based on natural gas. Also during the site visit and interview with the PP it is verified that natural gas and LNG is the only fuel fired for the generation of the power and no other fuel is used as a back up or during start up operations. Hence it is confirmed that first applicability criteria with its footnote requirements are fulfilled

³ Natural gas should be the primary fuel. Small amounts of other startup or auxiliary fuels can be used, but can comprise no more than 1% of total fuel use, on energy basis.

Applicability criteria-2: The geographical/physical boundaries of the baseline grid can be clearly identified and information pertaining to the grid and estimating baseline emissions is publicly available;

Assessment-2: The boundary of the NEWNE (Northern, Eastern, western and North eastern) regional Grid of India is clearly defined as baseline grid. Information related to the NEWNE grid and baseline emissions are publicly available by Central Electricity Authority (CEA). www.cea.nic.in.

The geographical/physical boundaries of the baseline grid, i.e. the NEWNE grid, are clearly identified from the CEA database, publicly available on the CEA's web site. Thus, this applicability condition of the methodology is met by the project activity.

Applicability criteria-3: Natural gas is sufficiently available in the region or country, e.g. future natural gas based power capacity additions, comparable in size to the project activity, are not constrained by the use of natural gas in the project activity.⁴

Assessment-3: Project proponent has described in section B.2 of the PDD that the natural gas is sufficiently available for the project activity and will not result in price-inelastic supply constraints. Fuel availability in the host country i.e. India is determined by project proponent from domestic sources as well as imports from other countries. Reference of the news articles and other sources is checked by validation team to ensure that the fuel availability is sufficient available during the lifetime of the project activity.

During the period 2013 (when the project activity will get commissioned) to 2015-18 and thereafter (during the balance period of the crediting period) there are definite as well as highly probable new facilities and expansion plans which would be capable of supplying more than 540 million m³ per day of natural gas, which can fire approx. 100000 MW of power generation (*Refer Appendix 1 A to the PDD*).

Under the New Exploration and Licensing Policy of Government of India , new blocks were identified as a source of domestic supply of the Natural Gas. Approximate Domestic Natural Gas supply by Reliance Industries limited through KG D6 is 60 mmscmd, D4 basin with NIKO resources is 150 mmscmd, Gujarat State petroleum corporation is 12 mmscmd, Oil and Natural Gas Coporation Through western offshore cluster-7 and Vashistha & SI field is 66 mmscmd and further there are additional discoveries of the NG in Rajashthan area by Focus Energy Limited and by Shell gas in Punjab, Rajasthan, TamilNadu and North east region.

Import of the NG can also be available in the region. Petronet LNG Limited having agreement with Rasgas of Qatar and Exxon Mobil for the Gorgon field in Australia. Hazira LNG port limited, Mundra LNG terminal, Dabhol LNG, IOCL Energy, and other

⁴ In some situations, there could be price-inelastic supply constraints (e.g. limited resources without possibility of expansion during the crediting period) that could mean that a project activity displaces natural gas that would otherwise be used elsewhere in an economy, thus leading to possible leakage. Hence, it is important for the project proponent to document that supply limitations will not result in significant leakage as indicated here.

terminals capable of providing 70 mmscmd.

Based on the above resources existing availability of the NG is approx 180 mmscmd and having future projection of 540 mmscmd.

As verified from the CEA web site, total 11700 MW capacity power plants consists of 3300 MW Existing NG based power plant and future expansion of 8400 MW will be implemented by the year 2022 and require approximately ~49 mmscmd of gas supply in future⁵ against the availability of approximately 540 mmscmd by 2015-18.

During the last few years (even during financial depression of 2009-10), the Natural Gas (including LNG) prices have been fluctuating which in fact indicates that prices have not become inelastic (*Refer Appendix 2 of this PDD*).

On the basis of the above it can be easily concluded that there are no price-inelastic supply constraints as far as natural gas (including LNG) is concerned during the crediting period and therefore there are no significant leakages. Further to this validation team based on the information presented in the PDD on demand and supply of the natural gas, concludes that natural gas was sufficiently available in India at the time of decision making and will also be available in future to the extent that other future natural gas based power plant are not constraint by the uses of natural gas in the project activity.

Validation team verified and checked the current and future availability of the natural gas in the region and the estimated requirement of the NG in future to confirm that the natural gas is sufficiently available in the host country i.e. India. The Project Participant has demonstrated the same in the section B.2 of PDD along with information provided in the appendix 1A and appendix 1B of the PDD. The assessment team has checked all the references and links as cited by the PP in section B.4 and appendix 1 of the PDD and in additional also checked the information available in the public domain i.e. news article references to confirm that the natural gas is sufficiently available in the region or country. Footnote references and links used for demonstration of the natural gas availability and demand are submitted by project proponent in hard copy also as some of the links were expired during the course of validation process. These references and news articles are verified by validation to be correct. And value mentioned therein is correctly referred. Thus, it is concluded by validation team that the future natural gas based power capacity additions, comparable in size to the project activity, are not constrained by the use of natural gas in the project activity.

⁵ <http://www.cea.nic.in> and A Presentation by BHEL on Equipment Supply to Power Project - National Power Conference 2009 dated 04/12/2009

5.2.2 Project Boundary

As per the applicable methodology, the spatial extent of the project boundary includes the project site and all power plants connected physically to the baseline grid as defined in “Tool to calculate emission factor for an electricity system”.

In accordance to this, the project boundary comprises of the project site and all power plants connected physically to the NEWNE Grid. The specific components and facilities included in the project boundary are the gas turbine, heat recovery steam generator, steam turbine generator, station transformers, auxiliary equipment of the gas turbine and generator, heat recovery steam generator and steam turbine and generator; meters (gas, electricity) and gas supply pipelines.

The grid connectivity of the project plant was verified by the validation team during its site visit. The power plant is physically connected to the grid, as observed from a physical inspection at the project site switchyard from where the electricity generated by the plant is evacuated to the grid. The project activity is a new plant that has been set up and the validation team confirms from the site visit observations that the following equipment have been set up as a part of the project activity :

1. Advance class (F Class) gas turbine (SGT5 4000F) with several advanced technologies namely:
2. Matching triple pressure Heat Recovery Steam Generator (HRSG)
3. Steam Turbine and Generator

Based on the project boundary, Carbon Di-oxide CO₂ is indicated as the main source of baseline emissions, which is also in the project emissions. This is correct as per the project activity and the applicable methodology. Thus, it is concluded by validation team that the project boundary as specified in section B.3 of the PDD is correct and in line with the applied methodology AM0029, ver.3.0.

5.2.3 Baseline Identification

Description of baseline scenario and its identification is clearly and transparently mentioned in section B.4 of the PDD and same is verified by the validation team. As per the procedure/approach from paragraph 48 of the CDM modalities and procedures “Emissions from a technology that represents an economically attractive course of action, taking into account barriers to investment” is used to determine the baseline scenario identification. Thus the procedure to arrive to the baseline is derived from the applied methodology AM0029, Version 3.0.

Alternatives:

According to paragraph 103 of the VVM^{VVM/}, the applied methodology AM0029 and tool mentioned therein i.e. Tool for the demonstration and assessment of additionality version 06.1.0 prescribes the identification of the baseline scenario which is in accordance to paragraphs table-1 as described in Section B.4 of PDD.

Step 1: Identify plausible baseline scenarios

The project developer has considered following alternatives for the project activity, namely,

- a) *Project activity not implemented as a CDM project;*
- b) *Power generation using natural gas, but technologies other than the project activity;*
- c) *Power generation technologies using energy sources other than natural gas;*
- d) *Import of electricity from connected grids, including the possibility of new interconnections.*

The validation team has validated and verified the contention, whether all possible realistic and credible alternatives that provide outputs or services comparable with the proposed CDM project activity (including the proposed project activity without CDM benefits) have been analysed in the PDD by project proponent. By doing this all type of power plants that could be constructed as alternative to the proposed project activity within the grid boundary (as defined in "Tool to calculate emission factor for an electricity system") have been considered. Thus, it could be confirmed by validation team that all possible realistic and credible alternatives that provide base load electricity power have been considered in the identification of the plausible baseline scenario. The detailed assessment of this step as adopted by project proponent and adequately validated by validation team is as follows:

- a) **Project activity not implemented as a CDM project i.e. Power generation using natural gas as fuel and combined cycle technology without CDM revenues has been correctly identified as a plausible baseline scenario.**

In this instant case 382.5 MW gas based CCPP (combined cycle power plant) with 57% efficiency⁶ (at 100% load factor under standard operating conditions) and lifetime of 25 years⁷. And this baseline alternative deliver outputs and services comparable to project activity and permitted by applicable regulations of the host country India. Thus, this baseline alternative is **considered realistic and credible** alternative scenario by validation team.

- b) **Natural Gas based power plant using the technologies other than the project activity. It includes the power plant using the combined cycle and open cycle power generation technologies which are identified under power generation using natural gas but technologies other than the project activity.**

1. Project proponent has taken into consideration power generation with a capacity of 340 MW (E class) Gas based combined cycle power project at Hazira⁸. Validation team has reviewed technical specification of the technology used for this project to confirm that at 100% load factor under standard operating conditions 52% efficiency is achieved over the lifetime of 25 years. Validation team is convinced that the alternative considered by the project participant uses a technology different from the technology considered in the

⁶ As per the EPC contract

⁷ CERC Terms and Conditions Regulations 2009

⁸ <http://cdm.unfccc.int/Projects/DB/BVQI1250060108.72/view> (Project 2915 : 340 MW Gas based combined cycle power project expansion at Hazira)

proposed project activity by project proponent. Hence, same is considered as appropriate by validation team.

2. It is obvious that the Gas turbine in power plants using open cycle has efficiency which is less as compared to combined cycle. Validation team has reviewed technical specification of the technology used for this alternative scenario to confirm that at 100% load factor under standard operating conditions 35% to 42% efficiency is achieved over the lifetime of 25 years. In the open cycle mode of operation, power generation takes place in the gas turbine generator and the heat content of the exhaust gas exiting the turbine is not utilised further. Thus, this scenario is not suitable to meet the base load demand and hence does not deliver the output and services comparable to the project activity. Furthermore, as verified from the Central Electricity Authority (CEA) report on capacity addition of the power plants in India during the 11th five year plan it is found that there is no such open cycle power plant recently constructed or are under construction or being planned. The validation team is therefore convinced that the same is not a plausible alternative.

c) Under the alternative Power generation technologies using energy sources other than natural gas, following alternatives were analyzed.

1. Wind source (153 Nos. 2.5 MW wind turbines⁹ with a life of 25 years):

This baseline alternative i.e. power generation using Wind power plant is correctly excluded from the baseline scenario. It is evident that this technology is based on renewable sources of energy and cannot deliver base load power as they are intermittent source of energy with season variation resulting low capacity utilization. As the project activity delivers base load and the identified scenario i.e. the wind power plant delivers power on intermittent basis, the exclusion of above alternative is justified and appropriate.

2. Solar thermal parabolic¹⁰ through power plant with a life of 25¹¹ years.

This baseline alternative i.e. power generation using Solar thermal technology is correctly excluded from the baseline scenario. Based on above argument for Wind it is evident that this technology also is based on renewable sources of energy and cannot deliver base load power as they are intermittent source of energy with season variation resulting low capacity utilization. As the project activity delivers base load and the identified scenario i.e. the solar power plant delivers power on intermittent basis, the exclusion of above alternative is justified and appropriate.

3. 5 MW Solid biomass¹² fired power plant with a life of 20 years

⁹ http://www.mnre.gov.in/annualreport/2010_11_English/Chapter%205/chapter%205.htm#1

¹⁰ <http://www.mnre.gov.in/press-releases/press-release-11122009-1.pdf>

¹¹ http://cercind.gov.in/Regulations/Amend_Renewable_Energy_tariff.pdf

¹² <http://biomass-power.industry-focus.net/index.php/haryana-biomass-projects/93-deepak-spinners-had-set-up-5-mw-biomass-plant-at-baddi.html>

This baseline alternative i.e. power generation using 5 MW Solid biomass fired power plant is correctly excluded from the baseline scenario. It has been checked that most of the biomass based power plants operates on the agriculture residues, which are seasonally available. Validation team has reviewed technical specification of the biomass technology used for this alternative scenario project to confirm the efficiency of 20% and the lifetime of 20 years is correct and appropriate. The availability of the biomass as a fuel throughout the year is a concern and the fuel required for the size of the project activity cannot be practically stored. Thus, the biomass base power plant cannot provide similar services as compared to the project activity.

Further, biomass plants are small scale plants due to the same fuel concern and not comparable with large scale plants like that of project activity. The biomass represents less than 1% of the installed capacity in the NEWNE grid and is not comparable to the size of the project activity.

Based on the above, the exclusion of above alternative is justified and appropriate.

4. 350 MW¹³ domestic Coal fired power plant using conventional technology (sub critical) with ~37.78% efficiency¹⁴ (under site conditions) and lifetime of 25 years¹⁵.

This baseline alternative scenario is correctly identified as a plausible scenario as it delivers similar service i.e. base load power.

5. 600 MW¹⁶ coal (imported) fired port based power plant using conventional technology (sub critical) with ~39.55% efficiency¹⁷ (under site conditions) and lifetime of 25 year.

This baseline alternative scenario is correctly identified as a plausible scenario as it delivers similar service i.e. base load power.

6. 660 MW¹⁸ domestic coal fired based power plant using super critical boiler technology with ~39.52% efficiency¹⁹ (under site conditions) and lifetime of 25 years

This baseline alternative scenario is correctly identified as a plausible scenario as it delivers similar service i.e. base load power.

7. 660 MW²⁰ coal (imported) fired port based power plant using super critical boiler technology with ~41.36% efficiency²¹ (under site conditions) and lifetime of 25 years.

This baseline alternative scenario is correctly identified as a plausible scenario as it delivers similar service i.e. base load power.

¹³ <http://www.cea.nic.in/archives/thermal/bs/dec09.pdf> – Kamalanga Tpp

¹⁴ CERC Terms and Conditions Regulations 2009 (calculated based on heat rate of 2276 Kcal/kWh)

¹⁵ CERC Terms and Conditions Regulations 2009

¹⁶ <http://www.cea.nic.in/archives/thermal/bs/dec09.pdf> – Coastal Energen

¹⁷ CERC Terms and Conditions Regulations 2009 (calculated based on heat rate of 2174 Kcal/kwh)

¹⁸ <http://www.cea.nic.in/archives/thermal/bs/dec09.pdf> (Amravati TPP)

¹⁹ CERC Terms and Conditions Regulations 2009 (calculated based on heat rate of 2176 Kcal/kwh)

²⁰ <http://www.cea.nic.in/archives/thermal/bs/dec09.pdf> – Tirora power plant

²¹ CERC Terms and Conditions Regulations 2009 (calculated based on heat rate of 2079 Kcal/kwh)

8. 135 MW²² Lignite fired power generation plant with ~37.78% efficiency²³
(under site conditions) and life time of 25 years

This baseline alternative scenario is correctly identified as a plausible scenario as it delivers similar service i.e. base load power.

9. Naphtha based power generation

Naphtha based power generation projects are now very rare in India constituting less than 2% of the installed capacity and same is evidenced by validation team from the CEA website. Further to this validation team has also reviewed the technical specification of the Naphtha based power plant installed in the host country i.e. India; to confirm the efficiency value of 46% and the lifetime of 25 years is correct and appropriate. In addition as per 11th Plan (2007-12) of power generation capacity addition in India, no such power plants are recently constructed or are under construction or are being planned. Hence, this baseline alternative scenario is not identified as a plausible scenario.

10. 168 MW²⁴ reservoir based hydro power plant with a lifetime of 35 years

The hydro plants depends on the factors out of the control of the investors i.e. availability of water, seasonal variation etc. Thus it cannot be termed as providing similar services of baseload as compared to the project activity.

Further, the PP has provided the average PLF of such plants in the PDD. The same has been validated with the mentioned references and it is found that the average Plant Load Factor of the hydro plants in India during 2007-08, 2008-09 and 2009-10 was only 37.08%, 34.58% and 32.58% respectively. Further the PLF was varying as per the seasonal availability of the water. Since storage hydro projects would not be able to provide the same type of service, viz., base load power, they are not regarded as an alternative that could provide a service comparable to the project activity and are therefore not considered in the baseline analysis.

11. Cluster of 4 units of 120 MW each²⁵ of run of river (ROR) hydro power plants
with a lifetime of 35 years²⁶

Run of the river type of hydro power projects the PLF is not comparable to the project activity as it depend totally on the availability of water resources for the power generation. Such a plant, even when operating would not be able to produce enough power for the grid during the lean seasons, when the flow of water in the river is reduced Hence, this alternative was excluded from consideration by the project participant as it is not a realistic and credible option.

12. 220 MW²⁷ Nuclear reactor based power plant with a lifetime of 40 years²⁸

²² <http://www.cea.nic.in/archives/thermal/bs/dec09.pdf> - Jallipa-Kapurdi TPL by Raj West Power Limited (JSW)

²³ CERC Terms and Conditions Regulations 2009 (calculated based on heat rate of 2276 Kcal/kwh)

²⁴ http://www.cea.nic.in/reports/yearly/annual_rep/2009-10/ar_09_10.pdf

²⁵ http://www.cea.nic.in/reports/yearly/annual_rep/2009-10/ar_09_10.pdf

²⁶ CERC tariff guidelines 2009-14

Validation team is convinced that this alternative scenario is not being credible enough due to regulatory requirement, no private investor in India is allowed to construct nuclear based power station. Hence exclusion of the alternative power generation using nuclear energy is appropriate and justifiable.

d) Import of electricity from connected grids, including the possibility of new interconnections.

1. Import of electricity from neighbouring countries is correctly excluded from consideration as a plausible baseline scenario because of the fact that neighbouring countries of India are developing country like Nepal, Bangladesh, Myanmar and are themselves power deficit with very less per capita power consumption. Import of power from Pakistan is ruled out based on the political conflict between India and Pakistan. Further to this as verified from the executive summary sheet of the report published by CEA India imports of less than 1% of power from Bhutan which is basically generated from Hydro power project which does not deliver the output and services comparable to the project activity. Thus, validation team is convinced that the import of electricity from neighbouring countries of India is not a plausible baseline alternative. Hence same is ruled out.
2. Import of electricity from other Indian grids under the possibility of existing connection is correctly excluded from consideration as a plausible baseline scenario because of the fact that there is frequency mismatch of the transmission network and other regional grid is power deficit grid. Peak Demand / Peak Met by Southern Region during the year 09-10 are verified by validation team from the CEA web site²⁹ to confirm that the average power deficit in southern grid is around 7%. Same is verified by the validation team from the web link and convinced that import of electricity from connected grid i.e. Southern regional grid is not a plausible scenario.

From the analysis of the alternatives as stated above and further assessment in Annex 2 of the report, the following baseline scenarios are considered plausible.

All plausible baseline alternatives identified as required by using Step 1 of "Identification of baseline scenarios" of the applied baseline methodology AM0029, version 3.0 are described by project proponent in section B.4 of the PDD

²⁷ <http://www.npcil.nic.in/main/AllProjectOperationDisplay.aspx>

²⁸ <http://www.leonardo-energy.org/life-expectancy-nuclear-power-plants>

²⁹ Source: <http://www.cea.nic.in>

- A. Project activity not implemented as a CDM project, i.e. 382.5 MW gas based combined cycle power plant with advance class gas turbine.
- B. Power Generation using natural gas but technology other than the project activity (i.e. 340 MW gas based CCPP)
- C. Power generation technologies using energy sources other than Natural Gas:
1. 350 MW coal (domestic) fired based power plant using conventional technology
 2. 600 MW coal (imported) fired port based power plant using conventional technology
 3. 660 MW coal fired (domestic) power plant using super critical boiler technology
 4. 660 MW coal (imported) fired port based power plant using super critical boiler technology.
 5. 135 MW Lignite fired power generation plant.

All the alternatives are in compliance with all applicable legal and regulatory requirements as

- the implementation of project activity is a voluntary initiative and is not mandatory or a legal requirement;
- the Electricity Act 2003 does not restrict or empower any authority to restrict the fuel choice for power generation;
- the applicable environmental regulations do not restrict the use of gas energy; and;
- There is no legal requirement on the choice of a particular technology.

Step 2: Identify the economically most attractive baseline scenario alternative

Since, the project activity has more than one alternative so the identification of the most plausible and conservative baseline scenario is selected by the levelized cost of electricity generation in INR/kWh. Therefore, the financial indicator chosen for the investment analysis is the levelized cost of electricity generation. The validation team accepts that this is an appropriate indicator for the purpose of the analysis as it gives the cost per unit of service delivered (i.e. kWh or unit of electricity produced) and is therefore as per the Sub-Step 2 (b) of the EB 69 Annex 20 i.e. "Tool for the demonstration and assessment of additionality" (version 06.1.0).

As said in the methodology, the levelised cost of electricity production in INR/kWh is used as financial indicator for investment analysis. The summary of levelised tariff for the plausible baseline options to the proposed project activity, as identified above is presented in the table below:

S. No	Baseline Option	Levelised Tariff (INR/kWh)
1	Project activity not implemented as a CDM project, i.e. 382.5 MW gas based combined cycle power plant	3.72

	with advance class gas turbine	
2	Power Generation using natural gas but technology other than the project activity (i.e. 340 MW gas based CCPP)	3.53
3	Power generation technologies using energy sources other than Natural Gas:	
3.1	350 MW coal (domestic) fired based power plant using conventional technology	2.29
3.2	600 MW coal (imported) fired port based power plant using conventional technology	3.18
3.3	660 MW coal fired (domestic) power plant using super critical boiler technology	2.31
3.4	660 MW coal (imported) fired port based power plant using super critical boiler technology.	3.24
3.5	135 MW Lignite fired power generation plant	3.28

Out of the selected alternative scenarios having least value of electricity generation in INR/kWh is selected as the most plausible baseline scenario. For the present project activity **domestic coal based power generation alternative using conventional technology** continue to remain the economically most attractive options and thus identified as the most plausible baseline scenario.

In accordance with para 20 of the investment guidance in EB 62, the project proponent has conducted a sensitivity analysis on the financials by varying the parameters which have a bearing of 20% or more on either the project costs or the project revenues and same is explained in section 5.2.5 of this report. The Guidance on assessment of investment analysis requires the robustness of the conclusion arrived at to be proved through a sensitivity analysis by varying the critical assumptions to a reasonable variation ($\pm 10\%$). The project developer has identified fuel cost and O&M cost as the most critical assumptions. However, as cost of the fuel consumed will depend on the PLF and heat rate also so, these two parameters along with project cost have been considered for sensitivity analysis.

Accordingly, sensitivity analysis has been conducted to analyze the impact of a change in (a) fuel price by 10%, (b) load factor by 10% (c) Project cost by 10% (d) O&M cost by 10% and (e) Heat Rate by 10% on the LUCE. The sensitivity analysis (as explained in section 5.2.5 of this report) reveals that even under more favourable conditions, the LUCE would not cross the benchmark value.

Sensitivity analysis on the LUCE is carried out by the PP and same is assessed by the validation team to cross check the robustness of the baseline scenario. The validation team assessed the applied financial parameters and it could be verified that they have been elaborated in accordance with the requirements of the §109 and §110 of the VVM (EB 51 Annex 3). By doing this the technical lifetime of the considered technologies (natural gas, coal and lignite power plants) has been

assessed as appropriately justified and in accordance with latest version of the “Guidance on the Assessment of Investment Analysis” as provided by the CDM EB and provisions of the EB 50 Annex 15. In addition the requirements of the EB 48 Annex 11 have been applied within the assessments of the plant Load factors. For detailed assessment of the applied parameters please refer to the Annex 3 of this report.

Furthermore, as fossil fuel (Domestic Coal using conventional technology) based power plant, was found to be economically more attractive alternative and thus forms the baseline scenario. The same was also confirmed by performing sensitivity analysis on the critical parameters (Fuel Price, PLF, Project Cost, O&M Cost and Heat Rate) as defined under the guidance for investment analysis. Thus, it is concluded by validation team that the analysis has been conducted in a fair and transparent manner. Further, the appropriate approach has been adopted to identify the most economically baseline scenario alternative.

5.2.4 Calculation of GHG Emission Reductions

The emission reduction calculation is conducted as per applied methodology AM0029 and the methodological tool “Tool to calculate the emission factor for an electricity system”. The emission reductions (ER_y) of the project activity are the difference between the baseline emissions (BE_y), project emissions (PE_y) and any leakage emissions (L_y) as follows:

$$ER_y = BE_y - PE_y - LE_y$$

Where:

ER_y: = Emissions reductions in year y (t CO₂e)

BE_y: = Emissions in the baseline scenario in year y (t CO₂e)

PE_y: = Emissions in the project scenario in year y (t CO₂e)

LE_y: = Leakage in year y (t CO₂e)

Baseline emission:

Baseline emissions are calculated by multiplying the electricity generated in the project plant (EG_{PJ, y}) with a baseline CO₂ emission factor (EF_{BL, CO₂, y}), as follows:

$$BE_y = EG_{PJ, y} \cdot EF_{BL, CO_2, y}$$

EG_{PJ, y} = Net electricity generated in the project activity during the year y, MWh

EF_{BL, CO₂, y} = Baseline CO₂ emission factor, tCO₂/MWh

According to the methodology, the emission factor (EF_{BL, CO₂, y}) shall be the lowest emission factor of the below options:

Option 1: The build margin is calculated according to “Tool to calculate emission factor for an electricity system”;

Option 2: The combined margin is calculated according to “Tool to calculate emission factor for an electricity system”, using a 50/50 OM/BM weight;

Option 3: The emission factor of the technology (and fuel) identified as the most likely baseline scenario under “Identification of the baseline scenario” above, and calculated as follows:

$$EF_{BL,CO_2}(tCO_2 / MWh) = \frac{COEF_{BL}}{\eta_{BL}} * 3.6GJ / MWh$$

Where:

- COEF_{BL} : = The fuel emission coefficient (tCO₂e/GJ), based on national average fuel data, if available, otherwise IPCC defaults can be used
- η_{BL} : = The energy efficiency of the technology, as estimated in the baseline scenario analysis above

To determine the ex-ante BM and CM values, the latest version of the “Tool to calculate the emission factor for an electricity system” is applied.

Option 1: Build Margi is calculated according to “Tool to calculate emission factor for an electricity system”. The PP has used the build margin of 858.78tCO₂/GWh (year 2010-11) for the NEWNE grid from the CEA CO₂ data base, version 7.0 dated January 2012. The CEA database is published by the Central Electricity Authority, Government of India and regularly updated. Further, the calculation of the build margin has been done in accordance with the Tool to calculate emission factor for an electricity system, version 02.2.1, which is the latest available version to be used. The CEA database version used by the PP is version 7.0, which is the latest available data at the time of submission of the PDD for validation and thus accepted.

Option 2: The combined margin is calculated according to “Tool to calculate emission factor for an electricity system”, using a 50/50 OM/BM weight. The project participant has used the combined margin of 920 tCO₂/GWh (year 2010-11) for the NEWNE grid from the CEA CO₂ data base, version 7.0 dated January 2012. The combined margin emission factor is calculated as 50/50 weighted average of the Operating Margin (OM) and Build Margin (BM) emission factors as required by the methodology. Further, the calculation of the combined margin has been done in accordance with the Tool to calculate emission factor for an electricity system, version 02.2.1, which is the latest available version to be used. The CEA database version used by the PP is version 7.0, which is the latest available data at the time of submission of the PDD for validation and thus accepted.

Option 3: The emission factor of the technology (and fuel) identified as the most likely baseline scenario under “Identification of the baseline scenario”. The emission factor of the most likely baseline scenario needs to be calculated in line with below equation.

$$EF_{BL,CO_2}(tCO_2/MWh) = \frac{COEF_{BL}}{\eta_{BL}} * 3.6GJ / MWh$$

Where:

- COEF_{BL} : = The fuel emission coefficient (tCO_{2e}/GJ), based on national average fuel data, if available, otherwise IPCC defaults can be used
- η_{BL} : = The energy efficiency of the technology, as estimated in the baseline scenario analysis above

The most likely baseline scenario as identified in the project activity is domestic coal based sub critical technology power plant.

Hence, the BM, CM and emission factor from baseline scenario calculated are:

BM_{EF} = 858.78 tCO_{2e}/ GWh

CM_{EF} = 920 tCO_{2e}/ GWh

Coal_{EF} = 894.64 tCO_{2e}/ GWh

From the above emission factors calculated, the project developer selected the build margin emission factor as the ex-ante baseline emission factor to determine the ex-ante baseline emission. Therefore, as stipulated by the methodology, the project participant has taken the lowest value (858.78 tCO_{2e}/GWh) among the three options as the baseline CO₂ emission factor for the project activity.

The expected electricity generation from the project activity, on the basis of the plant load factor assumed (85%) and the plant capacity (382.5 MW) comes to 2,762.65 GWh. However, part of generation would also be consumed by the plant itself for the running of auxiliary equipment of the plant (auxiliary consumption). This is assumed to be at 3% of the plant capacity (also justified in the table in table-3 of this report). The net generation by the project activity is therefore estimated as 2,762.65 GWh. This the electricity that the project activity would export to the grid for every year of its operation and corresponds to the parameter EG_{PJ,y} of the methodology. The values of Plant Load Factor (PLF) and auxiliary consumption have been validated by the validation team and a justification of the DOE's assessment is given in table-3 of this report. With the estimated net generation (EG_{PJ,y}) of 2,762.65 GWh, the baseline emissions were calculated by the project participant using equation (2) of the applied methodology AM0029, ver.3.0.

Therefore, the ex-ante baseline emissions are:

$$BE_y = EG_{PJ,y} \times EF_{BM,CO_2,y} \\ = 2,762.65 \text{ GWh} \times 858.78 \text{ tCO}_{2e}/\text{GWh} = \mathbf{2,372,510.41 \text{ tCO}_2}$$

Since the Build Margin is selected, it will be monitored ex post, in accordance to the latest version of the "Tool to calculate emission factor for an electricity system."

This build margin value of 858.78 tCO_{2e}/GWh is the lowest amongst three options is considered as baseline CO₂ emission factor for this project activity. This value is determined ex-ante at the time of validation and same will be updated annually ex-post As per "tool to calculate emission factor for an electricity system". Data source used is Central Electricity Authority is a Government organisation and is publicly available.

Project emissions:

The expected project emissions are as follows. Further details refer to section B.6.3 of PDD for calculation details.

The project activity is on-site combustion of natural gas to generate electricity. The CO₂ emissions from electricity generation (PE_y) are calculated as follows:

$$PE_y = \sum_f FC_{f,y} * COEF_{f,y}$$

Where:

FC_{f,y}: = Is the total volume of natural gas or other fuel 'f' combusted in the project plant or other start up fuel (m³ or similar) in year(s) y
COEF_{f,y}: = Is the CO₂ emission coefficient (tCO₂/m³ or similar) in year(s) for each fuel and is obtained as:

$$COEF_{f,y} = \sum NCV_y * EF_{CO2f,y} * OXID_f$$

Where:

NCV_{f,y}: = Is the net calorific value (energy content) per volume unit of natural gas in year y (GJ/m³) as determined from the fuel supplier, wherever possible, otherwise from local or national data
EF_{CO2f,y}: = Is the CO₂ emission factor per unit of energy of natural gas in year y (tCO₂/GJ) as determined from the fuel supplier, wherever possible, otherwise from local or national data
OXID_f: = Is the oxidation factor of natural gas

$$COEF_{f,y} = 0.035752 \text{ GJ/m}^3 \times 0.056100 \text{ (tCO}_2\text{/GJ)} \times 1.00$$

Therefore, estimated annual project emission is calculated as:

$$PE_y = 504,355,190.95 \text{ m}^3 \times [0.035752 \text{ GJ/m}^3 \times 0.056100 \text{ (tCO}_2\text{/GJ)} \times 1.00]$$

$$PE_y = 1,011,585.70 \text{ tCO}_2$$

Leakage:

According to the methodology AM0029, leakage emissions are due to fugitive upstream CH₄ emissions and CO₂ emissions from associated fuel combustion and flaring. Therefore, ex-ante leakage emissions as follows:

$$LE_y = LE_{CH_4,y} + LE_{LNG,CO_2,y}$$

Where:

- LE_y : = Leakage emissions during the year y in tCO₂e
 $LE_{CH_4,y}$: = Leakage emissions due to fugitive upstream CH₄ emissions in the year y in t CO₂e
 $LE_{LNG,CO_2,y}$: = Leakage emissions due to fossil fuel combustion/electricity consumption associated with the liquefaction, transportation, re-gasification and compression of LNG into a natural gas transmission or distribution system during the year y in t CO₂e

1. Fugitive CH₄ emissions associated with fuel extraction, processing, liquefaction, transportation, re-gasification and distribution of natural gas used in the project plant and fossil fuels used in the grid in the absence of the project activity; defined as $LE_{CH_4,y}$
The Fugitive methane emissions are calculated in accordance with and as per equation

$$LE_{CH_4,y} = [FC_y * NCV_y * EF_{NG, upstream, CH_4} - EG_{PJ,y} * EF_{BL, upstream, CH_4}] * GWP_{CH_4}$$

Where;

- $LE_{CH_4,y}$: = Leakage emissions due to fugitive upstream CH₄ emissions in the year y in t CO₂e
 FC_y : = Quantity of natural gas combusted in the project plant during the year y in m³.
 $NCV_{NG,y}$: = Average net calorific value of the natural gas combusted during the year y in GJ/m³,
 $EF_{NG, upstream, CH_4}$: = Emission factor for upstream fugitive methane emissions of natural gas from production, transportation, distribution, and, in the case of LNG, liquefaction, transportation, re-gasification and compression into a transmission or distribution system, in t CH₄ per GJ fuel supplied to final consumers
 $EG_{PJ,y}$: = Electricity generation in the project plant during the year in MWh
 $EF_{BL, upstream, CH_4}$: = Emission factor for upstream fugitive methane emissions occurring in the absence of the project activity in t CH₄ per MWh electricity generation in the project plant, as defined below
 GWP_{CH_4} : = Global warming potential of methane valid for the relevant commitment period

Fugitive upstream CH₄ emission ($LE_{CH_4,y}$) is calculated by multiplying the quantity of natural gas consumed by the project with emission factor for upstream fugitive CH₄ emissions ($EF_{NG,upstream,CH_4}$) from natural gas consumption and subtracting the emission occurring from fossil fuels used in the absence of the project activity which is calculated by multiplying energy generated in the project activity ($EG_{PJ,y}$) with emission factor for upstream fugitive methane emission in the absence of project activity ($EF_{BL,upstream,CH_4}$). For the emission reduction calculations, $EF_{NG,upstream,CH_4}$ is taken as 0.00016000 tCH₄/GJ and $EF_{BL,upstream,CH_4}$ is taken as 0.00051304 tCH₄/MWh based on the calculation of fugitive.

Emission factor for upstream fugitive methane emissions of natural gas ($EF_{NG,upstream,CH_4}$) and Emission Factor for upstream fugitive methane emission occurring in the absence of project activity $EF_{BL,upstream,CH_4}$ (tCH₄ / MWh) is correctly calculated by PP as per applied methodology AM0029, ver.3.0 and references of CO₂ Baseline Database for Indian Power Sector, published by Central Electricity Authority, Ministry of Power, Government of India, version 7, January 2012; Report on Gujarat Lignite Resources and Scope for Joint Sector Thermal Power and SSI Project (Annexure IV).

During the course of validation process, CAR B17 was raised by the validation team regarding the calculation of $EF_{BL,upstream,CH_4}$. In response to the said CAR project proponent has revised the PDD/^{IER/}PDD/ and emission reduction calculation sheet. Subsequently, based on the closure of CAR B17, the validation team has verified that revised PDD and emission reduction sheet for the calculation of $EF_{BL,upstream,CH_4}$. For the calculation of $EF_{BL,upstream,CH_4}$ the fuel quantity of each type of fuel has been calculated from the absolute emissions, GCV and emission factor of the each type of fuel as directly provided in CO₂ Baseline Database for Indian Power Sector, published by Central Electricity Authority, Ministry of Power, Government of India, version 7, January 2012. Further, as per the said database, the total absolute emission of the power plant includes the absolute emission from both primary and secondary fuels.

However, in order to be conservative for $EF_{BL,upstream,CH_4}$ calculation (a) the absolute emission of coal and lignite based plants as given in the CEA database has been reduced to such extent of emission due to the use of secondary fuel (i.e. oil) and (b) the entire fuel consumption (including secondary fuel i.e. natural gas for Naphtha based power plants) has been considered as Naphtha only for the calculation of absolute emission of Naphtha based plants as the Fugitive Methane emission factor of natural gas (160 tCH₄ /PJ) is higher than that of Naphtha (4.1 tCH₄/PJ). Further, It has been checked and confirmed from the database that gas base plants used in the build margin calculation do not involve secondary fuel.

Based on the above parameters, the ex-ante value for $LE_{CH_4,y}$ comes to 30,822.56 tCO₂e.

- 2. Leakage emission** due to fossil fuel combustion/electricity consumption associated with liquification, transportation, regasification and compression of LNG

into NG transmission or distribution will be calculated by multiplying quantity of natural gas combusted in the project (FC_y) with Emission factor for upstream CO₂ emission ($EF_{CO_2,upstream,LNG}$) of 6.0 tCO₂ / TJ taken from approved methodology AM0029 in absence of local specific data. By means of the document review the validation team has gained sufficient confidence that the reliable and accurate data on upstream CO₂ emissions due to fossil fuel combustion/electricity consumption associated with the liquefaction, transportation, re-gasification and compression of LNG into a natural gas transmission or distribution system is not available and hence the applied default values are found consistent with the approved methodology. Leakage calculation is calculated as follows:

$$LE_{LNG,CO_2,y} = FC_y \cdot EF_{CO_2,upstream,LNG}$$

Where:

- $LE_{LNG,CO_2,y}$: = Leakage emissions due to fossil fuel combustion/electricity consumption associated with the liquefaction, transportation, re-gasification and compression of LNG into a natural gas transmission or distribution system during the year y in t CO₂e
- FC_y : = Quantity of natural gas combusted in the project plant during the year y in m³
- $EF_{CO_2,upstream,LNG}$: = Emission factor for upstream CO₂ emissions due to fossil fuel combustion/electricity consumption associated with the liquefaction, transportation, re-gasification and compression of LNG into a natural gas transmission or distribution system

For $EF_{CO_2,upstream,LNG}$, the PP has considered the default value of 6 t CO₂/TJ in accordance with the methodology. The same is found appropriate and thus accepted. Ex-ante value of $LE_{LNG,CO_2,y}$ based on these values comes to 59,505.04 tCO₂e.

Therefore, leakage emission thus calculated for the project activity is :

$$LE_y = LE_{CH_4,y} + LE_{LNG,CO_2,y}$$

$$LE_y = [30,822.56] + [59,505.04] \text{ tCO}_{2e}$$

$$LE_y = \mathbf{90,327.61 \text{ tCO}_{2e}}$$

Emission Reduction:

According to above information, the emission reductions of the project is calculated as following:

$$\begin{aligned} ERY &= BE_y - PE_y - LE_y \\ &= 2,372,510.41 - 1,011,585.70 - 90,327.61 \end{aligned}$$

Hence, the annual GHG emission reductions estimated ex-ante is 1,270,597.11 tCO₂e.

The calculations of GHG emission reduction is represented by PP under section B.6 of the PDD. In accordance with AM0029 the emission reduction calculation covering leakage, project emission and baseline is demonstrated in the supporting excel sheets which were provided to the validation team. Leakage calculation is described in annex-3 of the PDD.

By means of the document review the validation team has gained sufficient confidence that the applied default values are found consistent with the approved methodology

5.2.5 Additionality Determination

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

The extract of resolution passed by the management of M/s Torrent Power Limited on 28/01/2010 which declares that the company intends to invest in the proposed natural gas based power project under clean development mechanism “CDM” activity and resolves to avail benefits from CDM to mitigate the risks of uncertainties involved in power project installation was evidenced to the validation team. The decision was taken by the Board of Directors which is the highest decision making authority of the company. Furthermore, as verified by validation team during the site visit and interview with the project proponent the viability of the power project was carried out at the time of taking the decision to invest indicates that the financial returns were not attractive enough. The company has been following up that decision with suitable steps of action designed to get the project registered as a CDM project with UNFCCC. Therefore, the consideration of CDM revenues at the time of implementation of the project ought to be considered as serious. As per Annex 13 of EB 62 the serious consideration of CDM is mentioned in the PDD.

The project participant has informed both DNA, i.e. Ministry of Environment and Forest, Govt. of India and UNFCCC within 6 months from the start date of the project i.e. 02/07/2010 (Notice to Proceed under the Engineering Procurement and Construction (EPC) Contract for main plant construction was issued on 02/07/2010 to Siemens) which is in conformity with Annex 13 of EB 62.

Copy of the prior Intimation (F-CDM-Prior consideration form dated 30/11/2010) submitted by M/s Torrent Power Limited (TPL) to UNFCCC and DNA i.e. Ministry of Environment and Forest via email dated 30/11/2010 is verified by validation team to be correct and accurate. Also the PP has received the acknowledgement email from UNFCCC and DNA via email dated 13/12/2010. The validation team verified the submitted documents and also cross checked with the website of UNFCCC as well as with the DNA of India website^{/MOEF/}.

Since the fulfillment of both the conditions stipulated vide paragraphs (2) and (4) of Annex 13 of EB 62 have been demonstrated with documentary evidence, and

background investigation on the website of UNFCCC and DNA of India had been done, Validation Team concludes that *there was a prior consideration of CDM and the CDM benefits were considered necessary in the decision to go ahead with the proposed project and simultaneously applying for CDM registration for the same project. The serious consideration of CDM benefits by the project developer is in conformity with paragraph 102 of VVM (1.2).*

The project start date is given as 02/07/2010 which is the Notice to Proceed under the Engineering Procurement and Construction (EPC) Contract given by project proponent for main plant construction was to Siemens. As this document signifies the commitment of the PP to meet major project related expenditure i.e. the date on which the implementation or construction or real action of the earliest project activity begins, which is accordance with the CDM glossary of terms and guidelines for completing the form.

Application of methodology / methodological tools

As the project activity falls in large scale project category hence, "Tool for the demonstration and assessment of additionality" version 6.1.0 has been correctly applied by project proponent for the project activity. In line with the applied methodology AM0029 ver.3.0, the additionality was demonstrated based on the valid version of the tool for demonstration and assessment of additionality i.e. version 6.1.0 and Guidance given vide annex 05 of EB 62. As validated by validation team all the requirements specified vide EB 69 Annex 20 i.e. "Tool for the demonstration and assessment of additionality" (version 06.1.0) and guidance on investment analysis are complied with by the project activity, this approach has been assessed to be correct and appropriate for the additionality demonstration of this project activity.

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 paragraph 110 of VVM (Ver. 1.2).

Alternatives

The selected baseline methodology for the project activity is the approved baseline methodology "Baseline methodology for Grid connected Electricity Generation Plants using Natural Gas" (AM0029, Version 3: EB 39). The selected baseline methodology, i.e., AM0029, Version 3 and Tool to calculate the emission factor for an electricity system version 2.1.1 is correctly applied to this type of grid connected electricity generation using natural gas. The project meets all the applicability criteria as set forth in the methodology. Each of the applicability criteria is validated by validation team and same is explained in above section. Thus, Validation team is convinced that as the project activity is being generation of electricity by using natural gas.

Identifying economically most attractive baseline scenario alternative:

The economically most attractive baseline scenario alternative has been identified according to the Step 2 of the methodology. By doing this the Levelized Unit Cost of Electricity (LUCE) in INR/kWh have been selected as financial indicator. This is in line with the methodology. Of the seven alternatives, alternative (i), (ii), (iv), (v), (vi) and (vii) i.e. Power Generation using natural gas but technology other than the project activity, Coal based (Imported / Domestic) fuel using subcritical and supercritical technology, Lignite based power plants and setting up the project as non-CDM activity cannot be considered because these are not the economically most attractive alternatives.

The Levelized Unit Cost of Electricity (LUCE) of power Generation using natural gas but technology other than the project activity is INR 3.53/kWh, domestic coal based power plant with sub critical technology is INR 2.29 / kWh, Coal based power plant with sub critical technology using imported coal is INR 3.18 /kWh, domestic coal based power plant with super critical technology is INR 2.31 / kWh, Coal based power plant with super critical technology using imported coal is INR 3.24 /kWh, Lignite based power plant is INR 3.28/ kWh and the Levelized Unit Cost of Electricity (LUCE) of the project as non-CDM activity is INR 3.72/kWh. Based on the above, the domestic coal based power plant with sub critical technology emerges as the most attractive baseline scenario.

However, this conclusion has been tested by subjecting the critical parameters to reasonable variations. The Guidance on assessment of investment analysis requires the robustness of the conclusion arrived at to be proved through a sensitivity analysis by varying the critical assumptions to a reasonable variation ($\pm 10\%$). The project developer has identified the **Fuel cost, Load Factor (PLF), project cost, O&M cost and station heat rate** as the most critical assumptions. Accordingly, sensitivity analysis has been conducted to analyze the impact of a change in (a) Fuel cost by 10% (b) Load Factor (PLF) by 10% (c) project cost by 10% (d) O&M cost by 10% and (e) station Heat rate by 10% on the LUCE. The sensitivity analysis reveals that even under more favourable conditions, the LUCE would not cross the benchmark value as given in the following table:

Table 4.4: Sensitivity Analysis

Parameter	Fuel Cost	PLF	Project Cost	O&M Cost	Station Heat Rate
-10%	3.49	3.88	3.63	3.68	3.49
0%	3.72	3.72	3.72	3.72	3.72
+10%	3.96	3.60	3.82	3.77	3.96

The validation team carried out its own independent assessment, which reveals that the project would become *non additional* only if

- Fuel cost goes down by ~ 62% (i.e. US \$ 2.41per MMBTU)
- Project cost goes down by ~148%
- O&M cost goes down by ~325%
- Station heat rate goes down by ~61%

LUCE is not sensitive to PLF at all. As the project cost and O&M cost requires being down by more than 100% which is unrealistic. Further, the fuel cost requires to goes down by 62% (i.e. US \$ 2.41 per MMBTU) which is unlikely as the price of natural gas considered in the analysis is sourced from the actual invoices of natural gas supply to the PP's other plant under operation at the time of investment decision.

Since, the Fuel Supply Agreement (FSA) for the proposed project activity is under discussion and same is not yet finalized by the project proponent. Hence, the validation team has verified the price of natural gas from the actual invoice of natural gas for the month June 2012 (latest) to the PP's other natural gas plant. Based on the same, the price has not decreased.

The project proponent has used station heat rate value as guaranteed by EPC contractor for the project activity. Hence, any decrease in station heat rate value up to the extent of 61% is neither possible nor realistic.

Hence, domestic coal based power plant with sub critical technology i.e. alternative (iii) could be justified as realistic, credible and plausible baseline alternative to the PP. It should be noted that baseline emissions will determined based on the build margin and not on the emission factor of such plausible baseline alternative (i.e. domestic coal based power plant with sub critical technology). This is in line with the methodology.

The validation team assessed the applied financial parameters and it could be verified that they have been elaborated in accordance with the requirements of the §109 and §110 of the VVM (EB 55 Annex 1). By doing this the technical lifetime of the considered technologies has been assessed as appropriately justified and in accordance with latest version of the "Guidance on the Assessment of Investment

Analysis" as provided by the CDM EB vide letter from the EPC contractor^{/ELT/}. For detailed assessment of the applied parameters please refer to the Annex 3 of this report.

Investment analysis

As per the requirement of the applied methodology, Project developer has demonstrated through the Sub-step 2b (Option III: Apply benchmark analysis) of the EB 69 Annex 20 i.e. "Tool for the demonstration and assessment of additionality" (version 06.1.0) that the financial indicator (LUCE) of the project activity will remain higher than the benchmark rate, i.e., the lowest value of levelised cost of generation of the baseline alternative.

The validation team has adopted a five pronged strategy to ascertain the veracity of the conclusion drawn by the project developer in accordance with the requirements of the §109 and §110 of the VVM (EB 55 Annex 1).

- a) determining the suitability of the benchmark applied for the type of financial indicator presented;
- b) conducting an assessment of parameters and assumptions used in calculating the financial indicator and determining the accuracy and suitability of parameters;
- c) cross-checking the parameters against third-party or publicly available sources;
- d) assessing the correctness of computations carried out and documented;;
- e) Subjecting the critical assumptions of the project activity to reasonable variations to determine under what conditions variations in the result would occur, and the likelihood of these conditions.

a) Suitability of financial indicator and benchmark:

The project developer has chosen LUCE to demonstrate the additionality of the project. "Tool for the demonstration and assessment of additionality" (version 06.1.0) of EB 69 Annex 20 permits the use of LUCE as financial indicator. Since the project developer is demonstrating the financial unattractiveness of the project, LUCE is appropriate, as it provides an immediate indication of how costly the power generated by the project activity. Having regard to the fact that the project proponent is in the business of power generation and if PP would not have gone for the gas based power plant, have installed other fossil fuel based power plant. Since in this instant case, baseline scenario leaves the project proponent no other choice than to make an investment to supply the electricity to the grid, LUCE comparison analysis is most suited as per Guidance 16 of Guidelines on the assessment of the investment analysis version 03, Annex 05 of EB 62

For benchmark, under Section 6 of the Sub-step 2 b of "Tool for the demonstration and assessment of additionality" (version 06.1.0) of EB 69 Annex 20, option 6(a) to 6(c) is not applicable to the project activity as it is not related to LUCE. Also option 6 (d) is not applicable in absence of any Government / official approved benchmark for this type of project activity in India. Hence under option 6(e), using any other benchmark as the lowest value of levelised cost of generation of the baseline alternative (i.e. for domestic coal based power generation using sub critical technology) as a benchmark and is considered appropriate.

In addition as a cross check PP has also worked out project IRR and considered WACC as a benchmark. Validation team has cross checked the calculations and confirmed that it does not cross the benchmark even with the sensitivity analysis of +/- 10 % and project remains additional.

While calculating the Benchmark (WACC) following input parameters are used

1. Cost of Debt (COD) - The interest rate of 12% has been sourced from the RBI web site³⁰ which is the modal BPLR of Public Sector Banks (PSBs) and is available at the time of decision making. As mentioned and verified by validation team from the Second Quarter Review of Monetary Policy 2009-10 date 27/10/2009, the modal BPLR interest rate is the monthly average (%) of public sector banks (PSBs). Further to this the validation team has also checked the average BPLR³¹ of the public sector banks (PSBs) which comes to 12.25%. Validation team has cross checked the value of the BPLR from RBI web site from weekly bulletin dated 21/01/2010 at the time of decision making and observed that the BPLR rate of 11- 12 % is applicable. Hence the value of 12% is within the range of 11-12% and not overestimated and hence conservative as per definition given for conservativeness in CDM glossary. However, as cross checked from the IRR analysis sheet that even if PP applies the minimum value of 11 % , the IRR will go down from 11.02 % to 10.63% and the benchmark comes down from 13.34% to 12.76% and still the project remains additional both in base case and in sensitivity analysis. Thus, it is concluded by validation team that the modal BPLR value chosen for the benchmark calculation is correct and appropriate.

The interest rate taken is in line with the commercial lending rates as provided by the Reserve Bank of India, India's central bank. The applied value has been verified and found correct. Hence validation team is convinced that the value considered is correct and appropriate.

2. Risk Free Return (Rf) – The risk free return of 8.3% has been source from the RBI web site³² and it was available at the time of decision making time. The risk free rate is the minimum value of Maximum Redemption Yield of all Government of India

³⁰ <http://rbi.org.in/scripts/NotificationUser.aspx?Id=5326&Mode=0> (Table 17)

³¹ <http://rbi.org.in/scripts/NotificationUser.aspx?Id=5326&Mode=0> (Table 16)

³² http://rbidocs.rbi.org.in/rdocs/Bulletin/PDFs/27T_EBU70110.pdf (page 2)

Securities having tenure over 15 years upto 25 years based on SGL Transactions. The same is verified by validation team and found to be correct and conservative.

3. Rate of Market Return (R_m) – The PP has chosen BSE-Sensex³³ as proxy for market return (R_m), which is considered appropriate by the validation team. Market return has been computed based on the data from April 1979 (since introduction of the index) to December 2009³⁴. The Market return works out to 18.28%³⁵. Consequently, the market risk premium works out to 9.98% (18.28% - 8.3%) [*Market Return (R_m) – Risk free rate of return (R_f)*]. PP has also submitted the market return based on BSE-500 however it is noted that the data for BSE 500 index is available for approximately 11 years only (i.e. from february 1999 to December 2009) and the market return for BSE 500 comes to 19.26%. Thus, it can be concluded by validation team that the selection of BSE-Sensex as proxy for market return is correct and appropriate.

4. Beta Calculation – The PP has provided the basis of selection of a company for Beta calculation in the WACC as given below:

- A Power company listed on the BSE and having presence in top 500 companies listed on the BSE in terms of market capitalisation,
- engaged mainly in similar activity as the PP, and
- should have been listed for minimum period of **four** years prior to the investment decision date

Based on the above, the following 7 companies could be considered for calculation of the Beta value.

1. GVK
2. Neyveli Lignite Corporation,
3. Calcutta Electricity Supply Corporation Ltd (CESC),
4. Gujarat Industries Power Company Limited
5. Tata power Limited
6. Jai Prakash Power ventures Limited

³³ Though it is customary to choose well diversified portfolio to compute market return (and also for computing beta) as BSE-500 was introduced only on February 1, 1999 and the investment decision was taken in January 2010, BSE 500 does not offer a reasonable long period for computing market return. Hence, selection of BSE – Sensex, which was introduced in April 1979 (and therefore provides above 30 years observation) is considered appropriate

³⁴ Aswath Damodaran states, “The most common approach to estimating the risk premium is to base it on historical data. In the arbitrage pricing model and multifactor models, the raw data on which the premium are based are historical data on asses prices *over very long time periods*. In the CAPM, the premium is estimated by looking at the difference between average returns on stocks and average returns on risk-less securities over an extended period of history.” [Corporate Finance, Theory and Practice; *Aswath Damodaran*, (second edition) (p.190)]. Accordingly, the market return (geometric return) has been computed based on the BSE-SENSEX index from the introduction of the index till December 2009.

³⁵ BSE SENSEX as on April, 1979 was 100 and as on December 31, 2009 were 17641.81. The duration is 30.75 years, Hence, the CAGR works out to 18.28%

7. National Thermal power corporation (NTPC)

The seven companies (as mentioned above) selected for Beta calculations are appropriate. The validation team has verified the same from the data available at the link <http://www.moneycontrol.com/stocks/top-companies-in-india/market-capitalisation-bse/power-generationdistribution.html> and found to be correct.

The minimum of the average beta value for the vintage of two, three and four years date has been considered by the PP as for the WACC calculation. This assumption is based on the research paper 'Estimating Risk Parameter' by Scholar Prof. Aswath Damodaran available at <http://pages.stern.nyu.edu/~adamodar/pdfiles/papers/beta.pdf>.

The justification and details regarding the same has been provided by the PP in the calculation sheet as given below:

A research paper titled "Estimating Risk Parameters" by the renowned scholar Aswath Damodaran (<http://pages.stern.nyu.edu/~adamodar/pdfiles/papers/beta.pdf>), who is a Professor of Finance at the Stern School of Business at New York University and an authority on the subject (page 9) states, "Risk and return models are silent on how long a time period one needs to use to estimate betas. Services use periods ranging from two years to five years for beta estimates, with varying results". Based on the same, the minimum of the average beta for two, three and four year's vintage period has been selected by the PP. Further, the PP has calculated the equity Beta for each of the seven selected companies for four year vintage period and considered the minimum of the same in further calculation. This is an appropriate approach as the minimum of the beta of four years represents the risk faced by the power sector as a whole which was available uniformly. The average beta comes to 1.30.

The data and calculation used in Beta calculation have been checked by the validation team including the financial expert and found appropriate and conservative and thus accepted.

Hence, it is concluded that the value of beta is correct and appropriate.

5. Rate of Return on Equity(ROE) - The cost of equity has been estimated based on Capital Asset Pricing Model (CAPM). As per the model, the required return on equity investment is the return of risk free security plus beta times the difference between market return and risk free return.

$$ROE = \text{Risk free rate of return (Rf)} + \text{Beta} \times [\text{Market Return (Rm)} - \text{Risk free rate of return (Rf)}]$$

As stated above, risk premium of the project type is nothing but a product of risk profile of the project and the market risk premium, i.e. $1.30 \times 9.98 = 12.93\%$ ($\text{Beta} \times [\text{Market Return (Rm)} - \text{Risk free rate of return (Rf)}]$).

Based on the above computations expected return works out to 21.23% [8.3 + 12.93 = 21.23]. The raw data, sources and calculations have been given in the worksheet, which was verified (with the source) and validated by the Validation team. The calculations have been checked with respect to the principle adopted as well as arithmetical accuracy and found to be correct.

6. Debt-Equity ratio - The value of 70:30 considered by the PP is based on the Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 page 13 which was available to the PP at the time of decision making and thereby conforms to paragraph 6 of EB 62, Annex 05. Validation team has also reviewed IDFC Information memorandum and loan sanction letter submitted by project proponent to conform that the gearing ratio considered in the project remains at 70:30. Thus, it is concluded by validation team the debt:equity ratio considered in the project activity is correct and appropriate.

The PP has used 70/30 Debt-equity ratio in the calculation of the WACC. This is as per the standard market practice and is consistent with the project activity debt-equity structure.

7. Tax rate - The tenure for the loan is considered by the PP as 12 years. Thus, the PP has calculated an average applicable tax rate for the period of 12 years i.e. 16.995%³⁶. The calculation has been checked and is found to be correct. The tax rate considered was available with the PP at time of investment decision and thereby confirms to paragraph 6 of EB 62, Annex 05.

Therefore, the tax rate is found appropriate as per the actual scenario and comparable to the project activity analysis, and thus correct and appropriate.

Based on above validated parameter, the WACC for the project activity is calculated as given below:

$$\begin{aligned}\text{WACC} &= \text{ROE} * \text{Equity\%} + (\text{Post-tax COD} * \text{Debt\%}) \\ &= 21.23\% * 0.3 + 12.0\% (1 - 16.995\%) * 0.7 \\ &= 13.34\%\end{aligned}$$

Thus, it is concluded by validation team the WACC of 13.34% considered for the project activity has been found to be correct and appropriate.

b) Parameters and assumptions used: The three important parameters, which determine LUCE/ project IRR, are project cost, financing pattern, and profitability estimates. Project cost is based on the EPC contract signed by PP dated 02/07/2010. As per EPC contract signed by TPL the actual project cost of the project considered in the financial analysis is INR 17915.96 million (i.e. INR 18330 Million minus INR 410 Million WC margin). Validation team has also verified Management Decision submitted by Project Proponent (PP) which evidences the project cost INR

³⁶ <http://www.kpcindia.com/Pdf/Tax-Guide-2009.pdf> - Tax Rate (Refer Page 2) (Corporate Tax – 33.99% and MAT – 16.995%)

19500 million (incl IDC, FC and WC margin). Value considered by the PP is conservative than as per management decision and hence confirming the guideline 6 of EB 62, Annex 05. Validation team has reviewed and verified the EPC contract and management decision signed by board of directors of the company to confirm that the project cost is correct and conservative. The value of 70:30 considered by the PP is based on the Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 page 13 which was available to the PP at the time of decision making and thereby conforms to paragraph 6 of EB 62, Annex 05. Validation team has also reviewed IDFC Information memorandum and loan sanction letter submitted by project proponent to confirm that the gearing ratio considered in the project remains at 70:30. Thus, it is concluded by validation team the debt:equity ratio considered in the project activity is correct and appropriate.

The profitability estimates of the project, which forms the basis for LUCE/project IRR calculation is also based on PLF, Gross Heat Rate, NCV, O&M cost, insurance cost, interest, depreciation, ROE based on CERC and taxation

1. The PLF value of 85% considered by the PP is based on the Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 page 42 which was available to the PP at the time of decision making and confirms to paragraph 6 of EB 62, Annex 05. Validation team has also verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 order for its appropriateness. The Central Electricity Regulatory Commission (CERC) is regulatory body of power sector in India. Hence, the consideration of its regulation is appropriate. Validation team has also cross checked the value of the PLF considered by other UNFCCC registered large scale power projects based on natural gas namely Gautami (UNFCCC Ref. No. 4828) Gautami (UNFCCC Ref. No. 4828) and Vemagiri (UNFCCC Ref. No. 4334) as 85 % and 80 % respectively. Hence, the value considered by the PP is found to be correct and appropriate.
2. The PP has calculated Gross Heat Rate value i.e. 1663.71 considered in the financial analysis is sourced from the EPC contract^{EPC-O/} of existing SUGEN plant having same unit capacity (382.5 MW) and same 'F' class of turbines supplied by same manufacturer and which was available to the PP at the time of decision making. Moreover, the heat rate as provided in the EPC contract is under optimum operating condition which is 6527 kJ/kWh. This has been converted to Gross station heat rate on GCV basis in kCal/kWh considering the following factors:
 - The multiplication factor 1.1 is the conversion factor from GCV to NCV (source: CO2 Baseline Database November, 2009 version 5 issued by CEA, Ministry of Power, Government of India.).
 - The factor of 0.97 for the Auxiliary Consumption of 3% (source: Central Electricity Regulatory Commission (Terms & Conditions of Tariff) Regulations, 2009 dated 19/01/2009 – Page no. 49)

- The standard conversion factor of 1 kCal = 4.186 kJ.

EPC contract submitted by PP is verified by validation team to confirm that the calculated value of Gross Heat Rate is correct and appropriate.

Later on the PP has signed the EPC contract^{/EPC/} with Siemens and the guaranteed heat rate for the project activity as provided by the EPC contractor is also same i.e. 1663.71 Kcal/KWh. Thus, the heat rate available to the PP at the time of investment decision is same as per the EPC contract signed for the project activity.

The heat rate considered by the PP is based on Design heat rate plus a margin. Such margin as considered by the PP is 1.05 based on the Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 page 47 which was available at the time of decision making and confirms to paragraph 6 of EB 62, Annex 05. The validation team has verified the value from CERC tariff order and the same has been found to be correct.

It was noted that the CERC Terms and Condition of Tariff allows a margin on the Design Heat Rate (5% for Gas based plants and 6.5% for coal and Lignite based plants) as the Design Heat Rate is for optimum operating conditions including grid frequency, load factor, ambient conditions etc. As these conditions are not achievable in actual plant operations, a margin on the design heat rate is permissible to cater for less than optimum conditions. The Central Electricity Regulatory Commission (CERC) is regulatory body of power sector in India. Hence, the consideration of its regulation is appropriate.

3. The PP has calculated Gross Calorific value^{/CV/} as 9395 Kcal/SCM (i.e. net calorific value of 8540.90kCal/SCM). This value is the weighted average (ratio of 1:1) GCV of gas supply from Reliance (i.e. 8910 kCal/SCM of GCV) and GCV of gas supply from Petronet LNG (i.e. 9880 kCal/SCM). Such calorific value has been sourced from the actual invoices of January 2010 of Torrent Power Limited (Torrent Power Limited is the parent company of the PP and is operating a 1147.5 MW NG fired power plant in the state of Gujarat itself) which was available at the time of decision making and confirms to paragraph 6 of EB 62, Annex 05. Based on the same the gross calorific value of comes out to be 9395 kCal/SCM. Validation team has cross checked the copy of the invoices and the same has been found to be in line with the stated values. Hence, the value is correct.

Further, the Validation team has also verified the calorific value^{/CV/} of gas supply from Reliance (source : the news article published in the Indian Express dated 10/04/2009) and of gas supply from Petronet LNG (9880 Kcal/SCM) (source report on subsidies description by Institute of economic growth submitted to UNCTAD (united nations conference on trade and Development) dated May 2009 (page no. 78)). The validation team confirms that the GCV value considered is appropriate.

In addition to this the validation team has cross checked the net caloric value given in the other registered projects e.g. 8462 kCal/SCM in Gautami (4828) and

8545 kCal/SCM in Vemagiri (4334). In this context, it is concluded that the Gross Calorific value of natural gas considered is correct and appropriate.

4. The project is expected to be commissioned in April 2013. Based on the same, the PP has considered O&M expense of 1.849 million INR/MW applicable for 2013-14 which is considered based on the Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 page 28 which was available at the time of decision making and confirms to paragraph 6 of EB 62, Annex 05. Validation team has verified the value from CERC tariff order and the same has been found to be correct. The Central Electricity Regulatory Commission (CERC) is regulatory body of power sector in India. Hence, the consideration of its regulation is appropriate. Further, As per the CERC tariff regulation 2009, Operation and Maintenance or O&M expenses shall comprise expenditure incurred on operation and maintenance of the project, or part thereof, and includes the expenditure on manpower, repairs, spares, consumables, insurance and overheads. Based on the above, it is concluded that the O&M expenses considered is correct and appropriate.
5. The PP has considered Interest on term loan of 12% from the Second Quarter Review of Monetary Policy for the Year 2009-10^{/RBI/}, as published by the Reserve Bank of India dated 27/10/2009 and available at the link of <http://rbi.org.in/scripts/NotificationUser.aspx?Id=5326&Mode=0>. As mentioned and verified by validation team from the second Quarter Review of Monetary Policy 2009-10 dated 27/10/2009, the modal BPLR interest rate chosen by PP is the monthly average (%) of public sector banks (PSBs). Further to this the validation team has also checked the average BPLR of the public sector banks (PSBs) which comes to 12.25%. Thus, it is concluded by validation team that the modal BPLR value chosen for the benchmark calculation is correct and appropriate and hence confirms to paragraph 6 of EB 62, Annex 05.
6. The PP has considered 12 years of tenure of long term loan with quarterly repayments of the amounts. The news article in the Financial Express dated 21/03/2009 mentions that SBI could offer the loan of tenure of 11-12 years. The Validator has verified that the information was available to the PP at the time of decision making and is in conformance to paragraph 6 of EB 62 Annex 5. Further, the Validator has also verified with Statement of Objects and Reasons for CERC Terms and Conditions (dated 03/02/2009) available at the time of decision making and is in conformance with paragraph 6 of EB 62 Annex 5. The same provides 12 years for all normative loans. Thus, it is concluded by validation team that the repayment period considered for the project activity is reasonable.
7. The PP has considered 15% depreciation rate³⁷ (on WDV) for calculation of tax to be payable as per the Income Tax Act, 1961 as applicable at the time of decision making (<http://law.incometaxindia.gov.in/DIT/Income-tax-acts.aspx>). The validation team has verified the same and found to be correct.

³⁷ <http://taxguru.in/company-law/rates-of-depreciation-under-the-companies-act-as-mentioned-in-schedule-xiv.html> - Depreciation Rate as per Companies Act (Refer II. **PLANT AND MACHINERY** Point (b) under Rate Table) – 15%

The PP has considered 5.28% depreciation rate³⁸ (on SLM) up to 100% of asset value in profitability statement as per the Companies Act, 1956 as applicable at the time of decision making (http://www.mca.gov.in/Ministry/companies_act.html) The validation team has verified the same and found to be correct.

8. The PP has considered the tax holiday (u/s 80IA of the Income Tax Act, 1961), which the infrastructure projects (under which the project activity falls) are entitled for the 10 consecutive years out of the first 15 years after commissioning. Further, the section of income tax (i.e. 80 IAB applicable for AY 2010-11)) has also been verified for the availability of such tax holidays and found to be correct. However, the project activity liable to pay MAT as per this section of income tax (i.e. 115JB applicable for AY 2010-11) for the year for which the assessed tax liability is lower than minimum alternate tax (i.e. 16.995%) on book profit. Further, the PP has considered 33.99 % as the corporate tax rate for the other years (i.e. except MAT applicability year) <http://law.incometaxindia.gov.in/DIT/Income-tax-acts.aspx>). The tax rates considered was available with the PP at time of investment decision and thereby conforms to paragraph 6 of EB 62, Annex 05. Therefore, the tax rate is found appropriate as per the actual scenario and comparable to the project activity analysis, and thus correct and appropriate.
9. The PP has considered salvage value of Power Plant & Equipment considered in the project activity is taken as 10% in the financial analysis . The source/reference³⁹ of the salvage value^{/S-VAL/} submitted by PP is verified by validation team to correct and appropriate. In addition to this CERC tariff order is also verified by validation team which also evidences the salvage value as 10%. Thus, it is concluded by validation team that the salvage value considered in the financial calculation is correct and conservative.

For details of parameters please refer to the Validation Table for Assessment of Financial Parameters included in the Annex – A of this report.

c) Cross checking parameters: The cost of project, O&M cost, interest costs, depreciation and tax rate have been cross checked with the given references, CERC guidelines, Companies Act and Income Tax Act. For details please refer to the Validation Table for Assessment of Financial Parameters included in the Annex of this report.

d) Assessment of correctness of computation: The assessment involves checking the data input taken from documents, adoption of correct accounting principle and arithmetical accuracy. The validation team checked the documents and ensured that right input has been taken in the project cost and projections. The accounting principles adopted with respect to tax computation are found to be in order. The arithmetical accuracy is also found to be correct.

³⁸ <http://taxguru.in/company-law/rates-of-depreciation-under-the-companies-act-as-mentioned-in-schedule-xiv.html> - Companies Act Depreciation – 5.28%

³⁹ <http://energytechnologyexpert.com/financial-models/how-to-evaluate-economic-feasibility-of-a-power-plant-project-use-project-finance-model/> dated November 9th, 2009

The principle adopted by the project developer for computing LUCE/Project IRR is in conformity with the “Guidance on the Assessment of Investment Analysis” version 05, EB 62, Annex 05 issued by EB. LUCE has been computed for 25 years for project activity as well as baseline alternatives. The same is in conformity with the guidance at 3 of the EB 62 Annex 05.

Based on the above, the IRR of the project works out to 11.02% in contrast to the benchmark of 13.34%. In the above background, the 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. The sensitivity analysis is also carried out for project IRR by applying variation of +/- 10 % for parameters Fuel Price, PLF, Project Cost, O&M Cost and Station heat rate as given below:

Input Parameters	Project IRR (without CDM revenue)		Benchmark (WACC)
Variation	+10%	-10%	Base IRR
Fuel Price	11.03%	11.00%	13.34%
PLF	11.03%	11.00%	13.34%
Project Cost	10.99%	11.05%	13.34%
O&M cost	11.04%	10.99%	13.34%
Heat Rate	11.03%	11.00%	13.34%

Since the tariff is based on cost plus basis i.e. (a) the tariff for IRR computation has been derived from the annual levelised cost of generation and (b) Cost elements as considered for computing the project IRR have been estimated following the fixed and variable cost as determined to compute levelised cost of generation the sensitivity analysis does not make any difference (except to the extent of impact on tax due to marginal modification in working capital loans). However, the PP has carried out the sensitivity analysis as per the guidance 20 & 21 of EB 62 Annex 5 even though the change in fuel cost O&M cost, PLF or heat rate will result in tariff change leading to very marginal variation in the project IRR as it is based on the levelised cost of generation.

Further, the validation team has also raised CL B17 to substantiate that the change in the fuel cost, O&M cost, PLF or heat rate (resulting in tariff change in actual operation of the project activity) as considered for the sensitivity analysis is appropriate. Based on the submission of PP in response to CL B17, the validation team observes that the change considered by the PP in fuel cost, O&M cost, PLF, heat rate and project cost is appropriate. However, the validation team carried out its own independent assessment, which reveals that even with +/- 50% for all the parameters, the IRR does not, crosses the benchmark. Even, the possibility of +/- 50% variation is not realistic.

The validation team has also cross checked the invoices^{INV} raised by the PP's existing power plant, whose tariff has also been determined by CERC under the

CERC Tariff Regulations 2009^{/CERC/}, for August, September and November of 2009 and January and March of 2010^{/INV/} and observes the variation in the tariff. Thus it is validated that the change in the fuel cost, O&M cost, PLF or heat rate will result in tariff change in the actual situation of the plant operation.

Further, the validation team has also reviewed recently registered project (4419) & (5554) and observed the similar results of sensitivity analysis on project IRR is obtained as the project activity.

As could be seen from the data given above, the project would continue to remain additional even when the factors are subjected to reasonable variation.

In the above background, validation team concludes that the project is additional and will continue to remain additional.

Barrier analysis

Project developer did not considered barrier analysis. Hence, this is not applicable

Common practice analysis

Project Activity is not a common practice which can be evidenced from the following arguments presented in section B.5 of the PDD.

Since it is a large scale project, as per paragraph 119 of the VVM (01.2), common practice analysis is required to be carried out as a credibility check of the other evidence used by the project participants to determine additionality. This is a test to complement the investment analysis to confirm that the project activity is not widely observed and commonly carried out in the region.

According to the "Tool for the demonstration and assessment of additionality", version 06.1.0; analysis of any other activities implemented previously or currently underway that are similar to the proposed project activity needs to be performed to describe whether and to which extent similar activities have already diffused in the relevant region. This has been analyzed by the PP as per Step 4 Para 47 of "Tool for the demonstration and assessment of additionality" (version 06.1.0) Annex 20 EB 69 and Guidelines on common practice (version 02.0) Annex 8 EB 69 and the same has been assessed by the validation team to be correct and appropriate.

Accordingly, the analysis has been carried out as per Para 47 of "Tool for the demonstration and assessment of additionality", version 06.1.0.

Entire host country (India) is correctly considered for the assessment. For any particular technology or project, approach to technology, access to the technology and finance, technical expertise, local laws and legislation, government policies differs country to country, therefore considering the entire country only for the geographical area is found acceptable.

Step 1- Output Range:

The PP has considered output range as +/-50% of the design output or capacity of the proposed project activity in line with the tool. The capacity of the project activity being 382.5 MW, the +50% design output or capacity comes to 573.75 MW and -50% design output or capacity comes to 191.25 MW.

Step 2 – identification of all the plants: The Project Proponent has considered two cases for identification of similar projects.

Case 1: Considering all the power plant irrespective of the type of fuel being used for generation of electricity.

Case 2: Considering only Natural Gas Based Power plant.

Case 1:

The PP has identified the all power plants having similar output (base load electricity generation). Except the hydro power plants in the range as determined in the step 1 irrespective of the type of fuel being used for generation of electricity. The analysis has been conducted for the determined geographical region (India). There are 337 power plants in the output range of 191.25 MW to 573.75 MW, available in operation at the time of start date of the project activity. The PP has provided the list of the same as Appendix 4 to the PDD. PP has taken the same from “The baseline CO₂ database in India” published by the CEA, government of India regularly. This database provides/incorporates details of all the power plant operating in the host country along with their installed capacity, year of commissioning and the fuel. Database is the latest publically available at http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm and which contains information about the projects whose commercial operations have started before the start date of the candidate project activity (i.e. 02/07/2010) and same has been used by the PP for common practice analysis. The same has been verified and found correct.

Case 2:

The PP has identified the all power plants having similar output (electricity generation) in the range as determined in the step 1 and using Natural Gas as fuel. The analysis has been conducted for the determined geographical region (India). There are 27 power plants in the output range of 191.25 MW to 573.75 MW, available in operation at the time of start date of the project activity. The PP has provided the list of the same as Appendix 4 to the PDD. PP has taken the same from “The baseline CO₂ database in India” published by the CEA, government of India regularly. This database provides/incorporates details of all the power plant operating

in the host country along with their installed capacity, year of commissioning and the fuel. Database is the latest publically available at http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm and which contains information about the projects whose commercial operations have started before the start date of the candidate project activity (i.e. 02/07/2010) and same has been used by the PP for common practice analysis. The same has been verified and found correct.

Step 3: Identification of plants N_{all}

Case 1:

Out of 337 plants, the PP has identified and removed 10 plants under the criteria of registered CDM projects and projects activities undergoing validations. The list of such plants has been checked and found correct.

Thus the total identified power plants in the range N_{all} is 327.

Case 2:

Out of 27 plants, the PP has identified and removed ten plants under the criteria of registered CDM projects and projects activities undergoing validations. The list of such plants has been checked and found correct.

Thus the total identified power plants in the range N_{all} is 17.

Step 4 – Identification of plants N_{diff}

Case 1:

In line with the Para 8 of the EB 69 Annex 8, the PP has defined the different technology as the plants having the different energy source or the fuel, plant owned and operated by public sector entity (Centre and State), and project implemented before 2002 under different investment climate. The CEA database also provides the primary fuel for all the power plant and based on the same it has been found that out of 310 plants uses input fuel other than Natural Gas, 10 Plants are owned and operated by public sector entity and 5 plants are pre 2002. The same has been verified from CEA database. Thus, the plants having different technology N_{diff} is 325. The same has been verified and found correct.

Case 2:

In line with the Para 8 of the EB 69 Annex 8, the PP has defined the different technology as the plants owned and operated by public sector entity (Centre and State), i.e 10 projects and project implemented before 2002 under different investment climate i.e. 5 projects. The same has been verified from CEA database. Thus the plants having different technology N_{diff} is 15. The same has been verified and found correct.

Step 5– Calculation of F:

Case 1

The factor F is defined as $F = 1 - N_{diff}/N_{all}$. Thus, $F = 1 - 325/327$. The factor F comes for the project activity as 0.006116 and $N_{all} - N_{diff} = 327 - 325 = 2$.

Case 2

The factor F is defined as $F = 1 - N_{diff}/N_{all}$. Thus, $F = 1 - 15/17$. The factor F comes for the project activity as 0.1176 and $N_{all} - N_{diff} = 17 - 15 = 2$.

As per the Para 47 annex 20 of EB 69 (“Tool for the demonstration and assessment of additionality”, version 06.1.0) and annex 8 of EB 69 (Guidelines on common practice version 02.0), proposed project activity is a common practice within a sector in the applicable geographical area if the factor F is greater than 0.2 and $N_{all} - N_{diff}$ is greater than 3. Here, in the case of proposed project activity, the factor F, as calculated above in both the cases, is not greater than 0.2 and also $N_{all} - N_{diff}$ is not greater than 3. Common Practice Analysis^(CPA) submitted by project proponent is verified by validation team to confirm that the factor “F” is calculated correctly in line with the “Tool for the demonstration and assessment of additionality”, version 06.1.0. Thus, it is concluded by validation team that the proposed project activity is not a common practice as per annex 20 (Tool for the demonstration and assessment of additionality version 06.1.0) and annex 8 (Guidelines on common practice version 02.0) of EB 69 within a sector in the applicable geographical area.

Summary

In the above background, the validation team concludes that the project is not a business as usual scenario and is additional with the provisions of the Methodology.

5.2.6 Monitoring Methodology

Applied baseline and monitoring methodology is AM0029 Version 3.0 which is approved by UNFCCC and appropriate for the project activity. Monitoring plan is described in section B.7.2 of the PDD. During the site visit and by conducting document review, validation team is convinced that the monitoring plan described in the PDD is implemented at the project site.

5.2.7 Monitoring Plan

The project applies approved monitoring methodology: AM0029 “Grid Connected Electricity Generation plant using Non-Renewable and less GHG intensive fuel”, Version 03, as per the CDM EB 39.

The methodology requires monitoring of Annual Fuel(s) consumption in project activity, Net Calorific value(s) of the fuel used in the project activity, Fuel emission factors for fuel(s) used in the project activity.

Calibration, periodical testing and maintenance procedures of monitoring equipment are clearly mentioned in the section B.7.2 of PDD as per QA/QC procedure.

Gas flow meters installed by the EPC contractor at the project end is turbine flow meter. Pressure transmitter and temperature transmitter is calibrated as per manufacturer guidelines.

For NCV measurement, chromatographs installed by gas supplier and calibrated as per standard. However, as per approved monitoring methodology AM 0029, no additional QA/QC is required for parameter NCV.

Baseline emissions

Validation team is convinced that the baseline parameters are properly identified and described in the PDD. Net annual electricity generated in the project plant is measured by online energy meters

Grid emission factor was identified based on the lowest of three options as required by the methodology. Accordingly the PP has taken the build margin as baseline emission factor. According to methodology as build margin is selected as emission factor it needs to be determined ex-post as described in tool to calculate emission factor for an electricity system and is specified in the PDD. The Build margin has been duly included in the monitoring plan. The procedures to monitor this parameter including the information about the data source and measurement method have been appropriately indicated in the section B.7.1 of the PDD.

Validation team has reviewed the CEA CO₂ database version available at the time of validation and procedures of approved methodology and confirmed that baseline emission factor is correctly identified for calculation of baseline emissions. The PP has duly selected option 1, Build margin emission factor amongst all three options. The value of data applied (**0.85878 tCO₂/MWh**) is correct.

For **project emission**, annual quantity of fuel i.e. natural gas used in the project activity is monitored by flow meters installed at the project end and cross checked with the invoices of the gas transporter. Net calorific value is measured by online chromatograph installed by gas transporter.

As per the methodology ex-post determination of emission factor for upstream fugitive methane emission is required to monitor **leakage emission**. Section B.7.1 of the PDD clearly specified the above requirement and will be determined ex-post based on the latest data available.

5.2.8 Project Management Planning

For the purpose of the projects monitoring an appropriate project management planning team is maintained by the project proponent at site. The detailed structure of the CDM project management team is clearly defined in section B.7.2 of the PDD. At each level the roles and responsibilities of project team members is mentioned clearly.

Validation team has also reviewed the documents submitted by the PP and ensured that roles and responsibilities for operation and maintenance and data recording are properly implemented. All monitored data will be archived in physical as well as in electronic form. The data will be kept for the whole crediting period and additional 2 years as given in the PDD^{/PDD2/}.

Thus it is concluded by validation team that the project management planning appropriate for the purpose of the projects monitoring is correct and appropriate.

5.2.9 Crediting Period

As described in section C.2.2.1 of the PDD^{/PDD/}, crediting period chosen is 10 years. And start date of the fixed crediting period is the date i.e. 02/04/2013 or a date not earlier than the date of request for registration.

Thus, it is concluded by validation team that the envisaged starting date of the crediting period is realistic, correct and appropriate, taking into consideration the times needed for validation and registration is correct and appropriate.

5.2.10 Environmental Impacts

The Environmental Impact Assessment study has been carried out for the proposed project activity was carried out by M/s EMTRC Consultants Private Limited dated March 2010 appointed by the project participant to assess the environmental impact and suggest mitigation measures from the Project.

This has been confirmed by the validation team during the site visit, interview with the stakeholder and review of the EIA report^{/EIA/} submitted to the validation team. Moreover the project has received Environmental Clearance^{/SC/} from MoEF and Consent for Establishment from Gujarat Pollution Control Board (GPCB). The project activity does not result in any negative impacts on environment.

Validation team has reviewed the EIA (Environment Impact Assessment) report^{/EIA/} and confirms that there are no significant environmental impacts on surrounding environment as this being gas based power plant which is a clean technology.

Thus, it is concluded by validation team that the analysis of the environmental impacts of the project activity been sufficiently described section D.2 of the PDD and in line with the host party environmental legislation.

5.2.11 Comments by Local Stakeholders

Local stakeholders were invited by personal invitation letter and public notice given to various stakeholders in English as well as in local language prior to the stakeholder meeting which was conducted on 25/11/2011.

Copy of minutes of meeting (MOM) of the stakeholder meeting dated 25/11/2011 and attendance and feedback questionnaire as received from the Stake-holders who attended the meeting is verified by validation team during the site visit and interview with the relevant stakeholders. This was also confirmed during the site visit by conducting document review^{/SHCP/} and interview with local stakeholders.

No negative or adverse comments were received. Details of the stakeholder consultation meet is described in section E of the PDD. Thus, it is concluded by validation team that the comments by local stakeholders has been considered relevant for the proposed CDM project activity and due account of comments received is described in the PDD.

6 VALIDATION OPINION

M/s Torrent Power Limited has commissioned the TÜV NORD JI/CDM Certification Program (CP) to validate the project: "UNOSUGEN Natural gas based grid connected Combined cycle power generation project" 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 pre-validation 21 Corrective Action Requests (CARs) and 18 Clarification Requests (CLs) were raised and successfully closed.

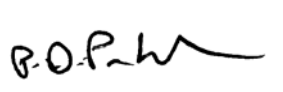
The review of the project design documentation and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and review of comments by parties, stakeholders and NGOs have provided TÜV NORD JI/CDM CP with sufficient evidence to validate the fulfilment 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) no.4/10/2012-CCC dated 27/06/2012.
- 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 **12,705,971 tCO_{2e}** are most likely to be achieved within the fixed crediting period of 10 years.

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

Vadodara, 29/12/2012



Pankaj Patel
TÜV NORD JI/CDM CP
Validation Team Leader

Essen, 29/12/2012



Stefan Winter
TÜV NORD JI/CDM CP
Final Approval

7 REFERENCES

Table 7-1: Documents provided by the project participant

Reference	Document
/COAL-P/	Government Of India Ministry Of Coal Rajya Sabha Unstarred Question No 2628 To Be Answered On 14/12/2009 Coal Prices. http://164.100.47.5:8080/members/website/quest.asp?qref=149034
/CPA/	Common practice analysis (CPA) for the project activity titled "UNOSUGEN Natural gas based grid connected Combined cycle power generation project"
/CV/	<ul style="list-style-type: none"> News article⁴⁰ published Indian express dated 10/04/2009 for considering NCV value of 8100 Kcal/SCM for Reliance natural gas. Report on subsidies description by Institute of economic growth submitted to UNCTAD (United Nations conference on trade and Development) dated May 2009 (page no. 78) for considering GCV value of Petronet LNG as 9880 Kcal/SCM.
/EIA/	Environment Impact Assessment (EIA) for the project activity prepared by EMTRC Consultants Private Limited dated March 2010.
/EPC/	EPC Contract signed between M/s Torrent Power Limited and Siemens AG & Siemens India Ltd on 02/07/2010 i.e. start date of the project activity.
/EPC-O/	Extract of EPC Contract signed between TPL and Siemens AG & Siemens India Ltd on May 2005 (existing SUGEN NG based power plant)
/ER/	<ul style="list-style-type: none"> Emission Reduction sheet for the project activity. Revised emission Reduction sheet for the project activity.
/GMR/	Equity research report prepared by ICRA on GMR
/Hazira-2915/	Registered CDM project - 340 MW Gas based combined cycle power project expansion at Hazira.
/HCA/	Host Country Approval letter No. 4/10/2010 dated 27/06/2012 from Ministry of Environment & Forest (MoEF), Government of India
/IDFC/	Project Appraisal and Information Memorandum dated September 2010 prepared by IDFC
/INV/	<ul style="list-style-type: none"> Invoices for NG supply and transportation by RIL and IOCL through

⁴⁰ <http://www.indianexpress.com/news/govt-allocates-kgd6-gas-to-power-sector/445266/>

Reference	Document
	<p>GSPL network at the site for SUGEN plant (PP's existing NG based power plant).</p> <ul style="list-style-type: none"> • Invoices (January first fortnight invoice) ref. no. GSPL/2010 for gas transportation services for by GSPL at the site for SUGEN plant (PP's existing NG based power plant) dated 16/01/2010. • Invoice (ref. no. TPL/SUGEN/COMMERCIAL/804) for power supplied (Ahmedabad) during the period of 01-31 December 2009 (i.e. prior to investment decision making time) by project proponent's existing project SUGEN Mega Power (natural gas based) project. • Invoice (ref. no. TPL/SUGEN/COMMERCIAL/803) for power supplied (Surat) during the period of 01-31 December 2009 (i.e. prior to investment decision making time) by project proponent's existing project SUGEN Mega Power (natural gas based) project. • Invoice for the month of August 2009 (dated 20/01/2010), September 2009 (dated 18/01/2010), November 2009 (dated 18/01/2010), January 2010 (dated 11/02/2010) and March 2010 (dated 09/04/2010) for power supplied (Surat) during such period by project proponent's existing project SUGEN Mega Power (natural gas based) project.
/LS/	Loan Sanction letter ref. No. CAG'A/AMT-I/448 of SBI dated 10/02/2011
/Lignite-P/	<ul style="list-style-type: none"> • Copy of Sale Prices Of Various Grades Of Lignite by GMDC LTD (A Government of Gujarat undertaking) For Large Scale Industries W.E.F. 1-1-2010 • Report on Gujarat Lignite Resources and Scope for Joint Sector Thermal Power and SSI Project (http://www.gidb.org/downloads/reportonGLRS.pdf) (Annexure IV)
/MD/	Extract of the minutes of meeting of the Board of Directors of M/s Torrent Power Limited (TPL) for the Project activity dated 28/01/2010.
/MOC/	Modalities of Communication
/PDD/	<ul style="list-style-type: none"> • Published Project Design Document (PDD) titled "UNOSUGEN Natural gas based grid connected Combined cycle power generation project" hosted from 11/04/2012 to 11/05/2012, Ver.1.0 dated 30/03/2012. • Project Design Document (PDD) titled "UNOSUGEN Natural gas based grid connected Combined cycle power generation project", Ver.2.0 dated 18/07/2012. • Project Design Document (PDD) titled "UNOSUGEN Natural gas based grid connected Combined cycle power generation project", Ver.3.0 dated 28/08/2012. • Project Design Document (PDD) titled "UNOSUGEN Natural gas based grid connected Combined cycle power generation project", Ver.4.0 dated 26/10/2012 • Final Project Design Document (PDD) titled "UNOSUGEN Natural gas

Reference	Document
	based grid connected Combined cycle power generation project", Ver.5.0 dated 27/12/2012
/PPA/	<ul style="list-style-type: none"> • Power purchase Agreement (PPA) signed (for 100 MW) between PP and PTC India Limited (formerly known as Power Trading Corporation of India Ltd) for project proponent's existing project SUGEN Mega Power (natural gas based) project dated 02/08/2005. • Power purchase Agreement (PPA) signed (for 273.75 MW) between PP and The Ahmedabad Electricity Company Limited for project proponent's existing project SUGEN Mega Power (natural gas based) project dated 08/05/2004. • Power purchase Agreement (PPA) signed (for 35 MW) between PP and PTC India Limited (formerly known as Power Trading Corporation of India Ltd) for project activity dated 04/04/2012.
/PI/	<ul style="list-style-type: none"> • Prior Intimation (F-CDM-Prior consideration form dated 30/11/2010) by M/s Torrent Power Limited (TPL) to UNFCCC via email dated 30/11/2010 and acknowledged by UNFCCC via email dated 13/12/2010. • Prior Intimation (letter dated 30/11/2010) by M/s Torrent Power Limited (TPL) to DNA dated 30/11/2010 and acknowledged letter copy by DNA dated 13/12/2010.
/SC/	<ul style="list-style-type: none"> • Environment Clearance (valid for a period of 5 years to start operation by the power plant) from Ministry of Environment & Forests, (Government of India) for 382.5 MW UNOSUGEN Gas based Combined Cycle Power Plant (CCPP) via letter ref. No. J 13012/74/2009-IA.II (T) dated 09/09/2010. • Consent to Establish (NOC) from Gujarat Pollution Control Board (GPCB) for 382.5 MW UNOSUGEN Gas based Combined Cycle Power Plant (CCPP) via letter ref. no. GPCB/CCA-SRT-1076/GPCB ID 32601/64048 dated 26/11/2010. • NOC for height clearance from Airport Authority of India via letter ref. no. BT-1/NOCC/CS/MUM/11/Chimney/04 dated 05/05/2011.
/SHCP/	<p>Stakeholder consultation process evidences:</p> <ul style="list-style-type: none"> • Copy of Invitation letter/public notice given to Mamltard Executive Magistrate, Mamltard office (Kamrej) in English and local language dated 14/11/2011. • Copy of Invitations letter to Regional Officer of GPCB, Surat dated 15/11/2011. • Copy of Invitation letter to Brackish Water Resources Centre, Surat dated 15/11/2011. • Copy of Minutes of Meeting (MOM) of the Stakeholder meeting dated 25/11/2011. • Copy of attendance and feedback questionnaire as received from the Stake-holders attended the meeting

Reference	Document
/S-VAL/	Article ⁴¹ on “How to evaluate economic feasibility of a power plant project – use project finance model” dated 09/11/2009 by Energy Technology and Pricing Expert Engr. Marcial T. Ocampo.
/Tariff-SUGEN/	Tariff order dated 11/01/2010 of existing SUGEN plant by CERC
/TUV-C/	Contract signed between M/s Torrent Power Limited and DOE for carrying out the validation of CDM project via proposal reference no. 10CDMIN060040 dated 30/03/2012.
/XLS/	<ul style="list-style-type: none"> • Spreadsheets w.r.t Published Project Design Document (PDD) titled “UNOSUGEN Natural gas based grid connected Combined cycle power generation project” hosted from 11/04/2012 to 11/05/2012, Ver.1.0 dated 30/03/2012. • Spreadsheets w.r.t Project Design Document (PDD) titled “UNOSUGEN Natural gas based grid connected Combined cycle power generation project”, Ver.2.0 dated 18/07/2012. • Spreadsheets w.r.t Project Design Document (PDD) titled “UNOSUGEN Natural gas based grid connected Combined cycle power generation project”, Ver.3.0 dated 28/08/2012. • Spreadsheets w.r.t Project Design Document (PDD) titled “UNOSUGEN Natural gas based grid connected Combined cycle power generation project”, Ver.4.0 dated 26/10/2012. • Spreadsheets w.r.t final Project Design Document (PDD) titled “UNOSUGEN Natural gas based grid connected Combined cycle power generation project”, Ver.5.0 dated 27/12/2012.

Table 7-2: Background investigation and assessment documents

Reference	Document
/AM29/	AM0029: Baseline Methodology for Grid Connected Electricity Generation Plants using Natural Gas (Version 3.0).
/ACT/	<ul style="list-style-type: none"> • Income Tax Act, 1961 <ul style="list-style-type: none"> 1. http://www.kpcindia.com/Pdf/Tax-Guide-2009.pdf - Tax Rate (Refer Page 2) (Corporate Tax – 33.99% and MAT – 16.995%)

⁴¹ <http://energytechnologyexpert.com/financial-models/how-to-evaluate-economic-feasibility-of-a-power-plant-project-use-project-finance-model/>

Reference	Document
	<ul style="list-style-type: none"> Companies Act, 1956 <ol style="list-style-type: none"> http://taxguru.in/company-law/rates-of-depreciation-under-the-companies-act-as-mentioned-in-schedule-xiv.html - Depreciation Rate as per Companies Act (Refer II. PLANT AND MACHINERY Point (b) under Rate Table) – 15% http://taxguru.in/company-law/rates-of-depreciation-under-the-companies-act-as-mentioned-in-schedule-xiv.html - Companies Act Depreciation – 5.28%
/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
/GCP/	UNFCCC: Guidelines for completing CDM-PDD and CDM-NM
/IPCC/	<ul style="list-style-type: none"> IPCC Good Practice Guidance & Uncertainty Management in National Greenhouse Gas Inventories, 2000 Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual
/PDD-T/	Project Design Document Form (CDM PDD) – Version 03
/KP/	Kyoto Protocol (1997)
/MA/	Decision 3/CMP. 1 (Marrakesh – Accords & Annex to decision (17/CP.7))
/T-REF/	<ol style="list-style-type: none"> GUJARAT ELECTRICITY REGULATORY COMMISSION Multi Year Tariff Framework Regulations Notification 1 of 2007 dated 30/11/2007 THE ELECTRICITY ACT, 2003 [No.36 of 2003] dated 26/05/2003. Gujarat Electricity Regulatory Commission (GERC)'s annual Performance Review for FY 2008-09 & aggregate Revenue Requirement for FY 2009-10 for Torrent Power Limited Case No. 966/2009 dated 09/12/2009
/TA/	<ul style="list-style-type: none"> Methodological tool "Tool for the demonstration and assessment of additionality" (version 06.1.0), of EB 69 Annex 20.. Guidelines on common practice (version 02.0) Annex 8 EB 69 Tool to calculate the emission factor for an electricity system, version 2.2.1, EB 65.
/VVM/	Validation and Verification Manual (Version 01.2, Annex 1, EB 55)

Table 7-3: Websites used

Reference	Link	Organisation
/BSE/	http://www.bseindia.com	Bombay stock Exchange data
/CEA/	http://www.cea.nic.in/	CO2 baseline Database for Indian Power Sector, November 2009 issued by Central Electricity Authority, Ministry of Power, Government of India
	http://www.cea.nic.in/archives/thermal/bs/dec09.pdf	CEA monthly report on Broad status of Thermal Power Project in the country dated December 2009
	http://www.cea.nic.in/archives/thermal/bs/dec09.pdf	Monthly Report on Broad Status of Thermal Power Projects.
/CERC/	http://www.cercind.gov.in/	<ul style="list-style-type: none"> Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 CERC Analysis⁴² of the Comments Received from Stakeholders on the Proposed Methodology for Calculating Escalation Rates for Use in Tariff Based Competitive Bidding by the Staff of the Commission (Table 1 – Page 4) Statement of Objects and Reasons of CERC⁴³ (Terms and Conditions of Tariff) Regulations, 2009
/CD4CDM/	www.cd4cdm.org	Capacity Development for the CDM (UNEP Risoe Centre)
/GERC/	http://www.gercin.org/regulationspdf/en_13010516_11.pdf	Multi Year Tariff Framework Regulation, 2007. Of Gujarat Electricity Regulatory Commission (GERC)
/IPCC/	www.ipcc-nggip.iges.or.jp	Intergovernmental Panel on Climate Change publications
/MOEF/	http://www.cdmindia.nic.in	Ministry of Environment and forests (DNA of India)
/MOP/	www.powermin.nic.in	Ministry of Power

⁴² http://cercind.gov.in/2010/ORDER/mis/Escalation_New_Method_Information_web.pdf

⁴³ <http://www.cercind.gov.in/2009/February09/SOR-regulations-on-T&C-of-tariff-05022009.pdf> (page 119-120)

Reference	Link	Organisation
/BSE/	http://www.bseindia.com	Bombay stock Exchange data
/RBI/	www.rbi.org	Modal BPLR of PSBs - Second Quarter Review of Monetary Policy 2009-10 date 27/10/2009 table 17 (http://rbi.org.in/scripts/NotificationUser.aspx?Id=5326&Mode=0)
/UNFCCC/	http://cdm.unfccc.int	United Nations Framework Convention on Climate Change

Table 7-4: List of interviewed persons

Reference	Mol ¹		Name	Organisation / Function
/IM01/	T,V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Jinal Mehta	Director, M/s Torrent Power Limited, UNOSUGEN
/IM01/	T,E,V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Rajiv Raghav	G.M.(Coordinator), M/s Torrent Power Limited, UNOSUGEN
/IM01/	T,E,V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Jaydip Chudasama	Manager, M/s Torrent Power Limited, UNOSUGEN
/IM01/	T,E,V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Rajdeep Barad	Assistant Manager, M/s Torrent Power Limited, UNOSUGEN
/IM03/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Dhanabhai Babubhai Rathod	Sarpanch, Village Nani Pardi
/IM03/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Prakashbhai Thakorbbhai Patel	Village Dhoran Pardi, Villager
/IM03/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Dhanabhai Babubhai Rathod	Sarpanch, Village Nani Pardi
/IM03/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	B.D.Ramani	Contractor

¹⁾ 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.
A. General Description of Project Activity				
A.1. Approval <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>	<i>Description:</i> Host country approval is not provided by the Project Participants for the project activity. <i>Justification of evidences:</i> Project Design Document <i>Conclusion:</i> Subject to closure of CAR A1	/PDD/	CAR A1	OK
A.1.2. Are the approvals issued from organisations listed as DNAs on the UNFCCC CDM website? (EB 55 Annex 1, §§ 44, 47, 48, 49 (b), 49 (c), 53) <i>Indicate the means of validation employed to assess the</i>	<i>Description:</i> Host country approval is not provided by the Project Participants for the project activity. <i>Justification of evidences:</i> Project Design Document	/PDD/	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.
<i>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>	<i>Conclusion:</i> Subject to closure of CAR A1			
A.1.3. Do the written approvals confirm that the corresponding party is a Party to the Kyoto Protocol? (EB 55 Annex 1, § 45(a))	<i>Description:</i> Host country approval is not provided by the Project Participants for the project activity. <i>Justification of evidences:</i> Project Design Document <i>Conclusion:</i> Subject to closure of CAR A1	/PDD/	CAR A1	OK
A.1.4. Do the written approvals confirm that the participation is voluntary? (EB 55 Annex 1, § 45(b))	<i>Description:</i> Host country approval is not provided by the Project Participants for the project activity. <i>Justification of evidences:</i> Project Design Document <i>Conclusion:</i> Subject to closure of CAR A1	/PDD/	CAR A1	OK
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> Host country approval is not provided by the Project Participants for the project activity. <i>Justification of evidences:</i> Project Design Document	/PDD/	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.
	<i>Conclusion:</i> Subject to closure of CAR A1			
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> Host country approval is not provided by the Project Participants for the project activity. <i>Justification of evidences:</i> Project Design Document <i>Conclusion:</i> Subject to closure of CAR A1	/PDD/	CAR A1	OK
A.1.7. Are the written approvals unconditional with regard to A.1.3 to A.1.6? (EB 55 Annex 1, § 46)	<i>Description:</i> Host country approval is not provided by the Project Participants for the project activity. <i>Justification of evidences:</i> Project Design Document <i>Conclusion:</i> Subject to closure of CAR A1	/PDD/	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)	<i>Description:</i> Details of project participants provided in the PDD are consistent <i>Justification of evidences:</i> Project Design Document <i>Conclusion:</i> Validation team has reviewed PDD and confirmed that the details of the project participants are consistent in Annex-1 and section A.3 of the PDD.	/PDD/	OK	OK
A.1.9. Are all project participants listed in the PDD	<i>Description:</i> Host country approval is not provided by the	/PDD/	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>approved at least by one Party involved?</p> <p>(EB 55 Annex 1, § 51)</p> <p><i>Indicate whether the participation of the project participant(s) has been approved by a Party to the Kyoto Protocol.</i></p> <p><i>Describe the means of validation employed to draw this conclusion.</i></p>	<p>Project Participants for the project activity.</p> <p><i>Justification of evidences:</i> Project Design Document</p> <p><i>Conclusion:</i> Subject to closure of CAR A1</p>		A1	
<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> Host country approval is not provided by the Project Participants for the project activity.</p> <p><i>Justification of evidences:</i> Project Design Document</p> <p><i>Conclusion:</i> Subject to closure of CAR A1</p>	/PDD/	CAR A1	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> Contractual agreement with TUV-NORD and M/s Torrent Power Limited (project participants)</p> <p><i>Justification of evidences:</i> Signed Service proposal dated 30/03/2012 between PP and DOE^{TUV-C/}.</p> <p><i>Conclusion:</i> As confirmed from the service proposal dated 30/03/2012 that the DOE has direct contractual agreement with PP.</p>	/PDD/ /TUV-C/	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.
A.2. Contribution to Sustainable Development <i>The project's contribution to sustainable development is assessed.</i>				
A.2.1. Has the host country confirmed that the project assists it in achieving sustainable development? (EB 55 Annex 1, §§ 125–127) <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>	<i>Description:</i> Host country approval is not provided by the Project Participants for the project activity. <i>Justification of evidences:</i> Project Design Document <i>Conclusion:</i> Subject to closure of CAR A1	/PDD/	CAR A1	OK
A.2.2. Will the project create other environmental or social benefits than GHG emission reductions? (EB 55 Annex 1, §§ 125–127) <i>Describe the other positive aspects not related to GHG emission reduction on the environment.</i>	<i>Description:</i> Installation of 382.5 MW power plant will generate other social and environmental benefits. <i>Justification of evidences:</i> The validation team had conducted interview during the on-site visit. Sustainable Development action plan of Appendix-6 of PDD. <i>Conclusion:</i> The project will lessen the power shortage in the region, generate locale employments and will bring benefits to the local community around the project site. PP has initiated various social activities like Shiksha Setu, Medical centre, bio gas plant as a CSR activity.	/PDD/ /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.
A.3. PDD editorial aspects <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)	<i>Description:</i> Latest version 03 of the PDD is applied by the PP. <i>Justification of evidences:</i> During visited UNFCCC official website found that the latest version is version 03 and same is applied. <i>Conclusion:</i> It evidenced that latest version of PDD for is utilized and applied accordingly.	/PDD-T/ /PDD/ /UNFCCC/ C/	OK	OK
A.3.2. Has the PDD been duly filled in accordance with the latest guidance(s)? (EB 55 Annex 1, §§ 56–57)	<i>Description:</i> PDD is correctly filled as required vide EB 46, Annex 12 <i>Justification of evidences:</i> PDD, AM 0029, unfccc tools <i>Conclusion:</i> Subject to closure of CAR A2 and A3	/PDD/ /AM29/	CAR A2 CAR A3	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.4. Technology to be employed <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, 64)</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>§64 (a) Describe the process undertaken to validate the accuracy and completeness of the project description.</i></p> <p><i>§64 (b) Contain the DOE's opinion on the accuracy and completeness of the project description.</i></p>	<p><i>Description:</i> The project description is given in various parts of the PDD (esp. In sections A.2 and A.4.2 and A.4.3).</p> <p><i>Justification of evidences:</i> The validation team has verified the relevant sections of the PDD and compared the observation during site visit against the applied methodology.</p> <p><i>Conclusion:</i> By means of site visit and document review it is confirmed that the description of the project activity along with its technical aspects has been filled adequately in the PDD.</p> <p>However CAR A4 and A5 were raised.</p>	/PDD/ /IM01/	CAR A4 CAR A5	OK
<p>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?</p>	<p><i>Description:</i> Description of the project activity is based on the real situation.</p> <p><i>Justification of evidences:</i> Document review of PDD and interview with project participants during on site visit.</p> <p><i>Conclusion:</i> The project is not yet commissioned and it has</p>	/PDD/ /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.
	been verified during site visit that the project will be implemented according to the project description in the PDD.			
<p>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?</p> <p>(EB 55 Annex 1, §§ 63–64) <i>Describe the steps taken to validate this issue.</i></p>	<p><i>Description:</i> Project does not involve alteration of the existing installation</p> <p><i>Justification of evidences:</i> Document review of PDD and interview with project participants during on site visit.</p> <p><i>Conclusion:</i> As verified, project activity is an installation of new natural gas based Grid connected CCPP and is a Greenfield project and does not involve any alteration of the existing installations.</p>	<p>/PDD/ /IM01/</p>	<p>OK</p>	<p>OK</p>
<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 description is given in various parts of the PDD (esp. In sections A.2 and A.4.2 and A.4.3).</p> <p><i>Justification of evidences:</i> By means of interview during the site visit and review of the technical specification of the project equipments by the validation team.</p> <p><i>Conclusion:</i> By means of knowledge of the validation team and document check it can be assessed that the project design and technology involves Gas turbines SGT5-4000F are F-class latest high efficiency gas turbines involving advance technology supplied by Siemens which reflects current good practice.</p>	<p>/PDD/ /IM01/ /TS/</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.
<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> The project description is given in various parts of the PDD (esp. In sections A.2 and A.4.2 and A.4.3).</p> <p><i>Justification of evidences:</i> During the site visit the technology and engineering of the project activity was verified. Project equipments involved in the project activity are supplied by Siemens renowned suppliers and is a proven technology.</p> <p><i>Conclusion:</i> By means of knowledge of the validation team and document check it can be assessed that the project design and technology involves Gas turbines SGT5-4000F are F-class latest high efficiency gas turbines involving advance technology supplied by Siemens represents state of the art technology.</p>	<p>/PDD/ /TS/ /IM01/</p>	<p>OK</p>	<p>OK</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> Operation and maintenance of the project is to be done by the project team assigned by the project participant.</p> <p><i>Justification of evidences:</i> This was confirmed by the validation team during the site visit and interview with the project management team.</p> <p><i>Conclusion:</i> By document review and interview conducted during site visit it is evident that the operation and maintenance of the project is looked after trained and skilled staff of project team. Further long term Service agreement was also entered with original manufacturer of the turbines to ensure safe operation of the plant.</p>	<p>/PDD/ /IM01/</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.
A.5. Small scale project activity <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> Project activity is an installation and operation of a new natural gas fired grid-connected Combined Cycle Power Plant (CCPP) of 382.5 MW capacity hence does not fall under small scale project.</p> <p><i>Justification of evidences:</i> The justification of chosen project type and category of the project activity is provided under the section B.2 of PDD in an adequate manner and project activity is greater than 15 MW and is a large scale project activity.</p> <p><i>Conclusion:</i> By document review it is confirmed that the project does not fall under small scale project as per the criteria defined by UNFCCC.</p>	/PDD/	OK	OK
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 methodologies⁴⁴, which provide guidance on equipment capacity, equipment performance, sampling and</i>	<p><i>Description:</i> Not applicable. Please refer A.5.1</p> <p><i>Justification of evidences:</i> Not applicable. Please refer A.5.1</p> <p><i>Conclusion:</i> Not applicable. Please refer A.5.1</p>	/PDD/	OK	OK

⁴⁴ <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.
<i>other monitoring related issues.</i>				
<p>A.5.3. Is the small scale project activity not a debundled component of a larger project activity?</p> <p>(EB 55 Annex 1, § 136 (c))</p> <p><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></p>	<p><i>Description:</i> Not applicable. Please refer A.5.1</p> <p><i>Justification of evidences:</i> Not applicable. Please refer A.5.1</p> <p><i>Conclusion:</i> Not applicable. Please refer A.5.1</p>	/PDD/	OK	OK
<p>A.5.4. Is an assessment of the environmental impacts of the proposed SSC CDM project activity required by the host Party?</p> <p>(EB 55 Annex 1, § 136 (d))</p>	<p><i>Description:</i> Not applicable. Please refer A.5.1</p> <p><i>Justification of evidences:</i> Not applicable. Please refer A.5.</p> <p><i>Conclusion:</i> Not applicable. Please refer A.5.1</p>	/PDD/	OK	OK
B. Project Baseline, Additionality and Monitoring Plan				
B.1. Application of the Methodology				
<p>B.1.1. Does the project apply an approved and applicable CDM methodology and a valid version thereof?</p>	<p><i>Description:</i> Project activity applies approved methodology AM0029 version 3.0.</p> <p><i>Justification of evidences:</i> Visited the UNFCCC official</p>	/PDD/ /AM29/	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.
(EB 55 Annex 1, § 65) <i>Describe the steps taken to validate this issue.</i>	website and confirmed that the latest version is version 3.0 of approved methodology AM0029. <i>Conclusion:</i> By document review it is confirmed that the PP has correctly applied approved methodology AM0029 and is valid.			
B.1.2. Is the applied CDM methodology identical with the version available on the UNFCCC website? (EB 55 Annex 1, §§ 65, 70) <i>Describe the steps taken to validate this issue.</i>	<i>Description:</i> Project activity applies approved methodology AM0029 version 3.0. <i>Justification of evidences:</i> Checked the UNFCCC official website and found that the latest version is version 3.0 of approved methodology AM0029. <i>Conclusion:</i> By document review it is confirmed that the PP has correctly applied approved methodology AM0029 version 3.0 and is valid and identical with the version available on UNFCCC website.	/PDD/ /UNFCCC/ C/	OK	OK
B.1.3. Are all applicability criteria in the methodology, the applied tools or any other methodology component referred to therein fulfilled? (EB 55 Annex 1, §§ 66(a)–(b), 68, 71, 76) <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>	<i>Description:</i> As described in section B.2 of the PDD, the applicability criteria of the approved methodology AM0029 version 3.0 are as below: Applicability Criteria 1 <i>The project activity is the construction and operation of a new natural gas fired grid-connected electricity generation plant.</i> <i>Natural gas should be the primary fuel. Small amounts of other start up or auxiliary fuels can be used, but can comprise no more than 1% of total fuel</i>	/PDD/ /TS/ /IM01/ /EPC/ /CEA/	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.
	<p><i>use, on energy basis.</i></p> <p>Justification: The project activity involves construction and operation of a new natural gas fired grid-connected electricity generation plant, of 382.5 MW capacity. The only fuel used is natural gas and no auxiliary fuels are used. Same is verified by conducting document review and interview during site visit.</p> <p>Applicability Criteria 2</p> <p><i>The geographical/ physical boundaries of the baseline grid can be clearly identified and information pertaining to the grid and estimating baseline emissions is publicly available.</i></p> <p>Justification: The baseline grid is NEWNE regional electricity grid, whose geographical/ physical boundaries can be clearly identified and information pertaining to the grid and estimating baseline emissions is available in public domain on the website of the Central Electric Authority of India http://cea.nic.in. Same is verified by conducting document review and interview during site visit.</p> <p>Applicability Criteria 3</p> <p><i>Natural gas is sufficiently available in the region or country, e.g. future natural gas based power capacity additions, comparable in size to the project activity, are not constrained by the use of natural gas in the project activity.</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><i>In some situations, there could be price-inelastic supply constraints (e.g. limited resources without possibility of expansion during the crediting period) that could mean that a project activity displaces natural gas that would otherwise be used elsewhere in an economy, thus leading to possible leakage. Hence, it is important for the project proponent to document that supply limitations will not result in significant leakage as indicated here.</i></p> <p><i>Justification of evidences: EPC contract, onsite visit, interview, technical specifications, CEA CO2 database</i></p> <p><i>Conclusion: Subject to closure of CARB1</i></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: All applicability criteria are met with the project activity as per AM 0029.</i></p> <p><i>Justification of evidences: PDD, AM 0029</i></p> <p><i>Conclusion: Based on the document review and conducting site visit it is ensured that all applicability conditions as required by the methodology are met. There is no request for clarification, revision or deviation required for the project activity.</i></p>	<p>/PDD/ /AM29/</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.
<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 all the other possible stipulations and /or limitations mentioned in all sections of the approved methodology selected.</i></p>	<p><i>Description: Project implementation is in accordance with requirement / stipulations mentioned in applied methodology and relevant guidance provided by CDM-EB.</i></p> <p><i>Justification of evidences: The stipulation/ requirements of the methodology and relevant EB guidance were checked.</i></p> <p><i>Conclusion: It can be confirmed that the project is in accordance to every other stipulation or requirement of the methodology and relevant guidance provided by CDM-EB.</i></p>	/PDD/ /AM29/ /UNFCCC/ C/	OK	OK
<p>B.2. Project Boundaries</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: The spatial extent of the project boundary includes the project site, project equipment i.e. Gas Turbine, Steam Turbine, HRSG, GT/ST Generator, other plant auxiliary equipments etc and all power plants connected to the NEWNE grid. This has been clearly shown in the section B.3 of the PDD</i></p> <p><i>Justification of evidences: Validation team has performed site visit and reviewed CO₂ database of Central Electricity Authority^{/CEA/}, Project design Document^{/PDD/} and cross checked the geographical boundary of the project.</i></p> <p><i>Conclusion: It can be confirmed that the project boundary of</i></p>	/PDD/ /IM01/	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.
	the proposed CDM project activity are clearly identified and is in conformity with the approved methodology AM0029.			
<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> As required by approved methodology CO₂ which is emitted from the electricity generation in fossil fuel fired power plants is the only GHG included in the project boundary to calculate the baseline emission and CO₂ emission from NG consumption to calculate project emission is included.</p> <p><i>Justification of evidences:</i> Same is verified by validation team by reviewing approved methodology available on UNFCCC web site^{/UNFCCC} and details provided in the PDD</p> <p><i>Conclusion:</i> Based on above it can be confirmed that all sources and GHG are included as per approved methodology.</p>	<p>/PDD/ /UNFCCC/ C/ /AM29/</p>	<p>OK</p>	<p>OK</p>
<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 methodology does not allow choosing a source and/or gas is to be included, hence this question is not applicable for this project activity.</p> <p><i>Justification of evidences:</i> PDD, Applied methodology.</p> <p><i>Conclusion:</i> Based on document review it is confirmed that methodology does not allow addition of source and/or gas other than described in the methodology.</p>	<p>/PDD/ /AM29/</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.3. Baseline Identification <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>	<i>Description:</i> Please refer table A-2 <i>Justification of evidences:</i> Please refer table A-2 <i>Conclusion:</i> As per the approved methodology AM0029, version 3.0, PP has correctly identified the possible baseline scenarios. However CAR B2 was raised.	/PDD/ /AM29/	CAR B2	OK
B.3.2. Is the list of alternatives complete? (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>	<input type="checkbox"/> All plausible alternative scenarios listed in the approved methodology have been considered. In the course of 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	/PDD/ /AM29/	CAR B2	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.
	However CAR B2 was raised.			
<p>B.3.3. What has been identified as the baseline scenario?</p> <p>(EB 55 Annex 1, §§ 81–82, 86)</p> <p><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></p>	<p><i>Description:</i> Domestic Coal based pit head power generation alternative using subcritical technology is identified as the most plausible baseline for the Project activity.</p> <p><i>Justification of evidences:</i> Assessment of the baseline scenarios given in section B.4 of the PDD by means of document review and information links.</p> <p><i>Conclusion:</i> Economically most attractive option out of the selected alternative scenarios Coal based power generation alternative using subcritical technology is selected as the baseline for the project activity.</p>	/PDD/ /AM29/	OK	OK
<p>B.3.4. Has the baseline scenario been determined according to the methodology?</p> <p>(EB 55 Annex 1, §§ 82, 87(e))</p> <p><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></p>	<p>For details of the assessment regarding the evaluation of the baseline scenario pl. refer to table A-2.</p> <p><input checked="" type="checkbox"/> The determination has been carried out as per the procedure contained in the applied methodology.</p> <p><input type="checkbox"/> The following CARs / CLs have been identified with respect to the selection of the baseline scenario:</p>	/AM29/ /PDD/	OK	OK
<p>B.3.5. Has any plausible alternative scenario been excluded?</p> <p>(EB 55 Annex 1, § 83)</p> <p><i>Describe how it is validated that no plausible alternative scenario has been excluded.</i></p>	<p>For details of the assessment regarding the evaluation of the baseline scenario pl. refer to table A-2.</p> <p><input type="checkbox"/> No plausible baseline scenario has been excluded.</p> <p><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:</p>	/PDD/	CAR B2	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.
	CAR B2 was raised			
<p>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?</p> <p>(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></p>	<p><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.</p> <p><input checked="" type="checkbox"/> The following CARs / CLs have been issued because assumptions used in the baseline determination have been assessed to be not conservative</p> <p>CL B11 – B 17 were raised</p>	/PDD/	CLB11 CLB17	OK
<p>B.3.7. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?</p> <p>(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></p>	<p><i>Description:</i> Consideration of national and sectoral policies ,macro-economic trends and political aspirations for baseline scenario</p> <p><i>Justification of evidences:</i> Based upon it local and sectoral expertise validation team has reviewed Central electricity Authority^{/CEA/}, Ministry of Power^{/MOP/}.</p> <p><i>Conclusion:</i> Validation team has reviewed Central electricity Authority^{/CEA/}, Ministry of Power^{/MOP/} and confirm that baseline scenario has taken into account prevailing national law of India.</p>	/PDD/ /CEA/ /MOP/	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.3.8. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?</p> <p>(EB 55 Annex 1, § 87(a)–(c)) Describe whether the documents and sources referred to in the PDD are correctly quoted and clearly referenced.</p>	<p><i>Description:</i> Compatibility of baseline scenario with available data and referenced sources in the PDD.</p> <p><i>Justification of evidences:</i> Document review of PDD, CEA and ministry of Power web site.</p> <p><i>Conclusion:</i> Validation team is convinced that the sources and data are properly referenced in the PDD for the determination of the baseline scenario</p>	<p>/PDD/ /CEA/ /MOP/</p>	<p>OK</p>	<p>OK</p>
<p>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.</p> <p>(EB 55 Annex 1, § 86)</p>	<p><i>Description:</i> Under the section B.4 of the PDD there is a verifiable description of the identified baseline scenario including the description of the technology with respect to efficiency and technical life time that would be employed and/or that would take place in absence of the proposed CDM project activity.</p> <p><i>Justification of evidences:</i> Validation team has reviewed Technical specifications^{/TS/}, PDD, and conducted site visit.</p> <p><i>Conclusion:</i> As per the approved methodology AM0029, version 3.0, PP has correctly identified the baseline scenarios and PDD contain a description of the plausible scenarios including the description of the technology with respect to efficiency and technical life time etc</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.
B.4. Additionality Determination <i>The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.</i>				
B.4.1. Methodology				
<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> PDD describes the additionality of the project in conformity with the methodology</p> <p><i>Justification of evidences:</i> AM0029, Additionality Tool, PDD, worksheet</p> <p><i>Conclusion:</i> Subject to closure of CAR B5 and CL B1 and B2</p>	/TOOL/ /PDD/	CAR B5 CL-B1 CL-B2	OK
B.4.2. Consideration of CDM before project start				
<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, § 99, 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</i></p>	<p><i>Description:</i> The date of notice to proceed (i.e. 02/07/2010) has been considered as Start date of the project, which is in conformity with CDM Glossary of terms</p> <p><i>Justification of evidences:</i> PDD</p>	/PDD/	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.
<i>begin.</i> <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. Appropriate evidence should be given.</i>	<i>Conclusion:</i> Subject to closure of CAR B4			
B.4.2.2. In case the project start date is on or after 2 nd August 2008 has the PP informed the DNA and UNFCCC about the intension to seek CDM status? (EB 55 Annex 1, §§ 99–101) <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>	<i>Description:</i> PP has informed DNA and UNFCCC about the intention to seek CDM status <i>Justification of evidences:</i> PDD <i>Conclusion:</i> Subject to closure of CL B18	/PDD/	CLB18	OK
B.4.2.3. In case the project start date is before commencing of validation and 2 nd August 2008, was the incentive from the CDM seriously considered and are details given in the PDD? (EB 55 Annex 1, §§ 100, 102) <i>Describe whether the evidence to support such consideration is adequately and transparently described in the PDD.</i>	<i>Description:</i> Not applicable <i>Justification of evidences:</i> PDD <i>Conclusion:</i> Not applicable	/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.4.2.4. How and when was the decision to proceed with the project taken? <i>Describe the steps taken to validate the starting date.</i>	<i>Description:</i> Decision was taken by the Board <i>Justification of evidences:</i> PDD, MD <i>Conclusion:</i> Subject to closure of CL B18	/PDD/	CLB18	OK
B.4.2.5. Is the project start date consistent with the available evidences? (EB 55 Annex 1, § 102) <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>	<i>Description:</i> Evidence has not been submitted <i>Justification of evidences:</i> PDD <i>Conclusion:</i> Subject to closure of CL B18	/PDD/	CLB18	OK
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)) <i>Describe the steps taken to validate this issue.</i>	<i>Description:</i> The decision was taken by the Board, which is the competent authority <i>Justification of evidences:</i> PDD, <i>Conclusion:</i> Subject to closure of CL B18	/PDD/	CLB18	OK
B.4.2.7. How was the CDM involved in the decision making process?	<i>Description:</i> Not applicable as it is a 'new project activity'	/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.
(EB 55 Annex 1, § 102) <i>Describe why CDM was a decisive factor in the decision making process.</i>	<i>Justification of evidences:</i> PDD <i>Conclusion:</i> No CAR/CL is necessary			
B.4.2.8. Do the evidences provided doubtlessly prove that continuous and real actions were taken in order to secure the CDM status? (EB 55 Annex 1, § 102; EB 62 Annex 13 § 7)	<i>Description:</i> Not applicable as it is a 'new project activity' <i>Justification of evidences:</i> PDD <i>Conclusion:</i> No CAR/CL is necessary	/PDD/	OK	OK
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? (EB 62 Annex 13 § 8)	<i>Description:</i> Not applicable as it is a 'new project activity' <i>Justification of evidences:</i> PDD <i>Conclusion:</i> No CAR/CL is necessary	/PDD/	OK	OK
B.4.2.10. Did implementation of the project ceased after its commencement and did implementation recommence after consideration of the CDM? (EB 62 Annex 5, § 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> Not applicable as it is a 'new project activity' <i>Justification of evidences:</i> PDD <i>Conclusion:</i> No CAR/CL is necessary	/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.4.2.11. Can the CDM involvement in the decision assessed as serious?</p> <p>(EB 55 Annex 1, § 104(b)–(c)) Describe whether or not the project would have been undertaken without the incentive of the CDM.</p>	<p><i>Description:</i> Not applicable as it is a 'new project activity'</p> <p><i>Justification of evidences:</i> PDD</p> <p><i>Conclusion:</i> No CAR/CL is necessary</p>	/PDD/	OK	OK
<p>B.4.3. Identification of alternatives Step 1 (in case of SSC projects pl. skip steps 1 and 2 if appropriate)</p>				
<p>B.4.3.1. Does the list of alternatives contain the status-quo situation, the project not 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?</p> <p>(EB 55 Annex 1, §§ 105–107) Describe the steps taken to validate this issue on the basis of your local and sectoral knowledge.</p>	<p><i>Description:</i> Alternatives considered are in conformity with the methodological requirements</p> <p><i>Justification of evidences:</i> PDD, IRR</p> <p><i>Conclusion:</i> Subject to closure of CAR B2, and CL B11-B17</p>	/PDD/ /XLS/	CAR B2 CLB11 CLB17	OK
<p>B.4.3.2. Have all realistic alternatives been identified to the project?</p> <p>(EB 55 Annex 1, §§ 105–107) Describe whether the list of alternatives is credible and complete. Describe how it is validated that the alternatives are realistic.</p>	<p><i>Description:</i> Realistic alternatives have been identified</p> <p><i>Justification of evidences:</i> PDD, IRR</p> <p><i>Conclusion:</i> Subject to closure of CAR B2, and CL B11-B17</p>	/PDD/ /XLS/	CAR B2 CLB11 CLB17	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.4.3.3. Do all identified alternatives comply with 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><i>Description:</i> Yes, all the identified alternatives comply with enforced legislations</p> <p><i>Justification of evidences:</i> PDD</p> <p><i>Conclusion:</i> Based on the document review and local and sectoral expertise, validation team has verified that all identified alternatives comply with enforced legislations.</p>	/PDD/	OK	OK
<p>B.4.4. Investment analysis Step 2</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> PDD provides evidence on project's additionality using LUC</p> <p><i>Justification of evidences:</i> PDD, IRR</p> <p><i>Conclusion:</i> Subject to closure of CAR B5 and CL B1, B2</p>	/PDD/ /XLS/	CAR B5 CL-B1 CL-B2	OK
<p>B.4.4.2. Is an appropriate analysis method chosen for the project (simple cost analysis, investment comparison analysis or benchmark analysis)?</p>	<p><i>Description:</i> The investment analysis chosen is not in conformity with Methodological requirements</p> <p><i>Justification of evidences:</i> PDD, IRR</p>	/PDD/ /XLS/	CAR B5 CL-B1 CL-B2	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, § 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>	<i>Conclusion:</i> Subject to closure of CAR B5 and CL B1, B2			
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>	<input checked="" type="checkbox"/> Yes, a clear, viewable and unprotected Excel spreadsheet is available. <input type="checkbox"/> No, a respective Excel spreadsheet needs to be made available for investment calculation. In this context the following additional findings have been identified: N/A	/XLS/	OK	OK
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? (EB 55 Annex 1, § 109; EB 62 Annex 5, § 3 – 4) <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>	<i>Description:</i> The technical lifetime of the project activity equipment is taken as 25 years. So, the investment analysis has been carried out for 25 years for the project activity and other alternatives, which is in conformity with Annex 15, EB 50 <i>Justification of evidences:</i> PDD <i>Conclusion:</i> No CAR/CL is necessary	/PDD/ /XLS/	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.4.4.5. 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> Not applicable</p> <p><i>Justification of evidences:</i> PDD</p> <p><i>Conclusion:</i></p>	/PDD/	OK	OK
<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 62 Annex 5, § 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> Salvage value computation is not in conformity with guidance 4 of Annex 5, EB 62</p> <p><i>Justification of evidences:</i> PDD, IRR</p> <p><i>Conclusion:</i> Subject to closure of CAR B5, B8 CL B1 and B2</p>	/PDD/ /XLS/	CAR B5 CAR B8 CL B1 CL B2	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 62 Annex 5, § 4)</p>	<p><i>Description:</i> Salvage value computation does not conform to guidance 4 of Annex 5, EB 62</p> <p><i>Justification of evidences:</i> PDD, IRR</p> <p><i>Conclusion:</i> Subject to closure of CAR B5, B8, CL B1 and B2</p>	/PDD/ /XLS/	CAR B5 CAR B8 CL B1 CL B2	OK
<p>B.4.4.8. Are depreciation and other non-cash related items only considered in the tax calculation and not as cash outflow?</p>	<p><i>Description:</i> Since LUC has been used to demonstrate additionality, this question is not applicable</p>	/PDD/ /XLS/	CAR B5 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.
(EB 55 Annex 1, § 109; EB 62 Annex 5, § 5)	<i>Justification of evidences:</i> PDD, IRR <i>Conclusion:</i> Subject to closure of CAR B5, CL B1 and B2		B8 CL-B4 CL-B2	
B.4.4.9. Were the input values used in the investment analysis valid and applicable at the time of the investment decision? (EB 55 Annex 1, § 109,112; EB 62 Annex 5, § 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>	<i>Description:</i> Input parameters used do not conform to Guidance 6 and rationale given thereto in Annex 5, EB 62 <i>Justification of evidences:</i> PDD, IRR <i>Conclusion:</i> Subject to closure of CAR B9, CAR B11-B13 ,CL B3-B17	/PDD/ /XLS/	CAR B9 CAR B44 CAR B13 CLB3 CLB17	OK
B.4.4.10. 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> PLF considered does not conform to Annex 11, EB 48 <i>Justification of evidences:</i> PDD, IRR <i>Conclusion:</i> Subject to closure of CL B11	/PDD/ /XLS/	CLB14	OK
B.4.4.11. 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 62 Annex 5, § 9)	<input type="checkbox"/> N/A <input type="checkbox"/> Yes, the costs of financing expenditures have been included. <input checked="" type="checkbox"/> No, this requirement is not met. In this context the following additional findings have been	/PDD/ /XLS/	CAR B5, CAR B8 CL-B4 CL-B2	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.
	identified: PP has not used project IRR as financial indicator. CAR B5, B8 and CL B1 and CL B2 were raised			
B.4.4.12. 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. (EB 55 Annex 1, § 109; EB 62 Annex 5, § 11) <i>If this is not the case, ensure that taxation is excluded from the investment analysis.</i> <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>	<input type="checkbox"/> N/A <input type="checkbox"/> Yes, the interest has been taken into account. <input checked="" type="checkbox"/> No, this requirement is not met. In this context the following additional findings have been identified: PP has not used project IRR as financial indicator CAR B5, B8 and CL B1 and CL B2 were raised	/PDD/ /XLS/	CAR B5 CAR B8 CL B1 CL B2	OK
B.4.4.13. 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? (EB 55 Annex 1, § 109; EB 62 Annex 5, § 10)	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> Yes, in- and outflows have been considered correctly. <input type="checkbox"/> No, this requirement is not met. In this context the following additional findings have been identified: N/A	/PDD/	OK	OK
B.4.4.14. 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 project IRR; required/expected returns on	<i>Description:</i> Since LUC has been used, the question of benchmark does not arise. However, this is not in conformity with methodological requirements	/PDD/ /XLS/	CAR B5, CAR B8 CL B1	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.
equity for equity IRR)? (EB 55 Annex 1, § 111; EB 62 Annex 5, §§12 – 18) <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>	<i>Justification of evidences:</i> PDD, IRR <i>Conclusion:</i> Subject to closure of CAR B5, B8, CL B1 and B2		CL-B2	
B.4.4.15. 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? (EB 55 Annex 1, § 109; EB 62 Annex 5, §§13 – 18) <i>Describe whether it is reasonable to assume that a lower rate of return would consequently result in the baseline scenario.</i>	<i>Description:</i> Since LUC has been used, the question of benchmark does not arise. However, this is not in conformity with methodological requirements <i>Justification of evidences:</i> PDD, IRR <i>Conclusion:</i> Subject to closure of CAR B5, B8, CL B1 and B2	/PDD/ /XLS/	CAR B5, CAR B8 CL-B1 CL-B2	OK
B.4.4.16. Is it ensured that the project cannot be developed by other developers than the PP? (EB 55 Annex 1 § 109; EB 62 Annex 5, §§ 13 – 14) <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 behavior of the entity during at least the last 3 years in relation to similar projects.</i>	<i>Description:</i> Project can be developed by other developers <i>Justification of evidences:</i> PDD, IRR <i>Conclusion:</i> Subject to closure of CAR B5, B8, CL B1 and B2	/PDD/ /XLS/	CAR B5, CAR B8 CL-B1 CL-B2	OK
B.4.4.17. Was the benchmark consistently used in the past for similar projects with similar risks? (EB 55 Annex 1, § 112(c))	<i>Description:</i> Since LUC has been used, the question of benchmark does not arise. However, this is not in conformity with methodological requirements <i>Justification of evidences:</i> PDD, IRR	/PDD/ /XLS/	CAR B5, CAR B8 CL-B1	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> Subject to closure of CAR B5, B8, CL B1 and B2		GL-B2	
<p>B.4.4.18. 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,</p> <p>(EB 55 Annex 1, §§ 109–110(e); EB 62 Annex 5, § 20-21)</p> <p><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></p>	<p><i>Description:</i> PDD and spread sheets contain sensitivity analysis</p> <p><i>Justification of evidences:</i> PDD, IRR</p> <p><i>Conclusion:</i> Subject to closure of CAR B6, B7 and B14</p>	/PDD/ /XLS/	CAR B6 CAR B7 CAR B14	OK
<p>B.4.4.19. Were only variables that constitute more than 20% of either total project costs or total project revenues subjected to reasonable variation?</p> <p>(EB 55 Annex 1, § 109; EB 62 Annex 5, § 20)</p>	<p><i>Description:</i> Yes only variables that constitute more than 20% of total project cost/revenue have been subjected to sensitivity analysis</p> <p><i>Justification of evidences:</i> PDD, IRR</p> <p><i>Conclusion:</i> Subject to closure of CAR B6, B7and B14</p>	/PDD/ /XLS/	CAR B6 CAR B7 CAR B14	OK
<p>B.4.4.20. 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 62 Annex 5, § 20)</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% have not been subjected to sensitivity analysis</p> <p><i>Justification of evidences:</i> PDD, IRR</p> <p><i>Conclusion:</i> Subject to closure of CAR B6, B7 and B14</p>	/PDD/ /XLS/	CAR B6 CAR B7 CAR B14	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. 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 62 Annex 5, § 21)</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> Parameters have been subjected to $\pm 10\%$ variation</p> <p><i>Justification of evidences:</i> PDD, IRR</p> <p><i>Conclusion:</i> Subject to closure of CAR B6</p>	/PDD/ /XLS/	CAR B6	OK
B.4.5. Barrier analysis Step 3 or SSC additionality assessment				
<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>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 62 Annex 5.</i></p>	<p><i>Description:</i> Not applicable</p> <p><i>Justification of evidences:</i> PDD</p> <p><i>Conclusion:</i> Not applicable</p>	/PDD/	OK	OK
<p>B.4.5.2. Are the barriers described risk related (e.g technology failure, other performance related risks)?</p> <p>(EB 55 Annex 1, §§ 116, 134, 137)</p> <p><i>Are there other barriers or barriers due to prevailing practice existent which would have led to higher emissions?</i></p>	<p><i>Description:</i> Not applicable</p> <p><i>Justification of evidences:</i> PDD</p> <p><i>Conclusion:</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.
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)	<i>Description:</i> Not applicable <i>Justification of evidences:</i> PDD <i>Conclusion:</i> 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))	<i>Description:</i> Not applicable <i>Justification of evidences:</i> PDD <i>Conclusion:</i> Not applicable	/PDD/	OK	OK
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? (EB 55 Annex 1, § 116(b))	<i>Description:</i> Not applicable <i>Justification of evidences:</i> PDD <i>Conclusion:</i> Not applicable	/PDD/	OK	OK
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	<i>Description:</i> Not applicable <i>Justification of evidences:</i> PDD	/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.
related to the lack of access to capital, technologies and skilled labour are real? (EB 50 Annex 13, § 4)	<i>Conclusion:</i> Not applicable			
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? (EB 50 Annex 13, § 5)	<i>Description:</i> Not applicable <i>Justification of evidences:</i> PDD <i>Conclusion:</i> Not applicable	/PDD/	OK	OK
B.4.5.8. Would provision of additional financial means lead to the mitigation of the barrier(s) demonstrated? (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>	<i>Description:</i> Not applicable <i>Justification of evidences:</i> PDD <i>Conclusion:</i> Not applicable	/PDD/	OK	OK
B.4.6. Common practice analysis Step 4 (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</i>	<i>Description:</i> Entire country has been chosen for common practice analysis, which is appropriate <i>Justification of evidences:</i> PDD	/PDD/	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.
<i>transparent and unambiguous manner. If a region other than the entire host country is chosen, describe why this region is more appropriate.</i>	<i>Conclusion:</i> Subject to closure of CAR B8			
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> Common practice analysis reveals that less than 1% of projects in the geographical region have used similar technology <i>Justification of evidences:</i> PDD <i>Conclusion:</i> Subject to closure of CAR B8	/PDD/	CAR B8	OK
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? (EB 55 Annex 1, § 120(c))	<i>Description:</i> Common practice analysis reveals that less than 1% of projects in the geographical region have used similar technology <i>Justification of evidences:</i> PDD <i>Conclusion:</i> Subject to closure of CAR B8	/PDD/	CAR B8	OK
B.5. Ex-Ante Calculation of GHG Emission Reductions <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>				
B.5.1. Are the equations applied correctly according	<input checked="" type="checkbox"/> The equations applied for calculation are correctly	/PDD/	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>to the applied approved methodology?</p> <p>(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>applied according to the approved methodology.</p> <p><input type="checkbox"/> The following mistakes have been identified in this context:</p> <p><i>Description:</i> The applied equations for calculations of the emission reduction are in line with the requirements of the approved methodology AM0029.</p> <p><i>Justification of evidences:</i> Validation team has reviewed PDD, ER sheet and applied methodology.</p> <p><i>Conclusion:</i> All the equations are correctly applied in the PDD to calculate emission reduction calculations.</p> <p>However CAR B15 was raised.</p>	<p>/ER/ /AM29/</p>	<p>B15</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><i>Description:</i> As per the approved methodology, Justification is provided by the PP for selection of the emission factor and equations applied.</p> <p><i>Justification of evidences:</i> PDD, Applied methodology.</p> <p><i>Conclusion:</i> Same is verified by validation team and is convincing.</p>	<p>/PDD/ /AM29/</p>	<p>OK</p>	<p>OK</p>
<p>B.5.3. Have conservative assumptions been used</p>	<p><i>Description:</i> The calculations for project emissions, baseline</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.
when calculating the project emissions? (EB 55 Annex 1, §§ 90–91) <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>	emissions and leakages are considered conservatively as per the AM0029. <i>Justification of evidence:</i> Approved methodology AM0029 <i>Conclusion:</i> As per the approved methodology AM0029, the project emissions will be calculated based on the quantity of natural gas monitored and the CO2 emission coefficient of the natural gas and same is validated by document review by the validation team. Detailed assessment on input parameters are given in table A-3 of this report	/AM29/		
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)	<i>Description:</i> Project activity does not expect to contribute more than 1 % of overall expected average annual emission which is not addressed by the methodology. <i>Justification of evidence:</i> Approved methodology AM0029. <i>Conclusion:</i> Project activity is installation of natural gas based grid connected CCPP and does not lead to GHG emission within the project boundary more than 1 % of expected average annual emission reduction.	/PDD/	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</i>	<i>Description:</i> Plant load factor is defined ex-ante for determination of baseline emissions. <i>Justification of evidences:</i> PP has taken into consideration PLF as per the CERC Terms and Conditions of Tariff Regulations dated 19/01/2009 applicable for of the project activity. <i>Conclusion:</i> Subject to closure of CAR B16	/PDD/ /EPC/	CAR B16	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>cases the PLF may be different.</i>				
<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> As verified by the validation team, data and parameters that are available at validation which remains fixed throughout the crediting period and are considered for emission reduction calculation are correct, reasonable conservative.</p> <p><i>Justification of evidences:</i> Approved monitoring methodology AM0029</p> <p><i>Conclusion:</i> Validation team is convinced that the data source and assumptions made by the PP is either from IPCC, Central Electricity Authority for emission factors are appropriate to calculate correct and conservative emission reductions.</p> <p>However CAR B15 was raised.</p>	<p>/PDD/ /AM29/ /IPCC/ /CEA/</p>	<p>CAR B15</p>	<p>OK</p>
<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>/PDD/</p>	<p>OK</p>	<p>OK</p>
<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 generated from the project activity are real measurable and will provide long term benefit related to the mitigation of climate change.</p>	<p>/PDD/ /ER/ /IM01/</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.
<i>Describe the steps taken to validate this issue.</i>	<p><i>Justification of evidences:</i> The project is a green field natural gas based grid connected CCPP project. The emission reduction occurred from the project are calculated as per the Approved baseline methodology AM0029.</p> <p><i>Conclusion:</i> Emission reduction occurred due to project activity is calculated based on the monitored parameters described in the PDD. Monitoring facilities are reviewed by the validation team during site visit. Validation team is convinced that the emission reduction are real and measurable to mitigate climate change.</p>			
<p>B.6. Monitoring of Emission Reductions</p> <p><i>It is assessed whether the monitoring plan is appropriate for the project activity and in line with the applied methodology.</i></p>				
<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</i></p>	<p><i>Description:</i> As per approved methodology, all monitoring parameters are included in the monitoring plan.</p> <p><i>Justification of evidences:</i> Validation team has reviewed, PDD, Methodology for same.</p> <p><i>Conclusion:</i> As verified, from the document review and site visit all applicable monitoring parameters are as per the applied methodology. This has been clearly mentioned in the monitoring plan of the PDD^{/PDD/}.</p>	/PDD/ /AM29/	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>justified and correct.</i>				
<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>Assess whether the provided information for all parameters w.r.t.</p> <ul style="list-style-type: none"> a) Label (name of the data / parameter) b) data unit c) description d) source of data e) measurement equipment / method / procedure f) monitoring frequency g) QA/QC procedures <p>are appropriately described and in compliance with the requirements of the methodology..</p>	<p><i>Description:</i> Under Section B.7.1 for parameter of the webhosted PDD;</p> <p>the EF CO₂,f,y (Parameter B3), details provided under the head “Source of data to be used” is not specified clearly whether Supplier data / transporter data / local data / country specific data / IPCC values are used .</p> <p>Type of fuel “f” is not stated under the head “Description” in the table for parameter EF CO₂,f,y (Parameter B3), and FC f,y (Parameter B1) and</p> <p>Ex-ante calculation of Emission reduction are not carried out conservatively specifically with respect to value of plant availability / plant load factor considered for additionality determination.</p> <p><i>Justification of evidences:</i> PDD, AM0029</p> <p><i>Conclusion:</i> Subject to closure of CAR B16</p>	/PDD/ /AM29/	CAR B16	OK
<p>B.6.3. Are all parameters presented as per international standards?</p> <ul style="list-style-type: none"> a) Format: Standard format (e.g. 1,000 representing 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Standard formats have been used <input checked="" type="checkbox"/> SI units were used – or added <input checked="" type="checkbox"/> The short scale naming is correct 	/PDD/ /ER/	CAR B10	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>one thousand and 1.0 representing one).</i></p> <p>b) <i>Units: Values shall be directly given in SI units – or additionally to original units transferred to SI.</i></p> <p>c) <i>Short scale naming system: (Only) million = 10⁶ and billion 10⁹ shall be used.</i></p> <p><i>Please refer to the International System of Units (SI) as published within Guidance 11/08.</i></p>	<p>In this context the following additional findings have been identified:</p> <p>CAR B10 was raised.</p>			
<p>B.6.4. 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>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>Description:</i> PDD contains all the required equations for calculating ex-post emission reduction calculations.</p> <p><i>Justification of evidences:</i> Validation team has reviewed PDD, Methodology for assessment.</p> <p><i>Conclusion:</i> As described under monitoring plan under section B.7 of the PDD, all the required equations for calculating ex-post emission reductions are included as per the approved methodology.</p>	<p>/PDD/ /AM29/</p>	<p>OK</p>	<p>OK</p>
<p>B.6.5. 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.</i></p>	<p><i>Description:</i> Implementation of monitoring arrangement described in the PDD will be implemented during project commissioning.</p> <p><i>Justification of evidences:</i> PDD, AM0029</p> <p><i>Conclusion:</i> Validation team has interviewed the representatives of the PP and ensured that the monitoring</p>	<p>/PDD/ /AM29/</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.
<i>consider also special monitoring conditions, e.g. downtimes of monitoring equipment etc.</i>	arrangements as described in the PDD will be implemented. Same is also verified by conducting site visit.			
<p>B.6.6. Are the QA/QC procedures appropriate sufficient to ensure the emission reductions achieved from the project activit 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 maintenance of equipment. Address further any review procedures.</i></p>	<p><i>Description:</i> Calibration and maintenance procedures for the monitoring parameters will be carried out in line with the manufacturers specifications, prevailing applicable rules and regulations</p> <p><i>Justification of evidences:</i> Validation team has reviewed PDD, and AM0029 version 3.0.</p> <p><i>Conclusion:</i> QA/QC procedures for energy meters will be carried out as per the CEA guidelines and for gas flow meters as recommended by the Supplier M/s Siemens</p>	/PDD/ /IM01/	OK	OK
<p>B.6.7. 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> Organisation chart and roles and responsibility for data monitoring, calibration and maintenance and verification procedures are defined in the PDD section B.7</p> <p><i>Justification of evidences:</i> Validation team has reviewed, PDD, and conducted interview during site visit.</p> <p><i>Conclusion:</i> Based on the document review and interview conducted during the site visit it is ensured that all procedures are identified by the PP related to capturing of the onsite data, data management and verification of the collected data. Also data archiving provisions are made in the PDD.</p>	/PDD/ /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.
C. Duration of the Project/ Crediting Period <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>				
<p>C.1. 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> Operational lifetime of 25 years is identified for the project activity</p> <p><i>Justification of evidences:</i> Validation team has reviewed EPC contract.</p> <p><i>Conclusion:</i> As verified, operational life time is correctly applied as 25 years for Project activity.</p>	/PDD/ /EPC/	OK	OK
<p>C.2. 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> Crediting period chosen is the fixed crediting period of 10 years. Start of the crediting period stated is 01/04/2013 or a date not earlier than the date of registration under section C.2.2.1 of the PDD</p> <p><i>Justification of evidences:</i> PDD</p> <p><i>Conclusion:</i> Considering the tentative commissioning date of the project activity and approximate time taken for the validation of the project activity, start date of the crediting period defined in the PDD is appropriate and reasonable.</p>	/PDD/	OK	OK
D. Environmental Impacts <i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an</i>				

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>EIA should be provided to the DOE.</i>				
<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> As per Environment Impact Assessment Notification S.O. 1533 (E) dated 14/09/2006 of Ministry of Environment and Forests EIA is required to be conducted for gas based power projects in host country. (India)</p> <p><i>Justification of evidences:</i> Environment Impact Assessment Notification, Ministry of Environment and Forests and Environmental Clearance from MoEF</p> <p><i>Conclusion:</i></p> <p>As per the requirement, PP has carried out environment Impact Assessment for the project and obtained environmental clearances from Ministry of Environment and Forests.</p>	/PDD/ /EIA/ /MOEF/	OK	OK
<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? (EB 55 Annex 1, §§ 131–133) <i>Check the EIA and its approval, if applicable.</i></p>	<p><i>Description:</i> EIA is carried out and is duly approved by the Ministry of Environment and Forests.</p> <p><i>Justification of evidences:</i> Environment Impact Assessment Notification, Ministry of Environment and Forests and Environmental Clearance from MoEF</p> <p><i>Conclusion:</i></p> <p>As per the requirement, PP has carried out environment Impact Assessment for the project and obtained environmental clearances from Ministry of Environment and Forests.</p>	/PDD/ /EIA/ /MOEF/	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.
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? (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>	<i>Description:</i> Environmental impacts of the gas based power projects is described in the PDD based on the EIA carried out. <i>Justification of evidences:</i> EIA report, PDD, Statutory clearances. <i>Conclusion:</i> Various environmental impacts due to project activity is sufficiently described in the PDD with mitigation measures.	/PDD/ /EIA/ /MOEF/	OK	OK
D.1.4. Are transboundary environmental impacts considered in the analysis? (EB 55 Annex 1, §§ 131–133) <i>Check the documents and local official sources / expertise regarding transboundary environmental impacts.</i>	<i>Description:</i> Considering the location of the project activity in the south Gujarat, there are no chances of any transboundary impacts. <i>Justification of evidences:</i> PDD, <i>Conclusion:</i> Based on the document review and local and sectoral expertise, validation team is convinced that there are no transboundary environmental impacts.	/PDD/	OK	
E. Stakeholder Comments <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>				

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>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> Local community, NGO, State government agencies, employee, contractors and consultants are identified as relevant stakeholders for the project activity. Stakeholders were invited by notice dated 14/11/2011 to representatives.</p> <p><i>Justification of evidences:</i> PDD, Copy of the notice dated 14/11/2011</p> <p><i>Conclusion:</i> Validation team is convinced that the PP has identified relevant stakeholders for the project activity and invited through public notice dated 14/11/2011 prior to the date of the meeting on 25/11/2011.</p>	<p>/PDD/ /LSHC/</p>	<p>OK</p>	<p>OK</p>
<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, 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</i></p>	<p><i>Description:</i> As stated in the PDD local stakeholder concerns are invited during stakeholder meeting on 25/11/2011.</p> <p><i>Justification of evidences:</i> Same is confirmed by conducting interview with local stakeholder during site visit and reviewing minutes of meeting and by reviewing attendance register.</p> <p><i>Conclusion:</i> Stakeholder consultation process was properly undertaken to invite the concerns of the local stakeholders.</p> <p>Validation team has verified the public notice and conducted interview during site visit. Based on this validation team is convinced that stakeholder consultation process was adequately completed</p>	<p>/PDD/ /LSHC/ /IM03/</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.
<i>comments received and have described this process in the PDD.</i>				

ANNEX 2: ASSESSMENT OF BASELINE IDENTIFICATION

Table A-2: Assessment of Baseline Identification (EB 55 Annex 1 §§83 – 86)

<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)
Project activity not implemented as a CDM project.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Plausible baseline scenario	/PDD/	<input type="checkbox"/>	Project activity not implemented as a CDM project i.e. Power generation using natural gas as fuel and combined cycle technology without CDM revenues has been correctly identified as a plausible baseline scenario
Power generation using Natural gas but technology other than the project activity. (E- class GT)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Plausible baseline scenario	/CEA/ /MOP/	<input type="checkbox"/>	Power generation using Natural gas but technology other than the project activity. (E- class GT) having efficiency of 52 % has been correctly identified as a plausible baseline scenario as it delivers the similar service i.e. base load power.
Power generation using wind energy	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	As wind is intermittent source of energy, it does not provide continuous power and does not deliver services as the project activity i.e. in base load	/CEA/ /MOP/	<input checked="" type="checkbox"/>	It is evident that these technologies are based on renewable sources of energy and cannot deliver base load power. The project activity delivers base load and the wind power delivers the peak load. .Hence exclusion of alternatives is justified

Power generation using Solar thermal parabolic	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	As Solar is intermittent source of energy, it does not provide continuous power and does not deliver services as the project activity i.e. in base load	/CEA/ /MOP/	<input checked="" type="checkbox"/>	It is evident that these technologies are based on renewable sources of energy and cannot deliver base load power. The project activity delivers base load and the Solar thermal delivers the peak load. Hence exclusion of alternatives is justified
Power generation using solid biomass fuel.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Biomass power plants are of the small capacities not comparable with the installed capacity of the project activity.	/CEA/ /MOP/	<input checked="" type="checkbox"/>	It is evident that biomass based power plants are of smaller capacities and used for captive power requirements and are not comparable with the project activity. Total installed capacity of the biomass based plant in NEWNE grid is only 1105 MW which is only 0.95 % of the total installed capacity. Further due to shortage and seasonal variation associated with the nature of the type of biomass it does not deliver the base load on continuous basis. Hence exclusion of alternatives is justified
Power generation using coal (domestic) as fuel – sub critical technology (conventional technology)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Plausible baseline scenario	/CEA/ /MOP/	<input type="checkbox"/>	Power generation using domestic coal as a fuel with sub critical technology was correctly identified as a plausible scenario as it delivers the similar service i.e. base load power
Power generation using coal (imported) as fuel – sub critical technology (conventional technology)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Plausible baseline scenario	/CEA/ /MOP/	<input type="checkbox"/>	Power generation using imported coal as a fuel with sub critical technology was correctly identified as a plausible scenario as it delivers the similar service i.e. base load power
Power generation using coal (domestic) as fuel with super-critical technology	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Plausible baseline scenario	/CEA/ /MOP/	<input type="checkbox"/>	Power generation using coal (domestic) as a fuel with super critical technology was correctly identified as a plausible scenario as it delivers the similar service i.e. base load power
Power generation using coal (imported) as fuel with super-critical technology	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Plausible baseline scenario	/CEA/ /MOP/	<input type="checkbox"/>	Power generation using coal (Imported) as a fuel with super critical technology was correctly identified as a plausible scenario as it delivers the similar service i.e. base load power
Power generation using lignite as fuel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Plausible baseline scenario	/CEA/ /MOP/	<input type="checkbox"/>	Power generation using lignite as fuel was also correctly identified as a plausible scenario as it delivers the similar service i.e. base load power.

Power generation using Naphtha as fuel	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	As per Central Electricity Authority of India and as per 11th Plan (2007-12) of power generation capacity addition in India, no such power plants are recently constructed or are under construction or are being planned.	/CEA/ /MOP/	<input checked="" type="checkbox"/>	The Naphtha based power plant can be an alternative for the project activity as it provides the similar services as compared to the project activity in terms of peak vs. baseload power. However, it does not come under the criteria of the recently constructed/under construction or planned and thus further excluded by the PP from the consideration. This has been checked with the publicly available details from the CEA, Government of India
Power generation using reservoir based hydro energy	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	As hydro power is intermittent source of energy thus it does not provide continuous power and does not deliver services as the project activity i.e. in base load	/CEA/ /MOP/	<input checked="" type="checkbox"/>	It is evident that these technologies are based on renewable sources of energy and cannot deliver base load power. The project activity delivers base load and the hydro power delivers the peak load. Hence exclusion of alternatives is justified. Further generation of hydro power faces limitation due to discharge of water based on irrigation, drinking water, industrial water requirements.
Power generation using run of the river (RoR) based hydro energy	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	As hydro power is intermittent source of energy thus it does not provide continuous power and does not deliver services as the project activity i.e. in base load	/CEA/ /MOP/	<input checked="" type="checkbox"/>	It is evident that these technologies are based on renewable sources of energy and cannot deliver base load power. The project activity delivers base load and the hydro power delivers the peak load. Hence exclusion of alternatives is justified
Power generation using nuclear energy	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	As per the prevailing regulations this alternative is not available to any companies in India.	/ACT/	<input checked="" type="checkbox"/>	Due to regulatory requirement in host country, no company in India is allowed to construct nuclear based power station except nuclear power corporation which is under the direct control of Department of Atomic Energy and is not governed by the Indian Electricity Act 2003 and electricity regulatory commissions. Hence exclusion of the alternative power generation using nuclear energy is appropriate.

Import of electricity from connected grid, including the possibility of new interconnection (Electricity Imports from neighbouring countries)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Import of electricity from neighbouring countries is not a plausible baseline scenario hence same is ruled out for the baseline selection analysis.	/ACT/	<input checked="" type="checkbox"/>	Possibility of the import from neighbouring countries including already connected grid (Nepal, Bhutan) and new connections (Pakistan, Bangladesh, Myanmar) The validation team agrees that as depicted by the PP, the imports from connected grid or possible new connections are not realistic because those grids themselves are deficient in power. Hence, the validation team accepts the exclusion of this alternative from consideration.
Electricity Imports from other Indian grids Under the possibility of existing connection	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	As the inter-regional grids of India are mostly power deficit thus power demand-supply mismatch doesn't provide the services as the project activity and also due to lack of infrastructure facilities due to insufficient capacities of transmission network.	/CEA/	<input checked="" type="checkbox"/>	The baseline grid for the project activity is selected as NEWNE grid of India. Another connected grid of India to the baseline grid is Southern grid. There is no possibility of import from southern grid as it is itself a deficient grid and does not meet its average peak demand

ANNEX 3: ASSESSMENT OF FINANCIAL PARAMETERS

Table A-3: Assessment of Financial Parameters (EB 55 Annex 1, §§ 111, 112, 114/ in case financial parameters stem from FSR §113,)

1. Project activity not implemented as a CDM project, i.e. 382.5 MW gas based combined cycle power plant with advance class gas turbine

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
1	Capacity of Plant	382.5	MW	Management Decision of TPL dated 28/01/2010 EPC Contract signed between TPL and Siemens AG & Siemens India Ltd on 02/07/2010	/MD/ /EPC/	<input checked="" type="checkbox"/>	The value is based on Management decision taken by M/s Torrent Power Limited (TPL) which is available to the PP at the time of decision making confirming to guideline 6 of EB 62, Annex 05. Same is confirmed by validation team during site visit and by reviewing the EPC contract. Validation team examined the documents and observed that the capacity of the project is 382.5 MW as correct and accurate.
2	Total Project Cost (including IDC , Financing Charges)	17915.96	INR million	Management Decision of TPL dated 28/01/2010 EPC Contract signed between TPL and Siemens AG &	/MD/ /EPC/ /IDFC/	<input checked="" type="checkbox"/>	Project cost is based on the EPC contract signed by PP dated 02/07/2010 which post decision making. As per EPC contract signed by TPL the actual project cost of the project considered in the financial analysis is INR 17915.96 million (i.e. INR 18330 Million minus INR 410 Million WC margin). Validation team has also verified Management Decision ^{MD/} submitted by Project Proponent (PP) which evidences the project cost as INR 19500

<input type="checkbox"/>		No financial parameters are used for additionality justification																			
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below																			
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT															
						Correctness of value applied	Comment														
				Siemens India Ltd on 02/07/2010 Project Appraisal and Information Memorandum dated September 2010 prepared by IDFC (Infrastructure Development Finance Company).			<p>million (inclusive of IDC, FC and WC margin). Value considered in the web hosted PDD by the PP is conservative then as per management decision and hence confirming the guideline 6 of EB 62, Annex 05. Validation team has reviewed and verified the EPC contract and management decision signed by board of directors of the company to confirm that the project cost is correct and conservative.</p> <p>DOE has also verified the project appraisal and information memorandum prepared by IDFC to confirm the project cost and the cost break up. The project cost as per this document is INR 18330 Million. The cost break up is as follows:</p> <table><tr><th>Particulars</th><th>Cost (in INR Million)</th></tr><tr><td>Equipment and Civil Cost</td><td>13930</td></tr><tr><td>Pre-Operating Expenses</td><td>1320</td></tr><tr><td>Contingency</td><td>610</td></tr><tr><td>Interest during construction</td><td>2060</td></tr><tr><td>Margin Money for working capital</td><td>410</td></tr><tr><td>Total Project Cost</td><td>18330</td></tr></table> <p>Based on above DOE concludes that the project cost considered is appropriate and is conservative than the project cost available at</p>	Particulars	Cost (in INR Million)	Equipment and Civil Cost	13930	Pre-Operating Expenses	1320	Contingency	610	Interest during construction	2060	Margin Money for working capital	410	Total Project Cost	18330
Particulars	Cost (in INR Million)																				
Equipment and Civil Cost	13930																				
Pre-Operating Expenses	1320																				
Contingency	610																				
Interest during construction	2060																				
Margin Money for working capital	410																				
Total Project Cost	18330																				

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
							the time of decision making and thus meets the guidance 6 of EB 62 Annex 5. The assessment of project cost /MW is given below.
3	Cost per MW	46.84	INR million per MW	<p>EPC Contract signed between TPL and Siemens AG & Siemens India Ltd on 02/07/2010 Management Decision of TPL dated 28/01/2010.</p> <p>Monthly Report on Broad Status of Thermal Power Projects (http://www.cea.nic.in/archives/thermal/bs/dec09.pdf (page 5 and 77))</p> <p>Equity research report prepared by ICRA on GMR (http://www.icra.in/files/pdf/GMRInfrastructure-201104.pdf (page 8))</p>	/EPC/ /MD/ /CEA/ /GMR/	<input checked="" type="checkbox"/>	<p>As per EPC contract signed by PP, the cost per MW of the project cost works out to be INR 46.84 million and the same is considered in the financial calculation by PP. In addition to this as per management decision the cost per MW for the project is calculated as 50.98 INR million per MW.</p> <p>Validation team has also verified the cost per MW of the other Natural Gas based power plant from the CEA website. As verified from CEA web site actual project cost for Koenseema CCGP gas based project (Commissioned in May 2009) works out to be INR 45.73 million/MW which is comparable to the cost INR 46.84 INR million per MW considered in the project activity. Validation team would like highlight here that since the project got commissioned in May 2009 and thus considering the inflation factor, the estimated project cost for the project activity becomes more comparable and appropriate to the candidate project activity. In addition to this the cost per MW considered in 786 MW by GMR Rajahmundry Project (expected COD is in FY 2012) works out to be 42.9 INR million per MW. Same is verified by validation team from the equity research report prepared by ICRA on GMR^(GMR/). Thus, it is concluded by validation team the cost per MW considered for the project activity is correct and appropriate. Thus, it is concluded by validation team that the cost per MW considered</p>

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
							is appropriate and is conservative than the project cost available at the time of decision making and thus meets the guidance 6 of EB 62 Annex 5
4	Technical Life time	25	Yeas	CERC (Terms and conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) EPC Contract signed between TPL and Siemens AG & Siemens India Ltd on 02/07/2010	/CERC/ /EPC/	<input checked="" type="checkbox"/>	Technical lifetime of the Project activity is considered as 25 years which is as per CERC Regulation published in 19/01/2009 and hence available to the PP at the time of investment decision making time. Thus the financial analysis for the project activity for a period of 25 years is correct and valid. Validation team has verified the CERC regulation and the lifetime is found to be correct and appropriate. Validation team has cross checked the EPC contract submitted by PP which evidences the technical lifetime as 25 years. Thus it is concluded by validation team the technical lifetime of the project activity is correct and appropriate.
5	Debt: Equity	70:30		Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 13 Project Appraisal and Information	/CERC/ /LS/ /IDFC/	<input checked="" type="checkbox"/>	Value considered by the PP is based on the CERC tariff order which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has also cross verified the value from CERC tariff order for its appropriateness. Values considered by the PP are sourced from the central electricity regulatory commission which is regulatory independent body in India. Validation team has also reviewed IDFC Information memorandum and loan sanction letter submitted by project proponent to confirm that the gearing ratio considered in the project remains at 70: 30. Thus, it is concluded by validation team the debt: equity ratio considered in the project activity is

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				Memorandum dated September 2010 prepared by IDFC (Infrastructure Development Finance Company). Loan Sanction letter ref. No. CAG'A/AMT-I/448 of SBI dated 10/02/2011			correct and appropriate.
6	Return on Equity (ROE)	15.5	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 (www.cercind.gov.in) page 21	/CERC/	<input checked="" type="checkbox"/>	Value considered by the PP is based on the CERC tariff order which is available to PP at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has verified the value from CERC tariff order for its appropriateness. Thus, it is concluded by validation team that the Return on Equity (RoE) considered by the PP for calculation of tariff is sourced from the central electricity regulatory commission which is regulatory independent body is correct and appropriate.
7	Plant Load Factor (PLF)	85	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009	/CERC/	<input checked="" type="checkbox"/>	Value considered by the PP is based on the CERC tariff order which is available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has also cross verified the value from CERC tariff order for its appropriateness. Values considered by the PP are sourced from the central

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				(www.cercind.gov.in) page 42			electricity regulatory commission which is regulatory independent body. Validation team has also cross checked the value of the PLF considered by other registered large scale natural gas based power projects Gautami (UNFCCC Ref. No. 4828) and Vemagiri (UNFCCC Ref. No. 4334) as 85 % and 80 % respectively Hence validation team is convinced that the value considered by the correct and appropriate.
8	Cost of Natural gas	6.35	US \$ per mmbtu	Based on the following documents for existing SUGEN plant of PP: <ul style="list-style-type: none"> RIL (Inv. No. 4528800538 dated 15/01/2010), transportation RGTIL (Inv. No. 690 dated 15/01/2010) GSPL email dated 05/05/2009 IOCL email dated 21/01/2010 RIL (Inv No. 4528800725 dated 15/03/2010) RGTIL (Inv No. 	/INV/	<input checked="" type="checkbox"/>	Cost of the Fuel (50% NG and 50% LNG) includes supply cost of the Natural Gas and LNG plus transportation cost and applicable taxes. Landed cost based on the actual invoice for the month of March 2010 of the RIL, RGTIL and GSPL for NG and IOCL and GSPL for LNG for PPs existing SUGEN plant as a basis of assumption for the project activity. However, the validation team has cross checked the cost of fuel (from invoices for existing SUGEN Power project) based on the information available at the time of decision making i.e. January 2010. Such price works out to US \$ 6.52 per MMBTU on GCV basis. As the price considered i.e. US \$ 6.35 per MMBTU on GCV as per the actual invoices of March 2010 is lower and thus conservative, the same has been accepted With regards to the transportation cost, as the project activity is located adjacent to the Sugan Plant hence assuming the transportation cost of Sugan is considered as appropriate. For arriving at the cost of Fuel, validation team has cross checked the

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<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				880 dated 15/03/2010) • GSPL Invoice dated 18/03/2010) • IOCL Invoice dated 31/03/2010d transportation price of IOCL(email dated 21/01/2010			<p>copy of the invoices for PPs other project i.e. SUGEN to verify the same and also checked the calculation used to arrive at the weighted average fuel cost. Further DOE has verified that even if the percentage of LNG goes down to zero percentage or increased to 100% there is no change in the selected baseline alternative and also confirmed that IRR does not cross the benchmark.</p> <p>It may be noted that the landed fuel price is dependent on the transportation cost (based on location of the project and source of gas supply); applicability of central and states levies besides the cost of the fuel which in turn depends on the source of fuel supply. Thus, the fuel price would vary from project to project. The same has been verified by the validation team from the fuel price considered by Gautmi (UNFCCC ref. no 4828) and Vemagiri (UNFCCC ref. No. 4334) i.e. approximately 4 US \$ per mmbtu and 3.02 US \$ per mmbtu respectively having the start date in the same year.</p> <p>However, the project proponent has considered the authentic source for the fuel price (i.e. fuel invoices for its existing power plant located near to the project activity) hence, the validation team concludes that the fuel price considered for the project activity is appropriate.</p>
9	Gross Calorific value of	9395	Kcal/SCM	Based on news article published Indian	/CV/ /INV/	<input checked="" type="checkbox"/>	The Gross Calorific value is calculated in the financial analysis is 9395 Kcal/SCM by the PP. This value is weighted average of NCV

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
	Natural Gas			express dated 10/04/2009 and report on subsidies description by Institute of economic growth submitted to UNCTAD.(united nations conference on trade and Development) http://www.indianexpress.com/news/govt-allocates-kgd6-gas-to-power-sector/445266/ Invoices of GSPL for the month of March 2010 for SUGEN Project (existing Natural Gas Power Plant)			of Reliance and Petronet LNG. NCV of Reliance (8100 Kcal/SCM) is sourced from the news article published by Indian Express dated 10/04/2009 and GCV of Petronet LNG (9880 Kcal/SCM) is based report on subsidies description by Institute of economic growth submitted to UNCTAD (united nations conference on trade and Development) dated May 2009 (page no. 78) which is available at the time of decision making. Based on the same the net calorific value of comes out to 8540.91 kCal/SCM (i.e. gross calorific value of 9395 kCal/SCM). Validation team has cross checked the value form the copy of the invoices for NG/RLNG for PPs SUGEN plant to ensure the same. In addition to this the validation team has cross checked the net calorific value with the other registered projects and project under validation. Gautami (4828) and Vemagiri (4334) as 8462 and 8545 kcal/SCM respectively. Thus, it is concluded by validation team that the Gross Calorific value of Natural Gas is correct and appropriate.
10	Gross Heat Rate	1663.71	Kcal/kWh	EPC Contract signed between TPL and Siemens AG & Siemens India Ltd on	/EPC/	<input checked="" type="checkbox"/>	The calculated value of Gross Heat Rate i.e. 1663.71 considered in the financial analysis is sourced from the EPC contract ^{/EPC-o/} of existing SUGEN plant having same unit capacity (382.5 MW) and same 'F' class of turbines supplied by same manufacturer and

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				02/07/2010 EPC Contract signed between TPL and Siemens AG & Siemens India Ltd on May 2005	/EPC-O/		<p>which was available to the PP at the time of decision making. Moreover, the heat rate as provided in the EPC contract is under optimum operating condition which is 6527 kJ/kWh. The same is Net Station heat rate on NCV basis. This is to be converted to Gross station heat rate on GCV basis. The multiplication factor 1.1 is the conversion factor from GCV to NCV (source: CO2 Baseline Database January, 2012 issued by CEA, Ministry of Power, and Government of India.). The factor of 0.97 represents the Auxiliary Consumption of 3% (source: Central Electricity Regulatory Commission (Terms & Conditions of Tariff) Regulations, 2009 dated 19/01/2009 – Page no. 49) to convert Net Station Heat Rate to Gross Station Heat Rate value of 1663.71 KCal/kWh. EPC contract submitted by PP is verified by validation team to confirm that the calculated value of Gross Heat Rate is correct and accurate.</p> <p>The gross heat rate value is cross checked by validation team from the EPC contract^{/EPC/} of the project activity and the value is correct and appropriate. Gross Heat Rate value is also cross checked by validation team with the other registered project Gautami (4828) and (Vemagiri (4334) as 1850 and 1850 respectively. Based on the above the value considered is correct and appropriate.</p>
11	Auxiliary consumption	3	%	Central Electricity Regulatory Commission (Terms &	/CERC/	<input checked="" type="checkbox"/>	Auxiliary consumption is considered based on the Central Electricity Regulatory Commission (Terms & conditions of Tariff)

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 49			Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has cross verified the value from CERC tariff order for its appropriateness. Hence validation team is convinced that the value considered is correct, appropriate and similar to the project activity. Further, the validation team has also cross checked with other registered projects (i.e. project no. 4828 and 4334) registered on the same methodology and having similar technology have assumed the same auxiliary consumption.
12	O & M expenses	1.849	INR million per MW	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 for the year 2013-14 (www.cercind.gov.in) page 28 Central Electricity Regulatory Commission (CERC) order for the Petition No. 109/2009 dated 11/01/2010	/CERC/ /Tariff-SUGEN/	<input checked="" type="checkbox"/>	O&M expense considered in the financial analysis by the PP is based on the CERC tariff order which is available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. O&M expense for the project activity is 1.849 million INR per MW which is 3.94% of the project cost. Validation team has also cross verified the value from CERC tariff order for its appropriateness. Further, the validation team has also verified the final tariff order dated 11/01/2010 of existing SUGEN plant by CERC ^{/Tariff-SUGEN/} and observed that the O&M expenses approved by CERC is INR 2.670 and INR 2.968 Million per MW for 2009-10 and 2013-14 respectively. Hence, it is concluded that the value of O&M expenses considered by the PP is conservative and appropriate. Validation team has also cross checked the value of the O&M expense considered by other registered project Vemagiri (4334)

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
							and Gautmi (4828) as 2.7 % and 3.6% of the project cost respectively. Validation team would like to highlight here that the source of the O&M cost for both of these projects is CERC terms and conditions of tariff regulations as applicable at the start of these projects. The project activity has considered the same source i.e. CERC terms and conditions of tariff regulations as applicable to the start date of the project activity. Further to this, considering the reference projects are of earlier period and the escalation factor, the O&M expenses considered by the PP for the project activity is comparable.
13	O & M escalation	5.72	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff Regulations, 2009 (www.cercind.gov.in) page 28	/CERC/	<input checked="" type="checkbox"/>	The value considered by the PP is as per CERC order which is available at the time of decision making and the value is correct and appropriate. Same is also cross checked with the other registered projects i.e. 6% for Gautami (UNFCCC Ref. no 4828) and 4% for Vemagiri (4334). Validation team would like to highlight here that the source of the O&M cost escalation for both of these projects is CERC terms and conditions of tariff regulations as applicable at the start of these projects. The project activity has considered the same source i.e. CERC terms and conditions of tariff regulations as applicable to the start date of the project activity. Thus, it is concluded by validation team the O&M escalation considered in the financial analysis is correct and appropriate.
14	Interest rate on	12	%	Modal BPLR of PSBs - Second Quarter	/RBI/	<input checked="" type="checkbox"/>	The interest rate taken is in line with the commercial lending rates

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
	Term Loan			Review of Monetary Policy 2009-10 date 27/10/2009 table 17(http://rbi.org.in/scripts/NotificationUser.aspx?Id=5326&Mode=0)			as provided by the Reserve Bank of India, India's central bank. As mentioned and verified by validation team from the second Quarter Review of Monetary Policy 2009-10 dated 27/10/2009, the modal BPLR interest rate chosen by PP is the monthly average (%) of public sector banks (PSBs). Further to this the validation team has also checked the average BPLR of the public sector banks (PSBs) which comes be 12.25% Thus, it is concluded by validation team that the modal BPLR value choosen for the benchmark calculation is correct and appropriate. The applied value has been verified and found correct. Hence validation team is convinced that the value considered is correct, appropriate and similar to the project activity.
15	Working Capital -	-	-	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 (www.cercind.gov.in) page 25	- /CERC/	-	The working capital is in conformity with Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 available to the PP at the time of investment decision making. Same is verified by the validation team and convinced that the value considered is correct, appropriate.
	Receivable Fuel O & M Maintenance spare Secondary fuel	2	Months			<input checked="" type="checkbox"/>	
		1	Months			<input checked="" type="checkbox"/>	
		1	Months			<input checked="" type="checkbox"/>	
		30	% of O&M expense			<input checked="" type="checkbox"/>	

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
16	Tariff	3.72	INR/kWh	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) Power purchase Agreement (PPA) signed by Torrent Power Limited for existing project SUGEN Mega Power (natural gas based) project dated 02/08/2005 and 08/05/2004. Power purchase Agreement (PPA) signed (for 35 MW) between PP and PTC India Limited for project activity dated 04/04/2012.	/CERC/ /INV/ /PPA/	<input checked="" type="checkbox"/>	<p>Tariff is based on the levelised cost worked out for the project activity based on the fixed cost and variable cost. Same is sourced from various input values considered from the CERC and other references available at the time of decision making confirming to guideline 06 of EB 62, Annex 05. Tariff calculation is verified by validation team is found to be correct and input values used therein are found correct as mentioned above. Tariff considered by project proponent is based on two part tariff and is regulated by the CERC norms and same is verified by validation team from CERC tariff order. Thus, it is concluded by validation team that the tariff considered in the financial analysis is correct and appropriate.</p> <p>Further, the validation team has cross checked the invoices to DISCOMs raised by the PP's existing SUGEN plant which indicates that the basis for invoicing is based on two-part tariff as per Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009. To further support the contention that the project activity envisaged to use the two part tariff as per the norms of the CERC, validation team crosschecked the PPA submitted by project proponent for their existing SUGEN Natural Gas based Power Plant and project activity i.e. UNOSUGEN Natural Gas based Power plant for 35 MW (as PP has signed PPA for 35 MW as on date) which states the method of determination of Tariff Payments for any Tariff Year</p>

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
							during the Term of Agreement shall be in accordance with that set out in the CERC Tariff Regulations. Since, CERC (Central Electricity Regulatory Commission) is nodal agency which is empowered to regulate the electricity tariff for generation and distribution of power companies in India thus, tariff rate for the any thermal power plant set up in India with interstate connectivity allowed/approved the tariff rate in accordance with said CERC regulation on time to time basis. Thus, it is concluded by validation team that the tariff considered in the financial calculation is correct and appropriate.
17	Income Tax	33.99	%	Income Tax Act, 1961	/ACT/	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in India. The same is verified by DOE and found correct.
18	Minimum Alternate Tax (MAT)	16.995	%	Income Tax Act, 1961 ⁴⁵	/ACT/	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in India. The same is verified by DOE and found correct.
19	Repayment Period Moratorium Period	44 4	Quarters	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 (www.cercind.gov.in) page 41 and 44	/CERC/ /LS/	<input checked="" type="checkbox"/>	Repayment period considered for the project activity by the PP is 12 years which is based on Statement of Objects and Reasons for CERC Terms and Conditions which provides for 12 years for all normative loans. Thus, it is concluded by validation team that the repayment period considered for the project activity is correct and appropriate. The same is verified with the value mentioned in loan sanction

⁴⁵ <http://www.kpcindia.com/Pdf/Tax-Guide-2009.pdf> - Tax Rate (Refer Page 2) (Corporate Tax – 33.99% and MAT – 16.995%)

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				Loan Sanction letter ref. No. CAG'A/AMT-I/448 of SBI dated 10/02/2011			letter which also includes 1 year of moratorium period. Loan sanction letter is verified by validation team to confirm that the repayment period considered in the financial analysis is correct and appropriate.
20	Depreciation as per Income Tax	15	%	Income Tax Act, 1961	/ACT/	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in India. The same is verified by DOE and found correct.
21	Depreciation as per Companies Act	5.28	%	Companies Act, 1956	/ACT/	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in India. The same is verified by DOE and found correct.
22	Salvage Value	10	%	http://energytechnologyexpert.com/financial-models/how-to-evaluate-economic-feasibility-of-a-power-plant-project-use-project-finance-model/ dated November 9th, 2009 Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009	/S-VAL/ /CERC/	<input checked="" type="checkbox"/>	Salvage Value of Power Plant & Equipment considered in the project activity is taken as 10% in the financial analysis. The source/reference of the salvage value submitted by PP is verified by validation team to correct and appropriate. In financial calculation assets are depreciated to 100% of book value and this is being achieved in the 19th year of operations. The salvage value is being considered at the end of useful life i.e. 25 years. A 10% salvage value is considered by the project proponent for the project activity including all the alternatives which is a reasonable expectation of the potential profit or loss on the realization of the assets. In addition to this CERC tariff order is also verified by validation team which also evidences the salvage value as 10%. Thus, it is concluded by validation team that the salvage value considered in

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				(www.cercind.gov.in) page 23			the financial calculation is correct and conservative.
23	Risk free rate (Government Bond rate)	8.3	%	http://rbidocs.rbi.org.in/rdocs/Bulletin/PDFs/27T_EBU70110.pdf page 2	/RBI/	<input checked="" type="checkbox"/>	For calculating WACC, risk free rate are correctly sourced from the details available from Reserve Bank of India and is applicable at the time of decision making. Risk Free rate is the minimum value of Maximum Redemption Yield of all Government of India Securities having tenure over 15 years upto 25 years based on SGL Transactions. Same is verified by validation team and found to be correct and conservative.
24	Market Return	18.28	%	http://www.bseindia.com	/BSE/	<input checked="" type="checkbox"/>	Market return is calculated for the period of 30 years from April 1979 to December 2009 i.e. period prior to the investment decision making date i.e. 28/01/2010 for BSE 30 Index and BSE 500 Index. . Market return is also calculated for BSE 500 Index for the period i.e. Feb 1999 till December 2009 (10.92 Years) which comes to 19.26 %. Thus, it is concluded by validation team that the market return calculated for benchmark calculation is correct and conservative.
25	Rate of Interest on Working Capital	11.75	%	As per Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in)	/CERC/	<input checked="" type="checkbox"/>	As per Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 26, the Rate of interest on working capital shall be equal to the short-term Prime Lending Rate of State Bank of India. The validation team has verified the same. Based on the same, the short-term Prime Lending Rate of State Bank of India available at the time of decision making is

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				page 26 , the 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 (http://in.reuters.com/article/2010/01/04/india-plr-idINSGE6030BH20100104)			considered i.e. 11.75%. The same has also been verified from the article of Reuters dated 04/01/2010 (http://in.reuters.com/article/2010/01/04/india-plr-idINSGE6030BH20100104) and it is found correct. Based on the above, the value is correct and appropriate. This value has been considered for all alternatives.
26	Discounting Factor	1.1019		Discount rate as notified by Central Electricity Regulatory Commission on 30/09/2009 (http://cercind.gov.in/Escalation-rate/Notification-dated-30-09-09.pdf) Page 1	/CERC/	<input checked="" type="checkbox"/>	The discounting factor is taken from Central Electricity Regulatory Commission notification dated 30/09/2009 which was available at the time of decision making. The same is verified by Validation team and found correct and authentic. This value has been considered for all alternatives.

2. Power Generation using natural gas but technology other than the project activity (i.e. 340 MW gas based CCPP)

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
1	Capacity of Plant	340	MW	Registered CDM project - 340 MW Gas based combined cycle power project expansion at Hazira	/Hazira-2915/	<input checked="" type="checkbox"/>	The Project activity alternative is based on F Class (advance class) gas turbine from Siemens. The project selected as representative project for gas based other technology employing E class (conventional class) gas turbine from other technology provider (i.e. other than Siemens). As per CEA monthly report on Broad status of Thermal Power Project in the country dated December 2009, there was no power plant under construction having different technology provider with E class machine. Further to this the natural gas conventional technology will have lower carbon emissions when compared to other technologies (i.e. coal). Hence, it is conservative to select a project with lower project cost for the alternative under power generation using natural gas, but technologies other than the project activity as it increases the likelihood of its identification as the likely baseline scenario.
2	Total Project Cost (including IDC , Financing Charges)	8126.5	INR million	Registered CDM project - 340 MW Gas based combined cycle power project expansion at Hazira	/Hazira-2915/	<input checked="" type="checkbox"/>	The project cost for the selected baseline alternative is taken as 8126.5 INR million for the 340 MW gas based Power plant in Hazira, Gujarat. This project is registered under CDM and project design document (PDD) is verified by validation team to confirm that the project cost considered for the alternative using technology other than used in the project activity is correct and

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
							conservative. It is worthwhile to mention here that the project cost considered for the selected baseline alternative scenario is lowest among all registered project under the green field project. Thus, it is concluded by validation team that the project cost considered for this alternative scenario is correct and appropriate.
3	Cost per MW	23.90	INR million per MW	Registered CDM project - 340 MW Gas based combined cycle power project expansion at Hazira	/Hazira-2915/	<input checked="" type="checkbox"/>	As already mentioned the total project cost for the selected baseline alternative is most conservative among all the new greenfield natural gas based power plant available in the UNFCCC website in India. Hence, the cost per MW value for the baseline alternative is correct and conservative.
4	Technical Life time	25	Years	CERC (Terms and conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in)	CERC	<input checked="" type="checkbox"/>	<p>Technical lifetime of the selected alternative is considered as 25 years which is as per CERC Regulation published in 19/01/2009 and available at the time of investment decision making as per guideline 6 of EB 62, Annex 05. Validation team has verified the CERC regulation and the lifetime are found to be correct. Further, As per EB50, Annex-15, "Tool to determine remaining lifetime of the equipment" life time of the boiler and steam turbine is 25 years.</p> <p>Based on the above, it is concluded that the technical life time of the selected alternative for a period of 25 years is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.</p>
5	Debt: Equity	70:30		Central Electricity Regulatory	CERC	<input checked="" type="checkbox"/>	Value considered is based on Central Electricity Regulatory

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				Commission (Terms & conditions of Tariff) Regulations, 2009 (www.cercind.gov.in) page 13			Commission (Terms & conditions of Tariff) Regulations, 2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has also cross verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 page 13 for its appropriateness. Further, the ratio of Debt: Equity (i.e. 70:30) is normally accepted ratio of infrastructure projects. Thus, it is concluded that the debt: equity ratio considered is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
6	Return on Equity (ROE)	15.5	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 (www.cercind.gov.in) page 21	CERC	<input checked="" type="checkbox"/>	Value considered is based on Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 page 21 for its appropriateness. Thus, it is concluded the value considered is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
7	Plant Load Factor (PLF)	85	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff)	CERC	<input checked="" type="checkbox"/>	Value considered is based on Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				Regulations, 2009 (www.cercind.gov.in) page 42			making and confirms to guideline 6 of EB 62, Annex 05. Validation team has also cross verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 page 42 for its appropriateness. Hence validation team is convinced that the value considered is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
8	Cost of Natural gas	6.35	US \$ per mmbtu	Based on the following documents for existing SUGEN plant of PP: <ul style="list-style-type: none"> RIL (Inv. No. 4528800538 dated 15/01/2010), transportation RGTEL (Inv. No. 690 dated 15/01/2010) GSPL email dated 05/05/2009 IOCL email dated 21/01/2010 RIL (Inv No. 4528800725 dated 15/03/2010) 	/INV/	<input checked="" type="checkbox"/>	Cost of the Fuel (50% NG and 50% LNG) includes supply cost of the Natural Gas and LNG plus transportation cost and applicable taxes. Landed cost based on the actual invoice for the month of March 2010 of the RIL, RGTEL and GSPL for NG and IOCL and GSPL for LNG for PPs existing SUGEN plant as a basis of assumption for the project activity. However, the validation team has cross checked the cost of fuel based on the information available at the time of decision making i.e. January 2010. Such price works out to US \$ 6.52 per MMBTU on GCV basis. As the price considered i.e. US \$ 6.35 per MMBTU on GCV is as per the actual invoices of March 2010 is lower and thus conservative, the same has been accepted With regards to the transportation cost, as the project activity is located adjacent to the Sugan Plant hence assuming the

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	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"> RGITL (Inv No. 880 dated 15/03/2010) GSPL Invoice dated 18/03/2010) IOCL Invoice dated 31/03/2010d transportation price of IOCL(email dated 21/01/2010 			<p>transportation cost of Sugen is considered as appropriate. For arriving at the cost of Fuel, validation team has cross checked the copy of the invoices for PPs other project i.e. SUGEN to verify the same and also checked the calculation used to arrive at the weighted average fuel cost. Further DOE has verified that even if the percentage of LNG goes down to zero percentage or increased to 100% there is no change in the selected baseline alternative and also confirmed that IRR does not cross the benchmark.</p> <p>It may be noted that the landed fuel price is dependent on the transporation cost (based on location of the project and source of gas supply); applicability of central and states levies besides the cost of the fuel which in trun depends on the source of fuel supply. Thus, the fuel price would vary from project to project. The same has been verified by the validation team from the fuel price considered by Gautmi (UNFCCC ref. no 4828) and Vemagiri (UNFCCC ref. No. 4334) i.e. approximately 4 US \$ per mmbtu and 3.02 US \$ per mmbtu respectively having same start date in the same year.</p> <p>However, the project proponent has considered the authentic source for the fuel price (i.e. fuel invoices for its existing power plant located near to the project activity) hence, the validation team concludes that the fuel price considered for the project activity is appropriate</p>

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
9	Gross Calorific value of Natural Gas	9395	Kcal/SCM	Based on news article published Indian express dated 10/04/2009 and report on subsidies description by Institute of economic growth submitted to UNCTAD.(united nations conference on trade and Development) http://www.indianexpress.com/news/govt-allocates-kqd6-gas-to-power-sector/445266/ Invoices of GSPL for the month of March 2010 for SUGEN Project (existing Natural Gas Power Plant)	/CV/ INV	<input checked="" type="checkbox"/>	The Gross Calorific value is calculated in the financial analysis is 9395 Kcal/SCM by the PP. This value is weighted average of NCV of reliance and Petronet LNG. NCV of Reliance (8100 Kcal/SCM) us is sourced from the news article published Indian express dated 10/04/2009 and GCV of Petronet LNG (9880 Kcal/SCM) is based report on subsidies description by Institute of economic growth submitted to UNCTAD (united nations conference on trade and Development) dated May 2009 (page no. 78) which is available at the time of decision making. Based on the same the net calorific value of comes out to be 8540.91 kCal/SCM (i.e. gross calorific value of 9395 kCal/SCM). Validation team has cross checked the value form the copy of the invoices for NG/RLNG for PPs SUGEN plant to ensure the same. In addition to this the validation team has cross checked the net calorific value with the other registered projects and project under validation. Gautami (4828) and Vemagiri (4334) as 8462 and 8545, kcal/SCM respectively..
10	Gross Heat Rate	1950	Kcal/kWh	Registered CDM project - 340 MW Gas	/Hazira-2915/	<input checked="" type="checkbox"/>	Gross Heat Rate value for the selected baseline alternative is sourced from the registered PDD of Hazira Natural Gas project

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				based combined cycle power project expansion at Hazira			having UNFCCC Ref. no. 2915. The value thus considered is correct and appropriate.
11	Auxiliary consumption	3	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 49	CERC	<input checked="" type="checkbox"/>	Auxiliary consumption is considered based on the Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has cross verified the value from CERC tariff order for its appropriateness. Hence validation team is convinced that the value considered is correct, appropriate and similar to the project activity.
12	O & M expenses	1.849	INR million per MW	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 for the year 2013-14 (www.cercind.gov.in) page 28	CERC	<input checked="" type="checkbox"/>	O&M expense considered in the financial analysis is based on Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has also cross verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 for its appropriateness. Hence validation team is convinced that the value considered is correct and appropriate.
13	O & M escalation	5.72	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff)	CERC	<input checked="" type="checkbox"/>	The value considered in this baseline alternate scenario is as per the CERC tariff regulation which is available at the time of decision making and the value is correct and appropriate.

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				Regulations, 2009 (www.cercind.gov.in) page 28			
14	Interest rate on Term Loan	12	%	Modal BPLR of PSBs - Second Quarter Review of Monetary Policy 2009-10 date 27/10/2009 table 17 (http://rbi.org.in/scripts/NotificationUser.aspx?Id=5326&Mode=0)	RBI	<input checked="" type="checkbox"/>	<p>The interest rate taken is in line with the commercial lending rates as provided by the Reserve Bank of India, India's central bank. The applied value has been verified and found correct.</p> <p>As mentioned and verified by validation team from the second Quarter Review of Monetary Policy 2009-10 dated 27/10/2009, the modal BPLR interest rate chosen by PP is the monthly average (%) of public sector banks (PSBs). Further to this the validation team has also checked the average BPLR of the public sector banks (PSBs) which comes be 12.25%. Thus, it is concluded by validation team that the modal BPLR value chosen for the benchmark calculation is correct and appropriate.</p> <p>Hence validation team is convinced that the value considered is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.</p>
15	Working Capital: Receivables	2	Months	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009	CERC	<input checked="" type="checkbox"/>	The working capital is in conformity with Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 available to the PP at the time of investment decision making. Same is verified by the validation team and convinced that the value considered is correct, appropriate.
	Fuel O&M Maintenance Spare	1 1 30	Month Month % of O&M				

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
	Secondary Fuel	NA	Expense s NA	(www.cercind.gov.in) page 25			
16	Tariff	3.53	Rs/kWh	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 (www.cercind.gov.in)	CERC	<input checked="" type="checkbox"/>	<p>Tariff is based on the levelised cost worked out based on the fixed cost and variable cost. The same is calculated from various input values considered from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 and other references available at the time of decision making confirming to guideline 06 of EB 62, Annex 05. Tariff calculation is verified by validation team is found to be correct and input values used therein are found correct as mentioned above.</p> <p>The Tariff is based on two part tariff and is regulated by Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 and the same is also verified by validation team.</p> <p>Thus, it is concluded by validation team that the tariff considered in the financial analysis is correct and appropriate. The same approach has been used in tariff calculation of all alternatives as applicable to the project activity.</p>
17	Income Tax	33.99	%	Income Tax Act, 1961	Act	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in India. The same is verified by DOE and found correct, appropriate

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
							and similar to the project activity. This value has been applied for all considered alternatives.
18	Minimum Alternate Tax (MAT)	16.995	%	Income Tax Act, 1961 ⁴⁶	Act	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in India. The same is verified by DOE and found correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
19	Repayment Period Moratorium Period	44 4	Quarters	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 (www.cercind.gov.in) page 41 and 44 Loan Sanction letter ref. No. CAG'A/AMT-I/448 of SBI dated 10/02/2011	/CERC/ /LS/	<input checked="" type="checkbox"/>	Repayment period considered for the project activity by the PP is 12 years which is based on Statement of Objects and Reasons for CERC Terms and Conditions which provides for 12 years for all normative loans. Thus, it is concluded by validation team that the repayment period considered for the project activity is correct and appropriate. The same is verified with the value mentioned in loan sanction letter which also includes 1 year of moratorium period. Loan sanction letter is verified by validation team to confirm that the repayment period considered in the financial analysis is correct and appropriate.
20	Depreciation as per Income Tax	15	%	Income Tax Act, 1961	Act	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in India. The same is verified by DOE and found correct. This value has been applied for all considered alternatives.

⁴⁶ <http://www.kpcindia.com/Pdf/Tax-Guide-2009.pdf> - Tax Rate (Refer Page 2) (Corporate Tax – 33.99% and MAT – 16.995%)

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
21	Depreciation as per Companies Act	5.28	%	Companies Act, 1956	Act	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in India. The same is verified by DOE and found correct. This value has been applied for all considered alternatives.
22	Salvage Value	10	%	http://energytechnologyexpert.com/financial-models/how-to-evaluate-economic-feasibility-of-a-power-plant-project-use-project-finance-model/ dated November 9th, 2009 Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 (www.cercind.gov.in) page 23	/S-VAL/ /CERC/	<input checked="" type="checkbox"/>	Salvage Value of Power Plant & Equipment considered in the project activity is taken as 10% in the financial analysis. The source/reference of the salvage value submitted by PP is verified by validation team to correct and appropriate. In financial calculation assets are depreciated to 100% of book value and this is being achieved in the 19th year of operations. The salvage value is being considered at the end of useful life i.e. 25 years. A 10% salvage value is considered by the project proponent for the project activity including all the alternatives which is a reasonable expectation of the potential profit or loss on the realization of the assets. In addition to this CERC tariff order is also verified by validation team which also evidences the salvage value as 10%. Thus, it is concluded by validation team that the salvage value considered in the financial calculation is correct and conservative.
23	Rate of Interest on Working Capital	11.75	%	As per Central Electricity Regulatory Commission (Terms & conditions of Tariff)	CERC	<input checked="" type="checkbox"/>	As per Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 26, the Rate of interest on working

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 26, the 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 (http://in.reuters.com/article/2010/01/04/india-plr-idINSGE6030BH20100104)			capital shall be equal to the short-term Prime Lending Rate of State Bank of India. The Validation team has verified the same. Based on the same, the short-term Prime Lending Rate of State Bank of India available at the time of decision making is considered i.e. 11.75%. The same has also been verified from the article of Reuters dated 04/01/2010 (http://in.reuters.com/article/2010/01/04/india-plr-idINSGE6030BH20100104) and it is found correct. Based on the above, the value is correct and appropriate. This value has been considered for all alternatives.
24	Discounting Factor	1.1019		Discount rate as notified by Central Electricity Regulatory Commission on 30/09/2009 (http://cercind.gov.in/Escalation-rate/Notification-dated-30-09-09.pdf) Page 1	CERC	<input checked="" type="checkbox"/>	The discounting factor is taken from Central Electricity Regulatory Commission notification dated 30/09/2009 which was available at the time of decision making. The same is verified by Validation team and found correct and authentic. This value has been considered for all alternatives.

3. 350 MW domestic coal fired power plant using conventional technology (sub critical)

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
1	Capacity of Plant	350	MW	CEA monthly report on Broad status of Thermal Power Project in the country dated December 2009 http://www.cea.nic.in/archives/thermal/bs/dec09.pdf (page no. 86)	CEA	<input checked="" type="checkbox"/>	Kamalanga TPP (Thermal Power Plant) has been selected for levelised cost analysis representative project for this baseline alternative having latest zero date (i.e. 27/05/2009) of all under construction projects with conventional technology (both Public and Private) as per the Monthly Report on Broad Status of Thermal Power Project in the country December 2009 by Central Electricity Authority of India. This report is verified by validation team to confirm that the representative case considered in the levelised cost analysis is correct and appropriate.
2	Total Project Cost (including IDC , Financing Charges)	15134	INR million	CEA monthly report on Broad status of Thermal Power Project in the country dated December 2009 http://www.cea.nic.in/archives/thermal/bs/dec09.pdf (page no. 86)	CEA	<input checked="" type="checkbox"/>	The project cost of the selected baseline alternative has been sourced from the CEA monthly report on Broad status of Thermal Power Project in the country dated December 2009, available at the time of investment decision making. CEA report is verified by validation team to confirm that the project cost considered is correct. The assessment of project cost /MW is given below.
3	Cost per MW	43.24	INR million	CEA monthly report on Broad status of		<input checked="" type="checkbox"/>	The cost per MW for this baseline alternative comes out as 43.24 INR million per MW. Validation team has also cross verified the

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
			per MW	Thermal Power Project in the country dated December 2009 http://www.cea.nic.in/archives/thermal/bs/dec09.pdf (page no. 86)			cost assumed by other registered projects for coal based power plants using sub critical technology as an alternative and observed that they have assumed the cost of Rs. 40 million/MW as in the case of registered projects Gautami(4828) and Vemagiri (4334) Gas based combined cycle power project. Further the project UNFCCC No. 4629 though registered under different methodology, the cost for the alternative is considered as INR 40.5 Million per MW. Since the cost is based on the approved cost of various coal based power plants and the cost considered by project proponent (PP) is conservative, DOE accepted the cost as valid appropriate and conservative for the project activity
4	Technical Life time	25	Years	CERC (Terms and conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) (page no. 9)	CERC	<input checked="" type="checkbox"/>	Technical lifetime of the selected alternative is considered as 25 years which is as per CERC Regulation published in 19/01/2009 and available at the time of investment decision making as per guideline 6 of EB 62, Annex 05. Validation team has verified the CERC regulation and the lifetime is found to be correct. Further, As per EB50, Annex-15, "Tool to determine remaining lifetime of the equipment" life time of the boiler and steam turbine is 25 years. Based on the above, it is concluded that the technical life time of the selected alternative for a period of 25 years is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
5	Debt: Equity	70:30		Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 (www.cercind.gov.in) page 13	CERC	<input checked="" type="checkbox"/>	Value considered is based on Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has also cross verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 page 13 for its appropriateness. Further, the ratio of Debt: Equity (i.e. 70:30) is normally accepted ratio of infrastructure projects. Thus, it is concluded that the debt: equity ratio considered is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
6	Return on Equity (ROE)	15.5	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 (www.cercind.gov.in) page 21	CERC	<input checked="" type="checkbox"/>	Value considered is based on Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 page 21 for its appropriateness. Thus, it is concluded the value considered is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
7	Plant Load Factor (PLF)	85	%	Central Electricity Regulatory	CERC	<input checked="" type="checkbox"/>	Value considered is based on Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009

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<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				Commission (Terms & conditions of Tariff) Regulations, 2009 (www.cercind.gov.in) page 42			dated 19/01/2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has also cross verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 page 42 for its appropriateness. Hence validation team is convinced that the value considered is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
8	Cost of Coal	1133.18	INR/Tonne	GOVERNMENT OF INDIA MINISTRY OF COAL RAJYA SABHA UNSTARRED QUESTION NO 2628 TO BE ANSWERED ON 14.12.2009 COAL PRICES . http://164.100.47.5:8080/members/website/question.asp?qref=149034	/COAL-P/ /CEA/	<input checked="" type="checkbox"/>	Landed cost of the MCL (Mahanadi Coalfields Limited) 'F' grade coal i.e. 1133.18 INR/Tonne considered in the financial analysis for this baseline alternative is taken from the statement/answer given by ministry of Coal in Rajya Sabha ^{/COAL-P/} dated 14/12/2009. Validation team has verified the statement to confirm that the input values used in the calculation of coal price is correct. The validation team has also verified that the Gross Calorific Value of Coal grade "F" i.e. 3865 Kcal/kg considered for coal price reference is in line with the average Gross Calorific value i.e. 3755 KCal/Kg of coal consumed by Indian Coal based power plant. Hence validation team is convinced that the value considered is correct and appropriate. The validation team has cross verified the cost assumed by other registered projects and observed that Vamagir (4334) has

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				CO2 Baseline Database for the Indian Power Sector, November, 2009, issued by Central Electricity Authority, Ministry of Power, Government of India (http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm)			considered a cost of Rs.1173/MT for 4000 Kcal/Kg GCV (INR 0.29 / 1000 kCal) and Gautami (4828) has considered INR 1357/MT for 4760.50 Kcal/Kg GCV ((INR 0.29 / 1000 kCal). This is comparable to INR 0.30 / 1000 kCal (Rs.1133.18/MT assumed by the candidate project for 3755 kcal/kg GCV) on energy basis. Further, even if the price considered is double i.e. INR 0.60/1000kCal; the project activity continues to remain unattractive.
9	Gross Calorific value of Domestic Coal	3755	KCal/kg	CO2 Baseline Database for the Indian Power Sector, November, 2009, issued by Central Electricity Authority, Ministry of Power, Government of India (http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm)	CEA	<input checked="" type="checkbox"/>	The Gross Calorific Value i.e. 3755 KCal/kg of the domestic coal used in this baseline alternative scenario is sourced from the CO2 Baseline Database for the Indian Power Sector, November, 2009, issued by Central Electricity Authority, Ministry of Power, Government of India which was available at the time of investment decision making. Further to this the calorific value is lower than the calorific value of coal i.e. 3865 Kcal/kg being considered for reference coal price hence the Gross Calorific value of domestic coal is correct and conservative. Other registered project as discussed above (under the section for

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						Correctness of value applied	Comment
							the "cost of coal") has considered the have assumed GCV ranging from 4000 kcal/kg to 4760.5 kcal/kg. Since the coal cost is normally linked to GCV, the validation team computed the cost per 1000 kcal of other registered projects and observed that Vamagir (4334) has considered a cost of Rs.1173/MT for 4000 Kcal/Kg GCV (INR 0.29 / 1000 kCal) and Gautami (4828) has considered INR 1357/MT for 4760.50 Kcal/Kg GCV ((INR 0.29 / 1000 kCal). This is comparable to INR 0.30 / 1000 kCal (Rs.1133.18/MT assumed by the candidate project for 3755 kcal/kg GCV) on energy basis. Further, even if the price considered is double i.e. INR 0.60/1000kCal; the project activity continues to remain unattractive.
10	Gross Heat Rate	2276	Kcal/kWh	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 46	CERC	<input checked="" type="checkbox"/>	Gross Heat Rate value for the selected baseline alternative scenario is sourced from CERC tariff regulation dated 19/01/2009 which provided maximum design gross heat rate value for sub-critical domestic coal based power plant. CERC tariff order is verified by validation team to confirm that the value considered in the financial analysis is correct. Further, this heat rate is increased by 6.5% (the margin on design heat rate to be applied as per CERC Terms and Conditions of Tariff Regulations 2009 dated 19/01/2009 (page 46)). Thus, the effective heat rate used in the calculation works out to be 2423.94 kCal/kWh. The same has been cross checked with other registered projects Gautami (4828) and Vemagiri (4334) as which

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<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
							has considered GHR of 2500 kCal/kWh. As plausibility check under sensitivity analysis validation team has found that the project activity continues to remain unattractive. Based on the above, the heat rate considered by PP is appropriate.
11	Auxiliary consumption	8.50	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 (www.cercind.gov.in) page 48	CERC	<input checked="" type="checkbox"/>	The auxiliary consumption value i.e. 8.5% for the baseline alternative scenario is sourced from the CERC tariff regulation dated 19/01/2009 which was available at the time of investment decision making. The same has also been cross checked with other registered projects Gautami (4828) as 9.5% and Vemagiri (4334) as 9% Hence, the value considered by the PP is comparable. Validation team would like to highlight here that the source of the auxiliary consumption for both of these projects is as per CERC terms and conditions of tariff regulations as applicable at the start of these projects. The project activity has considered the same source i.e. CERC terms and conditions of tariff regulations as applicable to the start date of the project activity Based on the same, the value considered by the PP is correct and appropriate.
12	O & M expenses	1.999	INR million per MW	Central Electricity Regulatory Commission (Terms &	CERC	<input checked="" type="checkbox"/>	O&M expense considered in the financial analysis is based on Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at

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<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				conditions of Tariff) Regulations, 2009 dated 19/01/2009 for the year 2013-14 (www.cercind.gov.in) page 27			<p>the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has also cross verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 for its appropriateness.</p> <p>The same has also been cross checked with other registered projects Gautami (4828) as INR 2.5 Million /MW and Vemagiri (4334) as INR 1.04 Million /MW. The value considered by the PP is within the range and hence it is comparable.</p> <p>Validation team would like to highlight here that the source of the O&M expenses for both of these projects is CERC terms and conditions of tariff regulations as applicable at the start of these projects. The project activity has considered the same source i.e. CERC terms and conditions of tariff regulations as applicable to the start date of the project activity</p> <p>Based on the same, the value considered by the PP is correct and appropriate.</p>
13	O & M escalation	5.72	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 (www.cercind.gov.in) page 27	CERC	<input checked="" type="checkbox"/>	<p>The value considered in this baseline alternate scenario is as per the CERC tariff regulation which is available at the time of decision making and the value is correct and appropriate. The same has also been cross checked with other registered projects Gautami (4828) as 6% and Vemagiri (4334) as 4%. The value considered by the PP is within the range and hence it is comparable.</p> <p>Validation team would like to highlight here that the source of the</p>

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
							O&M escalation for both of these projects is CERC terms and conditions of tariff regulations as applicable at the start of these projects. The project activity has considered the same source i.e. CERC terms and conditions of tariff regulations as applicable to the start date of the project activity Based on the same, the value considered by the PP is correct and appropriate.
14	Interest rate on Term Loan	12	%	Modal BPLR of PSBs - Second Quarter Review of Monetary Policy 2009-10 date 27/10/2009 table 17(http://rbi.org.in/scripts/NotificationUser.aspx?id=5326&Mode=0)	RBI	<input checked="" type="checkbox"/>	The interest rate taken is in line with the commercial lending rates as provided by the Reserve Bank of India, India's central bank. The applied value has been verified and found correct. As mentioned and verified by validation team from the second Quarter Review of Monetary Policy 2009-10 dated 27/10/2009, the modal BPLR interest rate chosen by PP is the monthly average (%) of public sector banks (PSBs). Further to this the validation team has also checked the average BPLR of the public sector banks (PSBs) which comes be 12.25%. Thus, it is concluded by validation team that the modal BPLR value chosen for the benchmark calculation is correct and appropriate. Hence validation team is convinced that the value considered is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
15	Working Capital: Receivable	2	Months	Central Electricity Regulatory	CERC	<input checked="" type="checkbox"/>	The working capital is in conformity with Central Electricity

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<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
	Fuel	2	Months	Commission (Terms & conditions of Tariff) Regulations, 2009 (www.cercind.gov.in) page 25			Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 available to the PP at the time of investment decision making. Same is verified by the validation team and convinced that the value considered is correct, appropriate.
	O&M	1	Month				
	Maintenance Spare	20	% of O&M expenses				
	Secondary fuel Oil Consumption	2	Months				
16	Tariff	2.29	INR/kWh	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 (www.cercind.gov.in)	CERC	<input checked="" type="checkbox"/>	<p>Tariff is based on the levelised cost worked out based on the fixed cost and variable cost. The same is calculated from various input values considered from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 and other references available at the time of decision making confirming to guideline 06 of EB 62, Annex 05. Tariff calculation is verified by validation team is found to be correct and input values used therein are found correct as mentioned above.</p> <p>The Tariff is based on two part tariff and is regulated by Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 and the same is also verified by validation team.</p> <p>Thus, it is concluded by validation team that the tariff considered in the financial analysis is correct and appropriate. The same approach has been used in tariff calculation of all alternatives as</p>

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
							applicable to the project activity.
17	Income Tax	33.99	%	Income Tax Act, 1961	ACT	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in India. The same is verified by DOE and found correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
18	Minimum Alternate Tax (MAT)	16.995	%	Income Tax Act, 1961 ⁴⁷	ACT	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in India. The same is verified by DOE and found correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
19	Repayment Period Moratorium Period	44 4	Quarters	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 (www.cercind.gov.in) page 41 and 44	CERC	<input checked="" type="checkbox"/>	The repayment period for the selected baseline scenario is taken from the Statement of Objects and Reasons for CERC Terms and Conditions which provides for 12 years for all normative loans. Thus, it is concluded by validation team that the repayment period considered for the project activity is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
20	Depreciation as per Income Tax	15	%	Income Tax Act, 1961	ACT	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in India. The same is verified by DOE and found correct. This value has been applied for all considered alternatives.

⁴⁷ <http://www.kpcindia.com/Pdf/Tax-Guide-2009.pdf> - Tax Rate (Refer Page 2) (Corporate Tax – 33.99% and MAT – 16.995%)

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<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
21	Depreciation as per Companies Act	5.28	%	Companies Act, 1956	ACT	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in India. The same is verified by DOE and found correct. This value has been applied for all considered alternatives.
22	Salvage Value	10	%	http://energytechnologyexpert.com/financial-models/how-to-evaluate-economic-feasibility-of-a-power-plant-project-use-project-finance-model/dated November 9th, 2009 Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 (www.cercind.gov.in) page 23	/S-VAL/ CERC	<input checked="" type="checkbox"/>	Salvage Value of Power Plant & Equipment considered in the project activity is taken as 10% in the financial analysis. The source/reference of the salvage value submitted by PP is verified by validation team to correct and appropriate. In financial calculation assets are depreciated to 100% of book value and this is being achieved in the 19th year of operations. The salvage value is being considered at the end of useful life i.e. 25 years. A 10% salvage value is considered by the project proponent for the project activity including all the alternatives which is a reasonable expectation of the potential profit or loss on the realization of the assets. In addition to this CERC tariff order is also verified by validation team which also evidences the salvage value as 10%. Thus, it is concluded by validation team that the salvage value considered in the financial calculation is correct and conservative
23	Secondary fuel Oil Consumption	1	ml per kWh	Central Electricity Regulatory Commission (Terms &	CERC	<input checked="" type="checkbox"/>	The value considered in this baseline alternate scenario is as per the CERC tariff regulation which is available at the time of decision

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<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				conditions of Tariff) Regulations, 2009 (www.cercind.gov.in) page 48			making and the value is correct and appropriate. The impact of this on determination of levelised cost is negligible.
24	Price of Secondary Fuel Oil	30.6	INR /Litre	CERC Draft Order dated September 2009 (http://cercind.gov.in/2009/August09/Draft-Order-on-price-cap.pdf) (Page no. 4)	CERC	<input checked="" type="checkbox"/>	The value considered in this baseline alternate scenario is as per the CERC draft tariff order, which is available at the time of decision making and the value, is correct and appropriate. The impact of this on determination of levelised cost is negligible.
25	Calorific Value of Secondary Fuel Oil	10500	Kcal/Kg	CO2 Baseline Database for the Indian Power Sector, November, 2009, issued by Central Electricity Authority, Ministry of Power, Government of India (http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm)	CEA	<input checked="" type="checkbox"/>	The value considered in this baseline alternate scenario is as per the CO2 Baseline Database for the Indian Power Sector, November, 2009, issued by Central Electricity Authority, Ministry of Power, Government of India, which was available at the time of decision making and the value is correct and appropriate. The impact of this on determination of levelised cost is negligible.
26	Coal Shortage	0.8	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff)	CERC	<input checked="" type="checkbox"/>	The value considered in this baseline alternate scenario is as per the CERC tariff regulation for non pithead power plant, which is available at the time of decision making and the value, is correct and appropriate.

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<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				Regulations, 2009 (www.cercind.gov.in) page 35			
27	Compensatory Allowance	0.00 for 0 to 10 years 0.015 for 11 to 15 Years 0.035 for 16 to 20 years 0.065 for 21 to 25 years	INR MW /Year	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 29	CERC	<input checked="" type="checkbox"/>	The value considered is as per Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 applicable to coal based plants including lignite based plants, which was available at the time of decision making and the value is correct and appropriate. This value has been considered for all coal based (including lignite) alternatives.
28	Rate of Interest on Working Capital	11.75	%	As per Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 26, the Rate of interest on working capital shall be on	CERC	<input checked="" type="checkbox"/>	As per Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 26, the Rate of interest on working capital shall be equal to the short-term Prime Lending Rate of State Bank of India. The Validation team has verified the same. Based on the same, the short-term Prime Lending Rate of State Bank of India available at the time of decision making is considered i.e. 11.75%. The same has also been verified from the article of reuters dated 04/01/2010 (http://in.reuters.com/article/2010/01/04/india-plr-

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				normative basis and shall be equal to the short-term Prime Lending Rate of State Bank of India (http://in.reuters.com/article/2010/01/04/india-plr-idINSGE6030BH20100104)			idINSGE6030BH20100104) and it is found correct. Based on the above, the value is correct and appropriate. This value has been considered for all alternatives.
29	Discounting Factor	1.1019		Discount rate as notified by Central Electricity Regulatory Commission on 30/09/2009 (http://cercind.gov.in/Escalation-rate/Notification-dated-30-09-09.pdf) Page 1	CERC	<input checked="" type="checkbox"/>	The discounting factor is taken from Central Electricity Regulatory Commission notification dated 30/09/2009 which was available at the time of decision making. The same is verified by Validation team and found correct and authentic.

4. 600 MW coal (imported) fired port based power plant using conventional technology (sub critical)

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
1	Capacity of Plant	600	MW	CEA monthly report on Broad status of Thermal Power Project in the country dated December 2009 http://www.cea.nic.in/archives/thermal/bs/dec09.pdf (Page 84)	CEA	<input checked="" type="checkbox"/>	Coastal Energen (Thermal Power Plant) has been selected as the representative project for this baseline alternative having latest zero date (i.e. 06/08/2009) of all under construction projects with imported coal based conventional technology (both Public and Private) as per the Monthly Report on Broad Status of Thermal Power Project in the country December 2009 by Central Electricity Authority of India. In levelised cost calculation, the block size (i.e. 600 MW) of this representative is considered. This report is verified by validation team to confirm the selected representative and it was available at the time of investment decision guideline 6 of EB 62, Annex 05. Further, the capacity considered has no impact on levelised cost as per MW cost is calculated based on total project capacity and total project cost taken from the same report. Based on the above it is concluded that the selected representative for this baseline alternative is correct and appropriate.
2	Total Project Cost (including IDC , Financing Charges)	24000	INR million	CEA monthly report on Broad status of Thermal Power Project in the country dated December 2009 http://www.cea.nic.in/archives/thermal/bs/dec09.pdf	CEA	<input checked="" type="checkbox"/>	The project cost (i.e. INR 40 Million per MW X 600 MW) of the selected baseline alternative has calculated based on the per MW cost (i.e. INR 40 Million per MW) and the block size considered (i.e. 600 MW) sourced from the Central Electricity Authority of India Monthly Report on Broad status of Thermal Power Project in the country December 2009.

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				9.pdf (Page 84)			Validation Team has verified this report to confirm the total project cost (i.e. INR 48000 Million) and the total project capacity (i.e. 600 MW X 2 Units = 1200 MW). This report was available at the time of investment decision making guideline 6 of EB 62, Annex 05 and authentic (as published by Central Electricity Authority of India). Based on the above, it is concluded that the project cost is correct and appropriate. The assessment of project cost /MW is given below.
3	Cost per MW	40	INR million per MW	CEA monthly report on Broad status of Thermal Power Project in the country dated December 2009 http://www.cea.nic.in/archives/thermal/bs/dec09.pdf (Page 84) UNFCCC Ref. No. 4629 (http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1301452084.68/view)	CEA	<input checked="" type="checkbox"/>	The cost per MW for this baseline alternative comes out as 40 INR million per MW which is calculated based on the total project capacity (i.e. 600 MW X 2 Units = 1200 MW) and the total project cost (i.e. INR 48000 Million) as given in the Monthly Report on Broad status of Thermal Power Project in the country December 2009 by Central Electricity Authority of India for the selected baselines alternative. Validation Team has verified the same and it is found correct. The validation team has found that the registered CDM project i.e. Gautami (UNFCCC ref. no 4828) and Vemagiri (UNFCCC ref. no 4334) has not considered subcritical imported coal as one of the baseline alternative hence the Validation team has cross verified the per MW cost considered in registered PDD UNFCCC Ref. No. 4629 i.e. INR 39 Million per MW which is comparable. Since the cost is based on the approved cost of

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
							various coal based power plants and the cost considered by project proponent (PP) is conservative. Based on the above, it is concluded that the value is correct and appropriate.
4	Technical Life time	25	Years	CERC (Terms and conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) Page 9	CERC	<input checked="" type="checkbox"/>	Technical lifetime of the selected alternative is considered as 25 years which is as per CERC Regulation published in 19/01/2009 and available at the time of investment decision making as per guideline 6 of EB 62, Annex 05. Validation team has verified the CERC regulation and the lifetime is found to be correct. Further, As per EB50, Annex-15, "Tool to determine remaining lifetime of the equipment" life time of the boiler and steam turbine is 25 years. Based on the above, it is concluded that the technical life time of the selected alternative for a period of 25 years is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
5	Debt: Equity	70:30		Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009(www.cercind.gov.in) page 13	CERC	<input checked="" type="checkbox"/>	Value considered is based on Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has also cross verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 page 13 for its appropriateness. Further, the ratio of Debt: Equity (i.e. 70:30) is

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
							normally accepted ratio of infrastructure projects. Thus, it is concluded that the debt: equity ratio considered is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
6	Return on Equity (ROE)	15.5	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 21	CERC	<input checked="" type="checkbox"/>	Value considered is based on Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 page 21 for its appropriateness. Thus, it is concluded the value considered is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
7	Plant Load Factor (PLF)	85	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009(www.cerci nd.gov.in) page 42	CERC	<input checked="" type="checkbox"/>	Value considered is based on Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has also cross verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 page 42 for its appropriateness. Hence validation team is convinced that the value considered is

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
							correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
8	Cost of Coal	85.74	US \$/Tonne	GOVERNMENT OF INDIA MINISTRY OF COAL RAJYA SABHA UNSTARRED QUESTION NO 2628 TO BE ANSWERED ON 14.12.2009 COAL PRICES . http://164.100.47.5:8080/members/website/question.asp?qref=149034 CERC Analysis ⁴⁸ of the Comments Received from	/COAL-P/ /CERC/	<input checked="" type="checkbox"/>	The Landed cost of imported coal has been calculated from price of Indonesian coal given in the statement/answer given by Ministry of Coal in Rajya Sabha ^{COAL-P/} dated 14/12/2009 i.e. INR 4003.91 per Tonne and the exchange rate of INR 46.70 per US \$, available at the time of decision making as guideline 6 of EB 62, Annex 05. Validation team has verified the statement and it is found correct and authentic. Further, the same has been cross verified with registered PDD UNFCC Ref No. 4629 which has considered the price of imported coal as INR 0.35/1000 ⁴⁹ kCal for imported coal against INR 0.68/1000 kCal considered by the PP. The price considered by PP is higher and thus conservative. Further, the consideration of the price i.e. INR 0.35/1000kCal does not change the selected baseline alternative as the levelised tariff of imported coal conventional comes to INR 2.30 with INR 0.35 / 1000 kCal vis-à-

⁴⁸ http://cercind.gov.in/2010/ORDER/mis/Escalation_New_Method_Information_web.pdf

⁴⁹ Calculated based on INR 2148/MT and GCV of 6200Kcal/Kg as stated in the registered PDD (UNFCCC Ref. No. 4629 page no. 49). (Note: the imported coal price of INR 2148 per MT was converted into USD 49.21 per MT considering the average exchange rate of INR 43.65 per USD for the first half of 2005 sourced from Reserve Bank of India web-site. Further, the similar price of imported coal i.e. USD 49.59 per MT has been mentioned in the CERC Report titled "CERC Analysis of the Comments Received from Stakeholders on the Proposed Methodology for Calculating Escalation Rates for Use in Tariff Based Competitive Bidding by the Staff of the Commission" page 20).

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				Stakeholders on the Proposed Methodology for Calculating Escalation Rates for Use in Tariff Based Competitive Bidding by the Staff of the Commission			<p>vis INR 2.29 of the selected baseline alternative. Hence, there would not be any change in the selected baseline alternative.</p> <p>Further, the validation team would like to state here that cost of the coal considered by PP is higher as the source of price considered by PP is dated 14th December 2009 whereas the source of price considered by the project activity 4629 is sourced from the CERC approved Tariff order for Nagarjuna Power dated 25th October 2005. Hence, there is a difference in the period for which the price has been considered by the PP (i.e. available in December 2009) and the project activity 4629 (i.e. available in October 2005). During such period, coal prices of internationally traded coal have undergone huge volatility. The year 2008 saw traded coal prices reaching in the range of USD 180 per MT. The annual average prices were close to USD 130 per MT in 2008. This was nearly increase of 100% over the average prices for 2007. However, the three years moving average rate for 2009 was USD 88.81 per MT which is comparable to the price considered by the PP (source: CERC Analysis of the Comments Received from Stakeholders on the Proposed Methodology for Calculating Escalation Rates for Use in Tariff Based Competitive Bidding by the Staff of the Commission – page 19-20).</p> <p>Based on the above, validation team is convinced that the value considered is correct and appropriate.</p>

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
9	Gross Calorific value of Imported Coal	5900	Kcal/kg	GOVERNMENT OF INDIA MINISTRY OF COAL RAJYA SABHA UNSTARRED QUESTION NO 2628 TO BE ANSWERED ON 14.12.2009 COAL PRICES . http://164.100.47.5:8080/members/website/guest.asp?qref=149034	/COAL-P/	<input checked="" type="checkbox"/>	The gross calorific value has been taken from the statement/answer given by Ministry of Coal in Rajya Sabha ^{/COAL-P/} dated 14/12/2009 i.e. 5900 kCal/kg for Indonesia imported coal, available at the time of decision making as guideline 6 of EB 62, Annex 05. Validation team has verified the statement and it is found correct and authentic. Further, the same is considered in line with the price of imported coal i.e. US \$ 85.74 per Tonne taken for the financial analysis. Further, the other registered project as discussed above (under the section for the “cost of coal”) has considered the have assumed GCV ranging from 5400 kcal/kg to 6200 kcal/kg. The GCV considered by the PP i.e. 5900 kCal/Kg is within the range. Based on the above, validation team is convinced that the value considered is correct and appropriate.
10	Gross Heat Rate	2174	Kcal/kWh	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 46 Statement of Objects	/CERC/	<input checked="" type="checkbox"/>	Gross Heat Rate value for the selected baseline alternative scenario is sourced from CERC tariff regulation dated 19/01/2009 which has provided maximum design gross heat rate value for sub-critical imported coal based power plant. Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 page 46 is verified by validation team to confirm that the value considered is correct and available at the time of decision making as guideline 6 of EB 62, Annex 05.

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<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				and Reasons of CERC ⁵⁰ (Terms and Conditions of Tariff) Regulations, 2009			<p>Further, this heat rate is increased by 6.5% (the margin on design heat rate to be applied as per CERC Terms and Conditions of Tariff Regulations 2009 dated 19/01/2009 (page 46)). Thus, the effective heat rate used in the calculation works out to be 2315.31 kCal/kWh. The same has been cross checked with other registered projects UNFCCC Ref. No. 4629 (page 49) as 2226 kCal/kWh. Further, the consideration of this lower value of heat rate i.e. 2226 kCal/kWh does not change the selected baseline alternative.</p> <p>Additionally, validation team would like to highlight here that the gross heat rate value of 2174 kCal/kWh considered by PP is lower than that considered by the project activity 4629 (i.e. 2226 kCal/kWh sourced from Central Electricity Authority (CEA) report dated September 2008). Further, it may also be noted that such gross station heat rate is provided by CERC based on the recommendation of Central Electricity Authority (CEA) only (refer to Statement of Objects and Reasons of CERC (Terms and Conditions of Tariff) Regulations, 2009 (http://www.cercind.gov.in/2009/February09/SOR-regulations-on-T&C-of-tariff-05022009.pdf) page 119-120). However, in respect of coal/lignite based thermal generating units, the CERC in its regulation of 2009 has taken a view that the Station Heat Rate</p>

⁵⁰ <http://www.cercind.gov.in/2009/February09/SOR-regulations-on-T&C-of-tariff-05022009.pdf> (page 119-120)

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						Correctness of value applied	Comment
							<p>norms could not be set based on the actual performance of high performing units leaving them no scope for operational flexibility. CERC has provided a margin of 6.5% above the design heat rate. This additional margin is applicable for all coal /lignite based plants from 01 April 2009 onwards. Considering such additional margin, the heat rate considered by the PP (i.e. 2315.31 kCal/kWh) is higher than the heat rate considered by the project activity 4629 (i.e. 2226 kCal/kWh) Further as the project activity 4629 has a project investment decision making date of October 2008, such additional margin has not been considered in the project activity for the heat rate.</p> <p>Based on the above, it is concluded that the value is correct and appropriate.</p>
11	Auxiliary consumption	8.5	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 48	CERC	<input checked="" type="checkbox"/>	<p>The auxiliary consumption value i.e. 8.5% for the baseline alternative scenario is sourced from the CERC tariff regulation dated 19/01/2009 which was available at the time of investment decision making. The same has also been cross checked with other registered projects UNFCCC Ref. No. 4629 (page 49) as 6%, Hence, the price considered by PP is higher and thus conservative</p> <p>Based on the same, the value considered by the PP is correct and appropriate.</p>
12	O & M expenses	1.462	INR	Central Electricity Regulatory	CERC	<input checked="" type="checkbox"/>	The value of O&M expense is considered from Central Electricity

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
			million per MW	Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 27			Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has also cross verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 for its appropriateness. The same has also been cross checked with other registered projects UNFCCC Ref. No. 4629 (page 49) as 1.1 million per MW, which has considered the value for the year 2008-09 as per CERC Terms and Conditions Regulation 2004 (page 21). The same works out to INR 1.45 Million /MW for 2013-14 considering the escalation of 5.72%. Hence, the value considered by PP is comparable. Based on the same, the value considered by the PP is correct and appropriate.
13	O & M escalation	5.72	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 27	CERC	<input checked="" type="checkbox"/>	The value of O&M escalation is considered from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has also cross verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 for its appropriateness. Further, the validation team has verified the other registered

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
							<p>project UNFCCC Ref. No. 4629 for escalation in O&M expenses which has considered 4% as per CERC Terms and Conditions Regulation 2004. The PP has used the latest CERC Terms and Conditions of Tariff Regulations, 2009 available at the time of decision making.</p> <p>Based on the same, the value considered by the PP is correct and appropriate.</p>
14	Interest rate on Term Loan	12	%	Modal BPLR of PSBs - Second Quarter Review of Monetary Policy 2009-10 date 27/10/2009 table 17(http://rbi.org.in/scripts/NotificationUser.aspx?Id=5326&Mode=0)	RBI	<input checked="" type="checkbox"/>	<p>The interest rate taken is in line with the commercial lending rates as provided by the Reserve Bank of India, India's central bank which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. .</p> <p>As mentioned and verified by validation team from the second Quarter Review of Monetary Policy 2009-10 dated 27/10/2009, the modal BPLR interest rate chosen by PP is the monthly average (%) of public sector banks (PSBs). Further to this the validation team has also checked the average BPLR of the public sector banks (PSBs) which comes be 12.25%. Thus, it is concluded by validation team that the modal BPLR value chosen for the benchmark calculation is correct and appropriate.</p> <p>Hence validation team is convinced that the value considered is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.</p>
15	Working Capital			Central Electricity	CERC	<input checked="" type="checkbox"/>	The working capital requirement is considered from Central

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
	Receivable	2	Months	Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 25			Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has also cross verified the value from CERC tariff order for its appropriateness. Hence validation team is convinced that the value considered is correct and appropriate.
	Fuel	2	Months				
	O&M	1	Month				
	Maintenance spare	20	% of O&M expense				
	Secondary fuel Oil Consumption	2	Months				
16	Tariff	3.18	INR/kWh	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in)	CERC	<input checked="" type="checkbox"/>	<p>Tariff is based on the levelised cost worked out based on the fixed cost and variable cost. The same is calculated from various input values considered from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 and other references available at the time of decision making confirming to guideline 06 of EB 62, Annex 05. Tariff calculation is verified by validation team is found to be correct and input values used therein are found correct as mentioned above.</p> <p>The Tariff is based on two part tariff and is regulated by Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 and the same is also verified by validation team.</p> <p>Thus, it is concluded by validation team that the tariff considered in the financial analysis is correct and appropriate. The same</p>

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
							approach has been used in tariff calculation of all alternatives as applicable to the project activity.
17	Income Tax	33.99	%	Income Tax Act, 1961	ACT	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in India. The same is verified by DOE and found correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
18	Minimum Alternate Tax (MAT)	16.995	%	Income Tax Act, 1961 ⁵¹	ACT	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in India. The same is verified by DOE and found correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
19	Repayment Period Moratorium Period	44 4	Quarters	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 (www.cercind.gov.in) page 41 and 44	CERC	<input checked="" type="checkbox"/>	The repayment period for the selected baseline scenario is in line with the Statement of Objects and Reasons for CERC Terms and Conditions which provides for 12 years for all normative loans, available at the time of decision making Thus, it is concluded by validation team that the repayment period considered for the project activity is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
20	Depreciation as per Income Tax	15	%	Income Tax Act, 1961	ACT	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in India. The same is verified by DOE and found correct. This value

⁵¹ <http://www.kpcindia.com/Pdf/Tax-Guide-2009.pdf> - Tax Rate (Refer Page 2) (Corporate Tax – 33.99% and MAT – 16.995%)

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						Correctness of value applied	Comment
							has been applied for all considered alternatives.
21	Depreciation as per Companies Act	5.28	%	Companies Act, 1956	ACT	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in India. The same is verified by DOE and found correct. This value has been applied for all considered alternatives.
22	Salvage Value	10	%	http://energytechnologyexpert.com/financial-models/how-to-evaluate-economic-feasibility-of-a-power-plant-project-use-project-finance-model/ dated November 9th, 2009 Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 23	/S-VAL/ CERC	<input checked="" type="checkbox"/>	<p>Salvage Value of Power Plant & Equipment considered is taken as 10%. The source/reference of the salvage value submitted by PP is verified by validation team to correct and appropriate</p> <p>In financial calculation assets are depreciated to 100% of book value and this is being achieved in the 19th year of operations. The salvage value is being considered at the end of useful life i.e. 25 years. A 10% salvage value is considered in all the alternatives which is a reasonable expectation of the potential profit or loss on the realization of the assets.</p> <p>In addition to this Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulation, 2009 dated 19/01/2009 is also verified by validation team which also evidences the salvage value as 10%. Thus, it is concluded by validation team that the salvage value considered in the financial calculation is correct and conservative. This value has been applied for all considered alternatives.</p>

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
23	Secondary fuel Oil Consumption	1	ml per kWh	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 48	CERC	<input checked="" type="checkbox"/>	The value considered in this baseline alternate scenario is as per Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and the value is correct and appropriate. The impact of this on determination of levelised cost is negligible.
24	Price of Secondary Fuel Oil	30.6	INR /Litre	CERC Draft Order dated September 2009 (http://cercind.gov.in/2009/August09/Draft-Order-on-price-cap.pdf) (Page no. 4)	CERC	<input checked="" type="checkbox"/>	The value considered in this baseline alternate scenario is as per the CERC draft tariff order, which is available at the time of decision making and the value, is correct and appropriate. The impact of this on determination of levelised cost is negligible.
25	Calorific Value of Secondary Fuel Oil	10500	Kcal/Kg	CO ₂ Baseline Database for the Indian Power Sector, November, 2009, issued by Central Electricity Authority, Ministry of Power, Government of India (http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm)	CEA	<input checked="" type="checkbox"/>	The value considered in this baseline alternate scenario is as per the CO ₂ Baseline Database for the Indian Power Sector, November, 2009, issued by Central Electricity Authority, Ministry of Power, Government of India, which was available at the time of decision making and the value is correct and appropriate. The impact of this on determination of levelised cost is negligible.

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
26	Coal Shortage	0.8	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 35	CERC	<input checked="" type="checkbox"/>	The value considered in this baseline alternate scenario is as per Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 for non pithead power plant, which is available at the time of decision making and the value is correct and appropriate.
27	Compensatory Allowance	0.00 for 0 to 10 years 0.015 for 11 to 15 Years 0.035 for 16 to 20 years 0.065 for 21 to 25 years	INR MW /Year	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 29	CERC	<input checked="" type="checkbox"/>	The value considered is as per Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 applicable to coal based plants including lignite based plants, which was available at the time of decision making and the value is correct and appropriate. This value has been considered for all coal based (including lignite) alternatives.
28	Rate of Interest on Working Capital	11.75	%	As per Central Electricity Regulatory Commission (Terms & conditions of Tariff)	CERC	<input checked="" type="checkbox"/>	As per Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 26, the Rate of interest on working

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 26 , the 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 (http://in.reuters.com/article/2010/01/04/india-plr-idINSGE6030BH20100104)			capital shall be equal to the short-term Prime Lending Rate of State Bank of India. The validation team has verified the same. Based on the same, the short-term Prime Lending Rate of State Bank of India available at the time of decision making is considered i.e. 11.75%. The same has also been verified from the article of reuters dated 04/01/2010 (http://in.reuters.com/article/2010/01/04/india-plr-idINSGE6030BH20100104) and it is found correct. Based on the above, the value is correct and appropriate. This value has been considered for all alternatives.
29	Discounting Factor	1.1019		Discount rate as notified by Central Electricity Regulatory Commission on 30/09/2009 (http://cercind.gov.in/Escalation-rate/Notification-dated-30-09-09.pdf) Page 1	CERC	<input checked="" type="checkbox"/>	The discounting factor is taken from Central Electricity Regulatory Commission notification dated 30/09/2009 which was available at the time of decision making. The same is verified by Validation team and found correct and authentic. This value has been considered for all alternatives.

5. 660 MW domestic coal fired based power plant using super critical boiler technology

<input type="checkbox"/>		No financial parameters are used for additionality justification					
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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
1	Capacity of Plant	660	MW	CEA monthly report on Broad status of Thermal Power Project in the country dated December 2009 http://www.cea.nic.in/archives/thermal/bs/dec09.pdf (Page 73)	CEA	<input checked="" type="checkbox"/>	Amravati (Thermal Power Plant) has been selected for levelised cost analysis representative project for this baseline alternative having latest zero date (i.e. 01/07/2009) of all under construction projects with domestic coal Supercritical technology (both Public and Private) as per the Monthly Report on Broad Status of Thermal Power Project in the country December 2009 by Central Electricity Authority of India. In levelised cost calculation, the block size (i.e. 660 MW) of this representative is considered. It has to be noted that the minimum size unit of supercritical plant is 660 MW. This report is verified by validation team to confirm that the representative case considered in the levelised cost analysis is correct and appropriate.
2	Total Project Cost (including IDC , Financing Charges)	34440	INR million	CEA monthly report on Broad status of Thermal Power Project in the country dated December 2009 http://www.cea.nic.in/archives/thermal/bs/dec09.pdf (Page 73)	CEA	<input checked="" type="checkbox"/>	The project cost (i.e. INR 52.182 Million per MW X 660 MW) of the selected baseline alternative has been calculated based on the per MW cost (i.e. INR 52.182 Million per MW) and the block size considered (i.e. 660 MW) sourced from the Central Electricity Authority of India Monthly Report on Broad status of Thermal Power Project in the country December 2009. Validation Team has verified this report to confirm the total project

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							cost (i.e. INR 68880 Million) and the total project capacity (i.e. 660 MW X 2 Units = 1320 MW). This report was available at the time of investment decision making guideline 6 of EB 62, Annex 05 and authentic (as published by Central Electricity Authority of India). Based on the above, it is concluded that the project cost is correct and appropriate. The assessment of project cost /MW is given below.
3	Cost per MW	52.182	INR million	CEA monthly report on Broad status of Thermal Power Project in the country dated December 2009 http://www.cea.nic.in/archives/thermal/bs/dec09.pdf (Page 84) UNFCCC Ref. No. 4629 (http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1301452084.68/view)	CEA		The cost per MW for this baseline alternative comes out as 52.182 INR million per MW which is calculated based on the total project capacity (i.e. 660 MW X 2 Units = 1320 MW) and the total project cost (i.e. INR 68880 Million) as given in the Monthly Report on Broad status of Thermal Power Project in the country December 2009 by Central Electricity Authority of India for the selected baselines alternative. Validation Team has verified the same and it is found correct. The validation team has found that the registered CDM project i.e. Gautami (UNFCCC ref. no 4828) and Vemagiri (UNFCCC ref. no 4334) has not considered supercritical domestic coal as one of the baseline alternative. Hence, Validation team has cross verified the per MW cost considered in registered PDD UNFCCC Ref. No. 4629 i.e. INR 51 Million per MW which is comparable. Since the cost is based on the approved cost of various Coal based power plants

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
							and the cost considered by project proponent (PP) is conservative. Based on the above, it is concluded that the value is correct and appropriate.
4	Technical Life time	25	Years	CERC (Terms and conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) Page 9	CERC	<input checked="" type="checkbox"/>	Technical lifetime of the selected alternative is considered as 25 years which is as per CERC Regulation published in 19/01/2009 and available at the time of investment decision making as per guideline 6 of EB 62, Annex 05. Validation team has verified the CERC regulation and the lifetime is found to be correct. Further, As per EB50, Annex-15, "Tool to determine remaining lifetime of the equipment" life time of the boiler and steam turbine is 25 years. Based on the above, it is concluded that the technical life time of the selected alternative for a period of 25 years is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
5	Debt: Equity	70:30		Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009(www.cerci nd.gov.in) page 13	CERC	<input checked="" type="checkbox"/>	Value considered is based on Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has also cross verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 page 13 for its appropriateness. Further, the ratio of Debt: Equity (i.e. 70:30) is normally accepted ratio of infrastructure projects.

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							Thus, it is concluded that the debt: equity ratio considered is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
6	Return on Equity (ROE)	15.5	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 21	CERC	<input checked="" type="checkbox"/>	Value considered is based on Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 page 21 for its appropriateness. Thus, it is concluded the value considered is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
7	Plant Load Factor (PLF)	85	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009(www.cercind.gov.in) page 42	CERC	<input checked="" type="checkbox"/>	Value considered is based on Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has also cross verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 page 42 for its

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						Correctness of value applied	Comment
							appropriateness. Hence validation team is convinced that the value considered is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
8	Cost of Coal	1133.18	Rs./MT	GOVERNMENT OF INDIA MINISTRY OF COAL RAJYA SABHA UNSTARRED QUESTION NO 2628 TO BE ANSWERED ON 14.12.2009 COAL PRICES . http://164.100.47.5:8080/members/website/question.asp?qref=149034 CO ₂ Baseline Database for the Indian Power Sector, November, 2009, issued by Central Electricity Authority, Ministry of Power,	/COAL-P/ /COAL-P/ /CEA/	<input checked="" type="checkbox"/>	Landed cost of the MCL (Mahanadi Coalfields Limited) 'F' grade coal i.e. 1133.18 INR/Tonne considered in the financial analysis for this baseline alternative is taken from the statement/answer given by ministry of Coal in Rajya Sabha dated 14/12/2009. Validation team has verified the statement to confirm that the input values used in the calculation of coal price is correct. The validation team has also verified that the Gross Calorific Value of Coal grade "F" i.e. 3865 Kcal/kg considered for coal price reference is in line with the average Gross Calorific value i.e. 3755 KCal/Kg of coal consumed by Indian Coal based power plant. Further, this is in line with the cost of coal considered in the baseline alternative scenario "350 MW domestic coal fired power plant using conventional technology (sub critical)". Hence validation team is convinced that the value considered is correct and appropriate.

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
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				Government of India (http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm)			
9	Gross Calorific value of Domestic Coal	3755	Kcal/Kg	CO ₂ Baseline Database for the Indian Power Sector, November, 2009, issued by Central Electricity Authority, Ministry of Power, Government of India (http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm)	/COAL-P/	<input checked="" type="checkbox"/>	<p>The Gross Calorific Value i.e. 3755 Kcal/kg of the domestic coal used in this baseline alternative scenario is sourced from the CO₂ Baseline Database for the Indian Power Sector, November, 2009, issued by Central Electricity Authority, Ministry of Power, Government of India which was available at the time of investment decision making. Further to this the calorific value is lower than the calorific value of coal i.e. 3865 Kcal/kg being considered for reference coal price. Hence the Gross Calorific value of domestic coal is correct and conservative.</p> <p>Further, this is in line with the gross calorific value of coal considered in the baseline alternative scenario "350 MW domestic coal fired power plant using conventional technology (sub critical)"</p>
10	Gross Heat Rate	2176	Kcal/kWh	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 46	CERC	<input checked="" type="checkbox"/>	<p>Gross Heat Rate value for the selected baseline alternative scenario is sourced from CERC tariff regulation dated 19/01/2009 which has provided maximum design gross heat rate value for super-critical domestic coal based power plant. Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 page 46 is verified by validation team to confirm that the value considered is correct and available at the time of decision making as guideline 6 of EB 62,</p>

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						Correctness of value applied	Comment
							<p>Annex 05. Further, it is maximum design heat rate and hence the same is also conservative.</p> <p>The same has been cross checked with other registered project UNFCCC No. 4629 as 2175 kCal/kWh. Hence, the value of heat rate considered is comparable. Further, this heat rate is increased by 6.5% (the margin on design heat rate to be applied as per CERC Terms and Conditions of Tariff Regulations 2009 dated 19/01/2009 (page 46)).</p> <p>Based on the above, it is concluded that the value is correct and appropriate.</p>
11	Auxiliary consumption	8.50	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 48	CERC	<input checked="" type="checkbox"/>	<p>The auxiliary consumption value i.e. 8.5% for the baseline alternative scenario is sourced from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of investment decision making.</p> <p>The same is verified by validation team to be correct and appropriate.</p>
12	O & M expenses	1.462	INR million per MW	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 for	CERC	<input checked="" type="checkbox"/>	<p>The value of O&M expense is considered from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has also cross verified the value from Central Electricity Regulatory Commission (Terms & conditions of</p>

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
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				the year 2013-14 (www.cercind.gov.in) page 27			Tariff) Regulations, 2009 dated 19/01/2009 for its appropriateness. The same has also been cross checked with other registered projects UNFCCC Ref. No. 4629 (page 49) as 1.1 million per MW, Hence, the value considered by PP is higher and thus conservative.
13	O & M escalation	5.72	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 27	CERC	<input checked="" type="checkbox"/>	<p>The value of O&M escalation is considered from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has also cross verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 for its appropriateness.</p> <p>Further, the validation team has verified the other registered project UNFCCC Ref. No. 4629 for escalation in O&M expenses which has considered 4% as per CERC Terms and Conditions Regulation 2004. The PP has used the latest CERC Terms and Conditions of Tariff Regulations, 2009 available at the time of decision making.</p> <p>Hence validation team is convinced that the value considered is correct and appropriate.</p>
14	Interest rate on Term Loan	12	%	Modal BPLR of PSBs - Second Quarter Review of Monetary	RBI	<input checked="" type="checkbox"/>	The interest rate taken is in line with the commercial lending rates as provided by the Reserve Bank of India, India's central bank which was available at the time of decision making and confirms to

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						Correctness of value applied	Comment
				Policy 2009-10 date 27/10/2009 table 17(http://rbi.org.in/scripts/NotificationUser.aspx?Id=5326&Mode=0)			guideline 6 of EB 62, Annex 05. . As mentioned and verified by validation team from the second Quarter Review of Monetary Policy 2009-10 dated 27/10/2009, the modal BPLR interest rate chosen by PP is the monthly average (%) of public sector banks (PSBs). Further to this the validation team has also checked the average BPLR of the public sector banks (PSBs) which comes be 12.25% Thus, it is concluded by validation team that the modal BPLR value chosen for the benchmark calculation is correct and appropriate. Hence validation team is convinced that the value considered is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
15	Working Capital:			Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 25	CERC	<input checked="" type="checkbox"/>	The working capital requirement is considered from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has also cross verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 for its appropriateness. Hence validation team is convinced that the value considered is correct and appropriate.
	Receivable	2	Months				
	Fuel	2	Months				
	O&M	1	Month				
	Maintenance spare	20	% of O&M expense				
	Secondary fuel Oil Consumption	2	Months				
16	Tariff	2.31	INR/kWh	Central Electricity Regulatory	CERC	<input checked="" type="checkbox"/>	Tariff is based on the levelised cost worked out based on the fixed

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				Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in)			cost and variable cost. The same is calculated from various input values considered from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 and other references available at the time of decision making confirming to guideline 06 of EB 62, Annex 05. Tariff calculation is verified by validation team is found to be correct and input values used therein are found correct as mentioned above. The Tariff is based on two part tariff and is regulated by Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 and the same is also verified by validation team. Thus, it is concluded by validation team that the tariff considered in the financial analysis is correct and appropriate. The same approach has been used in tariff calculation of all alternatives as applicable to the project activity.
17	Income Tax	33.99	%	Income Tax Act, 1961	ACT	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in India. The same is verified by DOE and found correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
18	Minimum Alternate Tax (MAT)	16.995	%	Income Tax Act, 1961 ⁵²	ACT	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in India. The same is verified by DOE and found correct, appropriate

⁵² <http://www.kpcindia.com/Pdf/Tax-Guide-2009.pdf> - Tax Rate (Refer Page 2) (Corporate Tax – 33.99% and MAT – 16.995%)

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							and similar to the project activity. This value has been applied for all considered alternatives.
19	Repayment Period Moratorium Period	44 4	Quarters	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 (www.cercind.gov.in) page 41 and 44	CERC	<input checked="" type="checkbox"/>	The repayment period for the selected baseline scenario is in line with the Statement of Objects and Reasons for CERC Terms and Conditions which provides for 12 years for all normative loans, available at the time of decision making. Thus, it is concluded by validation team that the repayment period considered is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
20	Depreciation as per Income Tax	15	%	Income Tax Act, 1961	ACT	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in India. The same is verified by DOE and found correct. This value has been applied for all considered alternatives.
21	Depreciation as per Companies Act	5.28	%	Companies Act, 1956	ACT	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in India. The same is verified by DOE and found correct. This value has been applied for all considered alternatives.
22	Salvage Value	10	%	http://energytechnologyexpert.com/financial-models/how-to-evaluate-economic-feasibility-of-a-power-	/S-VAL/	<input checked="" type="checkbox"/>	Salvage Value of Power Plant & Equipment considered is taken as 10%. The source/reference of the salvage value submitted by PP is verified by validation team to correct and appropriate In financial calculation assets are depreciated to 100% of book

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				plant-project-use-project-finance-model/ dated November 9th, 2009 Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 23	CERC		value and this is being achieved in the 19th year of operations. The salvage value is being considered at the end of useful life i.e. 25 years. A 10% salvage value is considered in all the alternatives which is a reasonable expectation of the potential profit or loss on the realization of the assets. In addition to this Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulation, 2009 dated 19/01/2009 is also verified by validation team which also evidences the salvage value as 10%. Thus, it is concluded by validation team that the salvage value considered in the financial calculation is correct and conservative. This value has been applied for all considered alternatives.
23	Secondary fuel Oil Consumption	1	ml per kWh	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 48	CERC	<input checked="" type="checkbox"/>	The value considered in this baseline alternate scenario is as per Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and the value is correct and appropriate. The impact of this on determination of levelised cost is negligible.
24	Price of Secondary Fuel Oil	30.6	INR /Litre	CERC Draft Order dated September 2009 (http://cercind.gov.in/2)	CERC	<input checked="" type="checkbox"/>	The value considered in this baseline alternate scenario is as per the CERC draft tariff order, which is available at the time of decision making and the value, is correct and appropriate. The

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						Correctness of value applied	Comment
				009/August09/Draft-Order-on-price-cap.pdf (Page no. 4)			impact of this on determination of levelised cost is negligible.
25	Calorific Value of Secondary Fuel Oil	10500	Kcal/Kg	CO2 Baseline Database for the Indian Power Sector, November, 2009, issued by Central Electricity Authority, Ministry of Power, Government of India (http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm)	CEA	<input checked="" type="checkbox"/>	The value considered in this baseline alternate scenario is as per the CO2 Baseline Database for the Indian Power Sector, November, 2009, issued by Central Electricity Authority, Ministry of Power, Government of India, which was available at the time of decision making and the value is correct and appropriate. The impact of this on determination of levelised cost is negligible.
26	Coal Shortage	0.8	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 35	CERC	<input checked="" type="checkbox"/>	The value considered in this baseline alternate scenario is as per Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 for non pithead power plant, which is available at the time of decision making and the value is correct and appropriate.
27	Compensatory Allowance	0.00 for 0 to 10 years	INR / MW /Year	Central Electricity Regulatory Commission (Terms &	CERC	<input checked="" type="checkbox"/>	The value considered is as per Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 applicable to coal based plants including lignite

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
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		0.015 for 11 to 15 Years 0.035 for 16 to 20 years 0.065 for 21 to 25 years		conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 29			based plants, which was available at the time of decision making and the value is correct and appropriate. This value has been considered for all coal based (including lignite) alternatives.
28	Rate of Interest on Working Capital	11.75	%	As per Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 26, the 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	CERC	<input checked="" type="checkbox"/>	As per Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 26, the Rate of interest on working capital shall be equal to the short-term Prime Lending Rate of State Bank of India. The Validation team has verified the same. Based on the same, the short-term Prime Lending Rate of State Bank of India available at the time of decision making is considered i.e. 11.75%. The same has also been verified from the article of reuters dated 04/01/2010 (http://in.reuters.com/article/2010/01/04/india-plr-idINSGE6030BH20100104) and it is found correct. Based on the above, the value is correct and appropriate. This value has been considered for all alternatives.

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				(http://in.reuters.com/article/2010/01/04/india-plr-idINSGE6030BH20100104)			
29	Discounting Factor	1.1019		Discount rate as notified by Central Electricity Regulatory Commission on 30/09/2009 (http://cercind.gov.in/Escalation-rate/Notification-dated-30-09-09.pdf) Page 1	CERC	<input checked="" type="checkbox"/>	<p>The discounting factor is taken from Central Electricity Regulatory Commission notification dated 30/09/2009 which was available at the time of decision making. The same is verified by Validation team and found correct and authentic.</p> <p>This value has been considered for all alternatives.</p>

6. 660 MW coal (imported) fired port based power plant using super critical boiler technology

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S.N	Parameter	Value	Unit	Source of	Reference	DOE ASSESSMENT	

		applied		Information (please indicate document and page)		Correctness of value applied	Comment
1	Capacity of Plant	660	MW	CEA monthly report on Broad status of Thermal Power Project in the country dated December 2009 http://www.cea.nic.in/archives/thermal/bs/dec09.pdf (Page 72)	CEA	<input checked="" type="checkbox"/>	Tirora (Thermal Power Plant) has been selected for levelised cost analysis representative project for this baseline alternative having latest zero date (i.e. 28/02/2008) of all under construction projects with imported coal Supercritical technology (both Public and Private) as per the Monthly Report on Broad Status of Thermal Power Project in the country December 2009 by Central Electricity Authority of India. In levelised cost calculation, the block size (i.e. 660 MW) of this representative is considered. This report is verified by validation team to confirm that the representative case considered in the levelised cost analysis is correct and appropriate.
2	Total Project Cost (including IDC , Financing Charges)	30876.7	INR million	CEA monthly report on Broad status of Thermal Power Project in the country dated December 2009 http://www.cea.nic.in/archives/thermal/bs/dec09.pdf (Page 72)	CEA	<input checked="" type="checkbox"/>	<p>The project cost (i.e. INR 46.78 Million per MW X 660 MW) of the selected baseline alternative has calculated based on the per MW cost (i.e. INR 46.78 Million per MW) and the block size considered (i.e. 660 MW) sourced from the Central Electricity Authority of India Monthly Report on Broad status of Thermal Power Project in the country December 2009.</p> <p>Validation Team has verified this report to confirm the total project cost (i.e. INR 92630 Million) and the total project capacity (i.e. 660 MW X 3 Units = 1980 MW). This report was available at the time of investment decision making guideline 6 of EB 62, Annex 05 and authentic (as published by Central Electricity Authority of India).</p> <p>Based on the above, it is concluded that the project cost is correct and appropriate.</p>
3	Cost per MW	46.78	INR million	CEA monthly report on Broad status of Thermal Power Project in the country dated	CEA	<input checked="" type="checkbox"/>	The cost per MW for this baseline alternative comes out as 46.78 INR million per MW which is calculated based on the total project capacity (i.e. 660 MW X 3 Units = 1980 MW) and the total project cost (i.e. INR 92630 Million) as given in the Monthly Report on

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				December 2009 http://www.cea.nic.in/archives/thermal/bs/dec09.pdf (Page 72) UNFCCC Ref. No. 4533 (http://cdm.unfccc.int/Projects/DB/RWTUV1298960710.55/view)			Broad status of Thermal Power Project in the country December 2009 by Central Electricity Authority of India for the selected baselines alternative. Validation Team has verified the same and it is found correct. The validation team has found that the registered CDM project i.e. Gautami (UNFCCC ref. no 4828), vemagiri (UNFCCC ref. no 4334) and UNFCCC Ref No. 4629 has not considered subcritical imported coal as one of the baseline alternative hence the validation team has cross verified the per MW cost considered in registered PDD UNFCCC Ref. No. 4533 i.e. INR 40 Million per MW which has start date in 2008. After considering the impact of inflation, the project cost is comparable. Since the cost is based on the approved cost of various coal based power plants and the cost considered by project proponent (PP) is conservative. Based on the above, it is concluded that the value is correct and appropriate.
4	Technical Life time	25	Years	CERC (Terms and conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) Page 9	CERC	<input checked="" type="checkbox"/>	Technical lifetime of the selected alternative is considered as 25 years which is as per CERC Regulation published in 19/01/2009 and available at the time of investment decision making as per guideline 6 of EB 62, Annex 05. Validation team has verified the CERC regulation and the lifetime is found to be correct. Further, As per EB50, Annex-15, "Tool to determine remaining lifetime of the equipment" life time of the boiler and steam turbine is 25

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						Correctness of value applied	Comment
							years. Based on the above, it is concluded that the technical life time of the selected alternative for a period of 25 years is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
5	Debt: Equity	70:30		Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009(www.cerci nd.gov.in) page 13	CERC	<input checked="" type="checkbox"/>	Value considered is based on Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has also cross verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 page 13 for its appropriateness. Further, the ratio of Debt: Equity (i.e. 70:30) is normally accepted ratio of infrastructure projects. Thus, it is concluded that the debt: equity ratio considered is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
6	Return on Equity (ROE)	15.5	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 21	CERC	<input checked="" type="checkbox"/>	Value considered is based on Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 page 21 for its appropriateness.

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
							Thus, it is concluded the value considered is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
7	Plant Load Factor (PLF)	85	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009(www.cercind.gov.in) page 42	CERC	<input checked="" type="checkbox"/>	Value considered is based on Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has also cross verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 page 42 for its appropriateness. Hence validation team is convinced that the value considered is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
8	Cost of Coal	85.74	US \$/Tonne	GOVERNMENT OF INDIA MINISTRY OF COAL RAJYA SABHA UNSTARRED QUESTION NO 2628 TO BE ANSWERED ON 14.12.2009	/COAL-P/	<input checked="" type="checkbox"/>	The Landed cost of imported coal has been calculated from price of Indonesian coal given in the statement/answer given by Ministry of Coal in Rajya Sabha dated 14/12/2009 i.e. INR 4003.91 per Tonne and the exchange rate of Rs. 46.70 per US \$, available at the time of decision making as guideline 6 of EB 62, Annex 05. Validation team has verified the statement and it is found correct and authentic.

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				COAL PRICES . http://164.100.47.5:8080/members/website/question.asp?qref=149034			Further, the same is line with the cost of imported coal considered in the baseline alternative scenario i.e. 600 MW coal (imported) fired port based power plant using conventional technology (sub critical) Based on the above, validation team is convinced that the value considered is correct and appropriate.
9	Gross Calorific value of Imported Coal	5900	Kcal/kg	GOVERNMENT OF INDIA MINISTRY OF COAL RAJYA SABHA UNSTARRED QUESTION NO 2628 TO BE ANSWERED ON 14.12.2009 COAL PRICES . http://164.100.47.5:8080/members/website/question.asp?qref=149034	/COAL-P/	<input checked="" type="checkbox"/>	The gross calorific value has been taken from the statement/answer given by Ministry of Coal in Rajya Sabha dated 14/12/2009 i.e. 5900 kCal/kg for Indonesian imported coal, available at the time of decision making as guideline 6 of EB 62, Annex 05. Validation team has verified the statement and it is found correct and authentic. Further, the same is considered in line with the price of imported coal i.e. US \$ 85.74 per Tonne taken for the financial analysis. Further, the same is line with the cost of imported coal considered in the baseline alternative scenario i.e. 600 MW coal (imported) fired port based power plant using conventional technology (sub critical) Based on the above, validation team is convinced that the value

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						Correctness of value applied	Comment
							considered is correct and appropriate.
10	Gross Heat Rate	2079	Kcal/kWh	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 46	CERC	<input checked="" type="checkbox"/>	<p>Gross Heat Rate value for the selected baseline alternative scenario is sourced from CERC tariff regulation dated 19/01/2009 which has provided maximum design gross heat rate value for super-critical imported coal based power plant. Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 page 46 is verified by validation team to confirm that the value considered is correct and available at the time of decision making as guideline 6 of EB 62, Annex 05. Further, it is maximum design heat rate and hence the same is also conservative.</p> <p>Further, this heat rate is increased by 6.5% (the margin on design heat rate to be applied as per CERC Terms and Conditions of Tariff Regulations 2009 dated 19/01/2009 (page 46)). Thus, the effective heat rate used in the calculation works out to be 2214.14 kCal/kWh. The same has been cross checked with other registered projects UNFCCC Ref. No. 4533 (page 41) as 2245 kCal/kWh.</p> <p>Based on the above, it is concluded that the value is correct and appropriate.</p>
11	Auxiliary consumption	8.50	%	Central Electricity Regulatory Commission (Terms &	CERC	<input checked="" type="checkbox"/>	The auxiliary consumption value i.e. 8.5% for the baseline alternative scenario is sourced from Central Electricity Regulatory

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				conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 48			Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of investment decision making. The same is verified by validation team to be correct and appropriate.
12	O & M expenses	1.462	INR million per MW	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 for the year 2013-14 (www.cercind.gov.in) page 27	CERC	<input checked="" type="checkbox"/>	The value of O&M expense is considered from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has also cross verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 for its appropriateness. Further, the validation team has verified the other registered project UNFCCC Ref. No. 4533 for O&M expenses which has considered MW for 2008-09 and INR 1.05 Million/MW for 2007-08 (CERC Terms and Conditions Regulation 2004 page 21). The same works out to INR 1.45 Million /MW for 2013-14 considering the escalation of 5.72% which is comparable to the value considered by the PP. Hence validation team is convinced that the value considered is correct and appropriate.

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13	O & M escalation	5.72	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 (www.cercind.gov.in) page 27	CERC	<input checked="" type="checkbox"/>	<p>The value of O&M escalation is considered from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has also cross verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 for its appropriateness.</p> <p>Further, the validation team has verified the other registered project UNFCCC Ref. No. 4533 for escalation in O&M expenses which has considered 4% as per CERC Terms and Conditions Regulation 2004.(page 21) The PP has used the latest CERC Terms and Conditions of Tariff Regulations, 2009 available at the time of decision making.</p> <p>Hence validation team is convinced that the value considered is correct and appropriate.</p>
14	Interest rate on Term Loan	12	%	Modal BPLR of PSBs - Second Quarter Review of Monetary Policy 2009-10 date 27/10/2009 table 17(http://rbi.org.in/scrip	RBI	<input checked="" type="checkbox"/>	<p>The interest rate taken is in line with the commercial lending rates as provided by the Reserve Bank of India, India's central bank which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05.</p> <p>As mentioned and verified by validation team from the second</p>

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				ts/NotificationUser.aspx?Id=5326&Mode=0)			Quarter Review of Monetary Policy 2009-10 dated 27/10/2009, the modal BPLR interest rate chosen by PP is the monthly average (%) of public sector banks (PSBs). Further to this the validation team has also checked the average BPLR of the public sector banks (PSBs) which comes be 12.25%. Thus, it is concluded by validation team that the modal BPLR value chosen for the benchmark calculation is correct and appropriate. Hence validation team is convinced that the value considered is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
15	Working Capital:			Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 25	CERC	<input checked="" type="checkbox"/>	The working capital requirement is considered from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has also cross verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 for its appropriateness. Hence validation team is convinced that the value considered is correct and appropriate.
	Receivable	2	Months				
	Fuel	2	Months				
	O&M	1	Month				
	Maintenance spare	20	% of O&M expense				
	Secondary fuel Oil Consumption	2	Months				
16	Tariff	3.24	INR/kWh	Central Electricity Regulatory Commission (Terms &	CERC	<input checked="" type="checkbox"/>	Tariff is based on the levelised cost worked out based on the fixed cost and variable cost. The same is calculated from various input values considered from Central Electricity Regulatory Commission

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				conditions of Tariff) Regulations, 2009 (www.cercind.gov.in)			<p>(Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 and other references available at the time of decision making confirming to guideline 06 of EB 62, Annex 05. Tariff calculation is verified by validation team is found to be correct and input values used therein are found correct as mentioned above.</p> <p>The Tariff is based on two part tariff and is regulated by Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 and the same is also verified by validation team.</p> <p>Thus, it is concluded by validation team that the tariff considered in the financial analysis is correct and appropriate. The same approach has been used in tariff calculation of all alternatives as applicable to the project activity.</p>
17	Income Tax	33.99	%	Income Tax Act, 1961	ACT	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in India. The same is verified by DOE and found correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
18	Minimum Alternate Tax (MAT)	16.995	%	Income Tax Act, 1961	ACT	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in India. The same is verified by DOE and found correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
19	Repayment Period Moratorium Period	44 4	Quarters	Central Electricity Regulatory	CERC	<input checked="" type="checkbox"/>	The repayment period for the selected baseline scenario is in line

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				Commission (Terms & conditions of Tariff) Regulations, 2009 (www.cercind.gov.in) page 41 and 44			with the Statement of Objects and Reasons for CERC Terms and Conditions which provides for 12 years for all normative loans, available at the time of decision making. Thus, it is concluded by validation team that the repayment period considered for the project activity is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
20	Depreciation as per Income Tax	15	%	Income Tax Act, 1961	ACT	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in India. The same is verified by DOE and found correct. This value has been applied for all considered alternatives.
21	Depreciation as per Companies Act	5.28	%	Companies Act, 1956	ACT	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in India. The same is verified by DOE and found correct. This value has been applied for all considered alternatives.
22	Salvage Value	10	%	http://energytechnologyexpert.com/financial-models/how-to-evaluate-economic-feasibility-of-a-power-plant-project-use-project-finance-model/ dated November 9th, 2009	/S-VAL/	<input checked="" type="checkbox"/>	Salvage Value of Power Plant & Equipment considered is taken as 10%. The source/reference of the salvage value submitted by PP is verified by validation team to correct and appropriate In financial calculation assets are depreciated to 100% of book value and this is being achieved in the 19th year of operations. The salvage value is being considered at the end of useful life i.e.

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				Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 23	CERC		25 years. A 10% salvage value is considered in all the alternatives which is a reasonable expectation of the potential profit or loss on the realization of the assets. In addition to this Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulation, 2009 dated 19/01/2009 is also verified by validation team which also evidences the salvage value as 10%. Thus, it is concluded by validation team that the salvage value considered in the financial calculation is correct and conservative. This value has been applied for all considered alternatives.
23	Secondary fuel Oil Consumption	1	ml per kWh	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 48	CERC	<input checked="" type="checkbox"/>	The value considered in this baseline alternate scenario is as per Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and the value is correct and appropriate. The impact of this on determination of levelised cost is negligible.
24	Price of Secondary Fuel Oil	30.6	INR /Litre	CERC Draft Order dated September 2009 (http://cercind.gov.in/2009/August09/Draft-	CERC	<input checked="" type="checkbox"/>	The value considered in this baseline alternate scenario is as per the CERC draft tariff order, which is available at the time of decision making and the value, is correct and appropriate. The

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						Correctness of value applied	Comment
				Order-on-price-cap.pdf (Page no. 4)			impact of this on determination of levelised cost is negligible.
25	Calorific Value of Secondary Fuel Oil	10500	Kcal/Kg	CO2 Baseline Database for the Indian Power Sector, November, 2009, issued by Central Electricity Authority, Ministry of Power, Government of India (http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm)	CEA	<input checked="" type="checkbox"/>	The value considered in this baseline alternate scenario is as per the CO2 Baseline Database for the Indian Power Sector, November, 2009, issued by Central Electricity Authority, Ministry of Power, Government of India, which was available at the time of decision making and the value is correct and appropriate. The impact of this on determination of levelised cost is negligible.
26	Coal Shortage	0.8	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 35	CERC	<input checked="" type="checkbox"/>	The value considered in this baseline alternate scenario is as per Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 for non pithead power plant, which is available at the time of decision making and the value is correct and appropriate.
27	Compensatory Allowance	0.00 for 0 to 10 years 0.015 for	INR MW /Year	Central Electricity Regulatory Commission (Terms & conditions of Tariff)	CERC	<input checked="" type="checkbox"/>	The value considered is as per Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 applicable to coal based plants including lignite based plants, which was available at the time of decision making

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		11 to 15 Years 0.035 for 16 to 20 years 0.065 for 21 to 25 years		Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 29			and the value is correct and appropriate. This value has been considered for all coal based (including lignite) alternatives.
28	Rate of Interest on Working Capital	11.75	%	As per Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 26, the 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 (http://in.reuters.com/article/2010/01/04/india-	CERC	<input checked="" type="checkbox"/>	As per Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 26, the Rate of interest on working capital shall be equal to the short-term Prime Lending Rate of State Bank of India. The Validation team has verified the same. Based on the same, the short-term Prime Lending Rate of State Bank of India available at the time of decision making is considered i.e. 11.75%. The same has also been verified from the article of reuters dated 04/01/2010 (http://in.reuters.com/article/2010/01/04/india-plr-idINSGE6030BH20100104) and it is found correct. Based on the above, the value is correct and appropriate. This value has been considered for all alternatives.

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				plridINSGE6030BH20100104)			
29	Discounting Factor	1.1019		Discount rate as notified by Central Electricity Regulatory Commission on 30/09/2009 (http://cercind.gov.in/Escalation-rate/Notification-dated-30-09-09.pdf) Page 1	CERC	<input checked="" type="checkbox"/>	<p>The discounting factor is taken from Central Electricity Regulatory Commission notification dated 30/09/2009 which was available at the time of decision making. The same is verified by Validation team and found correct and authentic.</p> <p>This value has been considered for all alternatives.</p>

7. 135 MW Lignite fired power generation plant

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
1	Capacity of Plant	135	MW	CEA monthly report on Broad status of Thermal Power Project in the country dated December 2009 http://www.cea.nic.in/archives/thermal/bs/dec09.pdf (Page 44)	CEA	<input checked="" type="checkbox"/>	Jallipa-Kapurdi TPL (Thermal Power Plant) has been selected for levelised cost analysis representative project for this baseline alternative having latest zero date (i.e. 01/03/2007) of all under construction projects (both Public and Private) as per the Monthly Report on Broad Status of Thermal Power Project in the country December 2009 by Central Electricity Authority of India. In levelised cost calculation, the block size (i.e. 135 MW) of this representative is considered. This report is verified by validation team to confirm that the representative case considered in the levelised cost analysis is correct and appropriate.
2	Total Project Cost (including IDC , Financing Charges)	6363.8	INR million	CEA monthly report on Broad status of Thermal Power Project in the country dated December 2009 http://www.cea.nic.in/archives/thermal/bs/dec09.pdf (Page 44)	CEA	<input checked="" type="checkbox"/>	The project cost (i.e. INR 46.99 Million per MW X 135 MW) of the selected baseline alternative has calculated based on per MW cost (i.e. INR 46.99 Million per MW) and the block size (i.e. 135 MW) sourced from the Central Electricity Authority of India Monthly Report on Broad status of Thermal Power Project in the country December 2009. Validation Team has verified this report to confirm the total project cost (i.e. INR 50750 Million) and the total project capacity (i.e. 135 MW X 8 Units = 1080 MW). This report was available at the time of investment decision making as per guideline 6 of EB 62, Annex 05 and authentic (as published by Central Electricity Authority of

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						Correctness of value applied	Comment
							India). Based on the above, it is concluded that the project cost is correct and appropriate.
3	Cost per MW	46.991	INR million	CEA monthly report on Broad status of Thermal Power Project in the country dated December 2009 http://www.cea.nic.in/archives/thermal/bs/dec09.pdf (Page 44) UNFCCC Ref. No. 4629 (http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1301452084.68/view)	CEA	<input checked="" type="checkbox"/>	The cost per MW for this baseline alternative comes out as 46.99 INR million per MW which is calculated based on the total project capacity (i.e. 135 MW X 8 Units = 1080 MW) and the total project cost (i.e. INR 50750 Million) as given in the Monthly Report on Broad status of Thermal Power Project in the country December 2009 by Central Electricity Authority of India for the selected baselines alternative. Validation Team has verified the same and it is found correct. The validation team has found that the registered CDM project i.e. Gautami (UNFCCC ref. no 4828) and Vemagiri (UNFCCC ref. no 4334) has not considered lignite based power plant as one of the baseline alternative hence the registered PDD UNFCC Ref. No. 4629 is INR 49 Million per MW which is comparable. The validation team also observed that the project activity does not become non additional, even if the cost is considered at INR 49 mn./MW Based on the above it is considered as correct and appropriate.

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
4	Technical Life time	25	Years	CERC (Terms and conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) Page 9	CERC	<input checked="" type="checkbox"/>	<p>Technical lifetime of the selected alternative is considered as 25 years which is as per CERC (Terms and conditions of Tariff) Regulations, 2009 dated 19/01/2009 and available at the time of investment decision making as per guideline 6 of EB 62, Annex 05. Validation team has verified CERC (Terms and conditions of Tariff) Regulations, 2009 dated 19/01/2009 and the lifetime is found to be correct. Further, As per EB50, Annex-15, "Tool to determine remaining lifetime of the equipment" life time of the boiler and steam turbine is 25 years.</p> <p>Based on the above, it is concluded that the technical life time of the selected alternative for a period of 25 years is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.</p>
5	Debt: Equity	70:30		Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009(www.cerci nd.gov.in) page 13	CERC	<input checked="" type="checkbox"/>	<p>Value considered is based on Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has also cross verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 page 13 for its appropriateness. Further, the ratio of Debt: Equity (i.e. 70:30) is normally accepted ratio of infrastructure projects.</p> <p>Thus, it is concluded that the debt: equity ratio considered is correct, appropriate and similar to the project activity. This value</p>

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S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
							has been applied for all considered alternatives.
6	Return on Equity (ROE)	15.5	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 21	CERC	<input checked="" type="checkbox"/>	Value considered is based on Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 page 21 for its appropriateness. Thus, it is concluded the value considered is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
7	Plant Load Factor (PLF)	85	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009(www.cercind.gov.in) page 42	CERC	<input checked="" type="checkbox"/>	Value considered is based on Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has also cross verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 page 42 for its appropriateness.
8	Cost of Lignite	1663.86	INR/MT	(www.gmdcltd.com/downloads/prices_minerals_gmdc.pdf)	/Lignite-P/	<input checked="" type="checkbox"/>	The cost of lignite has been taken as average of SALE PRICES OF VARIOUS GRADES OF LIGNITE BY GMDC LTD (A Government of Gujarat undertaking) FOR LARGE SCALE

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
							<p>INDUSTRIES W.E.F. 1-1-2010 i.e. INR 1663.86 per tonne and the same was available at the time of decision making as per guideline 6 of EB 62, Annex 05. Validation team has verified the source and it is authentic.</p> <p>Further, the same has been cross verified with registered PDD UNFCC Ref No. 4629 which has considered the price of lignite as INR 0.31/1000⁵³ kCal against INR 0.48/1000 kCal considered by the PP. The price considered by PP is higher and thus conservative. Further, the consideration of the price i.e. INR 0.31/1000kCal does not change the selected baseline alternative.</p> <p>Based on the above, validation team is convinced that the value considered is correct and appropriate.</p>
9	Gross Calorific value of Lignite	3500	Kcal/kg	Report on Gujarat Lignite Resources and Scope for Joint Sector Thermal Power and SSI Project (http://www.gidb.org/downloads/reportonGLR_S.pdf) (Annexure IV)	/Lignite-P/	<input checked="" type="checkbox"/>	<p>The gross calorific value has been taken from the Report on Gujarat Lignite Resources and Scope for Joint Sector Thermal Power and SSI Project which has given gross calorific value of lignite in Gujarat in the range of 3500-4500 kCal/kg. The lower range value is considered i.e. 3500 kCal/kg as being conservative. Further, the same is also in conformity of the price of lignite i.e. Price of Lignite in Gujarat (as mentioned above). The report was available at the time of decision making as guideline 6 of EB 62, Annex 05. Validation team has verified the report and it is found correct and authentic.</p>

⁵³ Calculated based on INR 862/MT and GCV of 2800Kcal/Kg as stated in the registered PDD (UNFCCC Ref. No. 4629 page no. 51)

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
							<p>Further, the other registered project as discussed above (under the section for the "cost of lignite") has considered the GCV of 2800 kcal/kg. The GCV considered by the PP i.e. 3500 kCal/Kg. Since the lignite cost is normally linked to GCV, the validation team computed the cost per 1000 kcal and observed that the PP has considered the highest cost. Thus it is conservative. Further, the consideration of the price i.e. INR 0.31/1000kCal does not change the selected baseline alternative.</p> <p>Based on the above, validation team is convinced that the value considered is correct and appropriate.</p>
10	Gross Heat Rate	2276	Kcal/kWh	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 46	CERC	<input checked="" type="checkbox"/>	<p>Gross Heat Rate value for the selected baseline alternative scenario is sourced from CERC tariff regulation dated 19/01/2009 which has provided maximum design gross heat rate value for domestic coal and lignite based sub critical power plant. Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 page 46 is verified by validation team to confirm that the value considered is correct and available at the time of decision making as per guideline 6 of EB 62, Annex 05.</p> <p>Further, this heat rate is increased by 1.065 (the margin on design heat rate to be applied as per CERC Terms and Conditions of Tariff Regulations 2009 dated 19/01/2009 (page 46)) and 1.04% for moisture content of 30% CERC Terms and Conditions of Tariff</p>

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
							Regulations 2009 dated 19/01/2009 (page 45)) as 1.04. Thus, the effective heat rate used in the calculation works out to be 2520.90 kCal/kWh. The same has been cross checked with other registered project UNFCC Ref No. 4629 as 2600 kCal/kWh Further, the consideration of this heat rate i.e. 2600 kCal/kWh does not increase the levelised cost of this alternative above INR 3.72/kWh for the project activity. Based on the above, it is concluded that the value is correct and appropriate.
11	Auxiliary consumption	10.00	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 48	CERC	<input checked="" type="checkbox"/>	The auxiliary consumption value i.e. 10% for this baseline alternative scenario sourced from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of investment decision making as per guideline 6 of EB 62, Annex 05. The same has been cross checked with other registered project UNFCC Ref No. 4629 as 9.83% which is comparable to the Auxiliary consumption % considered by the PP. Based on the same, the value considered by the PP is correct and appropriate.
12	O & M expenses	2.998	INR million per MW	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009	CERC	<input checked="" type="checkbox"/>	The value of O&M expense is considered from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and confirms to guideline 6 of EB 62,

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				dated 19/01/2009 (www.cercind.gov.in) page 28			<p>Annex 05. Validation team has also cross verified the value from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in).</p> <p>The same has been cross checked with other registered project UNFCC Ref No. 4629 as INR 1.17 Million/MW which is lower when compared to the value considered by the PP. However, the value considered by the above-mentioned registered project has also used the reference of CERC Terms and Conditions of Tariff Regulations, 2004 (page 21) while the PP has used the latest applicable CERC Terms and Conditions of Tariff Regulations, 2009 available at the time of decision making.. Further, even if the lowest value of O&M expenses is used, it does not change the selected baseline alternative.</p> <p>Based on the same, the value considered by the PP is correct and appropriate.</p>
13	O & M escalation	5.72	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 (www.cercind.gov.in) page 28	CERC	<input checked="" type="checkbox"/>	<p>The value of O&M escalation is considered from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has also cross verified the value from CERC tariff order for its appropriateness. The same has also been cross checked with other registered project UNFCC Ref No. 4629</p>

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
							as 4% while the PP has used the latest applicable CERC Terms and Conditions of Tariff Regulations, 2009 available at the time of decision making. Based on the above, validation team is convinced that the value considered is correct and appropriate.
14	Interest rate on Term Loan	12	%	Modal BPLR of PSBs - Second Quarter Review of Monetary Policy 2009-10 date 27/10/2009 table 17(http://rbi.org.in/scripts/NotificationUser.aspx?Id=5326&Mode=0)	RBI	<input checked="" type="checkbox"/>	The interest rate taken is in line with the commercial lending rates as provided by the Reserve Bank of India, India's central bank which was available at the time of decision making and confirms to guideline 6 of EB 62, Annex 05. As mentioned and verified by validation team from the second Quarter Review of Monetary Policy 2009-10 dated 27/10/2009, the modal BPLR interest rate chosen by PP is the monthly average (%) of public sector banks (PSBs). Further to this the validation team has also checked the average BPLR of the public sector banks (PSBs) which comes be 12.25%. Thus, it is concluded by validation team that the modal BPLR value chosen for the benchmark calculation is correct and appropriate. Hence validation team is convinced that the value considered is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
15	Working Capital			Central Electricity Regulatory Commission (Terms &	CERC	<input checked="" type="checkbox"/>	The working capital requirement is considered from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the
	Receivable	2	Months				
	Fuel	1.5	Months				

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
	O&M	1	Month	conditions of Tariff) Regulations, 2009 (www.cercind.gov.in) page 25			time of decision making and confirms to guideline 6 of EB 62, Annex 05. Validation team has also cross verified the value from CERC tariff order for its appropriateness. Hence validation team is convinced that the value considered is correct and appropriate.
	Maintenance Spare	20	% of O&M expense				
	Secondary Fuel oil consumption	2	Months				
16	Tariff	3.28	INR/kWh	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 (www.cercind.gov.in)	CERC	<input checked="" type="checkbox"/>	<p>Tariff is based on the levelised cost worked out based on the fixed cost and variable cost. The same is calculated from various input values considered from Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 and other references available at the time of decision making confirming to guideline 06 of EB 62, Annex 05. Tariff calculation is verified by validation team and it is found to be correct. The input values used therein are found correct as mentioned above.</p> <p>The Tariff is based on two part tariff and is regulated by Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 and the same is also verified by validation team.</p> <p>Thus, it is concluded by validation team that the tariff considered in the financial analysis is correct and appropriate. The same approach has been used in tariff calculation of all alternatives as applicable to the project activity.</p>

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
17	Income Tax	33.99	%	Income Tax Act, 1961	ACT	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in India. The same is verified by DOE and found correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
18	Minimum Alternate Tax (MAT)	16.995	%	Income Tax Act, 1961	ACT	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in India. The same is verified by DOE and found correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
19	Repayment Period Moratorium Period	44 4	Quarters	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 (www.cercind.gov.in) page 41 and 44	CERC	<input checked="" type="checkbox"/>	The repayment period for the selected baseline scenario is in line with the Statement of Objects and Reasons for CERC Terms and Conditions which provides for 12 years for all normative loans, available at the time of decision making. Thus, it is concluded by validation team that the repayment period considered for the project activity is correct, appropriate and similar to the project activity. This value has been applied for all considered alternatives.
20	Depreciation as per Income Tax	15	%	Income Tax Act, 1961	ACT	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in India. The same is verified by DOE and found correct. This value has been applied for all considered alternatives.
21	Depreciation as per Companies	5.28	%	Companies Act, 1956	ACT	<input checked="" type="checkbox"/>	This is as per the prevailing income tax rules and regulations in

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
	Act						India. The same is verified by DOE and found correct. This value has been applied for all considered alternatives.
22	Salvage Value	10	%	http://energytechnologyexpert.com/financial-models/how-to-evaluate-economic-feasibility-of-a-power-plant-project-use-project-finance-model/ dated November 9th, 2009 Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 23	/S-VAL/ CERC	<input checked="" type="checkbox"/>	<p>Salvage Value of Power Plant & Equipment considered is taken as 10%. The source/reference of the salvage value submitted by PP is verified by validation team to correct and appropriate.</p> <p>In financial calculation assets are depreciated to 100% of book value and this is being achieved in the 19th year of operations. The salvage value is being considered at the end of useful life i.e. 25 years. A 10% salvage value is considered in all the alternatives which is a reasonable expectation of the potential profit or loss on the realization of the assets.</p> <p>In addition to this Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulation, 2009 dated 19/01/2009 is also verified by validation team which also evidences the salvage value as 10%. Thus, it is concluded by validation team that the salvage value considered in the financial calculation is correct and conservative. This value has been applied for all considered alternatives.</p>
23	Secondary fuel Oil Consumption	1.25	ml per Kwh	Central Electricity Regulatory Commission (Terms & conditions of Tariff)	CERC	<input checked="" type="checkbox"/>	The value considered in this baseline alternate scenario is as per Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 which was available at the time of decision making and the value is correct and

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 48			appropriate. The impact of this on determination of levelised cost is negligible.
24	Price of Secondary Fuel Oil	30.6	INR /Litre	CERC Draft Order dated September 2009 (http://cercind.gov.in/2009/August09/Draft-Order-on-price-cap.pdf) (Page no. 4)	CERC	<input checked="" type="checkbox"/>	The value considered in this baseline alternate scenario is as per the CERC draft tariff order, which is available at the time of decision making and the value, is correct and appropriate. The impact of this on determination of levelised cost is negligible.
25	Calorific Value of Secondary Fuel Oil	10500	Kcal/Kg	CO2 Baseline Database for the Indian Power Sector, November, 2009, issued by Central Electricity Authority, Ministry of Power, Government of India (http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm)	CEA	<input checked="" type="checkbox"/>	The value considered in this baseline alternate scenario is as per the CO2 Baseline Database for the Indian Power Sector, November, 2009, issued by Central Electricity Authority, Ministry of Power, Government of India, which was available at the time of decision making and the value is correct and appropriate. The impact of this on determination of levelised cost is negligible.
26	Coal Shortage	0.2	%	Central Electricity Regulatory Commission (Terms & conditions of Tariff)	CERC	<input checked="" type="checkbox"/>	The value considered in this baseline alternate scenario is as per Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 for non pithead power plant, which is available at the time of decision making and the

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 35			value is correct and appropriate.
27	Compensatory Allowance	0.00 for 0 to 10 years 0.015 for 11 to 15 Years 0.035 for 16 to 20 years 0.065 for 21 to 25 years	INR / MW /Year	Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 29	CERC	<input checked="" type="checkbox"/>	The value considered is as per Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 applicable to coal based plants including lignite based plants, which was available at the time of decision making and the value is correct and appropriate. This value has been considered for all coal based (including lignite) alternatives.
28	Rate of Interest on Working Capital	11.75	%	As per Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 26 , the Rate of interest on working	CERC	<input checked="" type="checkbox"/>	As per Central Electricity Regulatory Commission (Terms & conditions of Tariff) Regulations, 2009 dated 19/01/2009 (www.cercind.gov.in) page 26, the Rate of interest on working capital shall be equal to the short-term Prime Lending Rate of State Bank of India. The Validation team has verified the same. Based on the same, the short-term Prime Lending Rate of State Bank of India available at the time of decision making is considered i.e. 11.75%. The same has also been verified from the article of Reuters dated 04/01/2010

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				capital shall be on normative basis and shall be equal to the short-term Prime Lending Rate of State Bank of India (http://in.reuters.com/article/2010/01/04/india-plr-idINSGE6030BH20100104)			(http://in.reuters.com/article/2010/01/04/india-plr-idINSGE6030BH20100104) and it is found correct. Based on the above, the value is correct and appropriate. This value has been considered for all alternatives.
29	Discounting Factor	1.1019		Discount rate as notified by Central Electricity Regulatory Commission on 30/09/2009 (http://cercind.gov.in/Escalation-rate/Notification-dated-30-09-09.pdf) Page 1	CERC	<input checked="" type="checkbox"/>	The discounting factor is taken from Central Electricity Regulatory Commission notification dated 30/09/2009 which was available at the time of decision making. The same is verified by Validation team and found correct and authentic. This value has been considered for all alternatives.
30	Moisture Content	30	%	Report on Gujarat Lignite Resources and Scope for Joint Sector Thermal Power and SSI Project	/Lignite-P/	<input checked="" type="checkbox"/>	The moisture content has been taken from the Report on Gujarat Lignite Resources and Scope for Joint Sector Thermal Power and SSI Project which has given moisture content value of lignite in Gujarat in the range of 30-40 %. The value is taken in the lower range i.e. 30% in conformity of the gross calorific value and price

<input type="checkbox"/>		No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>		Assessment of all financial parameters see below					
S.N	Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
						Correctness of value applied	Comment
				(http://www.gidb.org/downloads/reportonGLRS.pdf) (Annexure IV)			of lignite (as mentioned above). The report was available at the time of decision making as guideline 6 of EB 62, Annex 05. Validation team has verified the report and it is found correct and authentic. Based on the above, validation team is convinced that the value considered is correct and appropriate.

ANNEX 4: ASSESSMENT OF BARRIER ANALYSIS

Table A-4: Assessment of Barrier Analysis (EB 55 Annex 1, §118)

<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)

<input type="checkbox"/> No comments were received during the global stakeholder consultation period						
<input checked="" type="checkbox"/> Comments were received during the global stakeholder consultation period. The comments (in unedited form) and the consideration/response of the validation team are presented below:						
Comm ent No.:	Comm ent by:	Insert ed on:	Subj ect	Comment ¹⁾	Action taken by the validation team to take due account on the comment ¹⁾	Conclu sion (incl. CARs CLs or FARs)
001	Karthik eyan	10/05/2 012	NIL	This PDD is similar to DGEN. Hence comments are same. PDD says the investment analysis calculation spread sheet is confidential; Annex 8, EB 66 states additionality related information cannot be treated as confidential. How did DOE accept this project for webhosting?	It was an inadvetantly mentioned in the webhosted PDD. However, nothing had been kept confidential in the webhosted PDD or the final PDD, being submitted for requesting registration by the PP. The statement regarding the confidential information has been removed from the PDD. The investment analysis calculations were submitted to DOE at the time of web-hosting.	
002				All the explanations given in the PDD on the availability of natural gas do not give the true picture. If the DOE googles the non-availability of gas for power projects in India, it will come across a number of websites which prove that natural gas is not available. The Ministry of Power in its letter dated March 14th, 2012 states, "As per the information made available by MOP&NG regarding NELP gas the production is likely to go down by 15.03 mmscmd in 2012-13 and additional	The availability of the natural gas in the host country has been presented into the PDD by the PP and further validated in accordance to the requirement of the applied methodology. As far as the applicability of main condition 3 is concerned, PDD version 02 provides the future NG based power capacity addition up to 2022 and the NG requirement of such expected future capacity addition. Based on the same, it is justified that the future NG based power capacity additions, comparable in size to the project activity, are not constrained by the use of NG in the project activity. The documentary evidences for the same are	CAR B1

				<p>3.42 mmscmd in 2013-14 against the availability of 42.67 mmscmd of gas in 2011-12. MOP&NG has not given any projections for the years 2014-14 and 2015-16. It is evident from above that no additional domestic gas is likely to be available till 2015-16. Hence, developers are advised not to plan projects based on domestic gas till 2015-16” (http://www.powermin.nic.in/whats_new/pdf/advisory_for_developers_for_not_planning.pdf) Why should the Government issue this notification two months back if natural gas is available in plenty? The report published in newspapers recently states that Reliance has been fined Rs.6600 crore for D6 output fall (http://articles.economictimes.indiatimes.com/2012-05-04/news/31559336_1_oil-ministry-ril-executives-kg-d6). Latest newspaper report says that RIL gas output will fall further (http://timesofindia.indiatimes.com/city/delhi/RIL-gas-output-to-fall-further-Reddy/articleshow/13057790.cms)</p>	<p>submitted.</p> <p>With reference to information quoted through web-links on NG availability, the same are selective sources of 2012 (i.e. after two years of start of the project activity) on domestic gas supply. Further, such reference are referring the gas availability issue from specific domestic source i.e. KG D6. It may be noted that such decrease is temporary which could be verified by recent official communication from major operator of KG D6 fields to petroleum ministry of India (source: http://www.firstpost.com/business/ril-wants-to-triple-gas-price-at-kg-d6-from-2014-357830.html) Hence, the same could not be considered as overall and true scenario of natural gas availability. It may be noted that as per International Energy Agency (IEA), natural gas is well on its way to a bright future (http://www.iea.org/newsroomandevents/pressreleases/2012/june/name,27383,en.html). It may be further noted that many sources are also mentioning adequate availability of NG supply to meet the balance requirement of gas based power generation but at a higher price, hence . Some of the reports are mentioned below for ready reference:</p>						
003			<p>Another web site says, “Hyderabad-based Lanco Group has been unable to commission its 740MW power plant at Vijayawada in Andhra Pradesh because of the non-availability of gas. “We have invested close to Rs. 2,600 crore and the plant is ready for commissioning from the last two months,” a company official said, requesting anonymity. “We have not been able to sign a power purchase agreement as there is no assured fuel supply from the government despite several representations.”</p>	<table><tr><th>Title</th><th>Source</th></tr><tr><td>Coming LNG flood fuels rush of investment</td><td>The Financial Express (http://www.financialexpress.com/news/coming-lng-flood-fuels-rush-of-investment/922477/) dated 12th March 2012</td></tr><tr><td>Dabhol LNG terminal to be</td><td>Economics Times (http://articles.economictimes.indiatimes.com/2012-03-12/news/31153175_1_dabhol-lng-terminal-asia-gas-partnership-summit-spot-cargo) dated</td></tr></table>	Title	Source	Coming LNG flood fuels rush of investment	The Financial Express (http://www.financialexpress.com/news/coming-lng-flood-fuels-rush-of-investment/922477/) dated 12th March 2012	Dabhol LNG terminal to be	Economics Times (http://articles.economictimes.indiatimes.com/2012-03-12/news/31153175_1_dabhol-lng-terminal-asia-gas-partnership-summit-spot-cargo) dated	
Title	Source										
Coming LNG flood fuels rush of investment	The Financial Express (http://www.financialexpress.com/news/coming-lng-flood-fuels-rush-of-investment/922477/) dated 12th March 2012										
Dabhol LNG terminal to be	Economics Times (http://articles.economictimes.indiatimes.com/2012-03-12/news/31153175_1_dabhol-lng-terminal-asia-gas-partnership-summit-spot-cargo) dated										

				<p>(http://www.livemint.com/2011/11/17233943/Decline-in-gas-supplies-makes.html).” Yet another website says, “Plant load factor—a key measure of efficiency at electricity generating units—of gas-fired projects declined to 57.93% in September compared with 67.16% in April” (http://www.eai.in/club/users/Nikoli/blogs/12122). There is an ICRA report on the NG availability in the website which contradicts the PP’s claim (http://www.icra.in/Files/ticker/Indian%20Downstream.pdf). Therefore, the PP’s argument on gas availability is not correct.</p>	<p>commissioned by first week of April: GAIL CMD.</p>	12th March 2012	
					<p>Policy on shale gas auction in the works and likely to be announced by next year.</p>	<p>The Telegraph (http://www.telegraphindia.com/1120314/jsp/business/story_15247387.jsp) dated 14th March 2012</p>	
					<p>Energy firms to cash in on LNG import needs</p>	<p>Business Standard (http://www.business-standard.com/india/news/energy-firms-to-cash-inlng-import-needs/467696/) dated 14th March 2012</p>	
					<p>Kochi LNG terminal to go on stream by Dec 2012.</p>	<p>The Asian Age (http://www.asianage.com/kochi/lng-terminal-go-stream-dec-891) dated 14th March 2012</p>	
					<p>ONGC to invest Rs 2,600 cr in the third phase of</p>	<p>Economics Times (http://articles.economictimes.indiatimes.com/2012-03-19/news/31210837_1_gas-fields-interim-dividend-mobile-offshore-production-unit) dated 19th March 2012</p>	

					develop ment of C-series natural gas fields off the west coast.		
					GSPC expects inremen tal gas productio n from 2014-15.	Infraline News Team (http://www.infraline.com/Details/gspc-expects-98-mmcmd-incremental-gas-from-2014-15-203-mmcmd-in-fy21-170797.htm)dated 21st March 2012	
					India's 1st ever shale gas explorati on bidding by 2013 end.	Economic Times (http://articles.economictimes.indiatimes.com/2012-03-23/news/31230446_1_shale-gas-conventional-oil-and-gas-coal-bed-methane) dated 23rd March 2012	
					Reliance Industrie s likely to sell CBM for \$10 per unit	Economic Times (http://articles.economictimes.indiatimes.com/2012-03-24/news/31233908_1_oil-ministry-cbm-gas-price-discovery) dated 24th March 2012	
					India holds 527 tcf of shale gas reserves	Daily News and Analysis (http://www.dnaindia.com/money/report_india-holds-527-tcf-of-shale-gas-reserves_1685334) dated 7th May 2012	

004			Company's Annual Report both 2009-10 and 2010-11 state that the natural gas is in short supply. DOE may refer to page 14 of 2009-10 Annual Report and page 31 – item G of 2010-11 Annual Report. Either the company is giving incorrect information to the investors or to the global stakeholders.	Regarding the referred annual report of the M/s Torrent Power Limited, the PLF of Sugan Mega Power project, owned and operated by the parent company i.e. M/s Torrent Power Limited, was approx. 86% in 2009-10. Further, the annual reports of the parent company (i.e. M/s Torrent Power Limited) have mentioned that the costlier imported RLNG resulting into the higher electricity price (lower preference for offtake or purchase by the electricity buyer vis-à-vis cheaper coal based power generation) had been major constrained in meeting the entire requirement of gas for power sector (i.e. 100% PLF) even though RLNG supply capacity at Petronet LNG Limited Dahej has doubled.	
005			PP has selected the input parameters in such a way that the project becomes additional. There are reports available in the Published literature state that the cost differs only by 5-10% (see http://www.scribd.com/doc/3019711/Comparative-study-on-Subcritical-and-Super-Critical-Power-Cycles and also Mott Macdonald's report available in the web). If the super critical project cost is Rs.52.18 mn. per MW, then the sub critical project cost should be Rs.45 mn. PP has taken Rs.31.36 mn. for sub critical plant using imported coal and Rs.38.75 mn. for sub critical plant using domestic coal. Why the project cost should differ so much depending on the source of coal? When the project cost of baseline is reduced, the cost of project activity is given as Rs.48 million. Lanco Kondapalli project which is recently webhosted has taken the cost at Rs.35.18 mn for the project activity and Rs.40 mn. for sub-critical plant and Rs.49 mn. for super critical plant. Natural gas cost is taken at Rs.12/SCM whereas Lanco Kondapalli has taken	The reference projects for plausible alternative scenarios have been changed (for coal and lignite based power generation) and the reference projects are selected having latest zero date of all under implementation projects of respective category. Further, the value is taken from the review report of Central Electricity Authority of India and reported by the project developers. The same is not estimated based on theoretical parameters. Further, the technology supplier for Lanco Kondapalli is different than the project activity (i.e. GE, USA for Lanco Kondapalli and Siemens for the project activity) and the EPC contract for Lanco Kondapalli was executed in January 2008 i.e. more than two years before the project activity. It may also be noted that the project cost of Konaseema Gas Power Limited (located in the same region of Lanco Kondapalli project) comes to INR 45.7 Millions per MW which has the same supplier of gas turbine (i.e. Siemens) and having lower make (V94.2) than the project activity. The fuel price is arrived at considering the information available vide actual invoices for the existing SUGEN project of the PP .	CL B11- CL B17

				9.12/SCM. With such input figures, every project will be additional.		
006				PDD does not say whether the presented baseline alternative is linkage coal or pit head coal. If the alternative is only pit head coal, it is not correct. The project is in Gujarat where there is no coal mine. Pit head coal power plant is not realistic alternative and baseline. It should be only linkage coal power plant. DOE may take care of this issue	The alternative power plants could be constructed anywhere in the grid boundary as per the methodology (i.e. not limited to the west coast). However, the pit head or non-pit head represent the differentiation based on the location only (not in terms of technology, fuel or service) and the major differentiation factor between pit-head and non-pit head plants would be additional fuel transportation cost to be incurred for non pit head plants. In this context, it is submitted that in the levelised cost analysis for Pit-head alternative under section B.4, the fuel cost was inclusive of the fuel transportation cost (for being conservative). Hence, such alternative was not separately identified (i.e. already covered under the pit-head alternative). However, the worksheets have been amended considering 2 months of stocking period and 0.8% of shortage. Further, the freight (transportation) distance of 500 km has been considered based on average distance travelled by coal in India (source: Report of McKinsey & Company on logistic infrastructure page 30). Based on the same, the pit-head alternatives have now been changed to coal-linkage based alternatives.	CAR B2
007				The logic given arguing the use of levelised cost as financial indicator in sec. B5 is strange. If this argument is correct, then all energy power projects – renewable and fossil fuel based - can adopt investment comparison analysis with levelised cost as the financial indicator. PPs can always say that they can set up any other renewable energy based power project or fossil fuel based power projects instead of the project activity. PP should go through the guidance before advancing such misleading arguments. Step 1 of the methodology clearly states that the	The IRR calculation is submitted as an additional measure for demonstration of additionality. The same has also been included in PDD version 03.	CL B1 & CL B2


			benchmark analysis should be used for additionality demonstration. Additionality tool gives benchmark only for NPV and IRR and not for levelised unit cost. The argument given for levelised unit cost is for misleading DOE. DOE should insist on the benchmark analysis as explained in the additionality tool and not as interpreted by the PP. When Lanco Kondapalli has used benchmark analysis (using project IRR as financial indicator), the argument given by the PP has no merits.		
008			<p>This company is a DISCOM in Surat. Hence, the levelised cost is not the applicable tariff for the power sold. It should be the average power tariff realized by the company in its distribution business. This figure is available in annual reports. If the benchmark analysis is adopted, with corrections in the project cost, alternatives, fuel cost and the tariff, this project cannot be additional.</p>	<p>In this regard we would like to submit that:-</p> <ol style="list-style-type: none"> 1. As per the Electricity Act 2003 of India (http://www.cercind.gov.in/08022007/Act-with-amendment.pdf), generation and distribution are separate activities. 2. The generation of power is a non-licensed activity (Section 7 (page 13) of the Electricity Act 2003 of India) whereas the distribution of power is a licensed activity (Section 12 (page 16) of the Electricity Act 2003 of India). 3. The project activity is an inter-state generating station having other beneficiaries (i.e. other than distribution licensee for Ahmedabad and Surat) and its tariff will be determined by Central Electricity Regulatory Commission of India as per the functions of Central Electricity Regulatory Commission (Point (b) of Section 79 (page 65) of the Electricity Act 2003 of India) . 4. However, the electricity purchase and procurement of distribution licensee is to be regulated by the State Electricity Regulatory Commission as per the functions of State Electricity Regulatory Commission (Point (a) & (b) of Section 86 (page 70-71) of Electricity Act 2003 of 	CL B8

					<p>India). Based on the same, the purchase of power by TPL distribution activity from the grid is approved by the State Electricity Regulatory Commission of Gujarat under Gujarat Electricity Regulatory Commission (GERC) (Multi Year Tariff Framework Regulation, 2007 (http://www.gercin.org/regulationspdf/en_1301051611.pdf)). As per the said regulations, the tariff for sale of electricity by the distribution licensee is to be determined by GERC (Point (d) of section 3.1 page 5).</p> <p>5. The above—mentioned can be evidenced from the same principle being followed for the existing power plant (SUGEN Mega Power Project) of the PP. SUGEN is an IPP supplying power to distribution arms of TPL as also to others. In its order for tariff for the distribution arms of TPL, the GERC has</p> <ol style="list-style-type: none"> asked TPL to maintain separate book of accounts for generation and distribution (Refer page 25 of APR FY 2008-09 and ARR FY 2009-10 of Petition dated 9th December, 2009 for TPL-Ahmedabad and TPL-Surat Distribution). specified that the price as given by CERC will be the cost of power purchase to the distribution arms (Refer page 107 of APR FY 2008-09 and ARR FY 2009-10 of Petition dated 9th December, 2009 for TPL-Ahmedabad and TPL-Surat Distribution). <p>6. Further, the actual invoices raised by SUGEN plant on TPL-Ahmedabad and TPL-Surat (DISCOMs) for the month of December 2009 has also been submitted in conformity of the above-mentioned. It can be clearly seen that the tariff being charged in the invoices is based on CERC terms and Condition of Tariff Regulations 2009 as considered for the project activity.</p>	
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				<p>7. Further, the PPA between Ahmedabad Distribution and SUGEN (Article 5 and Article 20.7) are submitted showing that the tariff as specified by CERC will be applicable.</p> <p>8. The PPA between PTC and SUGEN is submitted showing that the tariff as specified by CERC will be applicable (Schedule E).</p> <p>9. The PPAs as mentioned above were available to PP at the time of decision making (28th January 2010) and were the basis of subsequent decisions which implies that the tariff as specified by CERC is applicable.</p> <p>10. Further, the PPA between UNOSUGEN and PTC has also been submitted for applicability of CERC Tariff (Schedule E).</p> <p>Thus the cost of generation as determined by CERC Terms and Condition of Tariff, 2009 is an appropriate tariff for the Project activity. Further the tariff as provided for by CERC is based on CERC Terms and Condition of Tariff, 2009. The parameters on which the tariff is defined can be varied as provided in the Regulations. The escalation as provided for in the Regulations has been applied in the calculations for Tariff.</p>	
009			<p>The levelised cost is Rs.3.68 for project and Rs.2.36 for baseline. Will the CDM benefits fill this gap? If not why is the PP taking up this project? Public are shareholders of this company and the company cannot put up a project, which gives lower profit or results in loss for the shareholders. Either the figures given in the PDD are incorrect or the company is not working in the interest of shareholders.</p>	<p>The benchmark analysis with CDM benefits has also been submitted for the impact of CDM revenue. And the proposed CDM project activity will alleviate the barriers that prevent the proposed project activity from occurring in the absence of the CDM.</p>	CAR B14 & CL B11

^{*)} In case clarifications have been requested by the validation team corresponding rows shall be added

ANNEX 6: STATEMENTS OF COMPETENCE OF ALL INVOLVED PERSONNEL



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

Mr. Pankaj Patel


SCHEME	STATUS	VALID UNTIL
CDM	Lead Assessor	2013-06-21
Validation, Verification	Lead Assessor	2013-06-21
VCS	Lead Assessor	2013-06-21

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
2.2	Heat Distribution
3.1	Energy Demand

031 – Rev. 0, Date: 2011-03-23

031_P03 rev0 / 2010-04-19



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	Lead Assessor	2014-06-22
Validation, Verification	Lead Assessor	2014-06-22
VCS	Lead Assessor	2014-06-22

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

007 – Rev. 1, Date: 2011-06-23

007_P03 rev1 / 2010-04-19



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

Mr. Saroj Kumar Sahoo


SCHEME	STATUS	VALID UNTIL
CDM	Lead Assessor	2014-08-02
Validation, Verification	Lead Assessor	2014-08-02
VCS	Lead Assessor	2014-08-02

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewable Energies

008 – Rev. 2, Date: 2011-08-03

008_P03 rev2 / 2010-04-19



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


Mr. Indrapal Parmar

SCHEME	STATUS	VALID UNTIL
CDM	Assessor	2014-03-27
VCS	Assessor	2014-03-27

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewable Energies

191 – Rev. 1, Date: 2011-06-16



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

Mr. Mohinder Amarnath B. J.


SCHEME	STATUS	VALID UNTIL
CDM	Lead Assessor	2013-06-21
VCS	Lead Assessor	2013-06-21

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewable Energies
3.1	Energy Demand
4.1	Cement Sector
13.1	Waste Handling and Disposal

053 – Rev. 1, Date: 2011-06-20

053_501-F003_2011-06-20_rev1



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

Mr. Stefan Winter

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2014-06-30
VCS	Senior Assessor (Validation, Verification) Technical Reviewer	2014-06-30

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA	TR SUBCATEGORIES
1.1	Thermal energy generation	1.2.1 Hydro 1.2.2 Wind 1.2.3 Geothermal 1.2.4 Solar 1.2.5 Total
2.2	Heat distribution	
3.1	Energy demand	
13.1	Waste handling and disposal	13.1.1 Waste management 13.1.2 Waste water management
13.2	Animal waste management	
15.2	Animal waste management	

163 – Rev. 2, Date: 2011-06-10

163_501-F003_2011-06-10_rev2