



TÜV NORD CERT GmbH • P.O. Box 10 32 61 • 45032 Essen • Germany

TÜV NORD CERT GmbH

Langemarckstrasse 20
45141 Essen
Germany

Phone: +49 201 825-0
Fax: +49 201 825-2517

Info.tncert@tuev-nord.de
www.tuev-nord-cert.com

TÜV®

CDM Executive Board

Our / Your Reference

Contact
Rainer Winter
E-Mail: rwinter@tuev-nord.de

Direct Dial
Phone: -3329
Fax: -2139

Date
04.09.2012

Initial Comments to incompleteness of project "Grid connected electricity generation using natural gas by Lanco Kondapalli Power Private Limited" (Ref. no. 5554)

Dear Honourable Members of the CDM Executive Board,

Please find below the response of the TÜV NORD JI/CDM Certification Program to the Request For Registration Incomplete for the above mentioned project No. 5554.

If you have any questions do not hesitate to contact us.

Yours sincerely,

TÜV NORD JI/CDM Certification Program

Rainer Winter

Headquarters
TÜV NORD CERT GmbH
Langemarckstraße 20
45141 Essen
Phone: +49 201 825-0
Fax: +49 201 825-2517
info.tncert@tuev-nord.de
www.tuev-nord-cert.com

Director
Dipl.-Volksw. Ulf Theike


Deputy director
Dipl.-Ing. Wolfgang Wielpütz

Registration Office
Amtsgericht Essen
HRB 9976
VAT No.: DE 811389923
Tax No.: 111/5706/2193

Deutsche Bank AG, Essen
Bank Code: 360 700 50
Account No.: 0607895000
BIC (SWIFT-Code): DEUTDEDE
IBAN-Code: DE 26 3607 0050 0607 8950 00

2012-09-04 S01-F041_DOE
Submission_Lanco final 2007
r1.doc rev0

Page 1 of 23

	<p align="center">S01-F041</p> <p align="center">Initial Comments to Request for Review</p>	<p align="center">Rev. 0</p> <p align="center">Page 2 of 23</p>
---	---	---

Question Raised by the EB	
1	<p>The PP/DOE are requested to present the sensitivity analysis of the investment analysis as per EB 48 Annex 60 paragraph 10 (a) and step 1 of the assessment of additionality stated the applied methodology.</p> <p>The PDD has not presented the sensitivity analysis of the IRR calculation.</p>
Changes Made in/ Reference	
<input checked="" type="checkbox"/> PDD	Section B.5
<input checked="" type="checkbox"/> FVR	Section 5
<input checked="" type="checkbox"/> Financial Models	IRR sheet
<input type="checkbox"/> ER Sheet	No changes required
<input checked="" type="checkbox"/> Additional Comment by PP	
<p>A sensitivity analysis of the project activity has been conducted following the paragraph 20 and 21 of the “guidelines on the assessment of investment analysis”, version - 05 (EB 62, Annex - 5). The following parameters have been considered to have material impact upon the IRR of the project activity and have been subjected to sensitivity analysis.</p> <ul style="list-style-type: none"> • Plant load factor (PLF) • Station Heat Rate • Project capital cost • Fuel cost • O&M cost <p>Sensitivity results are included in the revised PDD.</p>	
<input checked="" type="checkbox"/> Additional Comment by DOE	
<p>PP has included the sensitivity analysis of the investment analysis in the revised PDD. DOE has verified the sensitivity results presented in the revised PDD. Detailed assessment on the sensitivity is included in section 5 of the FVR.</p>	
<input type="checkbox"/> Other/Additional documents	

Question Raised by the EB	
2	<p>The DOE is requested to provide a description of steps taken to cross-check the information given in the PDD as per VVM v1.2 paragraph 88.</p> <p>(a) It is not clear how the DOE has crosschecked the following input values in the levelized cost analysis:</p> <ul style="list-style-type: none"> (i) for alternative of subcritical coal power plant: project cost, cost of coal and NCV of coal; (ii) for alternative of supercritical coal power plant with imported coal: project cost, cost of imported coal and NCV of imported coal; (iii) for alternative of supercritical coal power plant with domestic coal: project cost, cost of coal and NCV of coal. Furthermore, it is not clear why the project cost is different with the alternative of supercritical coal power plant with imported coal while the validation report indicates that they use the same unit cost in USD/kW (page 164 and page 168); (iv) for alternative of lignite power plant: project cost, cost of lignite and NCV of lignite; (v) for alternative of naphtha power plant: project cost, cost of naphtha and NCV of naphtha. Furthermore, it is not clear why the project cost of naphtha alternative is different with the project activity given that the VR page 174 mentions it is as per the project activity. <p>(b) the spreadsheet for the levelized cost analysis has not been provided.</p>
Changes Made in/ Reference	
<input checked="" type="checkbox"/> PDD	Revised PDD section B.4
<input checked="" type="checkbox"/> FVR	Revised FVR, Table A-3 of Annex-3

<input checked="" type="checkbox"/> Financial Models	LUCE sheets				
<input type="checkbox"/> ER Sheet	No changes required.				
<input type="checkbox"/> Additional Comment by PP					
It was observed during the cross-check that value of the following parameters have undergone further revision.					
Sr. No	Parameter	Value prior to revision	Value after revision	Levelised cost of generation after revision	Justification
01.	NCV of lignite	2800 kCal / kg	2,699 kCal / kg	2.2439 INR / kWh	The earlier value corresponds to GCV of lignite. The same has been converted to NCV in the revised PDD and related financial calculations.
02.	Project cost of naphtha	11928 Million INR	11880 Million INR	4.2872 INR/ kWh	The project cost of naphtha has been adjusted to match with the cost of gas based CCPP.
03.	NCV of naphtha	10500 kCal/ kg	9975 kCal / kg	4.2872 INR/ kWh	The earlier value corresponds to GCV of naphtha. The same has been converted to NCV in the revised PDD and related financial calculations.
The revision as explained above will not impact the baseline identification and additionality analysis of the project activity.					
<input checked="" type="checkbox"/> Additional Comment by DOE					
Paragraph 88 of VVM 1.2 requires DOE to provide description of the steps taken and sources of information used to cross check the information given in the PDD. Validation report is corrected to include the required information.					
The evidence used, and the cross checking made while accepting the parameters and assumption used in financial indicator calculation are given in the following table:					
Parameters		Value	Basis and Assessment		
(i) For Alternative of power plant based on coal using sub-critical					

technology :		
1. Total Project cost	20,000 INR million	<p>The project cost is calculated from per MW cost multiplied by the installed capacity considered for the baseline alternative i.e. 500 MW x 40 INR million/MW = 20,000 INR million.</p> <p>Per MW cost of the coal based sub critical technology i.e. 40 INR million / MW is sourced from the Central Electricity Authority Report of the Expert Committee on Fuels for Power Generation which is based on the approved projects.</p> <p>The website referred in the earlier submission is not working now, however the location of the document on the web is changed. The correct web site address is http://www.cea.nic.in/reports/articles/thermal/expert_committee_report_fuel.pdf</p> <p>DOE also cross verified the 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 mn. /MW as in the case of registered projects Gautami(4828), Vemagiri (4334) and Hazira (2915) Gas based combined cycle power project.</p> <p>Since the cost is based on the approved cost of various coal based power plants and the cost compares well with other projects, DOE accepted the cost as valid and appropriate for the project activity</p>
2. Cost of Coal (INR/Kg)	1.2849	<p>The cost of the coal is based on the tariff petition no 140/2005 for Ramagundam Thermal Power station stage-III (500 MW) and is sourced from the Central Electricity Regulatory Commission (CERC)¹As this value is sourced from the document available from Central Electricity Regulatory Commission which is a government regulatory Authority, value considered is authentic and appropriate.</p> <p>DOE cross verified the cost assumed by other registered projects and observed that Gautami (4828) has taken a cost of Rs 1357/ MT for GCV of 4760 kcal/kg, Vemagiri (4334) has taken cost of Rs 1173/MT for GCV of 4000, Torrent Power (1116) has considered a cost of Rs.1150/MT for 3755 kcal/kg CV. This is comparable to Rs.1284/MT assumed by the candidate project for 4093 kcal/kg GCV.(3946 NCV)</p>

¹ <http://cercind.gov.in/03022007/No-140-05-doh-22-5-07.pdf>

			In the above background, DOE considered the cost as appropriate and correct for the project activity.
3.	Calorific value of coal (NCV) kcal/kg	3946	<p>Net Calorific value of the coal is worked out considering GCV of the coal as 4093 kcal/kg and GCV to NCV conversion factor.</p> <p>The GCV of the coal is based on the tariff petition no 140/2005 for Ramagundam Thermal Power station stage-III (500 MW) and is sourced from the Central Electricity Regulatory Commission (CERC)²As this value is sourced from the document from Central Electricity Authority, value considered is authentic and appropriate.</p> <p>GCV to NCV conversion factor of 3.6 % is sourced from CEA CO2 database; version 02 dated 21st June, 2007 http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm</p> <p>DOE cross verified the cost and corresponding calorific value assumed by other registered projects and observed that Gautami (4828) has taken a cost of Rs 1357/ MT for GCV of 4760 kcal/kg, Vemagiri (4334) has taken cost of Rs 1173/MT for GCV of 4000, Torrent Power (1116) has considered a cost of Rs.1150/MT for 3755 kcal/kg CV. This is comparable to Rs.1284/MT assumed by the candidate project for 4093 kcal/kg GCV.(3946 NCV)</p> <p>Hence, this value has been accepted correct and appropriate for the project activity</p>

(ii) For Alternative of Supercritical coal power plant with imported coal:

Parameters	Value	Basis and Assessment
1. Project cost	31,331 INR million	<p>The project cost is calculated from per MW cost multiplied by the installed capacity considered for the baseline alternative i.e. 660 MW x 47.47 INR mn /MW = 31,331 INR Mn.</p> <p>Value of 47.47 INR million /MW is based on the British High Commission Report on UMPP Risk Analysis, April 2007. Cost considered for imported coal based supercritical power plant</p>

² <http://cercind.gov.in/03022007/No-140-05-doh-22-5-07.pdf>

			<p>is USD 1180 per kW which is wrongly presented as USD 1227 per kW in FVR during earlier submission. DOE regrets the typographical mistake; exchange rate considered is USD @ 40.23 INR. Same is verified by the validation team and is appropriate.</p> <p>DOE also cross verified the cost assumed by other registered projects for imported coal based power plant using super critical technology as an alternative and observed that they have assumed the cost of Rs. 45.22 mn. /MW as in the case of registered project Hazira (2915) Gas based combined cycle power project. While Gautami (4828), Vemagiri (4334) projects have not considered the supercritical as an alternative scenario.</p> <p>Since the cost is based on the authentic report published by British high commission on ultra mega power projects and the cost compares well with other project, DOE accepted the cost as valid and appropriate for the project activity</p>
	2. Cost of Imported Coal (INR/Kg)	1.925	<p>The cost of the imported coal is as per CEA³ expert committee report on fuel pricing.</p> <p>Same is verified by the validation team. The value is correct and acceptable.</p> <p>DOE also cross verified the cost assumed by other registered projects for imported coal based power plant using super critical technology as an alternative and observed that they have assumed the cost of Rs. 2020 Rs / MT for GCV of 5400 Kcal/Kg as in the case of registered project Hazira (2915) Gas based combined cycle power project. While Gautami(4828), Vemagiri (4334) projects have not considered the supercritical as an alternative scenario. This is comparable to Rs.1925/MT assumed by the candidate project for 5400 kcal/kg GCV.(5206 NCV)</p>

³ http://www.cea.nic.in/reports/articles/thermal/expert_committee_report_fuel.pdf

			<p>In the above background, DOE considered the cost as appropriate and correct for the project activity.</p>
3. Calorific value of imported coal (NCV) kcal/kg	5206		<p>Net Calorific value of the coal is worked out considering GCV of the imported coal as 5400 kcal/kg and GCV to NCV conversion factor of 3.6 %.</p> <p>The GCV of the coal is based on the CEA⁴ expert committee report on fuel pricing.</p> <p>GCV to NCV conversion factor of 3.6 % is sourced from CEA CO2 database; version 02 dated 21st June, 2007 http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm</p> <p>Further value considered is also comparable with other registered project. GCV of 5400 Kcal/Kg for imported coal is considered in the case of registered project Hazira (2915) Gas based combined cycle power project.</p> <p>As this value is sourced from the document of Central Electricity Authority, value considered is authentic and appropriate.</p>
<p>(iii) For Alternative of Supercritical coal power plant with domestic coal:</p>			
Parameters	Value	Basis and Assessment	
1. Project cost	32,579 INR million	<p>The project cost is calculated from per MW cost multiplied by the installed capacity considered for the baseline alternative i.e. 660 MW x 49.36 INR mn /MW = 32,579 INR Mn.</p> <p>Value of 49.36 INR million /MW is based on the British High Commission Report on UMPP Risk Analysis, April 2007.</p>	

⁴ http://www.cea.nic.in/reports/articles/thermal/expert_committee_report_fuel.pdf

			<p>Cost considered for domestic coal based supercritical power plant is USD 1227 per kW; exchange rate considered is USD @ 40.23 INR. Same is verified by the validation team and is appropriate.</p> <p>Since the cost is based on the authentic report published by British high commission on ultra mega power projects, DOE accepted the cost as valid and appropriate for the project activity</p>
2.	Cost of domestic Coal (INR/Kg)	1.2849	<p>The cost of the coal is based on the tariff petition no 140/2005 for Ramagundam Thermal Power station stage-III (500 MW) and is sourced from the Central Electricity Regulatory Commission (CERC)⁵As this value is sourced from the document available from Central Electricity Regulatory Commission which is a government regulatory Authority, value considered is authentic and appropriate.</p> <p>DOE cross verified the cost assumed by other registered projects and observed that Gautami (4828) has taken a cost of Rs 1357/ MT for GCV of 4760 kcal/kg, Vemagiri (4334) has taken cost of Rs 1173/MT for GCV of 4000, Torrent Power (1116) has considered a cost of Rs.1150/MT for 3755 kcal/kg CV. This is comparable to Rs.1284/MT assumed by the candidate project for 4093 kcal/kg GCV.(3946 NCV)</p> <p>In the above background, DOE considered the cost as appropriate and correct for the project activity.</p>
3.	Calorific value of domestic coal (NCV) kcal/kg	3946	<p>Net Calorific value of the coal is worked out considering GCV of the coal as 4093 kcal/kg and GCV to NCV conversion factor.</p> <p>The GCV of the coal is based on the tariff petition no 140/2005 for Ramagundam Thermal Power station stage-III (500 MW) and is sourced from the Central Electricity Regulatory Commission (CERC)⁶As this value is sourced from the document from Central Electricity Authority, value considered is authentic and appropriate.</p> <p>GCV to NCV conversion factor of 3.6 % is sourced from CEA CO2 database; version 02 dated 21st June, 2007 http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm</p>

⁵ <http://cercind.gov.in/03022007/No-140-05-doh-22-5-07.pdf>

⁶ <http://cercind.gov.in/03022007/No-140-05-doh-22-5-07.pdf>

DOE cross verified the cost and corresponding calorific value assumed by other registered projects and observed that Gautami (4828) has taken a cost of Rs 1357/ MT for GCV of 4760 kcal/kg, Vemagiri (4334) has taken cost of Rs 1173/MT for GCV of 4000, Torrent Power (1116) has considered a cost of Rs.1150/MT for 3755 kcal/kg CV. This is comparable to Rs.1284/MT assumed by the candidate project for 4093 kcal/kg GCV.(3946 NCV)

Hence, this value has been accepted correct and appropriate for the project activity

(iii) Part-II :

Furthermore, it is not clear why the project cost is different with the alternative of supercritical coal power plant with imported coal while the validation report indicates that they use the same unit cost in USD/kW (page 164 and page 168);

Parameters	Value	Basis and Assessment
Unit cost	1180 USD/kW	<p>In earlier submission, project cost considered for imported coal based supercritical power plant is wrongly presented as USD 1227 per kW instead of USD 1180 per kW. DOE regrets the typographical mistake due to interchange of the values sourced from the same document i.e. British High commission report on Ultra Mega Power Projects. There is no change in the input values of the project cost as this is only a typographical mistake.</p> <p>Since the cost is based on the authentic report published by British high commission on ultra mega power projects, DOE accepted the cost as valid and appropriate for the project activity</p>

(iv) For Alternative of Lignite Power Plant:

Parameters	Value	Basis and Assessment
1. Project cost	20,307 INR	As per the CEA publication on "broad status of thermal power project in the country" the estimated approved

		million	<p>cost of the thermal power station (unit 1 & unit 2 : 250 MW each) of Neyveli Lignite Corporation is INR 20307.80 million. This amounts to per MW project cost of INR 40.62 Million (INR 20307.80 million/500 MW)</p> <p>Value presented in earlier submission is INR 20,300 million which is rounded down value. However, now exact values are considered.</p> <p>Reference : http://www.cea.nic.in/reports/proj_mon/broad_status.pdf</p> <p>DOE also cross verified the cost assumed by other registered projects for lignite based power plant as an alternative and observed that they have assumed the cost ranging from Rs. 43 mn. /MW as in the case of 165 MW Gas based combined cycle power project at Hazira (1300) to Rs. 50 mn. as in the case of Grid-connected Combined Cycle Power Plant of capacity 219.067 MW using Natural Gas/ R-LNG as fuels at Gujarat, India (1352). DOE also observed that the project activity does not become non additional, even if the cost is considered at Rs.50 mn./Mw in as much as the Levelized cost of generation goes up from Rs.2.24/kwh to Rs.2.46/kWh in reference to the levelized cost of generation of Rs.2.68/kWh in the case of the project activity. Since the cost is based on the approved cost of one of the lignite based power plant and the cost compares well with other projects, DOE accepted the cost as valid and appropriate for the project activity</p>
	2. Cost of Lignite (INR/Kg)	0.80	<p>The cost of the imported coal is as per CEA⁷ expert committee report on fuel pricing.</p> <p>Same is verified by the validation team. The value is correct and acceptable.</p> <p>DOE also cross verified the cost assumed by other registered projects for lignite based power plant as an alternative and observed that they have assumed the cost of Rs. 876 / MT for GCV of 2673 Kcal/Kg as in the case of registered project Hazira (2915) Gas based combined cycle power project and Bhandar gas based CCPP (1300) This is comparable to Rs.800 /MT</p>

⁷ http://www.cea.nic.in/reports/articles/thermal/expert_committee_report_fuel.pdf

		<p>assumed by the candidate project for 2800 kcal/kg GCV.(2699 NCV)</p> <p>In the above background, DOE considered the cost as appropriate and correct for the project activity.</p>
3. Calorific value of Lignite (NCV) kcal/kg	2699	<p>Net Calorific value of the coal is worked out considering GCV of the lignite as 2800 kcal/kg and GCV to NCV conversion factor of 3.6 %.</p> <p>The GCV of the coal is based on the CEA⁸ expert committee report on fuel pricing.</p> <p>GCV to NCV conversion factor of 3.6 % is sourced from CEA CO2 database; version 02 dated 21st June, 2007 http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm</p> <p>DOE also cross verified the cost and corresponding calorific value assumed by other registered projects for lignite based power plant as an alternative and observed that they have assumed the cost of Rs. 876 / MT for GCV of 2673 Kcal/Kg as in the case of registered project Hazira (2915) Gas based combined cycle power project and Bhandar gas based CCPP (1300) This is comparable to Rs.800 /MT assumed by the candidate project for 2800 kcal/kg GCV.(2699 NCV)</p> <p>Values specified in earlier submission is wrongly presented as GCV instead of NCV by mistake. Error is regretted. Same is now revised and made consistent.</p> <p>Levelised cost of generation is now worked out to 2.2439 INR/kW from 2.2109 INR/kW and making this alternative all the more costly.</p> <p>As this value is sourced from the document of Central Electricity Authority, value considered is authentic and appropriate.</p>

⁸ http://www.cea.nic.in/reports/articles/thermal/expert_committee_report_fuel.pdf

(v) For Alternative of Naphtha Power Plant:		
Parameters	Value	Basis and Assessment
a) Project cost	11,880 INR million	<p>Input values of project cost for alternative of Naphtha based power plant is considered same as per the project activity considering only change of fuel type.</p> <p>Values specified in earlier submission is wrongly presented as 11,928 INR Millions instead of 11,880 INR Million by mistake. Error is regretted. Same is now revised and made consistent.</p> <p>Capacity of the power plant is also considered same as 366 MW as per the project activity.</p> <p>As input values for alternative of power generation through Naphtha are considered same as per the project activity, is considered appropriate for calculation of levelised cost of generation by validation team.</p>
b) Cost of Naphtha (INR/Kg)	17.40	<p>The cost of the Naphtha is as per CEA⁹ expert committee report on fuel pricing.</p> <p>DOE also cross verified the cost assumed by other registered projects for Naphtha based power plant as an alternative and observed that they have assumed the cost of Rs 18,000 / MT for GCV of 11360 Kcal/Kg for registered project Hazira (2915) Gas based combined cycle power project and cost of Rs. 30,000 / KL (equivalent to Rs 22,500 / Kg considering specific gravity of 750 kg/m³) for GCV of 11000 Kcal/Kg as in the case of registered project Bhandar gas based CCPP (1300). This is comparable to Rs.17,400 /MT assumed by the candidate project for 10,500 kcal/kg GCV (9975 NCV)</p> <p>In the above background, DOE considered the cost as appropriate and correct for the project activity.</p>
c) Calorific value of Naphtha (NCV) kcal/kg	9975	<p>Net Calorific value of the Naphtha is worked out considering GCV of the Naphtha as 10,500 kcal/kg and GCV to NCV conversion factor of 5 %.</p> <p>The GCV of the coal is based on the CEA¹⁰ expert</p>


⁹ http://www.cea.nic.in/reports/articles/thermal/expert_committee_report_fuel.pdf

			<p>committee report on fuel pricing.</p> <p>GCV to NCV conversion factor of 5 % is sourced from CEA CO2 database; version 02 dated 21st June, 2007 http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm</p> <p>DOE also cross verified the cost and corresponding calorific values assumed by other registered projects for Naphtha based power plant as an alternative and observed that they have assumed the cost of Rs 18,000 / MT for GCV of 11360 Kcal/Kg for registered project Hazira (2915) Gas based combined cycle power project and cost of Rs. 30,000 / KL (equivalent to Rs 22,500 / MT considering specific gravity of 750 kg/m3) for GCV of 11000 Kcal/Kg as in the case of registered project Bhandar gas based CCPP (1300). This is comparable to Rs.17,400 /MT assumed by the candidate project for 10,500 kcal/kg GCV (9975 kcal/kg NCV)</p> <p>Values specified in earlier submission is wrongly presented as GCV (10, 000 Kcal/Kg) instead of NCV (9975 kcal/kg) by mistake. Error is regretted. Same is now revised and made consistent.</p> <p>Levelised cost of generation is now worked out to 4.2872 INR/kW from 4.1195 INR/kW and making this alternative all the more costly.</p> <p>As this value is sourced from the document of Central Electricity Authority, value considered is authentic and appropriate.</p>
<p>(v) Part-II :</p> <p>Furthermore, it is not clear why the project cost of naphtha alternative is different with the project activity given that the VR page 174 mentions it is as per the project activity</p>			
	Parameters	Value	Basis and Assessment

¹⁰ http://www.cea.nic.in/reports/articles/thermal/expert_committee_report_fuel.pdf

	Project cost	11,880 INR million	<p>Input values of project cost for alternative of Naphtha based power plant is considered same as per the project activity considering only change of fuel type.</p> <p>Values specified in earlier submission is wrongly presented as 11,928 INR Millions instead of 11,880 INR Million by mistake. Error is regretted. Same is now revised and made consistent.</p> <p>Levelised cost of generation is now worked out to 4.2872 INR/kW from 4.1195 INR/kW and making this alternative all the more costly.</p> <p>Capacity of the power plant is also considered same as 366 MW as per the project activity.</p> <p>As input values for alternative of power generation through Naphtha are considered same as per the project activity, is considered appropriate for calculation of levelised cost of generation by validation team.</p>
(b) The spreadsheets for the levelised cost analysis are submitted.			
<input type="checkbox"/> Other/Additional documents			

Question Raised by the EB	
3	<p>The DOE is requested to include information on how it has validated the input values to the financial calculations as per VVM v 1.2 paragraph 114 (a).</p> <p>With regard to the input values of the project activity, the Validation Report has not provided the following:</p> <p>(a) the value of the heat rate that was used to crosscheck the heat rate of the project activity;</p> <p>(b) the values of the O&M expense and O&M annual escalation that were used to crosscheck the O&M expense and O&M annual escalation of the project</p>

	<p align="center">S01-F041</p> <p align="center">Initial Comments to Request for Review</p>	<p align="center">Rev. 0</p> <p align="center">Page 16 of 23</p>
---	---	--

	<p>activity;</p> <p>(c) the justification to use levelized cost for tariff, instead of the applicable tariff in the IRR calculation.</p>
Changes Made in/ Reference	
<input checked="" type="checkbox"/> PDD	Section B.5
<input checked="" type="checkbox"/> FVR	Table A-3 of Annex-3, Section 5
<input checked="" type="checkbox"/> Financial Models	LUCE,
<input type="checkbox"/> ER Sheet	No Changes required
<input checked="" type="checkbox"/> Additional Comment by PP	
<p>PP would like to clarify the justification of using levelised cost for tariff. The computation of levelised cost includes 14% return on equity (ROE) in addition to other variable and fixed cost elements as per CERC guideline dated 26th March, 2004 (Reference : http://www.cercind.gov.in/13042007/Terms_and_conditions_of_tariff.pdf). Hence the same has been used as tariff for IRR computation.</p> <p>Prior to the investment approval PP has developed the Detailed project Report (DPR) that has formed the basis of according investment approval to the present project activity. The approach that has been followed to estimate the levelised cost of generation in DPR conforms to the guideline on tariff computation (please refer to the CERC regulation dated 26th March, 2004; http://www.cercind.gov.in/13042007/Terms_and_conditions_of_tariff.pdf) for the utility scale power projects in the country. As per the guideline the levelised cost of generation for power projects will be derived based upon total fixed (including return on equity @ 14%) and variable cost as incurred by the project activity. In order to determine the levelised cost of generation the following cost elements have been estimated</p> <ul style="list-style-type: none"> • Variable cost <ul style="list-style-type: none"> ▪ Cost of fuel • Fixed cost <ul style="list-style-type: none"> ▪ Interest on debt ▪ Interest on working capital ▪ Operation and maintenance expenses ▪ Depreciation ▪ Advance against depreciation ▪ Return on equity 	

▪ Tax


Drawing reference from the above the project proponent has estimated tariff following the levelised cost approach which is also in accordance with the guideline recommended by CEA.

☒ **Additional Comment by DOE**

Validation team has reviewed the input values considered for the project activity and included detailed assessment as below. Same is also included in the revised FVR.


(i) For Project activity :		
Parameters	Value	Basis and Assessment
a) Gross Heat rate Kcal/Kwh	1850	<p>The value is based on the detailed project report. This is available at the time of decision making confirming to guideline 06 of EB 62, Annex 05. As verified, project activity is an installation of the advanced class gas turbines having good heat rate.</p> <p>DOE has cross verified the value of heat rate considered by the other registered project and observed that, Vemagiri (4334) and Gautami (4828) has considered heat rate of 1850 Kcal/Kwh. While Hazira (2915) and Bhandar (1300) has considered heat rate of 1950 Kcal/Kwh.</p> <p>TÜV NORD also observed that the assumed value is in conformity to the heat rate recommended by CERC for advanced class combined cycle gas power plants (1850 Kcal/kWh). Hence, this value has been accepted correct and appropriate for the project activity</p>
b) O&M expenses % of capital cost	2.8	<p>O&M expenses considered for the project activity is based on the detailed project report. O&M cost considered in the DPR is INR 0.91 million / MW. Considering the installed capacity of the project activity as 366 MW, total O&M expenditure works out to INR 333.06 million which is equivalent to 2.8 % of the capital cost for the project activity.</p> <p>Other registered projects have assumed O&M cost at much higher level. Bhandar Power (1300), for example has considered O&M cost at 4.26%; Torrent power (1116) has reckoned this cost at 3.25%; Bhandar Power (2915) has taken O&M cost at 3.26%. Though this cost compares well with those of other registered projects, it</p>

			<p>is marginally higher than CERC recommended rate of 2.5%. TÜV NORD observed that even if the O&M cost is reduced to 2.5%, the project does not become attractive, in that the Levelised cost comes down to Rs. 2.66/kWh in contrast to the levelised cost of Rs. 2.12/kWh in respect of coal based power plant. Since the value is based on DPR, compares well with the cost of other registered projects and does not affect the additionality, TÜV NORD accepted this cost as correct and appropriate.</p>
b)	Escalation in O&M cost %	4	<p>Escalation in O&M cost is considered as 4 % is based on the detailed project report prepared for the project activity and is also in conformity with CERC tariff order available at the time of decision making confirming to guideline 06 of EB 62, Annex 05.</p> <p>DOE cross verified the escalation in O&M cost assumed by other registered projects and observed that Gautami (4828) has taken a value of 6 %, Vemagiri (4334) has taken a value of 4% , Hazira CCPP (2915) has taken value of 6 %, Torrent Power (1116) has considered a value of 4 %. This is comparable to 4 % assumed by the candidate project.</p> <p>Since the escalation is based on DPR, in conformity with CERC order and compares well with other projects, TÜV NORD accepted this cost as correct and appropriate.</p>
c)	the justification to use levelized cost for tariff, instead of the applicable tariff in the IRR calculation		<p>Levelised cost of tariff used for the IRR calculation is based on the fixed cost and variable cost considered as per the Central Electricity Regulatory Commission guidelines dated 26/03/2004 for utility scale power projects. Same is also form the basis in Detailed project report available at the time of decision making. As per the guideline the levelised cost of generation for power projects will be derived based upon total fixed (including return on equity) and variable cost as incurred by the project activity.</p> <p>DOE has also cross checked the recently registered project GSEG (4419) and ensured that levelised cost of tariff was used for the calculation of the IRR as per the CERC guidelines.</p> <p>Based on above DOE has accepted the levelised cost</p>

	<p align="center">S01-F041 Initial Comments to Request for Review</p>	<p align="center">Rev. 0 Page 19 of 23</p>
---	--	---

		for tariff used for IRR calculation.
<input type="checkbox"/> Other/Additional documents		

Question Raised by the EB	
4	<p>The DOE is requested to include information on how it has validated sensitivity analysis of the investment analysis as per VVM v1.2 paragraph 111 (e).</p> <p>The Validation Report lacks information on the validation of the sensitivity analysis of the IRR calculation.</p>
Changes Made in/ Reference	
<input checked="" type="checkbox"/> PDD	Section B.5
<input checked="" type="checkbox"/> FVR	Section 5
<input checked="" type="checkbox"/> Financial Models	IRR sheet
<input type="checkbox"/> ER Sheet	No changes required
<input checked="" type="checkbox"/> Additional Comment by PP	
<p>A sensitivity analysis of the project activity has been conducted following the paragraph 20 and 21 of the “guidelines on the assessment of investment analysis”, version - 05 (EB 62, Annex - 5). The following parameters have been considered to have material impact upon the IRR of the project activity and have been subjected to sensitivity analysis.</p> <ul style="list-style-type: none"> Plant load factor (PLF) Station Heat Rate Project capital cost Fuel cost O&M cost 	

	<p align="center">S01-F041</p> <p align="center">Initial Comments to Request for Review</p>	<p align="center">Rev. 0</p> <p align="center">Page 20 of 23</p>
---	---	--

Sensitivity results have been included in the revised PDD.

☒ **Additional Comment by DOE**

DOE has verified the sensitivity results presented in the revised PDD. It is observed that there is marginal variation in the IRR and it always remains below the applied value of the benchmark. As levelised cost of tariff as considered in the IRR calculation is based on fixed and variable cost as per the Central Electricity Regulatory Commission (CERC) guidelines dated 24/03/2004, any variation in input parameter does not have any impact on the IRR value and it remains almost constant.

Further DOE has also verified the registered project of GSEG (4419) and observed that the sensitivity analysis does not have impact on IRR calculation as it is based on the CERC guidelines.

☐ **Other/Additional documents**

Question Raised by the EB

<p align="center">5</p>	<p>The DOE is requested to provide information on how it has validated the suitability of the benchmark as per VVM v 1.2 paragraph 114 (b).</p> <p>The DOE has not validated: (a) beta, and why 5 years data are used; (2) the average Prime Lending Rate being 13%, while the spreadsheet does not show that the average is 13% (it shows 10.50%-12% and 12.75%-13.25%).</p>
--------------------------------	---

Changes Made in/ Reference

<p><input checked="" type="checkbox"/> PDD</p>	<p>Section B.5</p>
<p><input checked="" type="checkbox"/> FVR</p>	<p>Section 5</p>
<p><input checked="" type="checkbox"/> Financial Models</p>	<p>IRR sheet / Benchmark calculation sheet</p>
<p><input type="checkbox"/> ER Sheet</p>	<p>No changes required</p>

☒ **Additional Comment by PP**

In order to draw comparison of applicable “Beta” over different time duration the same has been considered from 1 year to 5 year. The table below represents the “Beta” estimated over different time period

Sr. No.	Time duration (Year/s)	Average Beta
01.	1	0.9913
02.	2	1.0996
03.	3	1.0924
04.	4	1.1476
05.	5	1.1588

It is quite evident that value of “Beta” is the lowest that corresponds to one year average. The WACC of the project activity using 1 year average “Beta” has been estimated at 13.53% which is higher than the IRR of the project activity. It justifies additionality of the project activity even after following a conservative approach to compute WACC.

Also, the lowest value of “Beta” (5 years) corresponds to Torrent Power i.e. 0.843. The WACC of the project activity using the Beta value of 0.843 has been estimated at 13.10% which is higher than the project IRR.


Justification of Prime Lending Rate (PLR) :

PLR rate of 10.50% - 12.00% corresponds to the week ending on 12th January, 2007. which is almost a year before the project activity start date. Hence the same has not been considered to ascertain cost of debt. The PLR values that correspond to the time period (December, 2007 to 2nd week of January, 2008) which is immediately prior to the project activity start date have been considered to arrive at the cost of debt.

☒ **Additional Comment by DOE**

In earlier submission PP has considered five years beta considering 5 years as reasonable time frame for calculating returns on equity. However, now PP has calculated the beta value based on the **minimum** beta calculated for 1,2,3,4 and 5 years. As this approach is conservative, DOE has accepted the same. All other input values used for the calculation of beta is verified by the DOE and ensured that it is sourced from the authentic and reliable sources and is publicly available. Value of the benchmark is now reduced to 13.58 from 14.02 as considered earlier. Detail information is provided in the revised FVR.


As regard to the second query, DOE would like to submit that, PLR spreadsheet represents range of 10.50% - 12 % and 12.75 % - 13.25% is for the different time frame and presented for the yearly comparison purpose by the Reserve bank of India. Value stated as 10.50 % - 12.00 % is for the year 2006 while value of 12.75 % - 13.25 % is for the period 24th Aug, 07 to 28th Sep, 07. Hence average value of the PLR of range 12.75 % - 13.25% is appropriately taken by

	<p align="center">S01-F041 Initial Comments to Request for Review</p>	<p align="center">Rev. 0 Page 22 of 23</p>
---	--	---

the PP.

☐ **Other/Additional documents**

Question Raised by the EB	
6	<p>The DOE is requested to identify if the PDD has been updated and rectified according to the responses to the CARs, CLs and or FARs raised during validation as per VVM v 1.2 paragraph 39.</p> <p>The project participant on its response to CAR B18 mentions that information regarding monitoring of parameters has been stated in the PDD. However, the information about the accuracy of the ultrasonic meters being less than 0.1% (Validation Report page 43) and the calibration of gas flow meter being once in a year (Validation report page 44) is not available in the PDD.</p>
Changes Made in/ Reference	
<input checked="" type="checkbox"/> PDD	Section B.7
<input checked="" type="checkbox"/> FVR	Section 5
<input type="checkbox"/> Financial Models	No changes required
<input type="checkbox"/> ER Sheet	No changes required
<input checked="" type="checkbox"/> Additional Comment by PP	
<p>The followings have been mentioned in the revised PDD</p> <ul style="list-style-type: none"> • Accuracy of the ultrasonic meters will be maintained at less than 0.1%. • The calibration frequency of natural gas flow meter will be maintained at once in a year. 	
<input checked="" type="checkbox"/> Additional Comment by DOE	
PDD is revised by the PP in accordance with the replies of CAR B18. Same is verified by the	

	<p align="center">S01-F041</p> <p align="center">Initial Comments to Request for Review</p>	<p align="center">Rev. 0</p> <p align="center">Page 23 of 23</p>
---	---	--

DOE to ensure the inclusion of the required information regarding accuracy class and calibration frequency for the monitoring equipments used for the calculation of the emission reduction.

☐ **Other/Additional documents**