



VALIDATION REPORT

LANCO KONDAPALLI POWER LIMITED (LKPL)

VALIDATION OF THE GRID CONNECTED GAS BASED COMBINED CYCLE POWER PROJECT IN ANDHRA PRADESH

BUREAU VERITAS CERTIFICATION

62/71 Boulevard du Château

REPORT NO. INDIA-VAL/464.49/2012

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VALIDATION REPORT



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| Date of first issue: 02/11/2012 | Organizational unit: Bureau Veritas Certification Holding SAS |
| Client: Lanco Kondapalli Power Limited (LKPL) | Client ref.: Mr. K Satyannarayana |
| <p>Summary:</p> <p>Bureau Veritas Certification has made the validation of the "Grid Connected Gas based Combined Cycle Power Project in Andhra Pradesh" project of Lanco Kondapalli Power Limited (LKPL) located at Kondapalli village in Krishna District, state of Andhra Pradesh in India, on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.</p> <p>The validation scope is defined as an independent and objective review of the project design document, the project's baseline study, monitoring plan and other relevant documents, and consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final validation report and opinion. The overall validation, from Contract Review to Validation Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.</p> <p>The first output of the validation process is a list of Clarification and Corrective Actions Requests (CL and CAR), presented in Appendix A. Taking into account this output, the project proponent revised its project design document.</p> <p>In summary, it is Bureau Veritas Certification's opinion that the project correctly applies the baseline and monitoring methodology AM 0029 version 03 and meets the relevant UNFCCC requirements for the CDM and the relevant host country criteria.</p> | |

| | |
|---|------------------------------|
| Report No.: INDIA-val/464.49/2012 | Subject Group: CDM |
| Project title: Grid Connected Gas based Combined Cycle Power Project in Andhra Pradesh | |
| Work carried out by: Mr. Sanjay Patankar - Team Leader Mr. Prabhavtar Singh - Team member Mr. Sadashiva Bhat - Technical Expert M/s. Sushil Budhia & Associates- Financial Expert | |
| Internal Technical Review carried out by: Mr. H.B. Muralidhar- Internal Technical Reviewer | |
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Work approved by:

Mr. Flavio Gomes- Global Product Manager

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Abbreviation used:

| | |
|-----------------|--|
| BCM | Billion Cubic Meters |
| CAR | Corrective Action Request |
| CDM | Clean Development Mechanism |
| CEA | Central Electricity Authority |
| CER | Certified Emission Reductions |
| CERC | Central electricity Regulatory Commission |
| CL | Clarification Request |
| CO ₂ | Carbon Dioxide |
| DNA | Designated National Authority |
| DOE | Designated Operational Entity |
| EIA | Environment Impact Assessment |
| GCV | Gross Calorific Value |
| GHG | Green House Gas(es) |
| GTG | Gas Turbine Generator |
| GW/GWh | Giga Watt /Gigawatt- Hour |
| HRSG | Heat Recovery Steam Generator |
| I | Interview |
| IRR | Internal rate of return |
| kW/kWh | Kilowatt /Kilowatt-hour |
| MoEF | Ministry of Environment & Forests |
| M & P | Modalities and Procedure |
| MNOPNG | Ministry of Petroleum & Natural Gas |
| MoV | Means of Verification |
| MP | Monitoring Plan |
| MW/MWh | Mega Watt/Megawatt-hour |
| NCV | Net Calorific Value |
| NGO | Non Government Organization |
| O & M | Operation and Maintenance |
| OM/ BM/CM | Operating Margin / Build Margin /Combined Margin |
| LKPL | Lanco Kondapalli Power Limited |
| LNG | Liquefied Natural Gas |
| MMSCD | Million metric standard cubic meter per day |
| NG | Natural Gas |
| PDD | Project Design Document |
| PGCIL | Power Grid Corporation of India Limited |
| PLF | Plant Load Factor |
| PP | Project Participant |
| PPA | Power Purchase Agreement |
| SCM | Standard Cubic Meter |



| | |
|--------|--|
| STG | Steam Turbine Generator |
| SLM | Straight Line Method |
| TCF | Trillion Cubic Feet |
| VVM | Validation and Verification Manual |
| UNFCCC | United Nations Framework Convention for Climate Change |



1 INTRODUCTION

Lanco Kondapalli Power Limited (LKPL) has commissioned Bureau Veritas Certification to validate its CDM project “**Grid Connected Gas based Combined Cycle Power Project in Andhra Pradesh**” (hereafter called “the project”) at Kondapalli village in Krishna District in the state of Andhra Pradesh in India.

This report summarizes the findings of the validation of the project, performed on the basis of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1 Objective

The validation serves as project design verification and is a requirement of all projects. The validation is an independent third party assessment of the project design. In particular, the project's baseline, the monitoring plan (MP), and the project's compliance with relevant UNFCCC and host country criteria are validated in order to confirm that the project design, as documented, is sound and reasonable, and meet the stated requirements and identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.

1.2 Scope

The validation scope is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

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

1.3 Validation team

The validation team consists of the following personnel:

| FUNCTION | NAME | CODE HOLDER* | TASK PERFORMED |
|---------------|------------------|---|---|
| Lead Verifier | Sanjay Patankar | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | <input checked="" type="checkbox"/> DR <input type="checkbox"/> SV <input type="checkbox"/> RI |
| Verifier | Prabhavtar Singh | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | <input checked="" type="checkbox"/> DR <input checked="" type="checkbox"/> SV <input type="checkbox"/> RI |
| Technical | Sadashiva Bhat | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input checked="" type="checkbox"/> DR <input checked="" type="checkbox"/> SV <input type="checkbox"/> RI |



| | | | |
|--|----------------------------|---|---|
| Specialist | | | |
| Financial Specialist | Sushil Budhia & Associates | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | <input checked="" type="checkbox"/> DR <input type="checkbox"/> SV <input type="checkbox"/> RI |
| Work approved by | Flavio Gomes | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | <input checked="" type="checkbox"/> DR <input type="checkbox"/> SV <input checked="" type="checkbox"/> RI |
| Internal Technical Reviewer (ITR) | H.B. Muralidhar | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input checked="" type="checkbox"/> DR <input type="checkbox"/> SV <input type="checkbox"/> RI |

*DR = Document Review; SV = Site Visit; RI = Report issuance

2 METHODOLOGY

The overall validation, from Contract Review to Validation Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

In order to ensure transparency, a validation protocol was customized for the project, according to the version 01.2 of the Clean Development Mechanism Validation and Verification Manual, issued by the Executive Board at its 55th meeting on 30/07/2010. The protocol shows, in a transparent manner, criteria (requirements), means of validation and the results from validating the identified criteria. The validation protocol serves the following purposes:

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

The completed validation protocol is enclosed in Appendix A to this report.

2.1 Review of Documents

The Project Design Document (PDD) submitted by LKPL and additional background documents related to the project design and baseline, i.e. country Law, Guidelines for Completing the Project Design Document (CDM-PDD), Approved methodology, Kyoto Protocol, Clarifications on Validation Requirements to be Checked by a Designated Operational Entity were reviewed.

To address Bureau Veritas Certification corrective action and clarification requests, LKPL revised the PDD and resubmitted it on 02/11/2012

The validation findings presented in this report relate to the project as described in the PDD version 05(Ref/P3/)



2.2 Follow-up Interviews

On 04/05/2012 to 05/05/2012, Bureau Veritas Certification performed a site visit and interviews with project stakeholders and representatives of LKPL (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

| Interviewed organization | Interview topics |
|---|---|
| Lanco Kondapalli Power Limited (LKPL) | <ul style="list-style-type: none"> • Project Design and implementation • Technical Equipment and operation • Compliance with National Laws and regulations. • CDM consideration • Benchmark Analysis • Additionality • Monitoring Plan |
| Local Stakeholders | <ul style="list-style-type: none"> • Views and concerns about the project activity |
| Price Waterhouse Coopers [CDM consultant] | <ul style="list-style-type: none"> • Baseline Determination • Additionality • Benchmark Analysis • Monitoring Plan • GHG Calculation • Environmental Impacts |

2.3 Resolution of Clarification and Corrective Action Requests

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

Corrective Action Requests (CAR) is issued, where:

- a) The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;
- b) The CDM requirements have not been met;
- c) There is a risk that emission reductions cannot be monitored or calculated.

The validation team may also use the term Clarification Request (CL), if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.



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

2.4 Internal Technical Review

The validation report underwent an Internal Technical Review (ITR) before requesting registration of the project activity.

The ITR is an independent process performed to examine thoroughly that the process of validation has been carried out in conformance with the requirements of the validation scheme as well as internal Bureau Veritas Certification procedures.

The Lead Verifier provides a copy of the validation report to the reviewer, including any necessary validation documentation. The reviewer reviews the submitted documentation for conformance with the validation scheme. This will be a comprehensive review of all documentation generated during the validation process.

When performing an Internal Technical Review, the reviewer ensures that:

- The validation activity has been performed by the team by exercising utmost diligence and complete adherence to the CDM rules and requirements.
- The review encompasses all aspects related to the project which includes project design, baseline, additionality, monitoring plans and emission reduction calculations, internal quality assurance systems of the project participant as well as the project activity, review of the stakeholder comments and responses, closure of CARs, CLs and FARs during the validation exercise, review of sample documents.

The reviewer compiles clarification questions for the Lead Verifier and Validation Team and discusses these matters with Lead Verifier.

After the agreement of the responses on the 'Clarification Request' from the Lead Verifier as well as the PP(s) the finalized validation report is accepted for further processing such as uploading on the UNFCCC webpage.

3 VALIDATION CONCLUSIONS

In the following sections, the conclusions of the validation are stated.

The findings from the desk review of the original project design documents and the findings from interviews during the follow up visit are described in the Validation Protocol in Appendix A.



The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the Validation Protocol in Appendix A. The validation of the Project resulted in 9 Corrective Action Requests (CARs) and 10 Clarification Requests (CLs).

The CARs and CLs were closed based on adequate responses from the Project Participant(s) which meet the applicable requirements. They have been reassessed before their formal acceptance and closure.

The number between brackets at the end of each section correspond to the VVM paragraph

3.1 Approval (49-50)

The only party involved in the project activity at this stage is India, which is the host party for the project activity. The project participant has obtained a letter of approval (Ref /P1/) from the Ministry of Environment and Forests, which is the DNA of India. The Invitation letter from DNA for HCA meeting dated 29/02/2012(Ref/P22/) was also received. :

M/s. Lanco Kondapalli Power Limited on 10/10/2012 received the Host Country Approval (HCA) (Ref/P1/) from the Ministry of Environment and Forests (MoEF), which also acts as the DNA for India. The copy of HCA (vide reference no. 4/6/2012-CCC dated 10/10/2012) was submitted to the validation team. The Validation team verified the approval letter issued by the DNA.

Host Country Approval to “Grid Connected Gas based Combined Cycle Power Project in Andhra Pradesh” refers to the precise proposed CDM project activity title in the PDD being submitted for registration.

The letter of approval clearly states that India (host party) has ratified the Kyoto Protocol and that the approval is for voluntary participation in the proposed CDM project activity. It also, mentions that the project activity contributes to sustainable development of the host country.

At the start of the validation, Project participant had not submitted Letter of Approval; hence the validation team had raised a clarification request CL 01. After receipt of the LoA from the Project Participant, CL 01 was closed.

Bureau Veritas Certification confirms that the LoA was received from the project participant and does not doubt its authenticity since validation team verified the original document.



3.2 Participation (54)

The participation for the project participant has been approved by India, which is a Party to the Kyoto Protocol. This was checked from UNFCCC website <http://maindb.unfccc.int/public/country.pl?country=IN>.

The participation is approved by DNA and is accepted. The Host Country Approval clearly states that the participation of the project participant in proposed project activity is voluntary and will contribute to sustainable development of the host country (India). The validation team concluded this by reviewing the original Host Country Approval (HCA) of reference no. 4/6/2012-CCC dated 10/10/2012 (Ref/P1/) which describes the participation of **M/s Lanco Kondapalli Power Limited** being approved by the Government of India, which is a party of the Kyoto Protocol.

The project was webhosted on the UNFCCC website for global stakeholder's comments as per CDM requirements. The project was webhosted from 03/04/2012 to 02/05/2012¹. Comments were received from 10 global stakeholder entities for the project activity, which have been discussed in Appendix B of this report.

3.3 Project design document (57)

The validation team hereby confirms that the PDD complies with the latest forms of the guidance documents for completion of the PDD. The PDD is as per Guidelines for Completing the Project Design Document (CDM-PDD) (Ref/B1/)

3.4 Changes in the Project Activity

During the site visit following changes were observed in project as compared to details mentioned in webhosted PDD. The PDD, Version 05 has the following major changes with respect to version 01 which was webhosted.

1. Geographical Coordinates of the project activity were not correct in webhosted PDD and were corrected in the revised PDD version 04 as a result of CAR 01. The geo co-ordinates have been changed to decimal form in the revised PDD version 05
2. In the webhosted PDD, Project Participant had not applied escalation cost of the fuels in the calculation of levelised cost of generation for the various baseline alternatives considered. The same was considered in the calculations, in response to CL-06 raised by the validation team. As a result, the values of

¹ <http://cdm.unfccc.int/Projects/Validation/DB/89FV4B3RZ9J1INET00QJYE4WF2FPKI/view.html>



- levelised cost for all alternatives have undergone a significant change with respect to the webhosted PDD.
3. The validation team had raised CL-12 requesting the Project Participant to clarify the computations of the IRR value. The Project Participant revised the computations due to which the IRR value has revised from 10.88% in the webhosted PDD to **11.91%** in the revised PDD.
 4. The WACC benchmark has also undergone a revision from 13.32% in the webhosted PDD to **12.86%**
 5. The value of Project emissions was revised from 2,182,484 tCO₂e in the webhosted PDD to **2,400,732 tCO₂** in the revised PDD.
 6. The value (21.08 tCO₂ per MWh) of baseline fugitive upstream methane emission factor $EF_{BL,upstream,CH_4}$ calculated and stated in the webhosted PDD was found to be incorrect and was revised to 22.60 tCO₂/MWh. The revision was due to CL-13 raised by the validation team. The leakage emissions are therefore revised to **144,817 tCO₂e** from 128,805 tCO₂e
 7. The generation, project and leakage emissions during leap years due to one extra day occurring was also accounted for. Value of the average annual emission reduction in the ER spreadsheet and the PDD is now **1,388,315 tCO₂** per year. This was due to CAR-07 raised.
 8. The diagram of project boundary is changed to correctly depict the actual site conditions and include description of the mass and energy flow due to CAR 03 raised.
 9. The discussion on Common Practice has been revised in the PDD as a result of CL 07 raised by the team.
 10. Some of the monitoring parameters were not clearly described or included in sections B.7.1 and B.7.2 of the webhosted PDD. These have been included in the monitoring plan of the revised PDD as a result of CAR-04 & CAR 05 raised.

Details of the CARs raised, the responses of the project participant and the closure of the CARs are provided in Annex 1 of this report. The closure remarks explain the project participant's responses and their assessment by the validation team.

3.5 Project description (64)

The project is located in Kondapalli Village of Krishna District Andhra Pradesh, India (E80°33'05.33" and N 16°38'30.10"). The project boundaries are set as Southern Grid of India, which includes states grids of Andhra Pradesh, Kerala, Tamil Nadu and Karnataka. Based on methodology AM0029 the spatial extent of the power boundary covers the proposed project site and all power plants connected physically to the Southern Grid.

The project activity envisages two new gas-steam combined cycle power plant equipment, with capacity of 742 MW (2x371MW) and utilization of Natural Gas (NG) as fuel to generate electricity.



The gas turbines and gas turbine generators are supplied by GE Company (USA), Heat Recovery Steam generator from Thermax, steam turbine from Harbin Steam Turbine Company limited and steam turbine generator from Harbin Steam Turbine Company limited.

The proposed natural gas consumption is 3.27mmcmd and expected annual electricity generation is 5524.9GWh. Electricity will be delivered to Southern Grid of India through 400Kv double circuit transmission line from Project activity to PGCIL substation at Nunna. Net electricity delivered to southern grid will be 5359.184 GWh. The power generated from the project activity will be sold on merchant basis to the state utilities in Southern, Western & Northern India.

In accordance with the requirements specified in paragraph 62 of the VVM ver. 1.2, Bureau Veritas Certification conducted a physical visit to the project site on 04/05/2011 and confirmed the installation of these equipments at the site.

The natural gas required for the project activity is envisaged from Krishna Godavari Basin NG Reserves (KG-Basin), which is a new gas source in the country. The electricity generated by the project will be sold on merchant basis. The power generated from the project activity will be evacuated through the power evacuation point under the Power Grid Corporation of India Limited.

The Gas turbine in the project activity is a single shaft machine with the compressor and turbine sections assembled in a single casing. Compressed air exits the unit compressor and is passed to the Combustion Chamber of the gas turbine where Natural Gas is fired. The hot gases generated in the Combustion Chamber as the products of the combustion enter the turbine. Heat energy in the hot gases in the combustion chamber of the gas turbine is converted into mechanical energy. The gas turbine drives the GTG (Gas Turbine Generator) to produce electrical energy. The output electrical energy is controlled by regulating the flow rate of the natural gas fuel sent to the combustion chamber.

The exhaust gas from the turbine is sent to a HRSG (Heat Recovery System Generator). The heat in the exhaust gas is converted to steam which runs the steam turbine generator (STG). The exhaust gases after giving away heat in the HRSG are dispersed through the stack at a lower temperature. The team also confirmed at the time of its observations during the site visit that the HRSG is an unfired type and no supplementary firing is involved.



Bureau Veritas Certification Holding (BVCH) hereby confirms on the basis of its site visit observations and the review of all supporting documentation that the project description in the revised PDD is accurate and complete in all respects and that there are no changes to the project activity/design or boundary as compared to the webhosted PDD.

3.6 Baseline and monitoring methodology

3.6.1 General requirement (76-77)

The steps taken to assess the relevant information contained in the PDD against each applicability condition of the AM 0029 methodology applied to the project activity are described below.

Applicability condition 1:

“The project activity is the construction and operation of a new natural gas fired grid-connected electricity generation plant.”

As confirmed during the site visit on 04/05/2012, the project is a newly built natural gas based grid connected power plant of capacity 2x371 MW. Project participant has signed an EPC agreement (Ref/P9/) with Lanco Infratech Limited for civil construction, service and supply of the project equipment.

The observations at the project site by the team, have also confirmed that the plant runs on natural gas as the fuel. No other fuel is proposed to be used in the project activity.

At the time of the site visit, it was confirmed by the validation team that the plant runs on natural gas as the fuel and that the power plant was connected to the grid. The power generated by the plant is evacuated through a double circuit 400KV transmission line to PGCIL substation at Nunna which is connected to Southern Grid.

Applicability condition 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”

The baseline grid is southern 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>



The geographical/physical boundaries of the baseline grid, i.e. the Southern grid, are clearly identifiable as extending to the southern states in India. Information pertaining to the baseline grid also is available from the CEA² database, publicly available on the CEA's web site referred in the footnote.

Thus, this applicability condition of the methodology is met by the project activity.

Applicability condition 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”

As stated in the revised PDD and as verified from the website³ of Ministry of Petroleum and Natural gas, Government of India, the supply scenario of natural gas in the country can be summarised as follows:

Out of the total production of around 87 million standard cubic meters / day, around 74 million is available for sale to various consumers and most of the production of gas comes from the Western offshore area. In India, the production of gas is continuously on the increase with more and more discoveries along the east coast by RIL, GSPCL and ONGC. Based on efforts of Oil and Natural Gas Corporation (ONGC), which has pioneered gas exploration, Govt. of India (GOI) opened several blocks, both onshore as well as offshore, for exploration of Natural Gas by private sector.

There have been discoveries in Krishna-Godavari (KG) basin⁴ by – Reliance Industries Limited (“RIL”) way back in 2002. RIL expected to produce @ 80 MSCMD⁵ (i.e. 29.2 Billion Cubic Meter per year) RGTIL has constructed a cross country natural gas pipeline connecting eastern coast of India in Andhra Pradesh and Bharuch in Gujarat on western coast of India.

The project participant has quoted authentic sources of information which indicate that the present supply of natural gas in the country as well as the likely future supplies are sufficient to cater to the gas consumption requirements of future gas based power plants, such as those proposed in the 11th five year plan, of scale similar to that of the project activity. The

² http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm

³ <http://petroleum.nic.in>

⁴ <http://www.financialexpress.com/news/reliance-ippes-under-bses-may-use-krishnagodavari-gas/68427/>

⁵ <http://www.business-standard.com/india/news/more-d-6-gas-may-dryspot-Ing-in-months/361130/>



supply-demand statistics also indicate that the magnitude of the expected gas supply would be able to cover the requirements of these plants in addition to the consumption of gas by the project activity. The validation team verified the information provided and concluded, therefore, that future natural gas based power capacity additions would not be constrained as a result of the use of gas in the project activity and hence the applicability condition of the methodology pertaining to the availability of natural gas is met by the project activity. The details related to establishing the demand v/s. supply scenario, available to the project participant at the time of decision making, are reproduced in this report as below:

Demand scenario :

The project participant has estimated the power generation and gas consumption for each of these power plants and a summary of the same is as below:

| Sl.No | Station | Capacity (MW) | Power generation (Million units/Year) | Gas requirement (Million SCM/Year ⁶) |
|-------|--|--|---|--|
| 1. | Gautami - CCPP ; Andhra Pradesh ⁷ | Gas Turbine – 290MW Steam Turbine – 174 MW | 3251.71 | 708.87 |
| 2. | Koenseema CCPP ; Andhra Pradesh ⁸ | Gas Turbine 1 – 140 MW Gas Turbine 2 – 140 MW Steam Turbine – 165MW | 3119 | 680 |
| 3. | Lanco Kondapalli - CCPP - Stage - II ; (Project Activity) Andhra Pradesh | Gas Turbine – 233MW Steam Turbine – 133MW | 2565 | 588.78 (assumed SHR 1850 kCal / kWh) |
| 4. | Lanco Kondapalli - CCPP - Stage - III ; (Project Activity) Andhra Pradesh | Gas Turbine – 241 MW *2 Steam Turbine – 130 MW*2 | 5359 | 1193.8 (assumed SHR 1850 kCal / kWh) |
| 5. | Valuthur - GTPP; Phase II; Tamil Nadu ⁹ | Gas Turbine – 59.8 MW Steam Turbine – 32.4 MW | 646 | 141 |

⁶ http://www.cea.nic.in/archives/plg/monitor_11plan/jul09.pdf

⁷ http://www.cea.nic.in/archives/exec_summary/feb09.pdf (page 17)

⁸ http://www.cea.nic.in/archives/exec_summary/feb09.pdf (page 17)

⁹ http://www.cea.nic.in/archives/exec_summary/feb09.pdf (Page 17)



| Sl.No | Station | Capacity (MW) | Power generation (Million units/Year) | Gas requirement (Million SCM/Year ⁶) |
|--------------|---------|---------------|---|--|
| Total | | | 9581 | 3311.8 |

As all these gas based power plants are a part of the 11th five-year plan of India starting from year 2007 up to 2012, the validation team agrees that the same could be treated as future capacity additions.

The total fuel requirement of these gas based power stations has been estimated by the project participant at **3311.8** MSCM per year.

Supply scenario :

| Supply Source (Southern Region) | Units (MMTPA/Year) | Units (MSCM/Year) |
|--|-----------------------|----------------------|
| Reliance Industries Limited (RIL) – domestic natural gas. (East – West gas distribution network) | - | 29200 |
| Dahej Expansion – imported re-gasified LNG ¹⁰ . (East – West gas distribution network) | 5 | 7142.85 |
| Dabhol – imported re-gasified LNG ¹¹ (East – West gas distribution network) | 2.5 | 3571.429 |
| Total | - | 39914.29 |

The validation team confirmed the detailed gas supply scenario of Southern Region from available data on gas supply sources. The validation team affirms that gas availability information also presented by these sources on present and expected future gas supplies were available to the project participant at the time of taking the decision to invest in the project activity.

The validation team observed that the total quantity of gas availability in the Southern region from the supply sources as listed above is almost to the extent of 39914 MSCM per year. As against this, the total gas requirement for all the gas based power plants in the southern region, anticipated as the upcoming future power plants, is only **3311.8** MSCM per year which is only 8% of the total availability. The present rate of gas production is therefore capable in itself to take care of the demand.

However, the availability of natural gas is also in terms of the gas reserves that exist in the country. The validation team also referred to publicly available sources on the internet, from which it could be known that Reliance Industries

¹⁰ <http://www.petronetlng.com/> ; <http://www.petronetlng.com/news1/detailedratingrationalefinal.pdf> (company profile page 3 of 11)

¹¹ 1. <http://www.rgppl.com/project.html>; 2. <http://bsl.co.in/india/news/dabhol-ling-terminal-to-be-operational-by-november/371714/>



Ltd (RIL) had struck gas in 2002, in the KG D6 block, having reserves of up to 11.5 TCF. This is reported in a news article in a leading financial daily, Business Standard. The article was published on 01/09/2008 and is available through the web link <http://www.business-standard.com/india/news/ril-gearsfor-kg-basin-gas-production/333108/>.

A similar news report available on the web link <http://www.kgbasin.in/gspc-discoveries/> has stated that Gujarat State Petroleum Corporation (GSPC) had discovered an even larger gas reserve of 20 trillion cubic feet in the KG basin well #8 on 17th June 2005 and this was followed up by another find, a year later, on 2nd June 2006, which was capable of giving a yield of 4.8 mmscd. A conservative estimate of the recoverable gas from this source is however, put at 10 TCF, as per the information obtained by the validation team by referring to a news item published in the Sunday , November 12, 2005 edition of the Business Line; a reputed financial daily of the Hindu Group of publications. The news item is available as a publicly viewable reference on the web link <http://www.thehindubusinessline.in/2002/11/10/stories/2002111001580100.htm>

The quantity of gas reserves, estimated conservatively at 20 TCF can therefore be regarded large enough to meet the gas demand in both present as well as future scenarios. This is taking only the reserves found by RIL and GSPC. There are other companies in the fray as well, such as ONGC and Cairn India who are also engaged in exploration and it is expected that they would also report more discoveries in the same sector.

The validation team concluded on the basis of this supply-demand balance that the gas availability is sufficient to cover the future projected demand. The team therefore concluded that the supply-demand balance in the region in which the project activity had been set up was favourably tilted towards abundant availability of gas and that gas supplies drawn by the project activity itself would in no way constrain the availability of gas to future projects of similar size or scale and hence, the project activity meets the applicability condition of the methodology pertaining to the gas availability.

The validation team, by referring to the sources listed in the PDD by the project participant to demonstrate sufficient availability of natural gas, as well as on the basis of its own research was therefore able to conclude that the gas availability in the country would primarily be sufficient to meet the expected demand and hence, the project activity would not constrain future power capacity additions of comparable size.

BVCH hereby confirms that the selected baseline and monitoring methodology AM 0029 version 03 and the tool referred by the methodology, viz., the Tool for the demonstration and assessment of additionality version 6.0 of EB 65 Annex 21(Ref/B5/) is previously approved by the CDM Executive Board, and is applicable to the project activity, which, complies with all the applicability conditions therein.



The methodology AM 0029 also refers to the Tool to calculate the emission factor for an electricity system version. The Build margin (BM) and Operating margin (OM) emission factors used to compute the combined margin (CM) emission factor are based on the CEA database. The BM & OM available in the CEA database are calculated using the procedures specified in this tool. For this project activity, version 07 of the CEA database was used and the same is based on version 2.2.1 of the Tool to calculate the emission factor of an electricity system. The validation team has confirmed that this version of the database was the latest available at the time of the start of validation and hence, use of the CEA database version 07 is regarded as appropriate by the team.

The AM 0029 methodology has specified CO₂ as the main emission source in both baseline as well as the project activity. The PDD has also considered the same GHG and other gases are excluded for simplification. This is as per the methodology. During the site visit, the validation team also confirmed that there are no other emission sources apart from CO₂ generated in the project activity, as project emissions. The main fuel used is natural gas and its combustion gives rise to only CO₂ gas as an exhaust.

BVCH hereby confirms that, as a result of the implementation of the proposed CDM project activity, there are no greenhouse gas emissions occurring within the proposed CDM project activity boundary other than the project emissions, which are expected to contribute more than 1% of the overall expected average annual emissions reductions, which are not addressed by the applied methodology

3.6.2 Project boundary (80)

Bureau Veritas Certification Holding (BVCH) validated the project boundary in the following manner:

The spatial extent of the project boundary is assessed through the description in the PDD and the grid structure in India as known from the official data available from the Central Electricity Authority (CEA) (Ref/B10/). The project activity boundary therefore includes the project plant and also all power plants connected physically to the Southern electricity grid of India that the CDM project power plant is itself connected to. The grid connectivity of the project plant was verified by the validation team during its site visit on 04/05/2012. 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 :

- a) Gas turbine and generator (GTG)



b) Heat recovery steam generator (HRSG)

c) Steam turbine generator

The team has confirmed that the above equipment can be regarded as a part of the project boundary.

The project participant has selected CO₂ as the emission that will take place in the project activity. These emissions are accounted for in the project emissions calculations presented in section B.6.1 & B.6.3 of the PDD and validated by the DOE in section 3.6.4 of this report. The validation team noted in its observations at the project plant and the discussions held with the project participant's representatives that the power plant uses natural gas as fuel. As the combustion of natural gas gives rise to CO₂ emissions, the consideration of this gas as an emission source is regarded as appropriate by the validation team.

The consideration of only CO₂ gas for the baseline emissions is conservative and is in line with the methodology and hence appropriate. In the absence of the project activity, an equivalent of energy generated by the project activity would be produced in the grid. The power plants connected to the grid are mainly fossil fuel fired plants, as the Southern grid of India is dominated by such plants and hence, the emissions taking place in the baseline would also be CO₂ emissions.

The electricity imported by the project activity is accounted for in the calculation of the main energy parameter i.e. net electricity supplied to the Grid (EG_{PJ,y}), as this value is arrived at after deducting the imports from the electricity exports from the plant to the grid, thus giving the net electricity supplied to the grid by the project activity. The validation team confirms that there are no other sources of GHG emissions in the project boundary, other than the CO₂ emissions referred to above as project emissions.

The project design is sound and the geographical (Village - Kondapalli; East Godavari district in the state of Andhra Pradesh, India) and temporal (20 years) boundaries of the project activity are clearly defined. Project participant has taken a lifetime of 20 years for the project plant. The manufacturer of the gas turbine also has indicated that the equipment life could be estimated as 144,000 hours or approx 17 years, hence considering a higher lifetime of 20 years is appropriate and conservative for the sake of the analysis.

The project boundary demonstrated in the webhosted PDD was not in accordance with the actual site conditions and not as per requirements of Guidelines for Completing the PDD EB 41 Annex 12. Hence, the validation team raised CAR 03. In response, project participant has updated the



project boundary as per the actual site conditions and depicting monitoring points and also included the energy mass flow, the revised PDD. The validation team confirms that the updated project boundary is as per the actual scenario observed during site visit and closes CAR 03.

Based on the above assessment, BVCH hereby confirms that the identified boundary and the selected sources and gases are justified for the project activity.

3.6.3 Baseline identification (87-88)

The steps taken to assess the requirement given in paragraph 81 and 82 of the VVM are described below:

The AM 0029 methodology mandates the determination of the baseline for the project activity on the basis of the identification of alternative scenarios. In the PDD, the Project participant has identified various plausible scenarios as alternatives to the project activity. The following scenarios were identified:

Scenario 1: Power generation using natural gas as fuel and combined cycle technology without CDM revenues

The methodology requires the project activity to be considered as a plausible alternative and the same has been considered in the PDD. Hence, this is a plausible scenario.

Scenario 2: Power generation using Natural Gas as fuel and open cycle technology.

The project participant has taken into consideration the power generation with a capacity of 742 MW (i.e. same as the project activity) but run on the open cycle mode of operation, as one of the alternatives. In the open cycle mode of operation, power generation takes place in the gas turbine generator and the heat content of the exhaust gas leaving the turbine is not utilised further. This is a simpler mode of operation but has an efficiency at least 15% lower than the combined cycle. Thus, a gas turbine plant using the open cycle will consume a higher amount of fuel (natural gas) for the same amount of power generation. This will have the effect of increasing the cost of electricity generation (COG), making the generation of power through the open cycle a costlier option, compared to the combined cycle. This illustrates the large difference that exists between the two modes of operation of gas based power projects in terms of operating plant efficiencies and the higher cost of power generation in the open cycle due to the higher fuel consumption.

This is further justified from the Central Electricity Authority, Government of India reports 'Performance Review of Thermal Power Stations 2007-



2008¹² and 'Performance Review of Thermal Power Stations 2006-07¹³'. Page 1 of both reports state "Use of combined cycle operation in the field of Gas Turbines is being promoted for energy conservation. Further, current CEA database also shows that there is not a single power plant in the range of +/-50% of the capacity of the project activity, based on open cycle, operating in India. Hence, this option is not considered feasible to be implemented.

Scenario 3: Power generation using coal as fuel – sub critical technology

This alternative meets the requirement under the methodology which stipulates the consideration of alternatives based on power generation technologies using energy sources other than natural gas. The use of coal as a fuel for power generation is widespread in the host country.

The methodology has stated that identified alternatives need not necessarily be available to the project participant, but to other stakeholders as well, as long as they are within the grid boundary.

It is therefore established that the setting up of a coal based power plant within the grid boundary was a feasible option to stakeholders other than the project participant.

The alternative of power generation by a coal based power plant within the grid boundary was therefore a plausible alternative to the project activity.

Scenario 4: Power generation using coal (imported & domestic) as fuel with super-critical technology

The efficiency of super critical power plant is higher as compared to sub-critical power plant and can deliver base load requirements. So project participant has considered this as a plausible alternative. Validation team has also referred to a report "Working Group on Power for 11th Plan¹⁴" by Ministry of Power, which states that the 11th Plan feasible capacity addition of coal based plants includes 12 units based on super critical technology with a capacity of 8060 MW which is about 18% of total coal capacity planned for 11th Plan.

¹² http://www.cea.nic.in/reports/yearly/thermal_perfm_review_rep/0708Final/Section%2010.pdf

¹³ http://www.cea.nic.in/reports/yearly/thermal_perfm_review_rep/0607/SECTION-10.pdf

¹⁴ http://planningcommission.nic.in/aboutus/committee/wrkgrp11/wg11_power.pdf



The alternative of power generation by a coal based power plant using super critical technology was therefore a plausible alternative to the project activity. Supercritical power plants are installed as power units of higher capacity (660 MW) compared to subcritical plants. These plants typically require huge capital outlays and the economic viability of such plants can be ensured only through stable fuel linkage arrangements, to be able to attract private sector investments in setting up such plants. The efficiency of supercritical plants is also 4% to 5% higher than sub-critical plants. Most supercritical plants that are expected to be set up in India rely on the supply of superior grade imported coal. Hence, the Project Participant has worked out this alternative with the use of both domestic and imported coal.

Scenario 5: Power generation using lignite as fuel

PP has considered this as a plausible alternative. The lignite based power plants work on the same technology as coal based subcritical technology. There are reserves of lignite in states of Tamil Nadu, Rajasthan and Gujarat. Therefore alternative of power generation by a lignite based power plant is taken as plausible alternative to the project activity.

Scenario 6: Power generation using naphtha as fuel

The technology of gas turbine power generation can also be used with naphtha as the fuel. Thus, it is possible to operate a gas turbine power plant with the fuel choice as either natural gas or naphtha. This is also confirmed from the CEA database version 7.0 in which several plants are listed with “natural gas” as the primary fuel and “naphtha” as the secondary fuel. However, as naphtha is a much more expensive fuel, it would not be likely for a plant to be set up using only naphtha as the primary fuel. The levelised cost for a naphtha based plant is presented in the PDD only for the sake of comparison with other alternatives.

Scenario 7: Power generation using hydro power

The development of a hydropower plant of a size comparable to that of the project activity could be possible only at certain specific sites (within the grid boundary, as per the AM 0029 methodology requirement for identification of plausible baseline scenarios) which offer the required hydro-power generation potential. In the Southern grid, within which is located the project activity power plant, sites for large capacity projects have already been exploited. The validation team referred to data from the CEA database¹⁵ which confirms that hydropower capacity additions in the recent years (2004-2009) have been essentially small scale plants, with the maximum capacity of such a plant not exceeding 55 MW. The

¹⁵ http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm



capacity of the project activity, on the other hand, is 742 MW which is much larger.

Moreover, base load requirements of power can only be supplied to some extent, by run of the river plants. But even with these plants, the Plant Load Factor is not seen to go beyond 50-55%. The project activity would be expected to operate at a PLF of 85%, which is much higher. The other type of hydro plants, viz., storage hydro plants primarily serve peak load requirements and hence, cannot be compared to the project activity, which is a baseline plant.

Scenario 8: Power generation using wind energy

Wind power generation has a very low PLF. Also, the power generated is of infirm nature due to varying wind speed conditions. Hence, this alternative would not be able to fulfill the requirement of being able to provide base load power comparable to the project activity and was therefore excluded from consideration by the project participant and also accepted by the validation team.

Scenario 9: Import of electricity from connected grids, including the possibility of new interconnections

The consideration of this alternative in the baseline scenario evaluation is mandated by the AM 0029 methodology. Accordingly, the project participant has included the same in the analysis in section B.4 of the PDD.

The validation team however agrees with the project participant that imports from connected grids in India are not realistic because those grids themselves are deficient in power. The statistics provided in the CEA Executive Summary¹⁶ illustrate this fact. Hence, the validation team accepts the exclusion of this alternative from consideration.

PP in the webhosted PDD has not taken into consideration the solar power generation (Photovoltaic or Solar thermal) as plausible alternative. In response to the clarification CL 10, PP has clarified that there are no solar power plants of comparable capacity (742MW) installed in the Host Country. The validation team also understands that solar power plants would not serve the purpose of meeting base load demand due to their nature of operation at a low PLF. Hence excluding Power plants based on solar technologies is appropriate and CL 10 was closed

¹⁶ http://www.cea.nic.in/archives/exec_summary/oct09.pdf



The analysis of alternatives leaves the following options for further consideration:

Scenario 1: Power plant based on natural gas using CCPP technology

Scenario 2: Power plant based on coal using sub-critical technology

Scenario 3: Power plant based on coal (Imported fuel) with super-critical technology

Scenario 4: Power plant based on coal (Domestic fuel) with super-critical technology

Scenario 5: Power plant (s) based on lignite

Scenario 6: Power plant (s) based on naphtha

The validation team accepts these alternatives for the determination of the baseline due to the following reasons:

- It is technically possible to set up these alternatives. The capacity of 742 MW can be set up as a gas based plant (project activity itself). The capacities of coal and lignite plants are explained and justified in sections 3.6.4 and 3.7.3 of this report. Thus, all the alternatives remaining are realistic.
- The power generation capacity added to the grid would comprise of thermal power plants. This is evident from the CEA database version 7.0 which provides data on the installed capacities of power plants in Southern Region. 54.4% of the installed capacity is from thermal power plants, according to this data. All the remaining baseline alternatives are thermal power plants and hence they can be regarded as credible alternatives.
- The alternatives are capable of providing base load power to the grid. Hence, the type of service provided by the alternatives is the same as that of the project activity
- All alternatives considered are large scale plants having capacities comparable to the project activity's capacity.
- The alternatives identified for baseline selection are available to stakeholders within the grid boundary which is also as per the methodology requirement.
- All relevant power plant technologies have been considered in the analysis and their efficiencies and technical lifetime are also included in the PDD.
- The alternatives selected are in compliance with legal and regulatory requirements in the host country

The validation team therefore confirms that the selection and short listing of candidate baseline alternative scenarios is in line with the **Step 1** of the AM 0029 methodology.



Step 2 of the methodology requires the identification of the economically most attractive scenario among the selected alternatives as the baseline scenario, by using investment analysis. The project participant has carried out the investment analysis in line with the guidance provided by the “Tool for the demonstration and assessment of additionality” version 6.0 (Ref /B4/).

The project participant has demonstrated an investment comparison analysis. The validation team regards this as appropriate since the Step 2 requires the baseline identification to be done on the basis of the economically most attractive scenario and for that purpose a comparison will have to be made between the short listed alternatives (1), (2), (3),(4),(5)&(6) to determine which of the alternatives is economically the more attractive option; hence, an investment comparison analysis is appropriate in this case.

The financial indicator chosen for the investment analysis is the levelised 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 Additionality tool. This is also approved by CERC and accepted by the financial expert in the validation team.

The project participant has presented the investment comparison analysis for all the 6 alternatives in the form of MS-excel spreadsheets in which the levelised cost of generation for each of the alternatives is worked out (Ref/P8/). Section 3.7.3 provides details of the critical techno-economic parameters and assumptions (such as capital costs, fuel price projections, lifetimes, the load factor of the power plant and discount rate) applied in the analysis and the validation justification for the assumptions made by the project participant. The investment analysis is presented in a transparent manner and all the relevant assumptions have been provided in the PDD also. The validation team could reproduce the analysis and arrive at the results.

The PDD summarises the results of the investment comparison analysis, viz, the levelised cost of generation for each of the alternatives. The levelised cost computed is as follows:

| S.No. | Baseline Scenario | Levelized Tariff (INR/kWh) |
|-------|--|----------------------------|
| 1. | New power plant (s) based on natural gas | 4.2522 |
| 2. | New power plant (s) based on coal with sub-critical technology | 2.8556 |
| 3. | New power plant (s) based on coal with super-critical | 4.8385 |



| | | |
|----|--|---------|
| | technology using imported coal | |
| 4. | New power plant (s) based on coal with super-critical technology using domestic coal | 2.9340 |
| 5. | New power plant (s) based on lignite | 2.9063 |
| 6. | New power plant (s) based on naphtha | 13.9103 |

The levelised cost of generation for the alternative of power generation based on coal as fuel with sub-critical technology is lowest among all the alternatives. The results imply, therefore, that the project activity itself is not economically the most attractive alternative. [EB 65 Annex 21 Step 2 paragraph 22 (a)]. These results are also tabulated in the PDD.

The working of levelised cost of generation for all the above alternatives in the webhosted PDD had not considered any escalation in the fuel price. The validation team raised CL-06 and in response to the same, the Project Participant included appropriate rates of escalation for all fuels in the calculations. The re-computed values of levelised cost in the revised PDD are therefore higher than those in the webhosted PDD.

The validation team has confirmed that the rates of escalation applied are appropriate and since all alternatives have been subjected to the fuel price escalation, the team accepted the revised values, though they are significantly different from the webhosted PDD's values.

The project participant has also carried out a sensitivity analysis for all the alternatives, to confirm that the conclusion regarding the financial attractiveness is robust to reasonable variations in the critical assumptions made in the analysis. The parameters, project cost, plant load factor and fuel cost have been subjected to sensitivity.

The sensitivity analysis for all alternatives is presented in a tabular format as below for the levelised tariff for all baseline alternatives:

| Project Cost | Project Cost -10% | Project Cost +10% | SHR -10% | SHR +10% | Fuel Price - 10% | Fuel Price +10% | PLF - 10% | PLF +10% |
|--|-------------------|-------------------|----------|----------|------------------|-----------------|-----------|----------|
| | | | | | | | | |
| Gas | 4.2030 | 4.3013 | 3.9380 | 4.5664 | 3.9380 | 4.5664 | 4.3755 | 4.1512 |
| Coal – Sub-critical | 2.7703 | 2.9409 | 2.7032 | 3.0081 | 2.7038 | 3.0075 | 2.9924 | 2.7437 |
| Lignite | 2.8197 | 2.9929 | 2.7552 | 3.0574 | 2.7560 | 3.0566 | 3.0445 | 2.7932 |
| Super Critical Coal (Domestic fuel) | 2.8328 | 3.0353 | 2.7859 | 3.0822 | 2.7865 | 3.0816 | 3.0843 | 2.8111 |
| Super Critical Coal (Imported) | 4.7375 | 4.9395 | 4.4995 | 5.1776 | 4.5009 | 5.1761 | 4.9892 | 4.7153 |



| fuel) | | | | | | | | |
|----------------|---------|---------|---------|---------|---------|---------|---------|---------|
| Naphtha | 13.8173 | 14.0033 | 12.6123 | 15.2084 | 12.6123 | 15.2084 | 14.0136 | 13.8258 |

The sensitivity analysis also confirms that the levelised cost of generation for alternative - 2, viz., power generation based on coal as fuel with sub-critical technology is an economically more attractive option than the project activity implemented without CDM benefits.

On the basis of the same, the baseline scenario is identified as a “New power plant (s) based on coal with sub-critical technology”. The validation team agrees that the baseline is correctly identified and is in line with the AM 0029 methodology requirements and the EB 65 Annex 21 Tool for the demonstration and assessment of Additionality.

The identified baseline scenario is also as per paragraph 81 of the VVM (Ref/B12/) and is the scenario that reasonably represents the anthropogenic emissions by sources of GHGs that would occur in the absence of the proposed CDM project activity.

Based on the above assessment, BVCH hereby confirms that:

- All the assumptions and data used by the project participants are listed in the PDD, including their references and sources;
- All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;
- Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable;
- Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD;
- The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity.

The information contained in the PDD was cross-checked by BVCH validation team from sources of information provided by the Project participant and also the CEA CO₂ baseline database, which provides authentic data on the power plants operating in the host country. The CEA database is publicly accessible through its web site http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm. Other references were also used such as CERC (Terms & Conditions of Tariff) Regulations 2009 Statement of Reason <http://cercind.gov.in/2009/February09/SOR-regulations-on-T&C-of-tariff-05022009.pdf> and CERC Notification for Annual Escalation rates



for Bid Evaluation dated 30/09/2009
<http://www.cercind.gov.in/Escalation-rate/Notification-dated-30-09-09.pdf>.

3.6.4 Algorithms and/or formulae used to determine emission reductions (92-93)

The steps taken to assess the requirement outlined in paragraph 89 of the VVM are described below:

The project participant has used the algorithms and formulae in accordance with the methodology applied viz. AM 0029 version 03(Ref/B3/) and *Tool to calculate emission factor for an electricity system* (Ref /B6/). The detailed algorithms and/or formulae used in the calculations of baseline emissions, project emissions, leakage emissions and emission reductions are explained in section B.6.1 of the PDD. The validation team confirms that the formulae have been applied correctly in line with the applied methodology AM 0029 Version 03.

Baseline emissions (BE_y)

The PP has calculated the baseline emissions by multiplying the electricity generated in the project plant ($EG_{PJ,y}$) with the baseline CO_2 emission factor ($EF_{BL,CO_2,y}$). This is as per the requirement of applied methodology AM 0029 Version 03 for the calculation of baseline emissions. The project participant has calculated the baseline CO_2 emission factor for the Southern grid, which is the baseline grid as reported in section 3.6.3 above.

The AM 0029 methodology requires the project participant to calculate the baseline CO_2 emission factor as the lowest among three options:

Option I: The build margin (BM), calculated according to “Tool to calculate emission factor for an electricity system”.

The value of build margin emission factor has been taken directly by the Project Participant from the CEA database version 7 for the Southern grid. This value is 0.733 tCO₂e/ MWh. The validation team referred to the CEA database and verified that the value has been correctly taken.

Option II: The combined margin (CM), calculated according to “Tool to calculate emission factor for an electricity system”, using a 50/50 OM/BM weight.

The project participant has used data from the CEA database version 7 (Ref/B10/) to arrive at the value of the combined margin emission factor. The combined margin emission factor is a weighted average of the Operating Margin (OM) and Build Margin (BM) emission factors. The build margin is directly specified by the CEA database for the year 2010-11



(i.e. the year in which the CDM-PDD was submitted to BVCH for validation). The operating margin is calculated as the simple average for the recent 3 years preceding the year in which the CDM –PDD was submitted to the DOE for validation, i.e. 2008-09, 2009-10 & 2010-11. The PP has taken these values from the CEA database and calculated the combined margin from those values as a weighted average, applying 50/50 OM/BM weight, as prescribed by the methodology.

The value of CM calculated in the above manner was verified by the validation team and confirmed to be 0.843 tCO₂e / MWh. The validation team confirms that the project participant has used the values of OM correctly from the CEA database version 7.

Option III: The emission factor of the technology (and fuel) identified as the most likely baseline scenario under “Identification of the baseline scenario”

Option III specified in the methodology requires the project participant to compute the emission factor for the technology and fuel identified for use in the baseline scenario. An assessment of the baseline scenario is presented in section 3.6.3. The baseline scenario, as validated by the DOE, is “New power plant (s) based on coal with sub-critical technology”. The Project participant has therefore computed the emission factor for the baseline coal based power plant according to the equation (3) specified in the methodology.

$$EF_{BL,CO_2} \text{ (tCO}_2\text{/MWh)} = \{(\text{COEF}_{BL})/\eta_{BL}\} * 3.6 \text{ GJ/MWh}$$

The fuel emission coefficient COEF_{BL} in tCO₂/GJ is the value of emissions in tCO₂ per GJ of energy generation by the baseline fuel, i.e. coal. The project participant has taken this value from CEA CO₂ database version7 (Ref/B10/). This value is 96.07 tCO₂e/TJ. The value considered by the Project Participant is according to the methodology since it is based on the publically available data.



The energy efficiency (η_{BL}) of the technology used in the baseline is the thermal efficiency of the coal based sub critical power plant that would generate the same of amount of power ($EG_{PJ,y}$) as the project activity plant. To arrive at the value of efficiency for a coal based power plant, the project participant has used CEA database Version 07. The database provides values of the following:

- i) Net energy generation in GWh
- ii) Gross calorific value (G.C.V.) of the fuel used in the power plant, viz., coal

for all operational thermal power plants within the grid boundary of the Southern grid. This includes coal based plants also, for which these values are provided by the CEA database. At the time of the PDD submitted to the DOE for validation, there were 07 coal based power plants operating in the Southern grid, for which the above data was available from the CEA database. These plants are the following:

- 1 RAYAL SEEMA unit 3 of 210 MW capacity
- 2 RAYAL SEEMA unit 4 of 210 MW capacity
- 3 RAYAL SEEMA unit 5 of 210 MW capacity
- 4 R_GUNDEM STPS unit 7 of 500 MW capacity
- 5 RAICHUR unit 8 of 250 MW capacity
- 6 BELLARY TPS unit 1 of 500 MW capacity
- 7 VIJAYWADA TPP-IV unit 1 of 500 MW capacity
- 8 TORANGALLU EXT unit 1 of 300 MW capacity
- 9 TORANGALLU EXT unit 2 of 300 MW capacity
- 10 STERLITE TPP unit 1 of 600 MW capacity
- 11 STERLITE TPP unit 2 of 600 MW capacity
- 12 KAKATIYA TPP unit 1 of 500 MW capacity
- 13 UDUPI TPP unit 1 of 600 Mw capacity



The operating data for these 13 plants was used to derive the energy efficiency η_{BL} as there is no other source of data available to the project participant, which can provide the required data to the same level of authenticity as the CEA database.

With the help of this data from an authentic and reliable publicly available source as the CEA database, it was possible for the project participant to work out the thermal efficiencies of the operating coal based thermal power plants in the Southern grid. The efficiency calculated for above listed coal plants was 34.72%.

It is agreed by the validation team that the energy efficiencies of these thermal power plants operating on coal as a fuel would serve as a credible proxy for the energy efficiency η_{BL} to be calculated for the baseline coal based power plant for this project activity, due to the following reasons:

- a) The 13 power plants identified use similar technology of power generation, viz, sub-critical Rankine cycle of operation to produce power from steam. The baseline plant for the project activity also is a sub-critical power plant; hence, the two technologies are similar
- b) The baseline power plant uses coal as the fuel. All the above identified power plants also use coal as the primary fuel

The value of baseline CO₂ emission factor calculated with the third option (Option III) as described above is 0.996 t CO₂/MWh.

The CO₂ emission factor for Option I (Build margin) is the lowest of the three options. As stipulated by the methodology, therefore, the project participant has taken the lowest value (0.733 tCO₂e/MWh) among the three options as the baseline CO₂ emission factor for the project activity ($EF_{BL, CO_2, y}$).

The expected electricity generation by the project activity, on the basis of the plant load factor assumed (85%) and the plant capacity (742 MW) comes to 5,524,932 MWh. However, part of this 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 section 3.7.3 of this report). The net generation by the project activity is therefore estimated as 5,359,184 MWh. 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 DOE and a justification of the DOE's assessment is presented in section 3.7.3 of this report.

With the estimated net generation ($EG_{PJ,y}$) of 5359.184GWh, the baseline emissions were calculated by the project participant using equation (2) of the methodology.

The baseline emissions are calculated as:

$$\begin{aligned} BE_y &= EG_{PJ,y} * EF_{BL,CO_2,y} \\ &= 5,359,184 \text{ MWh} * 0.7339 \text{ tCO}_2/\text{MWh} \\ &= 3,933,105 \text{ tCO}_2 \text{ per year.} \end{aligned}$$

Project Emissions (PE_y)

The project activity involves the generation of power using natural gas as the fuel. As natural gas is a fossil fuel, its consumption in the project activity as a fuel will lead to CO_2 emissions that will also need to be accounted for as project emissions.

The project emissions are calculated as per equation (1) of the methodology

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

$FC_{f,y}$ denotes the quantity of natural gas that is combusted in the gas based power plant. This is in volumetric units (m^3). The gas volume is considered in standard cubic metres (SCM) of volume.

The gas combusted in the project activity has been estimated on the basis of

- i) expected electricity generation in the plant $EG_{PJ,y}$ (GWh)
- ii) station heat rate value of the plant (kcal/kWh) &
- iii) the net calorific value (N.C.V.) of the natural gas (kcal/SCM)

Expected electricity generation $EG_{PJ,y}$

This is calculated on the basis of the plant's installed capacity of 742 MW and the expected PLF (assumed as 85%). A detailed justification of the PLF is provided in the following section 3.7.3 of this report. This value is calculated as 5,524,932 MWh/year. [$EG_{PJ,y} = (742 \text{ MW} * 24 \text{ hours} * 365 \text{ days} * 85\% \text{ PLF})/1000 = 5,524,932 \text{ MWh/year}$]. A detailed calculation of $EG_{PJ,y}$ is also given in the Emission reduction Calculation sheet (Ref/P4/Error! Reference source not found.) submitted by the Project Participant.

Station Heat Rate (SHR)



The station heat rate assumed by the project participant was validated by the team and its justification of the same is included in section 3.7.3 of this report. This value is taken as 1850 Kcal/KWh on GCV basis or 1682 Kcal/Kwh on NCV basis.

Net Calorific Value (N.C.V.) of fuel

The project activity will use natural gas (NG) as fuel. The Net Calorific value (N.C.V.) of natural gas considered is 8562 kcal/SCM.

A detailed justification for the chosen N.C.V. values is provided by the validation team in section 3.7.3 of this report.

From these values, the gas consumption can be calculated. The project participant has calculated this to be 1193.8 SCM/Year SCM/year (equivalent to 3.27 mmscmd) which is the quantity $FC_{f,y}$ [a detailed calculation is presented by the PP in the worksheet of Emission reduction Calculation sheet (Ref/P4/Error! Reference source not found.).

$$FC_{f,y} = \frac{[EG_{PJ,y} (5524.932 \text{ GWh/year}) * 10^6 * SHR (1850 \text{ kcal/kWh})]}{[NCV (8562 \text{ kcal/SCM})]}$$

$$= 1193.8 \text{ million SCM/year}$$

$COEF_{f,y}$ is the emission coefficient of the natural gas used as the fuel. It is calculated as specified by equation (1a) of the methodology

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

The value of NCV_y is the net calorific value of natural gas in GJ/m³. As explained above in the table of assumptions in section 3.6.3 of this report, this value is considered as 8562 kcal/SCM

The CO₂ emission factor $EF_{CO2,NG,y}$ (since natural gas is the fuel, $EF_{CO2f,f,y} = EF_{CO2,NG,y}$) for natural gas is based on the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (Ref/B11/). This value is 56.1tCO₂/TJ or 0.0561 t CO₂/GJ

$OXID_f$ is the oxidation factor of natural gas is taken as 1. The assumption indicates a complete combustion of the fuel and can be considered as valid.

On the basis of these values, the $COEF_{f,y}$ is calculated as

$$COEF_{f,y} = 8562 \text{ kcal/SCM} * 56.1 \text{ tCO}_2/\text{TJ} * 1 * (4.186 \times 10^{-9})$$

$$= 0.002011 \text{ t CO}_{2e}/\text{SCM}$$

The numerical factor 4.186×10^{-9} is to convert kcal into TJ

The project emissions calculated with the above values and by applying the equation (1) of the methodology, works out to 2,400,732 tCO_{2e}/year.



This value is for project emissions resulting from the combustion of fuel in the project activity.

The Project emissions in the webhosted PDD had been calculated on the basis of fuel consumption worked out on the value of the “Net Power Generation” by the project activity, whereas the actual fuel consumption needs to be computed for the “Gross Generation”. The validation team raised CAR-06 requesting that the error in the PDD be corrected. The required corrections were carried out by the Project Participant. However, this resulted in a change in the value of project emissions from 2,182,484 tCO_{2e} to **2,400,732 tCO_{2e}**

Leakage (LE_y)

According to the AM 0029 methodology, leakage emissions need to be taken into account to calculate the emission reductions. The leakage emissions are due to

a) 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 [LE_{CH₄,y}] &

b) In case LNG is used in the project plant: CO₂ emissions from fuel combustion/electricity consumption associated with the liquefaction, transportation, re-gasification and compression into a natural gas transmission or distribution system. [LE_{LNG,CO₂,y}]

The fugitive CH₄ emissions (LE_{CH₄,y}) are calculated net of those that would have occurred in the baseline scenario. This is allowed by the methodology as per the equation (5)

$$LE_{CH_4,y} = [FC_y \cdot NCV_y \cdot EF_{NG,upstreamCH_4} - EG_{PJ,y} \cdot EF_{BL,upstreamCH_4}] \cdot GWP_{CH_4}$$

FC_y is the quantity of natural gas combusted in the project activity and is estimated to be 1193.78 million SCM/year (this is justified from detailed calculations presented in the worksheet of Emission reduction Calculation sheet (Ref/P4/), which were validated by the team and are also explained in the paragraphs above).

The calculations of EG_{PJ,y} is also explained in the preceding paragraph of “Project emissions”

EF_{NG, upstream, CH₄} is the emission factor for fugitive upstream emissions for natural gas. As reliable and accurate national data on fugitive upstream emissions associated with the production, transportation and distribution of natural gas is not available, the project participant has opted to use the default value specified under Table 2 of the AM 0029 methodology (Ref/B3/). This value is 296 tCO₂/PJ; applicable to rest of the world



countries other than the USA/Canada, Eastern Europe/Formal USSR and Western Europe.

$EF_{BL, upstream, CH_4}$ is the emission factor for upstream fugitive methane emissions occurring in the absence of the project activity.

As explained in the preceding paragraph of "Baseline emissions", $EF_{BL, CO_2, y}$ corresponds to the Option 1, viz., the build margin calculated according to the Tool to calculate the emission factor for an electricity system. Hence, the project participant has used the following equation given by the methodology to calculate $EF_{BL, upstream, CH_4}$.

$$EF_{BL, upstream, CH_4} = \frac{\sum_j FF_{j,k} \cdot EF_{k, upstream, CH_4}}{\sum_j EG_j}$$

Each of the quantities in the above equation have been calculated using authentic data from the version 7 of CEA database that was applicable at the start of the validation. The detailed calculations are presented in worksheets "Fugitive EM factor" of the CER spreadsheet submitted to the validation team. The team has verified the correctness of data and the computations. The validation team has confirmed that the calculation is consistent with the calculation of CO_2 emissions in the build margin and the combined margin, i.e. the same cohort of plants and data on fuel combustion and electricity generation have been used. This is because the CEA database provides the value of the operating and build margin emission factors and also includes a listing of all the plants supplying power to the respective grids. Thus, the calculation carried out is in line with the requirement of the methodology.

The following values for the above quantities are confirmed:

$FF_{j,k}$ is the quantity of the fossil fuel type 'k' consumed in the respective power plant 'j'

The project activity would be supplying power to the Southern grid. The fossil fuel based power plants in the Southern Grid use the following types of fuels:

- coal
- lignite
- natural gas
- naphtha
- diesel



As diesel fired plants are not a part of the plants that were considered in the computation of the build margin, these plants are also not included in the determination of the baseline upstream fugitive methane emission factor $EF_{BL, upstream, CH_4, y}$

From the CEA database, values of the fuel consumption of each of these fossil fuel types was taken and multiplied by the respective default emission factor for the fuel type prescribed in Table 2 of the methodology. The default emission factors applied are as below:

| Type of fossil fuel used in the power plant | Value of the default emission factor $EF_{k, upstream, CH_4}$ considered | Justification |
|---|--|---|
| Coal | 0.8 tCH ₄ per ktonne | This value is specified as the default value for surface mining of coal. Validation team has referred to the web site www.coalindia.in of Coal India Ltd., the major producer of coal in India. The information provided therein states that 88% of the coal mined in India is from open pit mines. Hence, it can be concluded that majority of the coal produced in India is surface mined. |
| Lignite | 0.8 tCH ₄ per ktonne | The value considered is the same as for coal, since lignite also is produced from open cast mines in India. Information available from the web site http://www.nlcindia.com/index.php?file_name=about_01b & http://www.nlcindia.com/news/news_04.htm of Neyveli Lignite Corporation, a major producer of lignite in the country, also states that "lignite deposits in India occur in sub-surface deposits". |
| Gas | 296 tCH ₄ per PJ | The methodology specifies this as the default value for fugitive CH ₄ upstream emissions of natural gas in rest of the world countries (such as the host country India, for this project activity) other than USA/Canada, Eastern Europe/former USSR and Western Europe. Hence this value is justified. |
| Oil & diesel | 4.1 tCH ₄ per PJ | This is the default value for fugitive emission factor for oil specified in the methodology; hence is justified. The same |



| | | |
|--|--|--|
| | | value is also considered for diesel. The methodology does not differentiate between oil and diesel and hence, a common value of fugitive emission factor for both the fuels is justified. However, diesel plants are not considered in the computation of $EF_{BL, upstream, CH_4, y}$ |
|--|--|--|

Apart from the above values, the other assumptions made in calculating the values of fossil fuels type 'k' consumed in the respective power plant 'j' included in the build margin are as follows :

Emission factor for upstream fugitive emissions in the absence of the project activity ($EF_{BL, upstream, CH_4}$) are justified as follows:

| Parameter assumed | Value applied | Justification |
|--|----------------------------|---|
| CO ₂ emission factor of coal | 26.2 tCO ₂ /GJ | The value considered is based on Volume 2, Chapter 1, Table 1.4, 2006 IPCC Guidelines for National Greenhouse Gas Inventories which is a standard reference and is therefore acceptable. |
| CO ₂ emission factor of lignite | 27.30 tCO ₂ /GJ | The value considered is based on Volume 2, Chapter 1, Table 1.4, 2006 IPCC Guidelines for National Greenhouse Gas Inventories which is a standard reference and is therefore acceptable. |
| CO ₂ emission factor of NG | 15.30 tCO ₂ /GJ | The value considered is based on Volume 2, Chapter 1, Table 1.4, 2006 IPCC Guidelines for National Greenhouse Gas Inventories which is a standard reference and is therefore acceptable. |
| CO ₂ emission factor of naphtha | 20 tCO ₂ /GJ | The value considered is based on Volume 2, Chapter 1, Table 1.4, 2006 IPCC Guidelines for National Greenhouse Gas Inventories which is a standard reference and is therefore acceptable. |
| Net power generation of plants in the build margin $\sum EG_j$ | 32,861 Million units (kWh) | This value is the summation of the electricity generation by all the power plants connected to the Southern grid and also included in the calculation of the build margin emission factor. The value is taken from CEA database version 7 which also provides the plant-wise break up of all such plants. This is as per the methodology. |
| Quantity of coal | 14705 kilo tonnes per year | This is a calculated value based on absolute CO ₂ emissions that had taken place during |



| | | |
|---|-----------------------|--|
| combusted in power plants in the build margin | | the year 2010-11 for coal fired plants and the value of emission factor of coal. The data on absolute emissions is available from the CEA database version 7, valid and applicable at the time of the start of validation |
| Quantity of lignite combusted in power plants in the build margin | 0 kilotonnes per year | This is a calculated value based on absolute CO ₂ emissions that had taken place during the year 2010-11 for lignite fired plants and the value of emission factor of lignite. The data on absolute emissions is available from the CEA database version 7, valid and applicable at the time of the start of validation. However, as there were no lignite fired plants in the cohort of plants that make up the build margin for the Southern grid, this value is taken as zero. |
| Quantity of natural gas combusted in power plants in the build margin | 79.74 PJ/year | This value is computed from absolute emissions data taken from the CEA CO ₂ baseline database version 7, valid and applicable at the time of the start of validation and from the value of CO ₂ emission factor for natural gas. The computation provides gas consumed in energy terms. |
| Quantity of naphtha combusted in power plants in the build margin | 0 PJ/year | This value is computed from absolute emissions data taken from the CEA CO ₂ baseline database version 7, valid and applicable at the time of the start of validation and from the value of CO ₂ emission factor for naphtha. The computation provides naphtha consumed in energy terms. However, as there were no naphtha fired plants in the cohort of plants that make up the build margin for the Southern grid, this value is taken as zero. |
| GWP _{CH4} | 21 | The global warming potential for GHG methane is a known standard value. |

The detailed computation of the fugitive upstream methane emissions occurring in the absence of the project activity $EF_{BL, upstream, CH_4}$ is presented in the CER spreadsheet submitted by the project participant to the validation team. The calculations therein were verified by the team.

Accordingly, the value of $EF_{BL, upstream, CH_4}$ is confirmed by the team as 22.60 tCO₂ per GWh.

The webhosted PDD had worked out the baseline fugitive upstream methane emission factor $EF_{BL, upstream, CH_4}$ on the fuel consumption $FC_{f,y}$



and $\sum EG_j$ values that have undergone a correction due to the CL-13 raised by the validation team. As a result, the leakage emissions values also have been revised in the PDD to 144,817 tCO₂e from 128,805 tCO₂e.

As per the methodology, the leakage emissions from fuel combustion/electricity consumption associated with the liquefaction, transportation, re-gasification and compression into a natural gas transmission or distribution system $LE_{LNG,CO_2,y}$ are to be calculated as per the equation:

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

FC_y is the quantity of natural gas combusted in the project activity and is calculated to be 1193.78 million SCM/year. An explanation for the consideration of this value is stated in the paragraphs above.

$EF_{CO_2, upstream, LNG}$ is the 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. As reliable and accurate data on the same is not available, the project participant has chosen the default value of this emission factor, prescribed by the methodology to be 6 tCO₂ per TJ.

But the project activity does not propose to use Liquefied Natural Gas (LNG). This was confirmed by the validation team after discussions with the PP's representatives. As a consequence, therefore, the leakage emissions due to LNG liquefaction, transportation, re-gasification and compression into natural gas would be zero. The leakage emissions are calculated using equation (5) of the methodology and are confirmed as 144,817 tCO₂ per year.

The total leakage emissions as a sum of the leakage emissions due to

- i) Net fugitive emissions due to usage of natural gas,
 $LE_{CH_4,y} = 144,817 \text{ tCO}_2 \text{ per year}$
- ii) Net fugitive emissions due to usage of R-LNG
 $LE_{LNG, CO_2,y} = 0 \text{ tCO}_2 \text{ per year}$
- iii) Total Leakage emissions per year LE_y
 $= LE_{CH_4,y} + LE_{LNG,CO_2,y}$
 $= 144,817 \text{ tCO}_2 \text{ per year}$

Emission reductions (ER_y)

From the values of baseline emissions, project emissions and leakage emissions, the emission reductions are calculated as



$$ER_y = BE_y - PE_y - LE_y$$

$$BE_y = 3,933,105 \text{ tCO}_{2e} \text{ per year}$$

$$PE_y = 2,400,732 \text{ tCO}_{2e} \text{ per year}$$

$$LE_y = 144,817 \text{ tCO}_{2e} \text{ per year}$$

$$\text{Hence, } ER_y = 1,387,555 \text{ tCO}_{2e} \text{ per year}$$

As during the crediting period, there would be 365 day years and also leap years of 366 days, the estimated annual average is expected to be 1,388,315 tCO_{2e} of emission reductions over the entire crediting period of 10 years represents a reasonable estimation using the assumptions considered by the project participant. All the assumptions for this estimate either come from the assumptions used for investment analysis or based on official data sources in line with relevant EB guidelines. The assumptions used for investment analysis have been validated in section 3.7.3 of this report. The validation team confirms that the estimates of baseline emissions can be replicated using the information provided. It also can be verified using the Emission reduction Calculation sheet (Ref/P4/) for calculations of emission reductions.

Based on the above assessment, the validation team hereby confirms that:

- (a) All assumptions and data used by the project participants are listed in the PDD, including their references and sources;
- (b) All documentation used by project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD;
- (c) All values used in the PDD are considered reasonable in the context of the proposed CDM project activity;
- (d) The baseline methodology has been applied correctly to calculate baseline emissions and emission reductions;
- (e) All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.

3.7 Additionality of a project activity (97)

The steps taken and sources of information used, to cross-check the information contained in the PDD on this matter are described below.

The steps taken by the validation team to assess the additionality of the Project Activity includes review of documents indicated in the assumptions in the IRR computation sheet (Ref/P6/). The detailed steps, including an assessment of how the documentation referred to in the PDD for the demonstration of additionality is appropriate, are described in Sections 3.7.1 through 3.7.5 below.



3.7.1 Prior consideration of the clean development mechanism (104)

The start date of the project activity stated in the PDD is 01/01/2010. The start date corresponds to the date of Notice to Proceed issued to the EPC contractor (Engineering, Procurement & Construction) Lanco Infratech Limited (Ref/P10/).

The Project participant had issued a Notice to Proceed to Lanco Infratech Limited on 01/01/2010 for Engineering & Construction Services (Ref/P10/). An EPC agreement had been signed prior to that on 23/12/2009 between the PP and Lanco Infratech Limited. The EPC agreement contained a provision for the project participant to issue a notice to proceed to the EPC contractor. In keeping with the same, such notice was issued to Lanco Infratech Limited on 01/01/2010.

The validation team confirmed the date of notice to proceed is 01/01/2010 from the original documents provided by the project participant.

As per the terms of the EPC agreement with Lanco Infratech Limited, the notice to proceed is a confirmation to the EPC contractor from the project participant's side of the decision to implement the project and signals the project participant's permission to commence work on the project activity. The date of such notice is the earliest date of real action taken by the project participant towards the start of the work and hence is acceptable as the start date of the project activity, as per the definition of the same provided in the CDM glossary of terms Version 5 EB 47 (Ref/B7/).

The start date of the project activity is after 2nd August 2008. The EB 62 Annex 13 guidelines on the demonstration and assessment of the prior consideration of CDM require (paragraph 2) the project participant must inform a host party designated national authority (DNA) and the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status. Such notification must be made within six months of the project activity start date and shall contain the precise geographical location and a brief description of the proposed project activity, using the standardized form F-CDM-Prior consideration.

The following chronology of events was assessed by the validation team to conclude the conformance of the project activity to EB 62 Annex 13 guideline.

| Date | Activity | Document verified |
|------------|---|--|
| 14/10/2009 | Board Resolution for setting up 2*371 MW with CDM consideration | Extract of Board resolution dated 08/10/2009 (Ref/P11/). The original copy of the Board resolution was also verified by the validation team during the office discussion with the project participant on |



| | | |
|------------|---|---|
| | | 04/05/2012. |
| 23/12/2009 | Date of EPC (Engineering, Procurement & Construction) Agreement with Lanco Infratech Limited | Copy of EPC agreement with M/s Lanco Infratech Limited Dated 23/12/2009(Ref/P9/). |
| 01/01/2010 | Notice to proceed issued to Lanco Infratech Limited (Start Date of the Project Activity) | Letter to Lanco Infratech limited for Notice to Proceed.(Ref/P10/) |
| 25/06/2010 | Intimation to UNFCCC & NCDMA | Email communication to UNFCCC & NCDMA on 25/06/2010 along with the form F-CDM-Prior consideration (Ref /P17/) |
| 19/07/2010 | Acknowledgement from UNFCCC | Email acknowledgement from UNFCCC on 27/01/2010 (Ref/P23/). |
| 26/08/2011 | Invitation for Local stakeholder meeting | Personal invitation to individual stakeholders from the project participant dated. 26/08/2011(Ref/P19/). |
| 15/09/2011 | Local stakeholder meeting | Minutes of Local stakeholder meeting held on 15/09/2011 (Ref/P21/) |

The date of communication to UNFCCC and Indian DNA for prior consideration of CDM is 25/06/2009 which is within six months from the project activity start date. This indicates that CDM was seriously considered in the decision to implement the project activity as communication with the UNFCCC secretariat and the Indian DNA was made within six months of project activity start date. The serious consideration of CDM is thereby demonstrated as per the EB 62 Annex 13 guidelines.

Based on the above assessment, the BVCH hereby confirms that the proposed CDM project activity complies with the requirements of the latest version of the EB Guidance on prior consideration of CDM.

3.7.1.1 Historical information on project timeline

There is no historical information on the project activity timeline, applicable to the project activity with respect to any real action prior to start date of the Project activity. The project participant took the decision to implement the project activity in its Board meeting held on 14/10/2009 and signed a contract with Lanco Infratech limited for Engineering, Procurement and Construction (EPC) on 23/12/2009. Subsequently Notice to Proceed was issued to Lanco Infratech Limited on 01/01/2010 which is the start date of project activity. The chronology of the the actions to



secure CDM has been discussed in details in section 3.7.1 of the validation report.

3.7.2 Identification of alternatives (107)

The project participant has identified all the realistic and credible alternatives to the project activity in the section B.4 of the PDD. The consideration of the selected alternatives was validated by the DOE and a detailed assessment of the same is provided in section 3.6.3 of this report.

- i) The list of alternatives considered in the PDD includes as one of the options that the project activity is undertaken without being registered as a proposed CDM project activity
- ii) The alternatives considered are regarded as plausible by the validation team on the basis of its local and sectoral knowledge and experience
- iii) Each of the alternatives complies with national and local legislation of the host country.

Hence, BVCH considers the listed alternatives to be credible and complete.

3.7.3 Investment analysis (114)

The project participant has used the levelised cost approach to analyse the identified alternatives to determine the baseline. With this approach, the levelised cost for each of the following alternatives was calculated:

Alternative 1: Power plant based on natural gas using CCPP technology

Alternative 2: Power plant based on coal using sub-critical technology

Alternative 3: Power plant based on coal (Imported fuel) with super-critical technology

Alternative: Power plant based on coal (Domestic fuel) with super-critical technology

Alternative 5: Power plant (s) based on lignite

Alternative 6: Power plant (s) based on naphtha

These were the only alternatives that remained in consideration for the determination of the baseline, as explained in section 3.6.3 & 3.7.2 above.

The levelised cost calculated for each of these alternatives was based on assumptions of input parameters as detailed in the table below. The sources of information and means of cross-check used for each of the values are also provided in the right hand column of the table.



**Alternative I : Power generation using natural gas as the fuel
(project activity without CDM)**

| Sr. No | Input parameter | Value of the parameter | Validation assessment | |
|----------------------------|--|------------------------|--|--|
| | | | Information source referred to and its appropriateness | Information source used for Cross-checking |
| PROJECT INVESTMENT RELATED | | | | |
| 1. | Project capacity | 742 MW | The plant capacity is as per DPR prepared by M/s Fitchner India, September 2009 (Ref/P12/). | The capacity was confirmed from EPC agreement with Lanco Infratech Limited which specified the capacity of the plant as 742 MW (2x371MW) (Ref/P9/). |
| 2. | Project cost | INR 26100 million | The total project cost is taken from the DPR dated. September 2009, this was available at the time of decision making (Ref/P12/). | The project cost has been cross checked with the value in the loan sanction letter of Axis Bank dated 15/10/2010 (Ref/P16/) |
| 3. | Debt : equity ratio | 70:30 | 70%:30% debt-equity ratio is taken from the DPR (Ref/P12/). | The debt equity ratio has been cross checked from the loan sanction letter of Axis Bank dated 15/10/2010 (Ref/P16/) which clearly mentions the debt equity ratio as 70:30. |
| 4. | Time frame for the investment analysis | 20 years | Lifetime of the project activity has been taken from the Detailed Project Report prepared by M/s Fitchner India a third party engineering company (Ref/P12/).. | The validation team confirmed from Detailed Project Report prepared by a third party, M/s Fitchner India that the lifetime assumed for the project activity was 20 years. The life time of the project equipment as checked from the technical specifications of the Gas Turbine |



| | | | | <p>Model 9FA is 144000 hours comes to nearly 17 years. The technical lifetime of 20 years assumed for the project activity gas turbines is hence conservative. The lifetime of the project activity has also been cross checked with the lifetime of the similar project activities which are already registered under UNFCCC and it is seen that the lifetime considered for these registered project activities is also 20 years.</p> <table><tr><th>Project ID</th><th>Lifetime Assumed</th></tr><tr><td>6520</td><td>20 years</td></tr><tr><td>5554</td><td>20 years</td></tr><tr><td>2915</td><td>20 years</td></tr></table> | Project ID | Lifetime Assumed | 6520 | 20 years | 5554 | 20 years | 2915 | 20 years |
|----------------------|--------------------------------------|-----|---|---|------------|------------------|----------------------|----------|----------------------|----------|----------------------|----------|
| Project ID | Lifetime Assumed | | | | | | | | | | | |
| 6520 | 20 years | | | | | | | | | | | |
| 5554 | 20 years | | | | | | | | | | | |
| 2915 | 20 years | | | | | | | | | | | |
| OPERATIONS RELATED | | | | | | | | | | | | |
| 5. | Plant Load Factor of the plant (PLF) | 85% | PLF of 85% is assumed from the Detailed Project Report from M/s Fichtner Consulting Engineers (India) Pvt. Ltd. (Ref/P12/). | Validation team has cross checked the PLF for gas based projects from CERC (terms and conditions of tariff) regulations, 2009(Ref/B13/). which considers normative value of 85% for all thermal generating stations. As the CERC, in its Statement of Objects and Reasons of the Terms & Conditions of Tariff Regulations, sets out the terms | | | | | | | | |



| | | | | |
|-----------------------|--|---------------------|--|--|
| | | | | and conditions for regulated tariffs in the power sector, the validation team accepted this as an authentic information source for the assumption made. |
| 6. | Auxiliary Power consumption | 3% | The assumption of auxiliary power consumption is sourced from the DPR by M/s Fichtner Consulting Engineers (India) Pvt. Ltd. (Ref/P12/). | Validation team has cross checked the Auxiliary consumption for combined cycle gas based projects from CERC (terms and conditions of tariff) regulations, 2009(Ref/B13/). which considers a value of 3%. |
| 7. | Operations & Maintenance (O&M) cost including insurance cost | 1.75 million per MW | The assumption of operation and maintenance) (O&M) cost has been sources from Statement of reason regulation Terms & Conditions Tariff dated 05/02/2009(Ref/B13/). | Since the CERC is a regulatory authority, the data derived from its Tariff Regulations can be regarded as authentic and hence it has been accepted by the validation team. The CERC notification is also available in the public domain. |
| 8. | Escalation in O&M cost | 5.72% per annum | The assumption of Escalation of O&M cost is sourced from the DPR by M/s Fichtner Consulting Engineers (India) Pvt. Ltd. (Ref/P12/). | Validation team has cross checked the O&M cost escalation rate for combined cycle gas based projects from CERC(terms and conditions of tariff) regulations, 2009(Ref/B13/) which considers a value of 5.72%. |
| ENERGY RELATED | | | | |

VALIDATION REPORT



| | | | | |
|----|---|---------------|--|---|
| 9. | Station heat rate of the power plant Combined Cycle | 1850 kcal/kWh | The station heat rate is taken from the DPR Dated. September 2009 (Ref/P12/). | Station heat rate was cross-checked against the CERC (Terms and Conditions of Tariff) Regulations, 2009 Statement of Reason (Ref/B13/). The station heat rate is specified in the CERC order as 1850 kcal/kWh for combined cycle operation plants. |
| 11 | Supply cost of Gas (NG) | \$4.2 /MMBTU | The supply cost of fuel from the DPR by M/s Fichtner Consulting Engineers (India) Pvt. Ltd.. (Ref/P12/). | The supply cost of natural gas has been crosschecked from a letter from Ministry of Petroleum and Natural Gas. http://petroleum.nic.in/PriceAPMGas1.pdf , which provides the fuel cost |
| 12 | Marketing Cost | \$0.13 | The marketing cost of fuel from the DPR by M/s Fichtner Consulting Engineers (India) Pvt. Ltd.. (Ref/P12/). | Validation team crosschecked the marketing cost from the news article http://articles.economic-times.indiatimes.com/2012-01-13/news/30623966_1_marketing-margins-apm-gas-tapti |
| 13 | Gas transportation cost | \$0.6/mm btu | The transportation cost of natural gas is sourced from the DPR by M/s Fichtner Consulting Engineers (India) Pvt. Ltd.. (Ref/P12/). | Validation team crosschecked the gas transportation cost from the news article http://www.livemint.com/Home- |



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|----|-----------------------|---------------------|---|---|
| | | | | Page/kdTE6sHMabqUj rHDdmFLgN/RGTIL- may-soon-raise- Rs1000-cr.html , which state a transportation cost of natural gas from \$0.5mmbtu to \$1.0 mmbtu, Hence the transportation cost assumed by PP is appropriate and conservative. |
| 14 | Landed cost of Gas | INR 9.13/SC M | Calculated from the sum of fuel cost (base price + marketing margin) and the transportation cost with applicable taxes, and using the appropriate currency and other conversion factors | The calculations are presented transparently in the IRR excel spreadsheet and were verified by the validation team and found to be correct. |



| | | | | |
|----|---|----------------|--|--|
| 15 | Annual gas price escalation | 1.31% | The rate of escalation is taken on the basis of CERC Escalation notification (Ref /B9/) dated 30th September 2009 available as a public reference at (http://www.cercind.gov.in/Escalation-rate/Notification-dated-30-09-09.pdf) | Since the CERC is a regulatory authority, the data derived from the notification published by it and available as a public reference can be regarded as authentic and hence it has been accepted by the validation team. |
| 16 | Annual escalation of gas transportation cost | 17.95% | The rate of escalation is taken on the basis of CERC Escalation notification (Ref /B9/) dated 30th September 2009 available as a public reference at (http://www.cercind.gov.in/Escalation-rate/Notification-dated-30-09-09.pdf) | Since the CERC is a regulatory authority, the data derived from the notification published by it and available as a public reference can be regarded as authentic and hence it has been accepted by the validation team. |
| 17 | Gross calorific value (N.C.V.) of the fuel (NG) | 8562 kcal/SC M | The gross calorific value of Natural Gas is taken from the DPR Dated. September 2009. (Ref/P12/). | The assumption can be cross-checked with CEA database version 7 which provides value of GCV of gas as 8800 |



| | | | | |
|-------------------|------------------------------|----------|---|--|
| | | | | kcal/SCM and a conversion factor (delta) of 10%, which will lead to a value of NCV as 7920 kcal/SCM. The value assumed in the analysis is higher and hence, more conservative |
| FINANCING RELATED | | | | |
| 18 | Interest rate on Term Loan | 11.5% | Prime Lending Rate at the time of investment decision making. Reference : http://www.rbi.org.in/scripts/WSSView.aspx?Id=14091 | As the rate assumed is drawn from the official web site of the Reserve Bank of India, there is no further need to cross-check this rate. The validation team cross checked the Loan sanction letter from the Bank (Ref/P16/) and noted that the interest rate charged by the Bank to the project participant to be 11.25%. |
| 19 | Loan repayment period | 12 years | The loan repayment period is taken from the DPR Dated. September 2009 (Ref/P12/). | Validation team has cross checked the same with the actual loan details in the loan sanction letter from Axis Bank dated 15/10/2010 (Ref/P16/) |
| 20 | Moratorium on loan repayment | 6 months | The moratorium is taken from the DPR Dated. September 2009 (Ref/P12/). | Validation team has cross checked the same with the actual loan details in the loan sanction letter from Axis Bank dated 15/10/2010 |



| | | | | |
|--------------------------------|---------------------------------|------------|---|---|
| | | | | (Ref/P16/) |
| 21 | Discounting rate | 10.19% | <p>The discounting rate is taken from CERC notification for the rates and other parameters for the purpose of bid evaluation. This notification is dated 30th September 2009 and is available at the following weblink:</p> <p>http://www.cercind.gov.in/Escalation-rate/Notification-dated-30-09-09.pdf</p> | <p>Since the CERC is a regulatory authority, the assumptions based on a notification issued by it can be regarded as authentic and hence it has been accepted by the validation team. The CERC notification is also available in the public domain.</p> |
| WORKING CAPITAL RELATED | | | | |
| 22 | Working capital interest rate | 11.5% | The Working capital interest rate has been assumed from the DPR (Ref/P12/). | Validation team has cross checked the same with the Prime lending rate published by RBI. |
| 23 | Receivables for working capital | 60 days | <p>The assumption is based on CERC regulation from the CERC (Terms & Conditions of tariff) Regulations 2009 Statement of objects & reasons (Ref/B13/) accessible from the weblink</p> <p>http://cercind.gov.in/2009/February09/SOR-regulations-on-T&C-of-tariff-05022009.pdf</p> | <p>Since the CERC is a regulatory authority, the assumptions based on a notification issued by it can be regarded as authentic and hence it has been accepted by the validation team. The CERC notification is also available in the public domain.</p> |
| 24 | Spares for working capital | 30% of O&M | | |
| 25 | Escalation factor for spares | 5.72% | As the cost of spares is dependent upon the O&M cost, the rate of escalation applying is considered to be the same as for the O&M cost | The validation team has confirmed that the cost of spares has been considered @30% of the O&M cost and hence the rate of escalation is already applied in the O&M cost and not again applied to the |



| | | | | |
|----------------------------|-----------------------|----------|--|--|
| | | | | cost of spares. Thus there is no double counting of the escalation. |
| 26 | Primary fuel stock | 30 days | The assumption is based on CERC regulation from the CERC (Terms & Conditions of tariff) Regulations 2009 Statement of objects & reasons (Ref/B13/) accessible from the weblink http://cercind.gov.in/2009/February09/SOR-regulations-on-T&C-of-tariff-05022009.pdf | Since the CERC is a regulatory authority, the assumptions based on a notification issued by it can be regarded as authentic and hence it has been accepted by the validation team. The CERC notification is also available in the public domain. |
| 27 | O&M expenses | 30 days | | |
| TAX & DEPRECIATION RELATED | | | | |
| 28 | Income Tax Rate | 33.99% | Income Tax Act; budget of 2009-10 states the rate of corporate tax is 33.99% (http://www.madaan.com/taxrates.htm) | The tax rate considered is as per the prevailing tax laws of India and was validated by the financial expert in the validation team who is a Chartered Accountant by profession. Hence it has been accepted by the validation team. |
| 29 | Minimum Alternate Tax | 17% | Income Tax Act http://articles.economictimes.indiatimes.com/2009-07-07/news/27634848_1_mat-rate-zero-tax-companies-minimum-alternate-tax | The tax rate considered is as per the prevailing tax laws of India and was validated by the financial expert in the validation team who is a Chartered Accountant by profession. Hence it has been accepted by the validation team. |
| 30 | Income tax exemption | 10 years | Income Tax Act http://law.incometaxindia. | The tax rate considered is as per |



| | | | | |
|----|--|-------|---|--|
| | period | | gov.in/dittaxmann/income-taxacts/2008itact/sec_080-ia.htm | the prevailing tax laws of India and was validated by the financial expert in the validation team who is a Chartered Accountant by profession. Hence it has been accepted by the validation team. |
| 31 | Rate of Depreciation for the first 12 years | 5.28% | http://cercind.gov.in/2009/February09/SOR-regulations-on-T&C-of-tariff-05022009.pdf (Last paragraph of page 44), Appendix-III available at: http://cercind.gov.in/2009/Whats-New/tariff-pdf/Appendix-III.pdf | Since the CERC is a regulatory authority, the assumptions based on its regulations can be regarded as authentic and hence it has been accepted by the validation team. The CERC notification is also available in the public domain. The Companies Act also specifies the same rate of depreciation. |
| 32 | Rate of depreciation for the remaining lifetime of the project | 3.33% | Calculated Based on description http://cercind.gov.in/2009/February09/SOR-regulations-on-T&C-of-tariff-05022009.pdf (Last paragraph of page 44), Appendix-III available at: http://cercind.gov.in/2009/Whats-New/tariff-pdf/Appendix-III.pdf | Since the CERC is a regulatory authority, the assumptions based on its regulations can be regarded as authentic and hence it has been accepted by the validation team. The CERC notification is also available in the public domain. |
| 33 | Recovery of Depreciation | 90% | CERC (Terms and Conditions of Tariff) Regulations, 2009 http://cercind.gov.in/2009/February09/SOR-regulations-on-T&C-of- | Since the CERC is a regulatory authority, the assumptions based on its regulations can be regarded as |



| | | | | |
|----|---|-------|--|--|
| | | | tariff-05022009.pdf | authentic and hence it has been accepted by the validation team. The CERC notification is also available in the public domain. |
| 34 | Return on Equity (RoE) | 16% | CERC (Terms and Conditions of Tariff) Regulations, 2009 http://cercind.gov.in/2009/February09/SOR-regulations-on-T&C-of-tariff-05022009.pdf | Since the CERC is a regulatory authority, the data derived from the assumptions based on its regulations can be regarded as authentic and hence it has been accepted by the validation team. The CERC notification is also available in the public domain. |
| 35 | Currency exchange rates of the INR /USD | 48.41 | Taken from publicly available source http://data.worldbank.org/indicator/P.A.NUS.FCRF | Data available from public domain. Hence it has been accepted by the validation team. |

The inputs for the financial analysis for other alternatives considered along with the validation justification for the same are presented in the tables below:-

Project Cost (INR Million/MW)

| | | |
|-------------------|-------|---|
| Coal Sub Critical | 40.0 | Project cost has been taken from CEA expert committee report. http://www.cea.nic.in/reports/articles/thermal/expert_committee_report_fuel.pdf (page11). The Central Electricity Authority is a duly constituted body under the Government of India's Ministry of Power. The CEA publishes a database on the Baseline CO ₂ emission from all operating power plants in India every year which can be regarded as an authentic information source from the value assumed. |
| Coal Super | 47.47 | British High Commission Report on UMPP |



| | | |
|------------------------------|-------|--|
| Critical Domestic | | <p>Risk Analysis, April 2007 http://www.decc.gov.uk/assets/decc/what%20we%20do/global%20climate%20change%20and%20energy/tackling%20climate%20change/intl_strategy/dev_countries/india/umpp-risk-analysis.pdf The UMPP risk analysis study report was prepared by Mott MacDonald for the British High Commission. Mott MacDonald are reputed engineering consultancy and contracting firm and hence, the findings of their report is regarded as authentic by the validation team</p> |
| Coal Super Critical Imported | 47.47 | <p>British High Commission Report on UMPP Risk Analysis, April 2007 http://www.decc.gov.uk/assets/decc/what%20we%20do/global%20climate%20change%20and%20energy/tackling%20climate%20change/intl_strategy/dev_countries/india/umpp-risk-analysis.pdf</p> |
| Lignite | 40.6 | <p>http://mospi.nic.in/status_report_july_sept07.pdf (Page 15 of 237 mentions Expansion of NLC TPS - II to be of cost INR 2030.78 Crores; this project is of capacity 500 MW) <u>Neyveli Lignite Corporation (NLC) is one of the foremost State sector lignite mining companies in Southern India and are also into lignite based power generation. Hence, the assumption of project cost for lignite power plant is regarded as a reliable source of information for the purpose of this analysis</u></p> |
| Naphtha | 35.18 | <p>Has been considered same as Project activity since gas turbine plants can be run on alternate fuels such as natural gas and naphtha, with the rest of the plant remaining the same.</p> |

Debt Equity Ratio

| | | |
|------------------------------|-------|---|
| Coal Sub Critical | 70:30 | <p><i>Considered Same as Project Activity.</i></p> <p>CERC (Terms and Conditions of Tariff) Regulations, 2009 Statement of Reason. (Ref/B13/)</p> <p>Since the CERC is a regulatory authority, the data derived from the tariff regulations of CERC are regarded as authentic and hence accepted by the</p> |
| Coal Super Critical Domestic | | |
| Coal Super Critical Imported | | |
| Lignite | | |
| Naphtha | | |



| | | |
|--|--|--|
| | | validation team. The debt-equity ratio assumed is also very commonly observed for power sector projects in the host country. |
|--|--|--|

Return on Equity (RoE)

| | | |
|------------------------------|-----|---|
| Coal Sub Critical | 16% | CERC (Terms and Conditions of Tariff) Regulations, 2009 (Ref/B13/) Since the CERC is a regulatory authority, the data derived from the tariff regulations of CERC can be regarded as authentic and hence accepted by the validation team. The RoE has been considered uniformly across all alternatives |
| Coal Super Critical Domestic | | |
| Coal Super Critical Imported | | |
| Lignite | | |
| Naptha | | |

Project Financing

| | | |
|------------------------------|-------------------------------|---|
| Project Financing | | |
| Coal Sub Critical | Rate of Interest 11.5% | Has been considered by the project participant as same as project activity, for the sake of an even comparison between the alternatives considered. |
| Coal Super Critical Domestic | | |
| Coal Super Critical Imported | Term of Debt 12years | |
| Lignite | Moratorium period 6 months | |
| Naphtha | | |

Working capital norms

| | | |
|------------------------------|---|--|
| Coal Sub Critical | Receivables of 60 days | The assumptions for the calculation of working capital are drawn from CERC (Terms & Conditions of Tariff) Regulations 2009. Since the CERC is a regulatory authority, the data derived from the tariff regulations of CERC are regarded as authentic and hence accepted by the validation team. |
| Coal Super Critical Domestic | | |
| Coal Super Critical Imported | | |
| Lignite | Spares @20% of the O&M cost | As the O&M cost is assumed to escalate @5.72% every year and the cost of spares is based on the O&M cost, the same rate of escalation is also considered for the cost of spares. |
| | Rate of escalation on spares @5.72% | |
| | Primary | |



| | | |
|---------|---|--|
| | fuel stock of 60 days Secondary fuel stock of 60 days O&M expense of 30 days | |
| Naphtha | Receivables of 60 days Spares @30% of the O&M cost Rate of escalation on spares @5.72% Primary fuel stock of 30 days O&M expense of 30 days | The assumptions for the calculation of working capital are drawn from CERC (Terms & Conditions of Tariff) Regulations 2009. Since the CERC is a regulatory authority, the data derived from the tariff regulations of CERC are regarded as authentic and hence accepted by the validation team. |

Station Heat Rate (Kcal/Kwh)

| | | |
|-------------------|------|--|
| Coal Sub Critical | 2450 | CERC (Terms and Conditions of Tariff) Regulations, |
|-------------------|------|--|



| | | |
|------------------------------|------|---|
| Coal Super Critical Domestic | 2380 | 2009 Statement of Reason (Ref/B13/) Since the CERC is a regulatory authority, the data derived from the tariff regulations of CERC can be regarded as authentic and hence accepted by the validation team. |
| Coal Super Critical Imported | 2274 | |
| Lignite | 2668 | |
| Naphtha | 2117 | CEA CO ₂ baseline database for Indian power sector version (Ref/B15/) |

Auxiliary Consumption

| | | |
|------------------------------|------|--|
| Coal Sub Critical | 9% | CERC (Terms and Conditions of Tariff) Regulations, 2009 Statement of Reason (Ref/B13/) Since the CERC is a regulatory authority, the data derived from the tariff regulations of CERC can be regarded as authentic and hence accepted by the validation team. |
| Coal Super Critical Domestic | 9% | |
| Coal Super Critical Imported | 9% | |
| Lignite | 9% | |
| Naphtha | 3.5% | CEA CO ₂ baseline database for Indian power sector version (Ref/B15/) |

Plant Load Factor (PLF)

| | | | |
|------------------------------|-----|--|---|
| Coal Sub Critical | 85% | PP has considered it same as project activity. As all the considered alternatives are expected to deliver the same nature of service, viz., catering to base load demand, the PLF is assumed the same across all alternatives. | Validation team has verified the same from the CERC (Terms and Conditions of Tariff) Regulations, 2009 Statement of Reasons (Ref/B13/). The CERC, as a regulatory body defines terms & conditions for the determination of tariff. Hence, the validation team has accepted the PLF assumption based on this source. |
| Coal Super Critical Domestic | 85% | | |
| Coal Super Critical Imported | 85% | | |
| Lignite | 85% | | |
| Naphtha | 85% | | |

Net Calorific Value of Fuel



| | | |
|---------------|--------------------------------|--|
| Coal | 3946Kcal/kg (domestic coal) | <p>The Net Calorific Value of coal is assumed based on the tariff order passed by CERC on the tariff petition before it (140/2005). The said tariff petition was concerning the approval of tariff in respect of the Ramagundam Super Thermal Power Station Stage (III) for the period 25.03.2005 to 31.03.2009.</p> <p>The date of the tariff order is 15th October 2007 and therefore, it was available at the time of the PP's decision for investment in the project activity. The tariff order can be accessed by following the weblink http://cercind.gov.in/03022007/No-140-05-doh-22-5-07.pdf Page no 25 of 34 of this tariff order has mentioned the GCV of coal to be 4093 kcal/kg.</p> <p>The NCV value can be derived from the GCV, considering a factor of 3.6% to account for the difference between GCV and NCV values. This is taken as a reference from the CEA CO2 database version 07</p> <p>The database is available at the weblink: www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm</p> |
| Imported Coal | 5784Kcal/Kg | <p>CEA expert committee report on fuel for power generation (Ref/B14/). The report provides data on fuels used in power plants in India. It is prepared by a committee of experts of the Central electricity authority and hence is regarded as an authentic source. The Gross Calorific Values (GCV) of the are stated in the CEA Report. These values can be converted to the NCV by applying the GCV to NCV conversion factor of (1-5%).</p> |
| Lignite | 2699 Kcal/Kg | |
| Naptha | 9,975 Kcal/kg | |

Cost of Primary Fuel

| | | |
|------|---------------|---|
| Coal | 1.2849 INR/Kg | <p>Assumed on the basis of CERC Tariff order in respect of petition filed 140/2005 Page no 25 of 34 of the said petition has mentioned the price of coal.</p> <p>Validation team crosschecked the coal price for "E" grade coal from report by Coal India Limited http://www.coalindia.in/documents/pricing_revised_final030311.pdf. The report gives a range of Coal prices from different coal fields ranging from 730 to 1020 INR/Tonne. The</p> |
|------|---------------|---|



| | | |
|---------------|-----------------|--|
| | | value assumed in the analysis is higher and hence, more conservative. |
| Imported Coal | 4.518 INR/Kg | <p>Cost of Imported coal is sourced from a presentation published by Infraline Research. The report is available at the weblink http://www.infraline.com/coal/presentations/VinayaVarma-mjunction.pdf</p> <p>The source for cost of Imported coal is authentic and publicly available. The appropriateness of the cost can be crosschecked from a report by planning commission of India (http://planningcommission.nic.in/plans/mta/11th_mta/chapterwise/chap15_energy.pdf), which gives the cost of imported Australian coal at Chennai port is Rs. 4288/MT. The value considered by PP is slightly higher, validation team is of the opinion that value considered is appropriate and conservative.</p> |
| Lignite | 0.80IN R/Kg | <p>CEA expert committee report on fuel for power generation (Ref/B14/).</p> <p>Validation team has checked the price of Lignite from weblink http://www.expressindia.com/latest-news/govt-slashes-lignite-prices-by-rs-150-per-metric-tonne/413343/ which gives price of lignite from INR 1000/Tonne to INR1500/Tonne. Validation team has checked the levelised cost of electricity using lignite as fuel with these values also and found that LCOE of lignite based power plant does not cross LCOE of natural gas based power plant. The LCOE (lignite) with a higher fuel cost of lignite is also greater than the LCOE (sub-critical coal). Hence, New power plant (s) based on coal with sub-critical technology still remains the baseline scenario.</p> |
| Naphtha | 27.0 INR/Kg | <p>The price of naphtha have been sourced from a presentation by ONGC “<u>INDIA'S NAPHTHA TRADE OUTLOOK - CMT Conferences</u>” http://www.cmtevents.com/eventdatas/070523/pdf/ONGC.pdf (Slide 41)</p> |

Escalation rate of fuel price

| | | |
|------|-------|--|
| Coal | 6.12% | CERC Notification for Annual Escalation rates for Bid Evaluation (Ref/B9/) |
|------|-------|--|



| | | |
|---------------|-------|---|
| | | Since the CERC is a regulatory authority, the data derived from the CERC notification can be regarded as authentic and hence it has been accepted by the validation team. |
| Imported Coal | 6.12% | <p>The project participant observes that from the start of the year 2010 till decision date, there has been a fall in the price of imported coal - please refer slide 10 in the attached link:</p> <p>http://www.infraline.com/coal/presentations/VinayaVarma-mjunction.pdf</p> <p>For the sake of conservativeness, PP has considered the same escalation rate as considered for domestic coal (6.12% CEA tariff order: http://www.cercind.gov.in/Escalation-rate/Notification-dated-30-09-09.pdf)</p> <p>Validation team referred to the data provided by PP for imported coal prices, since there is no significant trend in increase or decrease in coal prices over time so considering escalation rate similar to escalation rate of domestic coal prices can be appropriate.</p> <p>The value has been sourced from CERC notification for escalation rates, since the CERC is a regulatory authority, the data derived from the same can be regarded as authentic and hence it has been accepted by the validation team.</p> |
| Lignite | 6.12% | http://www.cercind.gov.in/Escalation-rate/Notification-dated-30-09-09.pdf (the escalation rate as applicable for domestic coal has been considered for lignite as well) |
| Naphtha | 10% | <p>http://www.gercin.org/tarifforderpdf/en_1304750473.pdf.</p> <p>Since the GERC is a state regulatory authority, the data derived from its Tariff order can be regarded as authentic and hence it has been accepted by the validation team.</p> |

Secondary Fuel – Specific Oil requirement

| | | | | |
|------------------|-----|-----------------------------|---|-------------------------------------|
| Coal Critical | Sub | Specific Oil requirement | PP has considered the Specific oil requirement for | As the CERC, in its Statement of |
|------------------|-----|-----------------------------|---|-------------------------------------|



| | | | |
|---------------------------------|--|--|--|
| Coal Super Critical Domestic | 1ml/Kwh | for coal (sub-critical) and supercritical options @1 ml/kWh. For lignite based plant, the same is assumed @1.5 ml/kWh. The assumptions made are based on the CERC (Terms & Conditions of tariff) Regulations 2009 Statement of objects & reasons (Ref/B13/) which document has specified these values at paragraph 30.1 on page 126. The document is available through the weblink http://cercind.gov.in/2009/February09/SOR-regulations-on-T&C-of-tariff-05022009.pdf | Objects and Reasons of the Terms & Conditions of Tariff Regulations, sets out the terms and conditions for regulated tariffs in the power sector, the validation team accepted this as an authentic information source for the assumption made. |
| Coal Super Critical Imported | 1.5ml/Kwh for Lignite | NCV of Oil 9595Kcal/Ltr | The values assumed are related to secondary fuels used in the coal/lignite plants. The data accessed and used is provided by this tariff orders of the |
| Lignite | Cost of Oil 32,238 INR/KL | NCV of the OIL has been sourced from CEA CO2 database . | PSERC & GERC which is a Tariff Regulatory body of a State Government in India. The data is therefore authentic in nature and accepted by the validation team. The values are provided by the GERC tariff order which is a single source for this data. |
| | Escalation on Cost of oil 10.50% | Cost of OIL which is used as secondary fuel is sourced from Punjab State Electricity Regulatory Comission Tariff Order 2009-10 dated 08/09/2009 The escalation rate of Oil prices were sourced from GERC tariff order 861/2006 ; Page no 52 of 109, available at the web Link: http://www.gercin.org/index.php?option=com_tarifforder&Itemid=32&year=2006&lang=en | |

O&M cost



| | | |
|----------------------------------|--------------------------|---|
| Coal Sub Critical | INR 1.536 million/MW | The O&M expenses for Thermal Generating Stations are specified in the CERC (Terms & Conditions of tariff) Regulations, 2009 (Ref /B13/). The O & M cost is specified on page 64 of this document, according to the capacity of the generating sets in the power plant. Coal and lignite plants are of lower capacities (500 MW). Supercritical plants comprise of units of capacity exceeding 600 MW. Hence, the O & M costs for the two are different. |
| Coal Super Critical Domestic | INR 1.382 million/MW | |
| Coal Super Critical Imported | INR 1.382 million/MW | |
| Lignite | INR 1.536 million/MW | |
| Naphtha | 2.5% of the project cost | <u>Incremental Cost Analysis report of The Global Environment Facility (GEF)</u> http://www.thegef.org/gef/sites/thegef.org/files/repository/09.PAD.Annex_9.pdf (Page 5 of 13 provides the value of O&M cost for existing naphtha based power plants.) |
| Escalation rate for the O&M Cost | 5.72% | CERC (Terms and Conditions of Tariff) Regulations, 2009 Statement of Reason (Ref/B13/) provides escalation rate for the O&M cost. This was verified and accepted by the validation team. |

Tax and depreciation rates applied for the baseline alternatives are same as for the project activity

The above investment analysis described in the PDD and presented in more detail in the spreadsheets provided to the validation team meets the requirements mandated by the EB 62 Annex 05 guidelines on investment analysis (Ref/B5/) and also the applied methodology AM 0029 ver. 03 (Ref/B3/), with regard to the following:

- The period of assessment is not limited to the crediting period of the project activity but has been spread out over the entire operational lifetime of 20 years for project activity and 25 years for other alternatives. This meets the requirement of paragraph 3 of the EB 62 Annex 05 guidance. The lifetime for naphtha based power plant is considered to be 20 years, since the generating equipment in naphtha plants is similar to gas based plants, the only difference being the fuel used in the two plants.
- The validation team confirms that project participant has applied all the statutory levies and taxes as per the then valid tax rules. Incentives like provisions of section 80IA [deferred tax benefit] as per Indian Income Tax Act have also been correctly applied. The



financial expert in the validation team has validated the same and observed that they are correct.

- All the input values considered for the investment analysis are valid and applicable at the time of the investment decision that was made on 14.10.2009. The input values have also been applied consistently in the calculations. The requirement in paragraph 6 of EB 62 Annex 05 guidance is therefore met.
- The input values are based on either authentic data sources such as the Central Electricity Authority (CEA) database or the relevant tariff regulations /tariff orders ruled by tariff regulatory authorities such as the Central Electricity Regulatory Commission (CERC) that had been prevailing at the time of the Project Participant's investment decision. These sources are available in the public domain and the Project Participant has provided internet weblinks referring the same.
- Project participant has provided to the DOE spreadsheet versions of the investment analysis and the benchmark; These are readable and in them the individual cells, formulae and algorithms employed are viewable and unprotected. Paragraph 8 of EB 62 Annex 05 guidance on investment analysis makes it necessary for project participant to supply the DOE with spreadsheets that are readable and unprotected.
- Similarly, the use of levelised cost of generation for the alternatives, viz., i) Gas based power generation and ii) Other alternatives such as coal, coal-supercritical, lignite and naphtha based power generation is appropriate as a comparison between the various alternatives is possible on the basis of unit cost of output delivered by each of the respective alternatives.
- Project participant has carried out a sensitivity analysis as described in more detail below. Results of the sensitivity analysis establish that the investment analysis is robust enough over reasonable variations in the key input parameters

The methodology AM 0029 also requires project participants to demonstrate additionality of the project activity through an investment benchmark analysis (step 1). The benchmark analysis is based on project IRR compared against the investment benchmark.

The project IRR was computed considering yearly cash flows over a 20 year investment time frame. The assumptions used for computing the Project IRR are same as presented in the table above and the validation justification for each of the parameters is also provided in the same table. The value of project IRR calculated is 11.91%. The IRR value in the webhosted PDD was 10.88%. However, as revisions were necessitated to the IRR computations in response to the validation team's CL-12 raised,



the IRR value has changed to 11.91%. The financial expert in the validation team has validated the revised computation of IRR value.

Benchmark investment analysis:

The EB 62 Annex 05 guidance on investment analysis stipulates that the benchmark chosen for the demonstration of investment analysis should be suitable for the type of IRR calculated and used. In the case of the project activity, the financial indicator employed is the project IRR.

The project participant has chosen the weighted average cost of capital (WACC) as a benchmark for comparison with the project IRR. Paragraph 12 of the EB 62 Annex 05 guidance states that the WACC is an appropriate benchmark for project IRR and hence selection of the same as a benchmark meets the paragraph 12 requirement. Besides, the project activity funding is envisaged as a mixture of equity and debt (in the ratio 30:70) and therefore such a benchmark is also relevant for comparison with the financial indicator.

The financial indicator used to demonstrate the additionality is the project IRR. In computing the same, loan interest is added back to arrive at the net cash flow. The benchmark used is a post-tax weighted average value. The calculation of project IRR, however, is based on actual interest payable; hence the requirement of paragraph 11 of EB 62 Annex 05 guidance is met.

The WACC is a composite benchmark based on a weighted average of the cost of equity and debt and reflects the cost of capital employed for investment in a project activity. Cost of debt and the cost of equity are the two values necessary to be determined for arriving at the WACC. The WACC is a weighted average cost of funds for the project activity which is also based on the debt: equity ratio.

i) **Debt-Equity ratio** considered for the weighted average cost of capital is 70%:30%. The Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2009 was published in September 2009 (prior to the date of investment decision) and hence, available to the project participant at the time of the investment decision. The regulation has prescribed the same debt & equity (70:30) structure for power projects, as seen from the regulation document. Thus, the debt-equity ratio taken into consideration (70%:30%) is a typical financing structure observed for power sector projects in the country. Hence the same is accepted since it meets the requirements in paragraph 18 of the EB 62 Annex 05 guidance on investment analysis.

Cost of Equity CoE :

The project participant has computed the cost of equity with the help of the Capital Asset Pricing Model (CAPM), using publicly available financial



data. The CAPM is a widely accepted model by investors to estimate the expected rate of return on equity (Cost of Equity). The computation of the CoE with the CAPM therefore is in accordance with sound financial practice and meets paragraph 15 requirement of the EB 62 Annex 5 guidelines on investment analysis. The project participant has used the following equation to calculate the cost of equity. The “Beta” in the equation represents the risk involved in the project type.

$$\text{Cost on Equity CoE} = \text{Risk free rate of return} + \text{Market risk premium} * \text{Beta}$$

The formula used is as per the CAPM method for arriving at the cost of equity. This can be verified from the source of information provided on <http://www.investopedia.com/articles/06/capm.asp#axzz27NVTW3tK>.

The method used for the calculation of benchmark is in accordance with the Guidelines on the assessment of investment analysis (Annex 05, EB-62). The financial data used are standard in the market and hence the above approach for calculating benchmark was accepted by the validation team.

All the parameters used in calculation of the cost of equity (by CAPM) were checked by the validation team for their appropriateness. The rate of risk free return has been taken as 7.696%, which has been sourced from Month-end yield to maturity of SGL transactions in Central Government dated securities for a 20-year maturity. An average of the rates of securities over a one year period preceding the investment decision has been taken for determining this rate. This is based on data available from the Reserve Bank of India (RBI) bulletin on 12/10/2009 and therefore available to the project participant as on the date of decision, i.e. 14/10/2009.

The validation team accessed the webpage link provided by the PP and confirmed that the average rate of yield of SGL transactions in Central Government Securities, with maturity of 20 years, from Aug-2008 to Sep-2009 was 7.696%. The said information is available in Section 27 C of RBI Bulletin dated 12/10/2009 (http://rbi.org.in/scripts/BS_ViewBulletin.aspx?Id=10652). The date of publication of this report was also checked and it was confirmed that this information was available to the PP at the time of decision making. The validation team has also been able to confirm that the RBI website has been operational since 1996¹⁷.

Market risk premium is calculated as the difference between a) the market return (over a sufficiently long period) and b) the risk free rate. The

¹⁷ http://www.rbi.org.in/scripts/chro_1991.aspx



market return is arrived at based on the Bombay Stock Exchange (BSE) Sensex data, which is a widely accepted market index for a diverse portfolio of stocks across various industry sectors.

Beta value:

The beta value for the project type, as stated in the PDD, is derived as a proxy value based on the beta values of the listed stocks of a group of equivalent power generating companies in India that were listed on the Bombay Stock Exchange at the time of the project participant's investment decision. The companies that were considered for the computation of the beta value are as follows:

1. BF Utilities Ltd.
2. CESC Ltd.
3. Neyveli Lignite Ltd.
4. Tata Power Ltd.
5. Gujarat Industries Power Company Limited
6. GVK Power Ltd.
7. Reliance Infrastructure
8. Torrent Power
9. JVPL

All these companies considered as a sample group for deriving the beta value fall into the same industry type, viz., "Power Generation & Distribution". The project participant has included the beta values taken from Bloomberg database and screenshots of the same are included in the Annex to the PDD. The average beta value for the 9 companies in the group is calculated as 1.209 and the same was used by the project participant to calculate the cost of equity.

The CoE according to the CAPM is then calculated as
$$\text{CoE} = \text{Risk free rate} + \text{beta} * (\text{Market return} - \text{Risk free rate})$$

The risk free rate as explained in the paragraph on "return on equity" above is 7.696%, being the rate of interest on long term Central Government securities. The market return is the return computed as the CAGR (Compounded Annual Growth Rate) on values of the BSE Sensex index from the year of the inception of the index (1979) up to the date of investment decision (14-October-2009) and is worked out as 18.37%. This is also explained in the excel spreadsheet submitted by the PP to the validation team.

The beta value was computed to be 1.209 in the same excel spreadsheet. Hence, the cost of equity CoE is calculated as

$$7.696 \% + 1.209 * (18.37\% - 7.696\%) = 20.60\%.$$

**Cost of debt C_d :**

The cost of debt was taken as the Prime Lending Rate (PLR) of the Reserve Bank of India for Public Sector Banks prevailing at the time of the investment decision and can be considered as a conservative value for the cost of debt in the market.

The PP has stated that the RBI's webpage as the source for deducing the PLR. The validation team checked the webpage <http://www.rbi.org.in/scripts/WSSView.aspx?Id=14091> and it was noted that the PLR given in benchmark calculation sheet viz., 11.50% and information stated on the RBI web page report were the same. The PLR is published by the RBI on its web site in the form of weekly updates. Hence, the value of PLR at a given point of time can be found by referring to the latest weekly update published on its web site by RBI. The validation team confirmed that the RBI's webpage was launched in the year 1996 and was operational and accessible at the time of decision making, thus enabling the published data on its web site available at the time of the investment decision of the PP.

The PLR at a given point of time in the past can also be referred to through the same website, as the past data is retained for several years. The validation team accessed the data published in the weeks prior to the date of decision for the project activity and found that the range of PLR at that time was 11.00% to 12.00%. The validation team therefore accepts that the median value selected (11.50%) is appropriate. Therefore, it was confirmed that

- I. the value of the PLR (11.50%) was available to the PP at the time of decision,
- II. the value was correct and hence, is acceptable

Computation of WACC:

The WACC is a weighted average cost computed in the following manner:

$$WACC = CoE * w_e + C_d * (1 - T) * w_d$$

Where,

CoE : Return on equity computed with the CAPM as explained above (20.61%)

C_d : Cost of debt (11.5%)

w_e : percentage of equity funding (30%)

w_d : percentage of debt funding (70%)

T : percentage of tax assumed on the debt (17%)

***Tax assumed (T) :***

The PP has taken minimum Alternate Tax (MAT) as the percentage of tax to be applied in working out the WACC value. Due to prevailing tax rate structure, the power sector companies in India are eligible to claim tax exemptions for a period of up to 10 years, as per section 80 IA of the Income Tax Act. Tax depreciation also impacts the overall tax computations and the assessed Company finally pays tax at a reduced rate of Minimum Alternate Tax (MAT). The same rate is therefore considered as the tax rate 'T' in the determination of the WACC. In the webhosted PDD, the tax rate had been considered @11.33%. However, the validation team raised CL-14 requesting the Project Participant to clarify why the rate applied was different from the rate considered in the investment analysis. In response, the Project Participant revised the computations and as a result, the benchmark value also was revised from 13.32% in the webhosted PDD to 12.86%. The financial expert in the validation team has validated the revised benchmark calculations.

The validation team verified the correctness and authenticity of the data used for the calculation of cost of equity. The data used for the benchmark computation is based on values of market return, risk free rate of return, beta values of stocks. These are standard market parameters. The data is obtained from public sources that can be accessed and hence, could be validated by the DOE. The benchmark thus computed is a reasonable expectation of return by an investor and also meets the requirements of paragraph 15 of the EB 62 Annex 05 "Guidelines on the Assessment of Investment Analysis" and hence the validation team has accepted the same.

The benchmark WACC thus determined is 12.86% and the project IRR was compared against the same. The validation team notes that the project IRR of 11.91% is much lower than the benchmark.

The project IRR is below the benchmark. Paragraph 34 of Step 2(c) of the, Tool for the demonstration and assessment of additionality (EB 65 annex 21) states that the project activity cannot be regarded as "financially attractive", if the financial indicator is lower than the benchmark. The validation team therefore agrees that the project activity is additional because the project IRR is less than the benchmark.

With the demonstration of project IRR being less than the benchmark, the Step 1 of the applied methodology AM0029 ver. 03, combined with the Tool for the demonstration and assessment of additionality EB 65 Annex 21, regarding the assessment of additionality is fulfilled.

The validation team has confirmed that all data used to arrive at the benchmark was derived from sources available to the project participant



at the time of the investment decision and hence the validation team accepted the same.

The data is obtained from sources that can be accessed and hence, could be validated by the DOE. The benchmark thus computed is a reasonable expectation of return by an investor and also meets the requirements of the EB 62 Annex 05 "Guidelines on the Assessment of Investment Analysis" and hence the validation team has accepted the same.

Sensitivity analysis:

The project participant has carried out a sensitivity analysis in order to determine whether small changes in the values of the input parameters were likely affect the overall result of the analysis. Paragraph 20 of the EB 62 Annex 05 guidance on investment analysis requires sensitivity analysis to be carried out for all variables that contribute to 20% of either total project costs or total project revenues. Accordingly, the sensitivity analysis carried out by the project participant has subjected the following variables to variation in the levelised cost analysis for both alternatives, viz., gas based power generation and coal based power generation :

- i) Total project cost
- ii) Plant Load Factor (PLF)
- iii) Station heat rate of the power plant
- iv) Fuel cost

The results of sensitivity analysis are as follows:

| S. NO | Parameter | Project IRR (%) | Project IRR (%) | Project IRR (%) | Benchmark (%) |
|-------|----------------------|-----------------|-----------------|-----------------|---------------|
| | Percent change | (-10%) | Base Case | (+10%) | |
| 1 | Plant Load Factor | 11.91% | 11.91% | 11.91% | 12.86% |
| 2 | Station Heat Rate | 11.91% | 11.91% | 11.91% | 12.86% |
| 3 | Project capital cost | 12.56% | 11.91% | 11.41% | 12.86% |
| 4 | Fuel Cost | 11.91% | 11.91% | 11.91% | 12.86% |

The validation team observed from the analysis that the project IRR always remains below the benchmark value. The project IRR value in the analysis is computed on the basis of costs and revenue projections. In considering the revenue, the unit cost of electricity generation computed as per the CERC tariff regulation 2009, for every year is taken as the basis for the price of electricity. Therefore, any change in the parameters will automatically change the tariff and thus, it has no impact on the project IRR in the sensitivity analysis.



Validation team also confirms that the project IRR will only cross the benchmark in a case when the project cost is decreased by 14.6%. However this is very unlikely since the project cost assumed by the PP is exactly the same as the project cost in the EPC agreement signed with M/s Lanco Infratech Limited Ref/P9/. Hence, no possibility of a decrease in the project cost is likely and the consideration of a range of +10%/-10% as per the clause 21 of the EB 62 Annex 5 Guidelines on the assessment of investment analysis can be regarded as sufficient.

Variations made in the values of other parameters such as fuel cost, PLF and SHR have the effect of increasing the tariff considered in the IRR analysis in corresponding proportion as explained in the paragraph above and hence, the IRR value does not change even when these parameters are subjected to variation. The validation team is therefore convinced that requirements of para 111(e) are met.

The above investment analysis described in the PDD and presented in more detail in the spreadsheets provided to the validation team meets the requirements mandated by the EB 62 Annex 05 guidelines on investment analysis (Ref/B5/) and also the applied methodology AM 0029 ver. 03 (Ref/B3/), with regard to the following:

- The period of assessment is not limited to the crediting period of the project activity but has been spread out over the entire operational lifetime of 20 years for project activity and 25 years for other alternatives. This meets the requirement of paragraph 3 of the EB 62 Annex 05 guidance. The lifetime for naphtha based power plant is considered to be 20 years, since the generating equipment in naphtha plants is similar to gas based plants, the only difference being the fuel used in the two plants.
- Depreciation of the plant is added back while computing the project cash flows, since it is not a real expense to the project activity. This meets paragraph 5 requirement of the EB 62 Annex 05 guidance.
- The validation team confirms that project participant has applied all the statutory levies and taxes as per the then valid tax rules. Incentives like provisions of section 80IA [deferred tax benefit] as per Indian Income Tax Act have also been correctly applied. The financial expert in the validation team has validated the same and observed that they are correct.
- All the input values considered for the investment analysis are valid and applicable at the time of the investment decision that was made on 14.10.2009. The input values have also been applied



consistently in the calculations. The requirement in paragraph 6 of EB 62 Annex 05 guidance is therefore met.

- The input values are based on either authentic data sources such as the Central Electricity Authority (CEA) database or the relevant tariff regulations /tariff orders ruled by tariff regulatory authorities such as the Central Electricity Regulatory Commission (CERC) that had been prevailing at the time of the Project Participant's investment decision. These sources are available in the public domain and the Project Participant has provided internet weblinks referring the same.
- Project participant has provided to the DOE spreadsheet versions of the investment analysis and the benchmark; These are readable and in them the individual cells, formulae and algorithms employed are viewable and unprotected. Paragraph 8 of EB 62 Annex 05 guidance on investment analysis makes it necessary for project participant to supply the DOE with spreadsheets that are readable and unprotected.
- The financial indicators selected are the levelised cost of generation and the project IRR. As the project activity is funded through a combination of equity and debt, the choice of project IRR as a financial indicator is appropriate for the benchmark analysis. Similarly, the use of levelised cost of generation for the alternatives, viz., i) Gas based power generation and ii) Other alternatives such as coal, coal-supercritical, lignite and naphtha based power generation is appropriate as a comparison between the various alternatives is possible on the basis of unit cost of output delivered by each of the respective alternatives.
- The benchmark chosen for the investment analysis is the weighted average cost of capital (WACC) which is acceptable, as the financial indicator is also the project IRR. This is in line with paragraph 12 of the EB 62 Annex 05 guidance which states that WACC is an appropriate benchmark for a project IRR.
- As the project activity is an independent power project that can be developed by any entity (and not just the project participant), the benchmark chosen for the analysis is based on publicly available data, which could be validated by the DOE. This is in line with the paragraph 13 of the EB 62 Annex 05 guidance.
- The choice of a benchmark analysis to demonstrate the additionality of the project activity is also appropriate and in line with the requirement of the AM 0029 ver. 03 methodology to demonstrate additionality in Step 1.



BVCH, based on the assessment result by the financial expert engaged, hereby confirms that the underlying assumptions are appropriate and the financial calculations are correct.

3.7.4 Barrier analysis (118)

The project participant has not claimed that there are any barriers to the implementation of the project activity. Hence, this requirement of the VVM is not applicable to the validation assessment of the project activity.

3.7.5 Common practice analysis (121)

In accordance with Step 2 of the assessment of additionality under the AM0029 methodology, the project participant is required to demonstrate that the project activity is not common practice in the relevant country or sector, by applying the step 4 of the 'Tool for the demonstration and assessment of additionality'.

In webhosted PDD the Common Practice analysis was not in accordance with the requirements of Para 47 of the "Tool for the demonstration and assessment of additionality" Version06 (Ref/B4/), subsequently clarification CL 07 was raised. In response PP has updated the PDD and provided a separate excel sheet to demonstrate the Common Practice Analysis as per Para 47 of Tool for the demonstration and assessment of additionality" The same has been presented in Section B.5 of the PDD and is described and validated as below.

The validation team cross checked the Common practice analysis spreadsheet (Ref/P5/). For the purpose of the demonstration of the common practice analysis, the project participant has chosen the entire host country India as the applicable geographical area, as a default. The spreadsheet identifies all the power plants in the country. This list is based on the data published by CEA in its CO2 database version 07 (Ref/B9/). The CEA (Central Electricity Authority) is a body under the Government of India's Ministry of Power. The data published by CEA on the power plants in India can be regarded as the most authentic for the purpose of demonstration of the extent of diffusion of power plant technologies in the country. This database was published in January 2012 and therefore contains information on all power plants commissioned prior to 01/01/2010, viz., the start date of the project activity.

The project activity is a grid connected power generation plant that uses gas as the fuel for power generation and the baseline established is a New power plant (s) based on coal with sub-critical technology. Hence, the project activity essentially is a technology switch from a baseline



alternative that uses a more emission intensive fossil fuel (Coal) to a less emission intensive fossil fuel, viz., gas and the project activity can be classified as a measure referred to in paragraph 6 (b) of “Tool for the demonstration and assessment of additionality” Version 06, i.e. “Switch of technology with or without change of energy source”.’

Project Participant has therefore applied the requirements of paragraph 47 of the EB 65 guidance to illustrate that the project activity is not common practice.

Geographical scope of the common practice analysis:

For the purpose of the demonstration of the common practice analysis, the project participant has chosen the entire host country India as the applicable geographical area, as a default. This meets the requirement specified under paragraph 5 of EB 65 Annex 21 Tool for the demonstration and assessment of additionality.

The EB 65 guidance has provided a step-wise approach in paragraph 47 to demonstrate the common practice analysis. Compliance to the same is shown in the PDD.

Step 1: Calculate applicable output range as +/-50% of the design output or capacity of the proposed activity

The project activity is a power plant of capacity 742 MW. Hence, the Project Participant has identified the output range as 371 MW to 1113MW, which is -50%/+50% of the project capacity.

Step 2: In the applicable geographical area, identify all plants that deliver the same output or Capacity, within the applicable output range calculated in Step 1, as the proposed project activity and have started commercial operation before the **start date of the project**. Note their number N_{all} . Registered CDM project activities and projects activities undergoing validation shall not be included in this step.

PP has shortlisted all the power plants which started commercial operation before start date of project activity (01.01.2010) and fall in the applicable output range. Registered CDM projects and projects undergoing validation are excluded from the list. The projects identified after step 2 are listed below :-

| S.No | Power Plant Type | Number of Plants |
|------|-------------------------|------------------|
| 1 | Thermal (coal based) | 46 |
| 2 | Thermal (lignite based) | 2 |



| S.No | Power Plant Type | Number of Plants |
|------|---------------------|------------------|
| 3 | Thermal (oil based) | 1 |
| 4 | Thermal (gas based) | 10 |
| 5 | Hydro | 28 |
| 6 | Nuclear | 4 |
| | Total | 91 |

Hence, N_{all} is identified as 91.

Step 3: Within plants identified in Step 2, identify those that apply **technologies different** that the technology applied in the proposed project activity. Note their number N_{diff}

PP has identified all those projects that apply technologies that are different from the technology of the project activity. The different technologies constitute the following:

1. Project using different fuel source
 - Hydro and nuclear plants
 - Thermal Power plants that use fuel/s other than natural gas [such as coal, lignite, oil]
 - Gas based Plants that use multiple fuels [gas-naphtha or gas-diesel plants]

As the project activity is a gas based plant, it is appropriate to compare only those power plants with technology and fuel similar to the project activity (as defined in paragraph 9a of the EB 65 Annex 21 Methodological Tool for the Demonstration and Assessment of Additionality), for the purpose of the common practice analysis. The exclusion of hydro, nuclear as well as thermal power plants using fuels other than gas is therefore justified.

2. Different Investment climate

- Projects promoted by Centre or State govt. agencies

The Project Participant has excluded the gas based power plants in the list that are Government owned. The validation team agrees with the Project Participant's contention in the PDD that in terms of their capability to access financing, private projects cannot be treated on par with Government projects as the latter are known to enjoy special debt terms. Government decisions to set up infrastructure projects are also guided by other social development considerations such as ensuring that reliable supply of power is made available to the community, costs of generation of power notwithstanding.



The validation team therefore agrees with the above two criteria employed in defining different technologies. The number of projects identified, as applying different technologies, is the number N_{diff} that Step 3 of EB 65 Annex 21 guidance refers to. That number, from the list of projects shortlisted in this step is 90.

Step 4: Calculate factor $F=1-N_{diff}/N_{all}$ representing the share of plants using technology similar to the technology used in the proposed project activity in all plants that deliver the same output or capacity as the proposed project activity.

Computation of the diffusion factor F from the values of N_{all} and N_{diff} arrived at from Steps 1, 2 & 3. The same is computed as

$$\begin{aligned} F &= 1 - (N_{diff}/N_{all}) \\ &= 1 - (90/91) = 1 - 0.989 \\ &= 0.011 \text{ which is less than } 0.2 \end{aligned}$$

Also, the difference of N_{all} & N_{diff} is $91 - 90 = 1$, which is less than 3

Since, both the conditions laid down in Step 4 of paragraph 47 of the EB 65 annex 21 guidance are not fulfilled. This is sufficient to establish that the project activity is not a common practice, by the same guidance.

Hence, the validation team confirms that the proposed CDM project activity is not a common practice in the region.

3.8 Monitoring plan (124)

BVCH hereby confirms that the monitoring plan complies with the requirements of the methodology.

The steps taken to assess whether the monitoring arrangements described in the monitoring plan are feasible within the project design are described below.

The Project uses the approved monitoring methodology AM 0029 (Grid Connected Electricity Generation Plants using Non-Renewable and Less GHG Intensive Fuel), version 03 (Ref/B3/). The monitoring methodology is applicable under the same conditions as the baseline methodology. The applicability of the baseline methodology is explained in section 3.6.1 of this report. The applicability of the monitoring methodology is also, therefore, demonstrated under the same conditions.

From the observations made by the team during its visit to the site on 04.05.2012, the monitoring plan described in the webhosted PDD was found to be inadequate in several respects. The monitoring plan was not in conformity with the actual practice being followed at the site. Hence,



the validation team raised a series of findings in the form of CAR 04 & CAR 05, in which the inadequacies observed have been described in detail. The Project Participant revised the monitoring plan in sections B.7.1 & 7.2 of the PDD. On the basis of the corrections made, the CARs raised were closed by the team.

Project emissions

Project emissions are required to be monitored as per the monitoring methodology which specifies the following as relevant parameters to be monitored:

- 1) Annual Fuel(s) consumption in project activity ($FC_{f,y}$), The project activity power plant will use natural gas to generate electricity. The plant does not envisage use of any other start-up or co-fired fuels. Consumption of natural gas in project activity is monitored on-line by 2 gas flow meters (one each on line 1 & line 2 of the gas lines) installed by the gas transporter RGTIL, at the Gas conditioning skid of RGTIL and check meter installed at project end for cross-verification. This is in line with monitoring methodology AM0029 requirement. Fuel consumption will be measured on daily basis in the presence of supplier representative/s and representative/s of PP. The daily measurement is called as Joint ticket. Gas flow meters installed by the gas supplier and PP are ultrasonic flow meters. The PP and the supplier will record the reading daily, and the invoice will be used for crosscheck; the calibration will be carried out as per the standard procedures. Section B.7.1 of the PDD has therefore listed the $FC_{NG,y}$ as monitoring parameter.
- 2) Net Calorific value(s) of the fuel used in the project activity($NCV_{f,y}$)
 Net Calorific value of natural gas supplied in the project activity is monitored on-line on continuous basis by 2 Gas Chromatographs (one each on line 1 & line 2 of the gas lines) installed by the gas transporter RGTIL, at the Gas conditioning skid of RGTIL and another Gas Chromatograph owned by Project participant is installed at project end for cross-verification. This is in line with monitoring methodology AM0029 requirement.
 Net calorific value of natural gas ($NCV_{NG,y}$) to be used in the project activity will be provided by Gas Supplier fortnightly in the form of fuel invoice and data will be maintained by Project participant.
 The weighted average of NCV for the monitoring period will be calculated using daily joint ticket taken by RGTIL and PP. Section B.7.1 of the PDD has therefore listed the $NCV_{NG,y}$ as monitoring parameter.
- 3) Emission factors used in the project activity:



The emission factor of the types of fuels is included as monitoring parameters in the section B.7.1 of the PDD:-

- $\text{COEF}_{\text{NG},y}$ – the CO_2 emission coefficient in tCO_2 per m^3 for natural gas

[these will be calculated from values of NCV, OXID & $\text{EF}_{\text{CO}_2,y}$ for the respective fuel type, applicable during the crediting period]

4) Project emission PE_y

This is a calculated value using the above monitored parameters and is included as a monitoring parameter in section B.7.1 of the PDD.

Baseline emissions

As per the AM 0029 methodology, the baseline emissions are required to be monitored as per the Tool to calculate emission factor for an electricity system. The monitoring parameters specified by the tool and relevant to the baseline emissions are as follows:

- 1) Net Electricity supplied to the grid by the project activity $\text{EG}_{\text{PJ},y}$ is included as a monitoring parameter in section B.7.1 of the PDD. It is a calculated value from the electricity exported from the project activity as well as the Project participant's Phase-II gas based plant nearby. The electricity generated by the project activity and the Phase-II project of the PP is transmitted through a common transmission line to the PGCIL substation at Nunna. The electricity generated from both the plants is pooled at GIS substation at the project site and transmitted to PGCIL Substation through a 400KV double circuit transmission line. The monitoring plan includes the monitoring of electricity generated by project activity $\text{EG}_{\text{Phase-III}}$, electricity generated by Phase-II project $\text{EG}_{\text{Phase-II}}$ and the net electricity injected at the PGCIL grid by both the plants together $\text{EG}_{\text{Substation}}$, measured at Nunna. Appropriate apportioning procedures have been adopted in the PDD to arrive at Net electricity exported to the grid by the project activity alone.
- 2) Baseline emission factor $\text{EF}_{\text{BL},\text{CO}_2,y}$. 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.



Leakage emissions

The project participant has included the baseline upstream fugitive methane emissions factor $EF_{BL, upstream, CH_4}$ as an ex-post monitored value in the monitoring plan of the PDD in section B.7.1. The methodology requires that the emission factor for upstream fugitive CH_4 emissions occurring in the absence of the project activity ($EF_{BL, upstream, CH_4}$) should be calculated consistent with the baseline emission factor (EF_{BL, CO_2}) used in equation (4) of the methodology. As ex-post estimation of the EF_{BL, CO_2} value is stipulated under the methodology, a simultaneous ex-post estimation of the $EF_{BL, upstream, CH_4}$ value is regarded as appropriate by the validation team.

On the basis of the above observations made at the site, the validation team confirms that the monitoring arrangements described in the monitoring plan of the PDD are feasible within the project design.

The validation team also interacted with the project participant's representatives at the site. The project activity is managed by a competent team and the responsibilities for implementation of the project activity such as data verification, recording, storage and archiving have been allocated at different levels in the team. The validation team confirms from its site observations and its interviews with the site personnel that the project participant possesses the necessary ability to implement the monitoring plan as described in the PDD.

BVCH hereby confirms that the project participants are able to implement the monitoring plan.

3.9 Sustainable development (127)

The host Party's DNA confirmed the contribution of the project to the sustainable development of the host Party. An assessment of the same is provided in section 3.1 of this report. The project participant described contribution to sustainable development as per four indicators of sustainable development stipulated by Ministry of Environment & Forests in India. Project participant has obtained approval (Ref/P1/) from DNA of India and it is confirmed by the DNA that the project activity contributes to sustainable development in India. The project activity is in compliance with all current applicable legislations. The project activity will displace fossil fuel based electricity generation. Hence, there are only benefits derived out of the project and no adverse effects are envisaged. Moreover, the location of the project activity largely contributes to the social well being of the region. During the site visit it was noticed that the project provided substantial employment to local residents of nearby villages.



The host Party's DNA has also confirmed the contribution of the project to the sustainable development of the host country through the Host Country Approval Letter issued by it.

3.10 Local stakeholder consultation (130)

The steps taken to assess the adequacy of the local stakeholder consultation are described below.

During the site visit carried out by members of the validation team on 04.05.2012, a meeting was held with the local stakeholders to verify the process of consultation described by the project participant in the section E.1, E.2 & E.3 of the PDD. The team verified through personal interviews carried out with the local stakeholders that

- The stakeholder consultation had indeed been carried out by the project participant on 15.09.2011, at which local villagers, village elders and employees working at the LKPL's power plant as well as some representatives from Government agencies such as APSPDCL (Andhra Pradesh State Power Distribution Corporation Limited), APTRANSCO (Transmission Corporation of Andhra Pradesh Ltd.) had been invited and had also attended.
- The local stakeholders for the meeting that was planned on 15.09.2011 had been notified in advance to the local villagers on 26.08.2011. The notification was by means of personal invitation letters etc. The validation team verified the original of the invitation memo duly acknowledged by the stakeholders (Ref/P19/).
- The stakeholders informed the validation team that they had received sufficient notice in advance of the said meeting (19 days in advance)
- The local villagers who were interviewed by the validation team informed them that the consultation process was held in an open manner and they were given sufficient and relevant information about the project activity.
- The local stakeholders interviewed also informed that queries raised by them at the consultation meeting were responded to by the project participant in a satisfactory manner.
- The validation team verified the following documents :
 - a) the list of participants at the meeting held together with their respective signatures(Ref/P20/)
 - b) A copy of the meeting summary(Ref/21/) and the original were also verified by the validation team and found to be in order

The validation team, on the basis of the above confirms that the process of local stakeholder consultation is observed to be adequate.



3.11 Environmental impacts (133)

The Ministry of Environment & Forest (MoEF) in India requires that an Environmental Impact Assessment (EIA) be carried out by the project participant prior to establishing the project activity at the designated site. In accordance with the same, a Rapid Environment Impact Assessment was carried out by the project participant. A copy of the report was shared with the validation team. The team has noted that the EIA assessment report was prepared by the agency Pioneer Enviro Laboratories & Consultants(P) Ltd, dated 01/08/2007 (Ref/P18/) The environmental impacts on the soil, air quality and the ecology of the surrounding area have been adequately discussed in the report.

The project activity has obtained all the statutory permissions required to establish and operate the project activity such as

- i) The Environmental Clearance from the MoEF, dated 13/03/2008 (Ref /P15/)
- ii) Consent to Establish issued by Andhra Pradesh Pollution Control Board (APPCB), dated 11/08/2008 (Ref /P14/).
- iii) No objection certificate issued by Airport Authority of India, dated 10/09/2008 (Ref /P13/)

The validation team has been provided copies of the above statutory approvals and permissions. The copies were vetted against their originals and found to be a replica of the same.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD using methodology AM 0029 was webhosted on the UNFCCC for global stakeholders' comments as per CDM requirements. The project was webhosted from 03/04/2012 to 02/05/2012¹⁸.

The project activity received a total of 10 (Ten) comments during the webhosting period. The project participant provided response to these comments. Validation team took due account of these comments and the respective responses while making the validation opinion. The details of the comments received, responses by the project participant and the explanation of how due account of these is taken by the validation team are attached as Appendix B with this validation report.

5 VALIDATION OPINION

Bureau Veritas Certification has performed a validation of the project activity "**Grid Connected Gas based Combined Cycle Power Project in Andhra Pradesh**" in India. The validation was performed on the basis

¹⁸ <http://cdm.unfccc.int/Projects/Validation/DB/89FV4B3RZ9J1INETQ0QJYE4WF2FPK1/view.html>



of UNFCCC criteria and host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

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

Project participant used the latest tool for demonstration of the additionality. In line with this tool, the PDD provides an analysis of the investment, to determine that the project activity itself is not the baseline scenario.

By synthetic description of the project, the project is likely to result in reductions of GHG emissions partially. An analysis of the investment in the project activity demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented and maintained as designed, the project is likely to achieve the estimated amount of emission reductions. viz., 1,387,555 tCO₂ per annum (1,391,357 tCO₂ per annum for leap year).

The review of the project design documentation (version 03) and the subsequent follow-up interviews have provided Bureau Veritas Certification with sufficient evidence to determine the fulfillment of stated criteria. In our opinion, the project correctly applies and meets the relevant UNFCCC requirements for the CDM and the relevant host country criteria. Bureau Veritas Certification thus requests registration of Grid Connected Gas based Combined Cycle Power Project in Andhra Pradesh” as a CDM project activity.

6 REFERENCES

Category 1 Documents:

Documents provided by Type the name of the company that relate directly to the GHG components of the project.

| | |
|------|---|
| /P1/ | Host Country Approval File No.4/6/2012-CCC dated 10/10/2012 |
| /P2/ | Webhosted PDD version 1.1 dated 29/03/2012 |
| /P3/ | Revised PDD version 05 dated 21/01/2013 |
| /P4/ | Emission reduction Calculation sheet |
| /P5/ | Common practice analysis sheet |
| /P6/ | IRR computation sheet. |
| /P7/ | Benchmark-WACC calculation sheet |
| /P8/ | Financial Spreadsheet for Levelised Cost for Coal, Coal-supercritical, lignite and naphtha and Levelised cost and IRR for Natural Gas |



| | |
|-------|--|
| /P9/ | Signed EPC Contract with Lanco Infratech Limited dated 23/12/2009 |
| /P10/ | Notice to proceed Letter to EPC contractor ,dated 28/12/2009 |
| /P11/ | Copy of the resolution passed by the directors in the Board meeting held on 14/10/2009 |
| /P12/ | Detailed Project Report by M/s Fitchner India September 2009 |
| /P13/ | The No objection certificate issued by Airport Authority of India, dated 10/09/2008 |
| /P14/ | Consent to Establish issued by Andhra Pradesh Pollution control Board (APPCB), dated 11/08/2008 |
| /P15/ | Environmental clearance from the Ministry of Environment & Forests dated 13.03.2008 |
| /P16/ | Loan Sanction Letter by Axis Bank dated 15/10/2010 |
| /P17/ | Email communication to UNFCCC & NCDMA on 25/06/2010 along with the form F-CDM-Prior consideration |
| /P18/ | Environ Impact Assessment Report by M/s Pioneer Enviro Consultants |
| /P19/ | Acknowledged copies of the Invitation letter to the stake holder for the stake holder meeting dated 26/08/2011 |
| /P20/ | Local stakeholder meeting attendance sheet |
| /P21/ | Minutes of meeting of the stakeholder meeting held on 15/09/2011 |
| /P22/ | Invitation letter from DNA for HCA meeting dated 29/02/2012 |
| /P23/ | Email acknowledgement from UNFCCC on 27/01/2010 |

Category 2 Documents:

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

| | |
|------|--|
| /B1/ | PDD completion guidance - Guidelines for completing the project design document (CDM-PDD) and the form for proposed new baseline and monitoring methodologies (CDM-NM), version 07, EB 41 Annex 12 |
| /B2/ | CDM PDD Form, (CDM –PDD), Version 3 |
| /B3/ | AM 0029 - Version 3 Baseline Methodology for Grid Connected Electricity Generation Plants using Natural Gas |
| /B4/ | Tool for the demonstration and assessment of additionality, Version 6.0, EB 65 Annex 21 |
| /B5/ | Guideline on the Assessment of Investment Analysis, Version 5, EB 62, Annex 5 |
| /B6/ | Tool to calculate the emission factor for an electricity system - version 2.2.1 |
| /B7/ | CDM Glossary version 5, EB 47 |
| /B8/ | Guidelines on the demonstration and assessment of prior consideration of the CDM, version 4, EB 62 Annex 13 |



| | |
|-------|---|
| /B9/ | CERC Notification for Annual Escalation rates for Bid Evaluation dated 30/09/2009 http://www.cercind.gov.in/Escalation-rate/Notification-dated-30-09-09.pdf |
| /B10/ | CEA CO ₂ baseline database for Indian power sector version 7 http://www.cea.nic.in/reports/planning/cdm_co2/database_7.zip |
| /B11/ | IPCC Guidelines for National Greenhouse Gas Inventories- 2006 |
| /B12/ | VVM version 1.2 EB 55 Annex 1 |
| /B13/ | CERC (Terms and Conditions of Tariff) Regulations, 2009 Statement of Reason http://cercind.gov.in/2009/February09/SOR-regulations-on-T&C-of-tariff-05022009.pdf |
| /B14/ | CEA expert committee report on fuel for power generation; page 4 of 17 http://www.cea.nic.in/reports/articles/thermal/expert_committee_report_fuel.pdf |
| /B15/ | CEA CO ₂ baseline database for Indian power sector version 4 http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm |
| /B16/ | GERC (Gujarat Electricity Regulatory Commission) Tariff order of GSECL Case No.861/2006 dated 06.05.2006 (http://www.gercin.org/index.php?option=com_tarifforder&Itemid=32&year=2006&lang=en) |

Persons interviewed:

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

| | |
|-----|--|
| /1/ | Mr.K Satyanarayanan Executive Director & Company Secretary, Lanco Kondapalli Power Limited |
| /2/ | Mr. Rakesh Kumar Gupta- Chief Operating Officer Lanco Kondapalli Power Limited |
| /3/ | Mr.A Suresh Babu, Deputy, General Manager(Finance) Lanco Kondapalli Power Limited |
| /4/ | Mr. Sourish Dasgupta, Price Waterhouse Coopers (Consultants) |
| /5/ | Mr Vikram Srinivasan Price Waterhouse Coopers (Consultants) |
| /6/ | Mr. K Sudhakar Rao, Manager Sub Station(Nunna), Power Grid Corporation of India Limited |



7 CURRICULA VITAE OF THE DOE'S VALIDATION TEAM MEMBERS

Sanjay Patankar (Team Leader): Bureau Veritas Certification, Climate Change -Lead Verifier,

Educational qualifications: B.E. (Mech.) M.E. (Mech.)

He has over 20 years of experience in engineering manufacturing industry covering various functions like enterprise management, product design, engineering, tool & die design, improvements in the production shop, quality assurance & control and systems planning and implementation, including ISO 9001 based quality management systems. He is working for the last 4 years in Bureau Veritas Certification (India) Pvt. Ltd. as Lead Verifier for CDM and also Lead Auditor for ISO 9001, 14001 and OHSAS 18001 standards/specifications. Has undergone training related to Clean Development Mechanism and is currently involved in validation and verification of CDM project activities.

Prabhavtar Singh , (Team Member)

He has a Bachelors of Technology degree in Mechanical Engineering and Masters of Business Administration degree in Energy and Finance. Has 2 years of experience in manufacturing industry in functions like Quality, Process validation and QMS. Has over 1 year of experience as consultant in CDM/VCS. Has worked on various Wind, Hydro and Biomass based cogeneration projects. Has undergone training related to Clean Development Mechanism. He is working in Bureau Veritas Certification (India) Pvt. Ltd. as Verifier – Climate Change and currently involved in validation and verification of CDM projects.

Mr. H.B. Muralidhar, Internal Technical Reviewer

Bureau Veritas Certification, Climate Change Lead Verifier

He is a Graduate in Electrical Engineering with 25 years of experience power generation and distribution related fields as well as in management system auditing. Lead auditor in Bureau Veritas Certification for Environment Management System, Quality Management System and Occupational Health and Safety Management System. He is the Lead auditor for Environmental Management System, Quality Management system and Occupational Health and Safety Management System. He has undergone intensive training on Clean Development Mechanism. He is the technical expert & conducted Validation / Verification for more than 50 CDM Projects.



VALIDATION REPORT

APPENDIX A: LANCO KONDAPALLI POWER LIMITED CDM PROJECT VALIDATION PROTOCOL

VALIDATION PROTOCOL

Table 1 Validation requirements based on the Clean Development Mechanism Validation and Verification Manual (Version 01.2)

| CHECKLIST QUESTION | Ref. | § | COMMENTS | Draft Concl | Final Concl |
|--|------|------|--|----------------|----------------|
| 1. Approval | | | COUNTRY A (India) | | |
| a. Have all Parties involved approved the project activity? | VVM | 44 | Project Participant is requested to clarify, whether the Project activity has received the Letter of Approval (LoA) from the Host Party DNA. | CL 1 | OK |
| b. Has the DNA of each Party indicated as being involved in the proposed CDM project activity in section A.3 of the PDD provided a written letter of approval? (If yes, provide the reference of the letter of approval, any supporting documentation, and specify if the letter was received from the project participant or directly from the DNA) | VVM | 45 | Refer 1.a | (CL 1) | OK |
| c. Does the letter of approval from DNA of each Party involved: | VVM | 45 | Refer 1.a | | |
| i. confirm that the Party is a Party of the Kyoto Protocol? | VVM | 45.a | Refer 1.a | (CL 1) | OK |
| ii. confirm that participation is voluntary? | VVM | 45.b | Refer 1.a | (CL 1) | OK |
| iii. confirm that, in the case of the host Party, the proposed CDM project activity contributes to the sustainable development of the country? | VVM | 45.c | Refer 1.a | (CL 1) | OK |



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| CHECKLIST QUESTION | Ref. | § | COMMENTS | Draft Concl (CL 1) | Final Concl |
|--|------|------|--|-----------------------|-------------|
| iv. Refers to the precise proposed CDM project activity title in the PDD being submitted for registration? | VVM | 45.d | Refer 1.a | (CL 1) | OK |
| d. Is(are) the letter(s) of approval unconditional with respect to (i) to (iv) above? | VVM | 46 | Refer 1.a | (CL 1) | OK |
| e. Has(ve) the letter(s) of approval been issued by the respective Party's designated national authority (DNA) and is valid for the CDM project activity under validation? | VVM | 47 | Refer 1.a | (CL 1) | OK |
| f. Is there doubt with respect to the authenticity of the letter of approval? | VVM | 48 | Refer 1.a | (CL 1) | OK |
| g. If yes, was verified with the DNA that the letter of approval is authentic? | VVM | 48 | Refer 1.a | (CL 1) | OK |
| 2. Participation | | | PP1 (Lanco Kondapalli Power Limited) | | |
| a. Have all project participants been listed in a consistent manner in the project documentation? | VVM | 51 | The project participant, Lanco Kondapalli Power Limited (LKPL) has been consistently listed in the PDD. | OK | OK |
| b. Has the participation of the project participants in the project activity been approved by a Party to the Kyoto Protocol? | VVM | 51 | Project Participant is requested to clarify, whether the Project activity has received the Letter of Approval (LoA) from the Host Party DNA. | (CL 1) | OK |
| c. Are the project participants listed in tabular form in section A.3 of the PDD? | VVM | 52 | The PP is listed in tabular form in section A.3 of the PDD. | OK | OK |
| d. Is the information in section A.3 consistent with the contact details provided in annex 1 of the PDD? | VVM | 52 | The information provided in section A.3 is consistent with details provided in Annex 1 of the PDD. | OK | OK |
| e. Has the participation of each of the project participants been approved by at least one Party involved, either in a letter of approval or in a | VVM | 52 | Refer 1.a | (CL 1) | OK |



VALIDATION REPORT

| CHECKLIST QUESTION | Ref. | § | COMMENTS | Draft Concl | Final Concl |
|---|-------|--------|---|-------------|-------------|
| separate letter specifically to approve participation? (Provide reference of the approval document for each of the project participants) | | | | | |
| f. Are any entities other than those approved as project participants included in these sections of the PDD? | VVM | 52 | There are no other entities included in section A.3 of the PDD. | OK | OK |
| g. Has the approval of participation issued from the relevant DNA? | VVM | 53 | Refer 1.a | (CL 1) | OK |
| h. Is there doubt with respect to (g) above? | VVM | 53 | Refer 1.a | (CL 1) | OK |
| i. If yes, was verified with the DNA that the approval of participation is valid for the proposed CDM project participant? | VVM | 53 | Refer 1.a | (CL 1) | OK |
| 3. Project design document | | | | | |
| a. Is the PDD used as a basis for validation prepared in accordance with the latest template and guidance from the CDM Executive Board available on the UNFCCC CDM website? | VVM | 55 | The PDD used as a basis for validation is in accordance with the latest template and guidance from the CDM Executive Board. | OK | OK |
| b. Is the PDD in accordance with the applicable CDM requirements for completing the PDD? | VVM | 56 | The PDD is in accordance with the applicable CDM requirements for completing the PDD. | OK | OK |
| c. In CDM-PDD section A.1 are the following provided? | EB 41 | Ann 12 | | | |
| i. Title of project | EB 41 | Ann 12 | Title provided as, "Grid Connected Gas based Combined Cycle Power Project in Andhra Pradesh". | OK | OK |
| ii. Current version number and date of document | EB 41 | Ann 12 | Version no provided as 1.0 and date provided as 29/03/2012. | OK | OK |
| d. In CDM-PDD section A.2 are following provided (max. one page)? | EB 41 | Ann 12 | | | |
| i. A brief description of the project activity | EB | Ann | A brief description of the project activity covering | OK | OK |



VALIDATION REPORT

| CHECKLIST QUESTION | Ref. | § | COMMENTS | Draft Concl | Final Concl |
|---|-------|--------|--|---------------|-------------|
| covering purpose which includes the scenario existing prior to the start of project, present scenario and baseline scenario | 41 | 12 | purpose which includes the scenario existing prior to the start of project, present scenario and baseline are provided. | | |
| ii. Explanation on how the GHG emission reductions are effected | EB 41 | Ann 12 | Explanation has been provided in this section on how GHG emission reductions are affected. | OK | OK |
| iii. The PP's viewOK on the contribution of project activity to sustainable development | EB 41 | Ann 12 | The PP's view on the contribution of project activity to sustainable development is provided. | OK | OK |
| iv. Are there any changes/modifications compared to the webhosted PDD? | EB 41 | Ann 12 | | | |
| e. In CDM-PDD section A.3 are following provided in the tabular format? | EB 41 | Ann 12 | | | |
| i. List of project participants and parties | EB 41 | Ann 12 | Project participant identified as, "Lanco Kondapalli Power Limited". | OK | OK |
| ii. Identification of Host Party | | | Host party identified as, India. | OK | OK |
| iii. Indication whethre the Party wishes to be considered as project participant | EB 41 | Ann 12 | Indicated as, No. | OK | OK |
| f. In CDM-PDD section A.4.1 are following provided? | EB 41 | Ann 12 | | | |
| i. Technical description, location, host party(ies) and address as required | EB 41 | Ann 12 | Identified as Kondapalli village and Krishna district. | OK | OK |
| ii. Detailed physical location with unique identification of the project activity (eg. Longitude/latitude) – not to exceed one page | EB 41 | Ann 12 | The Geographical Coordinates provided in the webhosted PDD are not the same as per actual project location. PP also to provide the documentary evidence for the coordinates. | CAR 01 | OK |
| iii. Are there any changes/modifications compared to the webhosted PDD? | EB 41 | Ann 12 | | | |
| g. In CDM-PDD section A.4.2 is the list of categoreis of project activities provided? | EB 41 | Ann 12 | Provided as, "Energy industries (Renewable / Non renewable sources)" | OK | OK |



VALIDATION REPORT

| CHECKLIST QUESTION | Ref. | § | COMMENTS | Draft Concl | Final Concl |
|--|-------|--------|---|-------------|-------------|
| h. In CDM-PDD section A.4.3 are following provided? | EB 41 | Ann 12 | | | |
| i. A description of how environmentally safe and sound technology, and know-how, is transferred to the Host Party(ies) | EB 41 | Ann 12 | A description of how environmentally safe and sound technology, and know-how is provided. PDD indicates, "No technology transfer is involved in the project activity from Annex I countries". | OK | OK |
| ii. Explanation of purpose of project activity with scenario existing prior to the start of project, scope or present activities and the baseline scenario | EB 41 | Ann 12 | Explanation of purpose of project activity with scenario existing prior to the start of project, scope or present activities and the baseline scenario is provided. Project participant is requested to explain the gas supply arrangements (i.e. supply sources) for the project activity; in particular quantities of gas that would be procured from cheaper (administered price sources) and from market sources (private parties, spot market, etc.). | CL 11 | OK |
| iii. List and arrangement of the main manufacturing/production technologies, systems and equipments involved | EB 41 | Ann 12 | List and arrangement of the main manufacturing/production technologies, systems and equipments involved is provided. | OK | OK |
| iv. The emissions sources and GHGs involved | EB 41 | Ann 12 | PDD indicates, "In absence of the project activity, as identified in the section B4, the project proponent could have chosen a coal fired power plant of similar power output using sub-critical technology resulting in substantially higher GHG emissions". | OK | OK |
| v. Are there any changes/modifications compared to the webhosted PDD? | EB 41 | Ann 12 | | | |



VALIDATION REPORT

| CHECKLIST QUESTION | Ref. | § | COMMENTS | Draft Concl | Final Concl |
|--|-------|--------|--|----------------|----------------|
| i. In CDM-PDD section A.4.4 is the estimation of emission reductions provided as requested in a tabular format? | EB 41 | Ann 12 | The information in section A.4.4 clearly indicates the chosen crediting period and the estimated emission reductions during crediting period. | OK | OK |
| j. In CDM-PDD section A.4.5 is Information regarding Public funding provided? | EB 41 | Ann 12 | PDD indicates, "There is no ODA involved in development of the proposed CDM project activity". | OK | OK |
| k. In CDM-PDD section B.1 are following provided? | EB 41 | Ann 12 | | | |
| i. The approved methodology and version number | EB 41 | Ann 12 | The approved methodology provided as, "Baseline methodology for grid connected electricity generation plants using Natural Gas" and Version number provided as 03. | OK | OK |
| ii. Any methodologies or tools which the above approved methodology draws upon and their version number | EB 41 | Ann 12 | The tools referenced by the methodology are provided. | OK | OK |
| l. In CDM-PDD section B.2 are following provided? | EB 41 | Ann 12 | | | |
| i. Justification of the choice of methodology that the project activity meets each of the applicability conditions | EB 41 | Ann 12 | Justification for choice of methodology is provided. | OK | OK |
| ii. Documentations with references that had been used. This can be provided in Annex 3 instead | EB 41 | Ann 12 | The document references are provided in the PDD. | OK | OK |
| m. In CDM-PDD section B.3 are following provided? | EB 41 | Ann 12 | Refer 3.f.ii above | | |
| i. Description of all sources and gases included in the project boundary in the table | EB 41 | Ann 12 | | | |
| ii. A flow diagram of the project boundary physically delineating the project activity | EB 41 | Ann 12 | | | |
| iii. The flow diagram with all equipments, systems | EB | Ann | | | |



VALIDATION REPORT

| CHECKLIST QUESTION | Ref. | § | COMMENTS | Draft Concl | Final Concl |
|--|----------|-----------|---|----------------|----------------|
| and flows of mass and energy etc | 41 | 12 | | | |
| n. In CDM-PDD section B.4 are following provided? | EB 41 | Ann 12 | | | |
| i. Explanation how the most plausible baseline scenario is identified in accordance with the selected baseline methodology | EB 41 | Ann 12 | An explanation on how the most plausible baseline scenario is identified in accordance with the selected methodology is provided. | OK | OK |
| ii. Justification of key assumptions and rationales | EB 41 | Ann 12 | Justification of key assumptions and rationales is provided in section B.4 of the PDD. | OK | OK |
| iii. Transparent illustration of all data used to determine the baseline scenario (variables, parameters, data sources, etc.) | EB 41 | Ann 12 | Transparent illustration of all data used to determine the baseline scenario is provided. | OK | OK |
| iv. A transparent and detailed 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 project activity | EB 41 | Ann 12 | A transparent and detailed description is provided in section B.4 of the PDD. | OK | OK |
| v. Are there any changes/modifications compared to the webhosted PDD? | EB 41 | Ann 12 | There are no changes as compared to the webhosted PDD. | OK | OK |
| o. In CDM-PDD section B.5 are following provided? | EB 41 | Ann 12 | | | |
| i. Explanation of how and why this project activity is additional and therefore not the baseline scenario in accordance with the selected baseline methodology | EB 41 | Ann 12 | An explanation of how and why this project activity is additional and therefore not the baseline scenario in accordance with the selected baseline methodology is provided. | OK | OK |
| ii. Justification of key assumptions and rationales | EB 41 | Ann 12 | Justification of key assumptions and rationales is provided in section B.5 of the PDD. | Ok | OK |
| iii. Transparent illustration of all data used to determine the baseline scenario (variables, | EB 41 | Ann 12 | Transparent illustration of all data used to determine the baseline scenario is provided. | Ok | OK |



VALIDATION REPORT

| CHECKLIST QUESTION | Ref. | § | COMMENTS | Draft Concl | Final Concl |
|---|-------|--------|--|-------------|-------------|
| parameters, data sources etc) | | | | | |
| iv. Evidence that the incentive from the CDM was seriously considered in the decision to proceed with the project activity, if the starting date of the project activity is before the date of validation | EB 41 | Ann 12 | The project start date mentioned in PDD is 01/01/2010. The PDD indicates CDM was seriously considered in board meeting held on 14/10/2009. | OK | OK |
| p. In CDM-PDD section B.6.1 are following provided? | EB 41 | Ann 12 | | | |
| i. Explanation as to how the procedures, in the approved methodology to calculate project emissions, baseline emissions, leakage emissions and emission reductions are applied to the proposed project activity | EB 41 | Ann 12 | An explanation as to how the procedures, in the approved methodology to calculate project emissions, baseline emissions, leakage emissions and emission reductions are applied to the proposed project activity are provided. | OK | OK |
| ii. Equations used in calculating emission reductions | EB 41 | Ann 12 | The equations used in calculating emission reductions are provided. | OK | OK |
| iii. Explanation and justification for all relevant methodological choices, including different scenarios or cases, options and default values | EB 41 | Ann 12 | Explanation and justification for all relevant methodological choices, including different scenarios or cases, options and default values are provided in the PDD. | OK | OK |
| q. In CDM-PDD section B.6.2 are following provided? | EB 41 | Ann 12 | | | |
| i. A compilation of information on the data and parameters that are not monitored throughout the crediting period but that are determined only once and thus remains fixed throughout the crediting period AND that are available when validation is undertaken | EB 41 | Ann 12 | A compilation of information on the data and parameters that are not monitored throughout the crediting period and are determined only once and thus remains fixed throughout the crediting period and that are available when validation is undertaken is provided. | OK | OK |
| ii. The actual value applied | EB 41 | Ann 12 | The actual value that is applied is provided. | OK | OK |



VALIDATION REPORT

| CHECKLIST QUESTION | Ref. | § | COMMENTS | Draft Concl | Final Concl |
|---|-------|--------|---|-------------|-------------|
| iii. Explanation and justification for the choice of the source of data | EB 41 | Ann 12 | OK | OK | |
| iv. Clear and transparent references or additional documentation in Annex 3 | EB 41 | Ann 12 | The source provided for the $EF_{BM,y}$ and $EF_{OM,y}$ has been shown as CO2 Baseline Database for Indian Power Sector “ Version 6.0 dated 1 st April 2011, where as the PDD also refers to version 7.0 . PP to check the consistency of the source of data in the PDD and clarify. | CAR 02 | OK |
| v. Where values have been measured, a description of the measurement methods and procedures (e.g. which standards have been used), indicated the responsible person/entity having undertaken the measurement, the date of measurement(s) and the measurement results | EB 41 | Ann 12 | The values used in section B.6.2 of the PDD are taken from publicly available data and are not measured. | OK | OK |
| r. In CDM-PDD section B.6.3 are following provided? | EB 41 | Ann 12 | | | |
| i. A transparent <i>ex ante</i> calculation of project emissions, baseline emissions (or, where applicable, direct calculation of emission reductions) and leakage emissions expected during the crediting period, applying all relevant equations provided in the approved methodology | EB 41 | Ann 12 | A transparent <i>ex ante</i> calculation of project emissions, baseline emissions and leakage emissions expected are provided. | OK | OK |
| ii. Documentation how each equation is applied, in a manner that enables the reader to reproduce the calculation | EB 41 | Ann 12 | Documentation how each equation is applied is provided. | OK | OK |
| iii. Additional background information and or data in Annex 3, including relevant electronic files | EB 41 | Ann 12 | The spreadsheet of CER calculations is provided. | OK | OK |



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| (i.e. spreadsheets) | | | | | |
| s. In CDM-PDD section B.6.4 are the results of the <i>ex ante</i> estimation of emission reductions for all years of the crediting period, provided in a tabular format? | EB 41 | Ann 12 | Yes the section B.6.4 includes the results of the <i>ex ante</i> estimation of emission reductions for all years of the crediting period in a tabular format. | OK | OK |
| t. In CDM-PDD section B.7.1 are following provided? | EB 41 | Ann 12 | Refer 7.h & 7.j.ii below | | |
| i. Specific information on how the data and parameters that need to be monitored would actually be collected during monitoring for the project activity | EB 41 | Ann 12 | | | |
| ii. For each parameter the following below information, using the table provided: | EB 41 | Ann 12 | | | |
| a. The source(s) of data that will be actually used for the proposed project activity (e.g. which exact national statistics). Where several sources may be used, explain and justify which data sources should be preferred. | EB 41 | Ann 12 | | | |
| b. Where data or parameters are supposed to be measured, specify the measurement methods and procedures, including a specification which accepted industry standards or national or international standards will be applied, which measurement equipment is used, how the measurement is undertaken, which calibration procedures are applied, what is the accuracy of the measurement method, | EB 41 | Ann 12 | | | |



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| who is the responsible person/entity that should undertake the measurements and what is the measurement interval; (i) A description of the QA/QC procedures (if any) that should be applied; (ii) Where relevant: any further comment. Provide any relevant further background documentation in Annex 4. | | | | | |
| u. In CDM-PDD section B.7.2 are following provided? | EB 41 | Ann 12 | | | |
| i. A detailed description of the monitoring plan | EB 41 | Ann 12 | Refer 7.h & 7.j.ii below | OK | OK |
| ii. The operational and management structure that the project operator will implement in order to monitor emission reductions and any leakage effects generated by the project activity | EB 41 | Ann 12 | Yes | OK | OK |
| iii. The responsibilities for and institutional arrangements for data collection and archiving | EB 41 | Ann 12 | Refer 7.h & 7.j.ii below | OK | OK |
| iv. Indication that the monitoring plan reflect good monitoring practice appropriate to the type of project activity | EB 41 | Ann 12 | Refer 7.h & 7.j.ii below | OK | OK |
| v. Relevant further background information in Annex 4 | EB 41 | Ann 12 | Further background information is provided in Annex 4. | OK | OK |
| v. In CDM-PDD section B.8 are following provided? | EB 41 | Ann 12 | | | |
| i. Date of completion of the application of the methodology to the project activity study in DD/MM/YYYY | EB 41 | Ann 12 | Date of completion provided as 29/03/2012. | OK | OK |
| ii. Contact information of the person(s)/entity(ies) | EB | Ann | Lanco Kondapalli Power Ltd. has been indicated | OK | OK |



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| responsible for the application of the baseline and monitoring methodology to the project activity | 41 | 12 | as the responsible entity for application of the baseline and monitoring methodology to the project activity. | | |
| iii. Indication if the person/entity is also a project participant listed in Annex 1 | EB 41 | Ann 12 | PDD indicates, "Lanco Kondapalli Power Ltd. is the project proponent and contact details are given in the Annex 1". | OK | OK |
| w. In CDM-PDD section C.1.1 are following provided? | EB 41 | Ann 12 | | | |
| i. The starting date of a CDM project activity, which is the earliest of the date(s) on which the implementation or construction or real action of a project activity begins/has begun (EB33, Para 76/CDM Glossary of terms/EB41, Para 67) | EB 41 | Ann 12 | Refer 6.a.c below | | |
| ii. A description of how this start date has been determined, and a description of the evidence available to support this start date | EB 41 | Ann 12 | Refer 6.a.c below | | |
| iii. If this starting date is earlier than the date of publication of the CDM-PDD for global stakeholder consultation by a DOE, description in Section B.5 contain a of how the benefits of the CDM were seriously considered prior to the starting date (EB41, Para 68). | EB 41 | Ann 12 | PDD indicates, CDM benefits were considered in board meeting held on 14/10/2009. | OK | OK |
| x. In CDM-PDD section C.1.2 is the expected operational lifetime of the project activity in years and months provided? | EB 41 | Ann 12 | The expected operational lifetime of the project activity is provided as 20 years and 0 months in section C.1.2 of the PDD. | OK | OK |
| y. In CDM-PDD section C.2 is it stated whether the project activity will use a renewable or a fixed crediting period and is C.2.1 or C.2.2 completed accordingly? | EB 41 | Ann 12 | The PDD applies fixed crediting period. | OK | OK |



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| z. In CDM-PDD section C.2.1 is it indicated that each crediting period shall be at most 7 years and may be renewed at most two times, provided that, for each renewal, a designated operational entity determines and informs the Executive Board that the original project baseline is still valid or has been updated taking account of new data where applicable? | EB 41 | Ann 12 | Not applicable. | OK | OK |
| aa. In CDM-PDD section C.2.1.1 are dates in the following format: (DD/MM/YYYY) provided? | EB 41 | Ann 12 | Not applicable. | OK | OK |
| bb. In CDM-PDD section C.2.1.2 is the length of the first crediting period in years and months provided? | EB 41 | Ann 12 | Not applicable. | OK | OK |
| cc. In CDM-PDD section C.2.2 is the fixed crediting period at most ten (10) years provided? | EB 41 | Ann 12 | Length of crediting period indicated as 10 years and 0 months. | OK | OK |
| dd. In CDM-PDD section C.2.2.1 are the dates provided in the following format: (DD/MM/YYYY)? | EB 41 | Ann 12 | Provided as 01/07/2012 or date of registration whichever is later. | OK | OK |
| ee. In CDM-PDD section C.2.2.2 is the length of the crediting period in years and months Provided? | EB 41 | Ann 12 | Length of crediting period indicated as 10 years and 0 months. | OK | OK |
| ff. In CDM-PDD section D.2 are the conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the Host Party, if environmental impacts are considered significant by the project participants or the Host, provided? | EB 41 | Ann 12 | Refer 10.a below | | |
| gg. In CDM-PDD section E.1 are the following provided? | EB 41 | Ann 12 | | | |
| i. The process by which comments by local | EB | Ann | The PDD indicates, the stakeholders were invited | OK | OK |



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| stakeholders have been invited and compiled. An invitation for comments by local stakeholders shall be made in an open and transparent manner, in a way that facilitates comments to be received from local stakeholders and allows for a reasonable time for comments to be submitted. | 41 | 12 | by personal invitation on 26/08/2011. The meeting was conducted on 15/09/2011. | | |
| ii. The project activity is described in a manner, which allows the local stakeholders to understand the project activity, taking into account confidentiality provisions of the CDM modalities and procedures. | EB 41 | Ann 12 | The PDD indicates, "A presentation was given by Mr. A. Suresh Babu, covering all the aspects related to global warming, Kyoto protocol, project activity, CDM, importance of local stakeholder's views and technology implemented". | OK | OK |
| iii. The local stakeholder process has been completed before submitting the proposed project activity to the DOE for validation. | EB 41 | Ann 12 | The local stakeholder process was completed on 15/09/2011 before submitting the project activity to the DOE for validation. | OK | OK |
| hh. In CDM-PDD section E.2 are following provided? | EB 41 | Ann 12 | | | |
| i. Identification of local stakeholders that have made comments | EB 41 | Ann 12 | The local stakeholders who have made the comments have been identified. | OK | OK |
| ii. A summary of this comments. | EB 41 | Ann 12 | A summary of the comments made by stakeholders are provided. | OK | OK |
| ii. In CDM-PDD section E.3 is the explanation of how due account have been taken of comments received from local stakeholders provided? | EB 41 | Ann 12 | The PDD indicates, "There were no adverse comments received during the stakeholders meeting". | OK | OK |
| jj. In CDM-PDD Annex 1 are the following provided? | EB 41 | Ann 12 | | | |
| i. Contact information of project participants | EB 41 | Ann 12 | Contact information of project participants is provided in Annex 1 of the PDD. | OK | OK |



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| ii. For each organisation listed in section A.3 the following mandatory fields: Organization, Name of contact person, Street, City, Postfix/ZIP, Country, Telephone and Fax or e-mail | EB 41 | Ann 12 | All the mandatory details are provided in Annex 1 of the PDD. | OK | OK |
| kk. In CDM-PDD Annex 2 is information from Parties included in Annex I on sources of public funding for the project activity which shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of those Parties provided? | EB 41 | Ann 12 | PDD indicates, "No public funding available for the project activity". | OK | OK |
| ll. In CDM-PDD Annex 3 is the background information used in the application of the baseline methodology provided? | EB 41 | Ann 12 | Yes, the Annex 3 of the webhosted PDD gives description of the calculation of grid emission factor and the efficiency of the baseline alternative . | OK | OK |
| mm. In CDM-PDD Annex 4 is the background information used in the application of the monitoring methodology provided? | EB 41 | Ann 12 | Background information is provided in Annex 4 of the PDD. | OK | OK |
| 4. Project description | | | | | |
| a. Does the PDD contain a clear description of the project activity that provides the reader with a clear understanding of the precise nature of the project activity and the technical aspects of its implementation? | VVM | 58 | The service order placed on "M/s. Fichtner Consulting Engineers India Pvt. Ltd". Dated 11/09/2009, for preparation of DPR, for the proposed capacity of 770 MW Natural Gas based Combined Cycle Power plant, however in the webhosted PDD the capacity of Project Activity has been mentioned as 742 MW. PP is requested to clarify the difference in the capacities mentioned. | CL 02 | OK |
| b. Is the description of the proposed CDM project | VVM | 59 | | | |



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| activity as contained in the PDD: | | | | | |
| i. sufficiently covering all relevant elements? | VVM | 59 | Refer 4.a | | |
| ii. accurate? | VVM | 59 | Refer 4.a | | |
| iii. providing the reader with a clear understanding of the nature of the proposed CDM project activity? | VVM | 59 | The PDD provides the reader with a clear understanding of the nature of the proposed project activity. | OK | OK |
| iv. Are there any changes/modifications compared to the webhosted PDD? | VVM | 59 | | | |
| c. Is the proposed CDM project activity in existing facilities or or utilizing existing equipments? | VVM | 60 | The project activity is a green field project. | OK | OK |
| d. Is the CDM project activity one of the following types: | VVM | 60 | | | |
| i. Large scale? | VVM | 60 | The project activity is a Large scale project. | OK | OK |
| ii. Non-bundled small scale projects with emission reductions exceeding 15,000 tonnes per year? | VVM | 60 | Not applicable. | OK | OK |
| iii. Bundled small scale projects, each with emission reductions not exceeding 15,000 tonnes? | VVM | 60 | Not applicable. | OK | OK |
| e. If yes to (c) and (d) above, was a physical site inspection conducted to confirm that the description in the PDD reflects the proposed CDM project activity, unless other means are specified in the methodology? | VVM | 60 | The physical site visit was conducted on 04/05/2012 | OK | OK |
| f. If yes to (d.iii) above, was the number of physical site visits base on sampling? | VVM | 60 | Not applicable. | OK | OK |
| g. If yes is the sampling size appropriately justified through statistical analysis? | VVM | 60 | Not applicable. | OK | OK |
| h. For other individual proposed small scale CDM project activities with emission reductions not | VVM | 61 | Not applicable. | OK | OK |



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| exceeding 15,000 tonnes per year, was a physical site inspection conducted? | | | | | |
| i. For all other proposed CDM project activities not referred to in paragraphs 59 – 61, was a physical site inspection conducted? | VVM | 62 | The physical site visit was conducted on 04/05/2012. | OK | OK |
| j. If no, was it appropriately justified? | VVM | 62 | Not applicable. | OK | OK |
| k. Does the proposed CDM project activity involve the alteration of an existing installation or process? | VVM | 63 | No, the proposed CDM project activity does not involve alteration, it is a new activity. | OK | OK |
| l. If yes, does the project description clearly state the differences resulting from the project activity compared to the pre-project situation? | VVM | 63 | Not applicable | OK | OK |
| 5. Baseline and monitoring methodology | | | | | |
| a. General requirement | | | | | |
| a. Do the the baseline and monitoring methodologies selected by the project participants comply with the methodologies previously approved by the CDM Executive Board? | VVM | 65 | The PDD applies the methodology AM0029 (Baseline methodology for grid connected electricity generation plants using Natural Gas), Version 03 approved by EB on EB 39 th meeting. | OK | OK |
| b. Is the selected methodology applicable to the project activity? | VVM | 66 | Refer to (5.b.a) below | - | - |
| c. Had the PP correctly applied the selected methodology? | VVM | 66 | Refer to (5.b.d) below | - | - |
| d. Had the selected methodology been correctly applied with respect to project boundary? | VVM | 67 | Refer to (5.c) below | - | - |
| e. Had the selected methodology been correctly applied with respect to baseline identification? | VVM | 67 | Refer to (5.d) below | - | - |
| f. Had the selected methodology been correctly | VVM | 67 | Refer to (5.e) below | - | - |



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| applied with respect to Algorithms and/or formulae used to determine emission reductions? | | | | | |
| g. Had the selected methodology been correctly applied with respect to additionality? | VVM | 67 | | | |
| Does the PDD explain the additionality of the project activity on the basis of the following steps : I. Benchmark investment analysis II. Common practice analysis | | | The selected methodology has been correctly applied with respect to additionality. | OK | OK |



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| h. Had the selected methodology been correctly applied with respect to monitoring methodology? | VVM | 67 | | | |
| i. Does the PDD refer to the AM 0029 monitoring methodology in conjunction with the baseline methodology w.r.t. the applicability conditions described as above in (g) ? | | | The selected methodology has been correctly applied with respect to monitoring methodology. | OK | OK |
| <i>b. Applicability of the selected methodology to the project activity</i> | | | | | |
| a. Is the selected baseline and monitoring methodology, previously approved by the CDM Executive Board, applicable to the project activity, including that the used version valid? | VVM | 68 | The PDD applies the methodology AM0029 (Baseline methodology for grid connected electricity generation plants using Natural Gas), Version 03, the latest available in the UNFCCC website. | OK | OK |
| b. Has the DOE applied specific guidance provided by the CDM Executive Board in respect to the applicable approved methodology? | VVM | 69 | Yes | OK | OK |
| c. Is the methodology correctly quoted? | VVM | 70 | The methodology is correctly quoted as, Baseline methodology for grid connected electricity generation plants using Natural Gas | OK | OK |
| d. Are the applicability conditions of the methodology met? | VVM | 71 | | | |
| i. Does the project activity involve the construction and operation of a natural gas fired power plant ? | | | The project activity is the construction and operation of a new natural gas fired power plant. | OK | OK |
| ii. Is the natural gas based power plant connected to the grid ? | | | The power plant is connected to the Southern Grid through 400KV double circuit line at PGCIL Substation at Nunna . | OK | OK |
| iii. Does the project activity use any secondary fuel? | | | The project activity will only use Natural Gas as fuel. | OK | OK |



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| iv. Are the physical and geographical boundaries of the baseline grid , the power plant is connected to –clearly identifiable ? | | | The geographical and physical boundaries of the baseline grid are clearly defined. | OK | OK |
| v. Is the information pertaining to the grid and the estimation of baseline emissions, publicly available ? | | | Information on the baseline grid and emission factors is publicly available from the CEA database. | OK | OK |
| vi. Has it be shown by the project participant that natural gas required for the project activity is sufficiently available and that future natural gas based power plants comparable in size to the project activity would not be constrained as a result of the use of natural gas by the project activity ? | | | <p>In section B.2 of webhosted PDD it is not clear what is the year of publication of data for the Production of natural gas in India.</p> <p>It is not clear from which source the expected produce by RIL @ 80MMSCMD is taken.</p> <p>The URL provided in the foot notes: 9, 10, 13, 14, 15 are not accessible.</p> | CL 03 | OK |



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| e. Is the proeject activity expected to result in emissions other than those allowed by the methodology? | VVM | 71 | The project activity is not expected to result in emissions other than those allowed by the methodology. | OK | OK |
| f. Is the choice of the methodology justified? | VVM | 71 | The choice of methodology is justified. | OK | OK |
| g. Have the project participants shown that the project activity meets each of the applicability conditions or the approved methodology? | VVM | 71 | Yes , the project participant has shown that the project activity meets each of the applicability conditions. | OK | OK |
| h. Have the project participants shown that the project activity meets each of the applicability conditions of any tool or other methodology component referred to the methodology? | VVM | 71 | Refer CL 03 above | | |
| i. Is the DOE, based on local and sectoral knowledge, aware that comparable information is available from sources other than that used in the PDD? | VVM | 71 | Refer CL 03 above | | |
| j. If yes, was the PDD cross checked against the other sources to confirm that the project activity meets the applicability conditions of the methodology? (provide the reference to these choices) | VVM | 71 | Refer CL 03 above | | |
| k. Can a determination regarding the applicability of the selected methodology to the proposed CDM project activity be made? | VVM | 72 | Refer CL 03 above | | |
| l. If no, clarification of the methodology was requested, in accordance with the guidance provided by the CDM Executive Board? | VVM | 72 | | | |
| m. If answer to (5.b.d) above is "no", revision or deviation from the methodology was requested, in accordance with the guidance provided by the | VVM | 73 | | | |



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| CDM Executive Board? | | | | | |
| n. If yes to (5.b.l) and (5.b.m) above, a request for registration was submitted before the CDM Executive Board has approved the proposed deviation or revision? | VVM | 74 | | | |
| c. Project boundary | | | | | |
| a. Does the PDD correctly describe the project boundary, including the physical delineation of the proposed CDM project activity included within the project boundary for the purpose of calculating project and baseline emissions for the proposed CDM project activity? | VVM | 78 | <p>The project boundary described in the Webhosted PDD is not meeting the requirements of Guidelines for Completing the PDD EB 41 Annex 12.</p> <p>The project boundary diagram in the PDD does not depict:</p> <ul style="list-style-type: none"> I. The mass and energy parameters to be monitored (measuring points). II. The source for auxiliary power consumption. III. The depiction of the project boundary is not as per the actual site conditions observed during validation site visit. | CAR 03 | OK |
| b. Is the delineation in the PDD of the project boundary correct and include identification of all locations, processes and equipment including secondary equipment and associated processes such as logistics etc.? | VVM | 79 | Refere 5.c.a above | | |
| c. Does the delineation in the PDD of the project boundary meet the requirements of the selected | VVM | 79 | Refere 5.c.a above | | |



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| baseline? | | | | | |
| d. Have changes been made to the project boundary in comparison to the webhosted PDD. If yes please comment on the reason for the changes. | VVM | 79 | | | |
| e. Have all sources and GHGs required by the methodology been included within the project boundary? | VVM | 79 | All the GHG's involved in the project activity is not described in section A.2 of the PDD. | Ok | Ok |
| f. Does the methodology allow project participant to choose whether a source or gas is to be included within the project boundary | VVM | 79 | The methodology does not allow the project participant to choose, whether a source or gas is to be included in the project boundary. | OK | OK |
| g. If yes, have the project participants justified that choice? | VVM | 79 | Not Applicable. | OK | OK |
| h. If yes, is the justification provided reasonable? (provide reference to the supporting documented evidence provided by the project participants) | VVM | 79 | Not Applicable. | OK | OK |
| d. Baseline identification | | | | | |
| a. Does the PDD identify the baseline for the proposed CDM project activity, defined as the scenario that reasonably represents the anthropogenic emissions by sources of GHGs that would occur in the absence of the proposed CDM project activity? | VVM | 81 | The PDD identifies the baseline scenario that reasonably represents the anthropogenic emissions by sources of GHGs that would occur in the absence of the proposed CDM project activity. | OK | OK |
| b. Has any procedure contained in the methodology to identify the most reasonable baseline scenario, been correctly applied? | VVM | 82 | | | |
| i. Has the PDD derived the baseline scenario through an identification of various alternatives to | | | i. Project participant has considered a total of 7 alternative scenarios for baseline determination. | CL 10 | OK |



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| <p>the project activity?</p> <p>ii. Are all plausible alternatives to the project activity considered in the analysis ?</p> <p>iii. Do the alternatives considered provide outputs or services comparable to the project activity ?</p> <p>iv. Do the alternatives include at least the following :</p> <ul style="list-style-type: none"> • The project activity not implemented as a CDM project; • Power generation using natural gas, but technologies other than the project activity; • Power generation technologies using energy sources other than natural gas; • Import of electricity from connected grids, including the possibility of new interconnections. <p>v. Do the alternatives consider all power plant technologies that have recently been constructed or are under construction or being planned ?</p> <p>vi. Is a clear description of each baseline scenario alternative, including information on the</p> | | | <p>ii. All the alternatives considered are plausible. However, only those alternatives realistically plausible are taken into final consideration</p> <p>iii. It has been shown in the PDD that alternatives provide similar outputs and services comparable to the project activity</p> <p>iv. The PDD includes, in section B.4 all the alternatives required as a minimum to be considered, as per the methodology</p> <p>v. Yes</p> <p>vi. Each of the alternatives is clearly described in the PDD.</p> | | |



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| <p>technology such as efficiency and technical lifetime, provided in the PDD ?</p> <p>vii. Are all the alternatives considered for the baseline scenario in compliance with the legal and regulatory requirements ?</p> | | | <p>vii. All the alternatives considered are in compliance with the legal and regulatory requirements of the host country.</p> <p>PP is requested to clarify why in section B.4 “New power plant (s) based on Solar technologies” cannot be considered as plausible baseline alternative</p> | | |
| c. Does the selected methodology require use of tools (such as the “Tool for the demonstration and assessment of additionality” and the “Combined tool to identify the baseline scenario and demonstrate additionality”) to establish the baseline scenario? | VVM | 82 | The methodology does not require use of any tools to establish the baseline scenario. | OK | OK |
| d. If yes, was the methodology consulted on the application of these tools? (In such cases, the guidance in the methodology shall supersede the tool.) | VVM | 82 | | | |
| i. Specific questions per methodology regarding application of tools to establish the most reasonable baseline scenario. | | | The methodology does not require use of any tools to establish the baseline scenario. | OK | OK |
| e. Does the methodology require several alternative scenarios to be considered in the identification of the most reasonable baseline scenario? | VVM | 83 | The methodology requires several alternative scenarios to be included in the identification of most reasonable baseline scenario. | OK | OK |
| f. If yes, are all scenarios that are considered by the project participants and are supplementary to those required by the methodology reasonable in the context of the proposed CDM project activity? | VVM | 83 | All scenarios required by the methodology is considered by the project participant. | OK | OK |



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| g. Has any reasonable alternative scenario been excluded? | VVM | 83 | No scenarios prescribed by the methodology are excluded. | OK | OK |
| h. Is the baseline scenario identified reasonably supported by: | VVM | 84 | | | |
| i. Assumptions? | VVM | 84 | Yes | OK | OK |
| ii. Calculations? | VVM | 84 | PP has submitted the Levelized Tariff calculation sheets. | OK | OK |
| iii. Rationales? | VVM | 84 | | | |
| i. Are the documents and sources referred to in the PDD correctly quoted and interpreted? | VVM | 84 | Yes the documents and sources referred to in the PDD are correctly quoted and interpreted. | OK | OK |
| j. Was the information provided in the PDD cross checked with other verifiable and credible sources, such as local expert opinion, if available? (identify the sources) | VVM | 84 | Not Applicable | OK | Ok |
| k. Have all applicable CDM requirements been taken into account in the identification of the baseline scenario for the proposed CDM project activity? | VVM | 85 | All applicable CDM requirements have been taken into account in the identification of the baseline scenario for the proposed CDM project activity. | OK | OK |
| l. Have all relevant policies and circumstances been identified and correctly considered in the PDD, in accordance with the guidance by the CDM Executive Board? | VVM | 85 | All relevant policies and circumstances have been identified and correctly considered in the PDD, in accordance with the guidance by the CDM Executive Board. | OK | OK |
| m. Does the PDD provide a verifiable 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? | VVM | 86 | Project participant has identified the baseline scenario by using the Steps specified by the approved applicable methodology AM0029 Version 3. | OK | OK |



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| <i>e. Algorithms and/or formulae used to determine emission reductions</i> | | | | | |
| a. Do the steps taken and equations applied to calculate project emissions, baseline emissions, leakage and emission reductions comply with the requirements of the selected baseline and monitoring? | VVM | 89 | <p>The steps taken and equations applied to calculate project emissions, baseline emissions, leakage and emission reductions comply with the requirements of the selected baseline and monitoring.</p> <p>However, the baseline emissions, project and leakage emissions can not be uniform for all years of operation of the project activity. For leap years, there is one extra day which has to be accounted for.</p> | CAR-07 | OK |
| b. Have the equations and parameters in the PDD been correctly applied with respect those in the select approved methodology? | VVM | 90 | | | |
| i. Specific questions per methodology regarding steps taken and equations and parameters applied to calculate project emissions, baseline emissions, leakage and emission reductions. | | | The steps taken and equations applied to calculate project emissions, baseline emissions, leakage and emission reductions comply with the requirements of the selected baseline and monitoring. | OK | OK |
| c. Does the methodology provide for selection between different options for equations or parameters? | VVM | 90 | The methodology does not provide for selection between different options for equations or parameters. | OK | OK |
| d. If yes, has adequate justification been provided (based on the choice of the baseline scenario, context of the proposed CDM project activity and other evidence provided)? | VVM | 90 | Not Applicable. | OK | OK |
| e. If yes, have correct equations and parameters | VVM | 90 | Refer to (5.e.b) above | CAR-06 | OK |



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| been used, in accordance with the methodology selected? | | | <p>In section B.6.3 of the PDD, the calculation of fuel consumption $FC_{f,y}$ (used further to determine the Project emissions PE_y), is based on "Net Power Generation" (5,359,184 MWh), which is incorrect. Fuel consumption should be based on the "Gross Generation by the project activity", and not the net generation.</p> <p>The value of $\sum EG_j$ (35268 million kWh) used for the determination of the baseline upstream fugitive methane emission factor is not linked to the values in the source cells in the emission reduction spreadsheet</p> | CL-13 | |
| f. Will data and parameters be monitored throughout the crediting period of the proposed CDM project activity? | VVM | 91 | The parameters $FC_{f,y}$, $NCV_{f,y}$, $EG_{PJ,y}$ and $EF_{Grid,y}$ will be monitored throughout the crediting period. | OK | OK |
| g. If no, and these data and parameters will remain fixed throughout the crediting period, are all data sources and assumptions: | VVM | 91 | The other parameters will remain fixed throughout the crediting period. | OK | OK |
| i. Appropriate and correct? | VVM | 91 | Yes | OK | OK |
| ii. Applicable to the proposed CDM project activity? | VVM | 91 | The data sources and assumptions are applicable to the project activity. | OK | OK |
| iii. Resulting in a conservative estimate of the emission reductions? | VVM | 91 | The data sources and assumptions result in a conservative estimate of emission reductions. | OK | OK |
| h. Will data and parameters be monitored on implementation and hence become available only after validation of the project activity? | VVM | 91 | The parameters $FC_{f,y}$, $NCV_{f,y}$, $EG_{PJ,y}$ and $EF_{Grid,y}$ will be monitored on implementation and hence become available only after validation of the project activity. | OK | OK |
| i. If yes, are the estimates provided in the PDD for | VVM | 91 | The estimates provided in the PDD for these data | OK | OK |



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| these data and parameters reasonable? | | | and parameters reasonable. | | |
| 6. Additionality of a project activity | | | | | |
| a. Does the PDD describe how a proposed CDM project activity is additional? | VVM | 94 | Yes, the section B.5 of the PDD describes the additionality of the project activity as per the steps prescribed by the methodology. The PP has used Benchmark analysis to prove additionality. | OK | OK |
| b. Were the following steps of the tool to assess additionality used: | EB 39 | Ann 10 | | | |
| i. Identification of alternatives to the project activity? | EB 39 | Ann 10 | The PDD adopts the 3 steps prescribed by the methodology and does not use any tool to demonstrate additionality. | OK | OK |
| ii. Investment analysis to determine that the proposed project activity is either: 1) not the most economically or financially attractive, or 2) not economically or financially feasible? | EB 39 | Ann 10 | The PDD adopts the 3 steps prescribed by the methodology and does not use any tool to demonstrate additionality. | OK | OK |
| iii. Barriers analysis? | EB 39 | Ann 10 | The PDD adopts the 3 steps prescribed by the methodology and does not use any tool to demonstrate additionality. | OK | OK |
| iv. Common practice analysis? | EB 39 | Ann 10 | Yes | OK | OK |
| c. In step 1 (i) have all the sub-steps as below been followed? | EB 39 | Ann 10 | | | |
| i. Sub-step 1a: Define alternatives to the project activity | EB 39 | Ann 10 | The PDD adopts the 3 steps prescribed by the methodology and does not use any tool to demonstrate additionality. | OK | OK |
| ii. Sub-step 1b: Consistency with mandatory laws and regulations | EB 39 | Ann 10 | The PDD adopts the 3 steps prescribed by the methodology and does not use any tool to demonstrate additionality. | OK | OK |



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| d. Have the following alternatives been included while defining alternatives as per sub-step 1a? | EB 39 | Ann 10 | | | |
| i. (a) The proposed project activity undertaken without being registered as a CDM project activity; | EB 39 | Ann 10 | The PDD adopts the 3 steps prescribed by the methodology and does not use any tool to demonstrate additionality. | OK | OK |
| ii. (b) Other realistic and credible alternative scenario(s) to the proposed CDM project activity scenario that deliver outputs services or services with comparable quality, properties and application areas, taking into account, where relevant, examples of scenarios identified in the underlying methodology; | EB 39 | Ann 10 | The PDD adopts the 3 steps prescribed by the methodology and does not use any tool to demonstrate additionality. | OK | OK |
| iii. (c) If applicable, continuation of the current situation (no project activity or other alternatives undertaken). | EB 39 | Ann 10 | The PDD adopts the 3 steps prescribed by the methodology and does not use any tool to demonstrate additionality. | OK | OK |
| e. Has the project participant included the technologies or practices that provide outputs or services with comparable quality, properties and application areas as the proposed CDM project activity and that have been implemented previously or are currently being introduced in the relevant country/region? | EB 39 | Ann 10 | The PDD adopts the 3 steps prescribed by the methodology and does not use any tool to demonstrate additionality. | OK | OK |
| f. Has the outcome of Step 1a: Identified realistic and credible alternative scenario(s) to the project activity done correctly? Please briefly mention the outcome. | EB 39 | Ann 10 | The PDD adopts the 3 steps prescribed by the methodology and does not use any tool to demonstrate additionality. | OK | OK |
| g. Is the alternative(s) in compliance with all mandatory applicable legal and regulatory requirements, even if these laws and regulations | EB 39 | Ann 10 | The PDD adopts the 3 steps prescribed by the methodology and does not use any tool to demonstrate additionality. | OK | OK |



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| have objectives other than GHG reductions, e.g. to mitigate local air pollution.? | | | | | |
| h. If an alternative does not comply with all mandatory applicable legislation and regulations, has it been shown that, based on an examination of current practice in the country or region in which the law or regulation applies, those applicable legal or regulatory requirements are systematically not enforced and that noncompliance with those requirements is widespread in the country? | EB 39 | Ann 10 | The PDD adopts the 3 steps prescribed by the methodology and does not use any tool to demonstrate additionality. | OK | OK |
| i. Has the outcome of Step 1b: Identified realistic and credible alternative scenario(s) to the project activity that are in compliance with mandatory legislation and regulations taking into account the enforcement in the region or country and EB decisions on national and/or sectoral policies and regulations done correctly? Please state the outcome. | EB 39 | Ann 10 | The PDD adopts the 3 steps prescribed by the methodology and does not use any tool to demonstrate additionality. | OK | OK |
| j. Has PP selected Step 2 (Investment analysis) or Step 3 (Barrier analysis) or both Steps 2 and 3? | EB 39 | Ann 10 | The PDD adopts the 3 steps prescribed by the methodology and does not use any tool to demonstrate additionality. | OK | OK |
| k. In step 2, have all the sub-steps as below been followed? | EB 39 | Ann 10 | | | |
| i. Sub-step 2a: Determine appropriate analysis method; | EB 39 | Ann 10 | NO | OK | OK |
| ii. Sub-step 2b: Option I. Apply simple cost analysis; | EB 39 | Ann 10 | NO | OK | OK |
| iii. Sub-step 2b: Option II. Apply investment | EB | Ann | No, the project participant has done benchmark | OK | OK |



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| comparison analysis; | 39 | 10 | analysis. | | |
| iv. Sub-step 2b: Option III. Apply benchmark analysis; | EB 39 | Ann 10 | The project participant has done benchmark analysis as required by the approved applied Methodology AM 0029 Version 03 | OK | OK |
| v. Sub-step 2c: Calculation and comparison of financial indicators (only applicable to Options II and III); | EB 39 | Ann 10 | Yes, Calculation and comparison of financial indicators done by project participant. | OK | OK |
| vi. Sub-step 2d: Sensitivity analysis (only applicable to Options II and III). | EB 39 | Ann 10 | Yes, Sensitivity analysis done by project participant. | OK | OK |
| I. In sub-step 2a has the determination of appropriate method of analysis done as per the guidance as below? | EB 39 | Ann 10 | | OK | OK |
| i. Simple cost analysis if the CDM project activity and the alternatives identified in Step 1 generate no financial or economic benefits other than CDM related income (Option I). | EB 39 | Ann 10 | No | OK | OK |
| ii. Otherwise, use the investment comparison analysis (Option II) or the benchmark analysis (Option III). Specify option used with justification. | EB 39 | Ann 10 | The project participant has done benchmark analysis as required by the approved applied Methodology AM 0029 Version 03 | OK | OK |
| m. Has the below guideline followed for sub-step 2b Option I. Apply simple cost analysis? Document the costs associated with the CDM project activity and the alternatives identified in Step1 and demonstrate that there is at least one alternative which is less costly than the project activity. | EB 39 | Ann 10 | Not Applicable | OK | OK |
| n. Has the below guideline followed for sub-step 2b Option II. Apply investment comparison analysis? Identify the financial indicator, such as IRR, NPV, | EB 39 | Ann 10 | Not Applicable | OK | OK |



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| cost benefit ratio, or unit cost of service most suitable for the project type and decision-making context. Please specify | | | | | |
| o. Has the below guideline followed for Sub-step 2b: Option III. Apply benchmark analysis? | EB 39 | Ann 10 | | | |
| i. Identify the financial/economic indicator, such as IRR, most suitable for the project type and decision context. | EB 39 | Ann 10 | Post tax project IRR has been chosen as the financial indicator. | OK | OK |
| ii. 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. Only in the particular case where the project activity can be implemented by the project participant, the specific financial/economic situation of the company undertaking the project activity can be considered. | EB 39 | Ann 10 | The project participant has used standard available data from CEA/CERC guidelines. | OK | OK |
| iii. Discount rates and benchmarks shall be derived from: (a) Government bond rates, increased by a suitable risk premium to reflect private investment and/or the project type, as substantiated by an independent (financial) expert or documented by official publicly available financial data; (b) Estimates of the cost of financing and required return on capital (e.g. commercial lending rates and guarantees | EB 39 | Ann 10 | Benchmark analysis has been used to demonstrate additionality. PP has chosen project IRR as financial indicator and WACC as Benchmark. The data required are used from Government/official approved data from Central Electricity Regulatory Commission and Central Electricity Authority. | OK | OK |



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| required for the country and the type of project activity concerned), based on bankers views and private equity investors/funds' required return on comparable projects; (c) A company internal benchmark (weighted average capital cost of the company), only in the particular case referred to above in 2. The project developers shall demonstrate that this benchmark has been consistently used in the past, i.e. that project activities under similar conditions developed by the same company used the same benchmark; (d) Government/official approved benchmark where such benchmarks are used for investment decisions; (e) Any other indicators, if the project participants can demonstrate that the above Options are not applicable and their indicator is appropriately justified. Please specify benchmark and justify. | | | | | |
| p. Has the below guideline followed for Sub-step 2c: Calculation and comparison of financial indicators (only applicable to Options II and III)? | EB 39 | Ann 10 | | | |
| i. Calculate the suitable financial indicator for the proposed CDM project activity and, in the case of Option II above, for the other alternatives. Include all relevant costs (including, for example, the investment cost, the operations and maintenance costs), and revenues (excluding CER revenues, but possibly including inter alia subsidies/fiscal incentives, | EB 39 | Ann 10 | | | |



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| ODA, etc, where applicable), and, as appropriate, non-market cost and benefits in the case of public investors if this is standard practice for the selection of public investments in the host country. | | | | | |
| ii. Present the investment analysis in a transparent manner and provide all the relevant assumptions, preferably in the CDM-PDD, or in separate annexes to the CDM-PDD. | EB 39 | Ann 10 | OK, the investment analysis in a transparent manner is provided in PDD. | OK | OK |
| iii. Justify and/or cite assumptions. | EB 39 | Ann 10 | OK, the assumptions are given in Appendix 3 of the PDD | OK | OK |
| iv. In calculating the financial/economic indicator, the project's risks can be included through the cash flow pattern, subject to project-specific expectations and assumptions. | EB 39 | Ann 10 | OK | OK | OK |
| v. Assumptions and input data for the investment analysis shall not differ across the project activity and its alternatives, unless differences can be well substantiated. | EB 39 | Ann 10 | OK | OK | OK |
| vi. Present in the CDM-PDD a clear comparison of the financial indicator for the proposed CDM activity. Please specify details for above. | EB 39 | Ann 10 | Clear Comparison of the financial indicator is presented in section B.5 of the PDD. | Ok | OK |
| q. Has the below guideline followed for Sub-step 2d: Sensitivity analysis (only applicable to Options II and III)? Include a sensitivity analysis that shows whether the conclusion regarding the financial/economic attractiveness is robust to reasonable variations in the critical assumptions. | EB 39 | Ann 10 | Yes | OK | OK |
| r. Has the outcome of Step 2 clearly mentioned | EB | Ann | The PDD adopts the 3 steps prescribed by the | OK | OK |



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| with justification? | 39 | 10 | methodology and does not use any tool to demonstrate additionality. | | |
| s. In step 3: Barrier analysis have all the sub-steps as below been followed? | EB 39 | Ann 10 | | | |
| i. Sub-step 3a: Identify barriers that would prevent the implementation of the proposed CDM project activity; | EB 39 | Ann 10 | The PDD adopts the 3 steps prescribed by the methodology and does not use any tool to demonstrate additionality. | OK | OK |
| ii. Sub-step 3 b: Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed project activity). | EB 39 | Ann 10 | The PDD adopts the 3 steps prescribed by the methodology and does not use any tool to demonstrate additionality. | OK | OK |
| t. Has the below guideline followed for Sub-step 3a: Identify barriers that would prevent the implementation of the proposed CDM project? | EB 39 | Ann 10 | | | |
| i. (a) Investment barriers: For alternatives undertaken and operated by private entities: Similar activities have only been implemented with grants or other non-commercial finance terms. No private capital is available from domestic or international capital markets due to real or perceived risks associated with investment in the country where the proposed CDM project activity is to be implemented, as demonstrated by the credit rating of the country or other country investments reports of reputed origin. | EB 39 | Ann 10 | The PDD adopts the 3 steps prescribed by the methodology and does not use any tool to demonstrate additionality. | OK | OK |
| ii. (b) Technological barriers: Skilled and/or properly trained labour to operate and maintain the technology is not available in the relevant | EB 39 | Ann 10 | The PDD adopts the 3 steps prescribed by the methodology and does not use any tool to demonstrate additionality. | OK | OK |



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| country/region, which leads to an unacceptably high risk of equipment disrepair and malfunctioning or other underperformance; Lack of infrastructure for implementation and logistics for maintenance of the technology, Risk of technological failure: the process/technology failure risk in the local circumstances is significantly greater than for other technologies that provide services or outputs comparable to those of the proposed CDM project activity, as demonstrated by relevant scientific literature or technology manufacturer information, The particular technology used in the proposed project activity is not available in the relevant region. | | | | | |
| iii. (c) Barriers due to prevailing practice: The project activity is the “first of its kind”. | EB 39 | Ann 10 | The PDD adopts the 3 steps prescribed by the methodology and does not use any tool to demonstrate additionality. | OK | OK |
| iv. (d) Other barriers, preferably specified in the underlying methodology as examples. | EB 39 | Ann 10 | The PDD adopts the 3 steps prescribed by the methodology and does not use any tool to demonstrate additionality. | OK | OK |
| u. Has the outcome from Step 3a clearly mentioned in PDD? | EB 39 | Ann 10 | The PDD adopts the 3 steps prescribed by the methodology and does not use any tool to demonstrate additionality. | OK | OK |
| v. Has the below guideline followed for Sub-step 3 b: Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed project activity)? | EB 39 | Ann 10 | | | |



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| i. If the identified barriers also affect other alternatives, explain how they are affected less strongly than they affect the proposed CDM project activity. In other words, demonstrate that the identified barriers do not prevent the implementation of at least one of the alternatives. Any alternative that would be prevented by the barriers identified in Sub-step 3a is not a viable alternative, and shall be eliminated from consideration. | EB 39 | Ann 10 | The PDD adopts the 3 steps prescribed by the methodology and does not use any tool to demonstrate additionality. | OK | OK |
| ii. Provide transparent and documented evidence, and offer conservative interpretations of this documented evidence, as to how it demonstrates the existence and significance of the identified barriers and whether alternatives are prevented by these barriers. | EB 39 | Ann 10 | The PDD adopts the 3 steps prescribed by the methodology and does not use any tool to demonstrate additionality. | OK | OK |
| iii. The type of evidence to be provided should include at least one of the following: (a) Relevant legislation, regulatory information or industry norms; (b) Relevant (sectoral) studies or surveys (e.g. market surveys, technology studies, etc) undertaken by universities, research institutions, industry associations, companies, bilateral/multilateral institutions, etc; (c) Relevant statistical data from national or international statistics; (d) Documentation of relevant market data (e.g. market prices, tariffs, rules); (e) Written documentation of independent expert judgments from industry, | EB 39 | Ann 10 | The PDD adopts the 3 steps prescribed by the methodology and does not use any tool to demonstrate additionality. | OK | OK |



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| educational institutions (e.g. universities, technical schools, training centres), industry associations and others. Please specify. | | | | | |
| w. Has the outcome from Step 3 clearly mentioned in PDD? | EB 39 | Ann 10 | The PDD adopts the 3 steps prescribed by the methodology and does not use any tool to demonstrate additionality. | OK | OK |
| x. In step 4: Common practise analysis have all the sub-steps as below followed? | EB 39 | Ann 10 | <i>Refer 5.e below</i> | | |
| i. Sub-step 4a: Analyze other activities similar to the proposed project activity; | EB 39 | Ann 10 | <i>Refer 5.e below</i> | | |
| ii. Sub-step 4b: Discuss any similar Options that are occurring. | EB 39 | Ann 10 | <i>Refer 5.e below</i> | | |
| y. Has the below guideline followed for Sub-step 4a: Analyze other activities similar to the proposed project activity? Provide an analysis of any other activities that are operational and that are similar to the proposed project activity. Other CDM project activities are not to be included in this analysis. Provide documented evidence and, where relevant, quantitative information. On the basis of that analysis, describe whether and to which extent similar activities have already diffused in the relevant region. | EB 39 | Ann 10 | <i>Refer 5.e below</i> | | |
| z. Has the below guideline followed for Sub-step 4b: Discuss any similar Options that are occurring? If similar activities are identified, then it is necessary to demonstrate why the existence of these activities does not contradict the claim that | EB 39 | Ann 10 | <i>Refer 5.e below</i> | | |



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| the proposed project activity is financially/economically unattractive or subject to barriers. This can be done by comparing the proposed project activity to the other similar activities, and pointing out and explaining essential distinctions between them that explain why the similar activities enjoyed certain benefits that rendered it financially/economically attractive (e.g., subsidies or other financial flows) and which the proposed project activity cannot use or did not face the barriers to which the proposed project activity is subject. In case similar projects are not accessible, the PDD should include justification about non-accessibility of data/information. | | | | | |
| aa. Has the outcome from Step 4 clearly mentioned in PDD? | EB 39 | Ann 10 | <i>Refer 5.e below</i> | | |
| bb. Has it been proved that the project is additional? | EB 39 | Ann 10 | Yes, it has been stated in PDD that project is additional. | | |
| a. Prior consideration of the clean development mechanism | | | | | |
| a. Is the project activity start date prior to the date of publication of the PDD for stakeholder comments? | VVM | 98 | The project activity start date mentioned in webhosted PDD i.e 01/01/2010, is prior to the date of publication of the PDD for stakeholder comments | OK | OK |
| b. If yes, were the CDM benefits considered necessary in the decision to undertake the | VVM | 98 | The CDM benefits were considered necessary in | OK | OK |



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| project as a proposed CDM project activity? | | | the board meeting held on 14/10/2009. | | |
| c. Is the start date of the project activity, reported in the PDD, in accordance with the "Glossary of CDM terms", which states that "The starting date of a CDM project activity is the earliest date at which either the implementation or construction or real action of a project activity begins."? | VVM | 99 | The start dates mentioned in section B.5 of the webhosted PDD and section C.1 are not consistent and same is not meeting the requirement of CDM Glossary of Terms. PP is requested clarify why the date of signing of EPC agreement with M/s Lanco Infratech Limited cannot be regarded as the start date for this project activity. | CL 04 | OK |
| d. Does the project activity require construction, retrofit or other modifications? | VVM | 99 | The project requires construction. | OK | OK |
| e. If yes, is it ensured that the date of commissioning cannot be considered as the project activity start date? | VVM | 99 | The date of commissioning has not been considered as start date. | OK | OK |
| f. Is it a new project activity (a project activity with a start date on or after 02 August 2008) or an existing project activity (a project activity with a start date before 02 August 2008)? | VVM | 100 | The project activity start date mentioned in webhosted PDD i.e 01/01/2010, which is after 02 August 2008. Its a new project. | Ok | OK |
| g. For a new project, for which PDD has not been published for global stakeholder consultation or a new methodology proposed to the CDM Executive Board before the project activity start date, had PPs informed the host Party DNA and the UNFCCC secretariat in writing of the commencement of the project activity and of their | VVM | 101 | The project participant has provided proof of intimation to UNFCCC and host party DNA (NCDMA). The intimation to UNFCCC has been checked with the UNFCCC website. | OK | OK |



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| intention to seek CDM status? (Provide reference to such confirmation from host Party DNA and UNFCCC secretariat). | | | | | |
| h. For an existing project activity, for which the start date is prior to the date of publication of the PDD for global stakeholder consultation, are the following evidences provided: | VVM | 102 | The project activity is not an existing project activity. | OK | Ok |
| ii. evidence that must indicate that awareness of the CDM prior to the project activity start date, and that the benefits of the CDM were a decisive factor in the decision to proceed with the project, including, inter alia: | VVM | 102 | The project participant has submitted the Extract of Board decision dated 14/10/2009 which indicates that the CDM benefits were decisive factor to proceed with the project. | OK | OK |
| a. minutes and/or notes related to the consideration of the decision by the Board of Directors, or equivalent, of the project participant, to undertake the project as a proposed CDM project activity? | VVM | 102 | The project activity is a new project. Hence not applicable. | OK | OK |
| iii. reliable evidence from project participants that must indicate that continuing and real actions were taken to secure CDM status for the project in parallel with its implementation, including, inter alia: | VVM | 102 | The project activity is a new project. Hence not applicable. | OK | OK |
| a. contract with consultants for CDM/PDD/methodology services? | VVM | 102 | The project activity is a new project. Hence not applicable. | OK | OK |
| b. Emission Reduction Purchase Agreements or other documentation related to the sale of the potential CERs (including correspondence with | VVM | 102 | The project activity is a new project. Hence not applicable. | OK | OK |



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| multilateral financial institutions or carbon funds)? | | | | | |
| c. evidence of agreements or negotiations with a DOE for validation services? | VVM | 102 | The project activity is a new project. Hence not applicable. | OK | OK |
| d. submission of a new methodology to the CDM Executive Board? | VVM | 102 | The project activity is a new project. Hence not applicable. | OK | OK |
| e. publication in newspaper? | VVM | 102 | The project activity is a new project. Hence not applicable. | OK | OK |
| f. interviews with DNA? | VVM | 102 | The project activity is a new project. Hence not applicable. | OK | OK |
| g. earlier correspondence on the project with the DNA or the UNFCCC secretariat? | VVM | 102 | The project activity is a new project. Hence not applicable. | OK | OK |
| h. Has the chronology of events including time lines been appropriately captured and explained/detailed in the PDD? | VVM | 102 | Yes the chronology of events including timelines has been explained in the PDD. | OK | OK |
| b. Identification of alternatives | | | | | |
| a. Does the approved methodology that is selected by the proposed CDM project activity prescribe the baseline scenario and hence no further analysis is required? | VVM | 105 | The methodology AM 0029, Version 03 does not prescribe the baseline scenario. | OK | OK |
| b. If no, does the PDD identify credible alternatives to the project activity in order to determine the most realistic baseline scenario? | VVM | 105 | Identification of baseline scenario has been performed as per the steps mentioned in the Approved applied methodology AM29 Identify the | | |



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| | | | <p>economically most attractive baseline scenario alternative Version 03. PP has used Levelised Tariff as an indicator to identify the economically most attractive baseline scenario alternative. PP has submitted the Levelized Tariff calculation sheet to DOE during validation.</p> <p>For all the plausible alternatives, the escalaiton in fuel prices has not been considered in computation of Levelized Tariff for electricity generation. PP to clarify.</p> | CL 05 | OK OK |
| c. Does the list of alternatives given in the PDD ensure that: | VVM | 106 | | | |
| i. the list of alternatives includes as one of the options that the project activity is undertaken without being registered as a proposed CDM project activity? | VVM | 106 | The project activity undertaken without being registered as a proposed CDM project activity is considered as one of the options. | OK | OK |
| ii. the list contains all plausible alternatives that the DOE, on the basis of its local and sectoral knowledge, considers to be viable means of supplying the outputs or services that are to be supplied by the proposed CDM project activity? | VVM | 106 | Yes the PDD contains all plausible alternatives and are viable means of supplying the output | OK | OK |
| iii. the alternatives comply with all applicable and enforced legislation? | VVM | 106 | The alternatives that comply with the legal requirements is identified in the PDD. | OK | OK |



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| c. Investment analysis | | | | | |
| a. Has investment analysis been used to demonstrate the additionality of the proposed CDM project activity? | VVM | 108 | Yes, to demonstrate the additionality of the proposed CDM project activity, investment analysis is carried out. | OK | OK |
| b. If yes, does the PDD provide evidence that the proposed CDM project activity would not be: | VVM | 108 | | | |
| i. the most economically or financially attractive alternative? | VVM | 108 | The PDD demonstrates the project activity will not be the economically most attractive for the purpose of determining baseline scenario. | OK | OK |
| ii. economically or financially feasible, without the revenue from the sale of certified emission reductions (CERs)? | VVM | 108 | Not Applicable. | OK | OK |
| c. Was this shown by one of the following approaches? | VVM | 109 | | | |
| i. The proposed CDM project activity would produce no financial or economic benefits other than CDM-related income. Document the costs associated with the proposed CDM project activity and the alternatives identified and demonstrate that there is at least one alternative which is less costly than the proposed CDM project activity. | VVM | 109 | Not applicable, the proposed CDM project activity would produce financial benefits other than CDM-related income, by sale of electricity it has generated. | OK | OK |
| ii. The proposed CDM project activity is less economically or financially attractive than at least one other credible and realistic alternative. | VVM | 109 | Not Applicable | OK | OK |
| iii. The financial returns of the proposed CDM project activity would be insufficient to justify the required investment. | VVM | 109 | The PDD applies Benchmark Investment analysis to show that the financial returns of the proposed project activity would be insufficient to | OK | OK |



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| | | | justify the required investment. | | |
| d. Is the period of assessment limited to the proposed crediting period of the CDM project activity? | EB 51 | Ann 58 | The period of assessment is upto the technical lifetime of the project activity, i.e 20 years. | OK | OK |
| e. Does the project IRR and equity IRR calculations reflect the period of expected operation of the underlying project activity (technical lifetime), or - if a shorter period is chosen - include the fair value of the project activity assets at the end of the assessment period? | EB 51 | Ann 58 | A period of 20 years i.e complete lifetime of the project project activity has been chosen for financial analysis. | OK | OK |
| f. Does the IRR calculation include the cost of major maintenance and/or rehabilitation if these are expected to be incurred during the period of assessment? | EB 51 | Ann 58 | Yes | OK | OK |
| g. Do the project participants justify the appropriateness of the period of assessment in the context of the underlying project activity, without reference to the proposed CDM crediting period? | EB 51 | Ann 58 | <i>Ok, the period of assessment is 20 years, project activity expected life time is also 20 years, and crediting period is 10 years.</i> | OK | OK |
| h. Does the cash flow in the final year include a fair value of the project activity assets at the end of the assessment period? | EB 51 | Ann 58 | Salvage value of land and plant and machinery is not considered in IRR computation. | (CL 12 (3)) | OK |
| i. Has the fair value been calculated in accordance with local accounting regulations where available, or international best practice? | EB 51 | Ann 58 | Refer clarification raised in 6.c.rr below | (CL 12 (3)) | OK |
| j. Does the fair value calculations include both the book value of the asset and the reasonable expectation of the potential profit or loss on the realization of the assets? | EB 51 | Ann 58 | Refer clarification raised in 6.c.rr below | (CL 12 (3)) | OK |



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| k. Was depreciation, and other non-cash items related to the project activity, which have been deducted in estimating gross profits on which tax is calculated, added back to net profits for the purpose of calculating the financial indicator (e.g. IRR, NPV)? | EB 51 | Ann 58 | | | |
| l. Has taxation been included as an expense in the IRR/NPV calculation in cases where the benchmark or other comparator is intended for post-tax comparisons? | EB 51 | Ann 58 | <p>Yes , taxation has been included as an expense in the computation of Project IRR.</p> <p>The MAT paid upto year 15 is allowed to be set off against the tax liability in year 16 and onwards. The effect of carry forward of MAT credit is not considered while computing the tax liability from year 16 onwards.</p> | CL 12 (2) | OK |
| m. Are the input values used in all investment analysis valid and applicable at the time of the investment decision taken by the project participant? | EB 51 | Ann 58 | <p>PP is requested to justify the basis & appropriateness of considering Levelised Tariff for calculation of Project IRR.</p> <p>PP is requested to justify, why the fuel escalation has not been considered in the IRR computation.</p> | CL 06 | OK |
| n. Is the timing of the investment decision consistent and appropriate with the input values? | EB 51 | Ann 58 | OK, the timing of investment decision is consistent and appropriate. | OK | OK |
| o. Are all the listed input values been consistently applied in all calculations? | EB 51 | Ann 58 | Refer CL12 raised | - | OK |
| p. Does the investment analysis reflect the economic decision making context at point of the | EB 51 | Ann 58 | Not Applicable | OK | OK |



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| decision to recommence the project in the case of project activities for which implementation ceases after the commencement and where implementation is recommenced due to consideration of the CDM? | | | | | |
| q. Have project participants supplied the spreadsheet versions of all investment analysis? | EB 51 | Ann 58 | Yes the project participant has provided all the investment analysis spreadsheets to DOE. | OK | OK |
| r. Are all formulas used in this analysis readable and all relevant cells be viewable and unprotected? | EB 51 | Ann 58 | All formulas used in the investment analysis are readable and all relevant cells are viewable and unprotected. | OK | OK |
| s. In cases where the project participant does not wish to make such a spreadsheet available to the public has the PP provided an exact read-only or PDF copy for general publication? | EB 51 | Ann 58 | All the spreadsheets are made available to the DOE. | OK | OK |
| t. In case the PP wishes to black-out certain elements of the publicly available version, is it justifiable? | EB 51 | Ann 58 | Not Applicable. | OK | OK |
| u. Was the cost of financing expenditures (i.e. loan repayments and interest) included in the calculation of project IRR? | EB 51 | Ann 58 | The financing expenditure has not been included in calculation of project IRR . Interest on the term loan has been included only for computation of tax. | OK | OK |
| v. In the calculation of equity IRR, has only the portion of investment costs which is financed by equity been considered as the net cash outflow? | EB 51 | Ann 58 | Not Applicable. | OK | OK |
| w. Has the portion of the investment costs which is financed by debt been considered a cash outflow in the calculation of equity IRR? (this is not allowed) | EB 51 | Ann 58 | No , the loan repayment is not included in the cash out flow. | OK | OK |
| x. Was a pre-tax benchmark be applied? | EB | Ann | NO, a post tax benchmark (WACC) has been | OK | OK |



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| | 51 | 58 | selected. | | |
| y. In cases where a post-tax benchmark is applied, is actual interest payable taken into account in the calculation of income tax? | EB 51 | Ann 58 | Yes the interest payable is taken into account. | Ok | OK |
| z. In such situations, was interest calculated according to the prevailing commercial interest rates in the region, preferably by assessing the cost of other debt recently acquired by the project developer and by applying a debt-equity ratio used by the project developer for investments taken in the previous three years? | EB 51 | Ann 58 | The prevailing rate at the point of decision making was 11.50% which was verified and found to be ok. | OK | OK |
| aa. In cases where a benchmark approach is used is the applied benchmark appropriate to the type of IRR calculated? | EB 51 | Ann 58 | Yes , PP has selected Weighted average cost of capital (WACC) as Benchmark for a Project IRR | OK | OK |
| bb. Has local commercial lending rates or weighted average costs of capital (WACC) selected as appropriate benchmarks for a project IRR? | EB 51 | Ann 58 | Yes , PP has selected Weighted average cost of capital (WACC) as Benchmark for a Project IRR In the computation of WACC benchmark, the cost of debt is worked out with tax rate @11.33% (MAT). However, the MAT considered in the financial analysis is 17%. Please clarify. | CL-14 | OK |
| cc. Has required/expected returns on equity selected as appropriate benchmark for an equity IRR? | EB 51 | Ann 58 | Not Applicable. | OK | OK |
| dd. In case benchmarks supplied by relevant national authorities selected is it applicable to the project activity and the type of IRR calculation presented? | EB 51 | Ann 58 | Not Applicable. | OK | OK |
| ee. In the cases of projects which could be | EB | Ann | External benchmark based on publicly available | Ok | OK |



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| developed by an entity other than the project participant is the benchmark applied based on publicly available data sources which can be clearly validated? | 51 | 58 | data is used. | | |
| ff. Have internal company benchmarks/expected returns (including those used as the expected return on equity in the calculation of a weighted average cost of capital - WACC) been applied in cases where there is only one possible project developer? | EB 51 | Ann 58 | Internal company benchmark has not been applied. | OK | OK |
| gg. In such cases, have these values been used for similar projects with similar risks, developed by the same company or, if the company is brand new, would have been used for similar projects in the same sector in the country/region? | EB 51 | Ann 58 | Internal company benchmark has not been applied. | OK | OK |
| hh. Has a minimum clear evidence of the resolution by the company's Board and/or shareholders been provided to the effect as above? | EB 51 | Ann 58 | Internal company benchmark has not been applied. | OK | OK |
| ii. Has a thorough assessment of the financial statements of the project developer - including the proposed WACC - to assess the past financial behavior of the entity during at least the last 3 years in relation to similar projects been conducted? | EB 51 | Ann 58 | Internal company benchmark has not been applied by the project participant. The benchmark applied by the project participant is based on publicly available data. | | |
| jj. Does the risk premiums applied in the determination of required returns on equity reflect the risk profile of the project activity being assessed, established according to national/international accounting principles? (It is | EB 51 | Ann 58 | Return on equity is calculated as per CAPM. No risk premium has been applied. | | |



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| not considered reasonable to apply the rate general stock market returns as a risk premium for project activities that face a different risk profile than an investment in such indices.) | | | | | |
| kk. Has an investment comparison analysis and not a benchmark analysis used when 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? | EB 51 | Ann 58 | Benchmark analysis has been used to demonstrate additionality, which is as per the requirement of the applicable methodology AM029 version 3. Investment comparison analysis has been done to determine the baseline scenario. | OK | OK |
| ll. Have variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues been subjected to reasonable variation (positive and negative) and the results of this variation been presented in the PDD and be reproducible in the associated spreadsheets? | EB 51 | Ann 58 | Yes, PP has carried out sensitivity analysis on following:- 1. Project Cost 2. Station Heat Rate 3. Fuel Cost 4. Plant Load Factor | OK | OK |
| mm. Have a corrective action been raised for a variable to be included in the sensitivity analysis which constitute less than 20% and have a material impact on the analysis? | EB 51 | Ann 58 | No | OK | OK |
| nn. Is the range of variations selected is reasonable in the project context? | EB 51 | Ann 58 | Yes, the 10% variation is prescribed by the Guidelines on the assessment of Investment Analysis – Annex 5 of EB 62. The same approach is applied by the PP, which is reasonable in the project context. | OK | OK |
| oo. Do the variations in the sensitivity analysis at least cover a range of +10% and -10%, unless | EB 51 | Ann 58 | The PP has applied 10 % (both - & +) in analysis. | OK | OK |



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| this is not deemed appropriate in the context of the specific project circumstances? | | | | | |
| pp. In cases where a scenario will result in the project activity passing the benchmark or becoming the most financially attractive alternative, is an assessment done of the probability of the occurrence of this scenario in comparison to the likelihood of the assumptions in the presented investment analysis, taking into consideration correlations between the variables as well as the specific socio-economic and policy context of the project activity? | EB 51 | Ann 58 | In none of the scenarios the IRR has crossed the benchmark. | OK | OK |
| qq. Was the plant load factor defined ex-ante in the CDM-PDD according to one of the following options: | EB 48 | Ann 11 | | | |
| i. The plant load factor provided to banks and/or equity financiers while applying the project activity for project financing, or to the government while applying the project activity for implementation approval? | EB 48 | Ann 11 | The project activity does not apply ACM 0002 or AMS.I.D methodology. Hence not applicable. | OK | OK |
| ii. The plant load factor determined by a third party contracted by the project participants (e.g. an engineering company)? | EB 48 | Ann 11 | The project activity does not apply ACM 0002 or AMS.I.D methodology. Hence not applicable. | OK | OK |
| rr. Was a thorough assessment of all parameters and assumptions used in calculating the relevant financial indicator, and determine the accuracy and suitability of these parameters using the available evidence and expertise in relevant accounting practices conducted? | VVM | 111 | <u>Observation in respect of the levelized cost and IRR working</u> 1. In computing the working capital, O&M expenses is added for arriving at Working capital Since O&M is an expense it would result in current liability and should be | CL 12 | OK |



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| | | | <p>reduced from working capital. Please clarify.</p> <p>2. The MAT paid upto year 15 is allowed to be set off against the tax liability in year 16 and onwards. The effect of carry forward of MAT credit is not considered while computing the tax liability from year 16 onwards.</p> <p>3. Salvage value of land and plant and machinery is not considered in IRR computation.</p> | | |
| ss. Were the parameters cross-checked against third-party or publicly available sources, such as invoices or price indices? | VVM | 111 | Refer CL12 raised above | - | OK |
| tt. Were feasibility reports, public announcements and annual financial reports related to the proposed CDM project activity and the project participants reviewed? | VVM | 111 | The sources of Input values to the investment analysis i.e Detailed project Report prepared by M/s Fichtner Consulting Engineers (India) Pvt. Ltd. And The CERC tariff order has been reviewed. | OK | OK |
| uu. Was the correctness of computations carried out and documented by the project participants assessed? | VVM | 111 | Refer CL12 raised above | - | OK |
| vv. Was the sensitivity analysis by the project participants to determine under what conditions variations in the result would occur, and the likelihood of these conditions assessed? | VVM | 111 | Refer CL12 raised above | - | OK |
| ww. Is the type of benchmark applied is suitable for the type of financial indicator presented? | VVM | 112 | The weighted average cost of capital(WACC) has been taken as a benchmark for Project IRR, which is suitable benchmark. | OK | OK |
| xx. Do any risk premiums applied determining the | VVM | 112 | Return on equity is calculated as per CAPM. | Ok | OK |



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| benchmark reflect the risks associated with the project type or activity? | | | No risk premium has been applied. | | |
| yy. To determine this, was it assessed whether it is reasonable to assume that no investment would be made at a rate of return lower than the benchmark by: | VVM | 112 | | | |
| i. assessing previous investment decisions by the project participants involved? | VVM | 112 | Internal company benchmark has not been applied by the project participant. The benchmark applied by the project participant is based on publicly available data. | Ok | OK |
| ii. determining whether the same benchmark has been applied? | VVM | 112 | Internal company benchmark has not been applied by the project participant. The benchmark applied by the project participant is based on publicly available data. | OK | OK |
| iii. determining if there are verifiable circumstances that have led to a change in the benchmark? | VVM | 112 | Internal company benchmark has not been applied by the project participant. The benchmark applied by the project participant is based on publicly available data. | Ok | OK |
| zz. Did the project participants rely on values from Feasibility Study Reports (FSR) that are approved by national authorities for proposed CDM project activities? | VVM | 113 | Project participant rely on the values from Detailed Project report which is prepared by third party engineering company M/s Fichtner Consulting Engineers (India) Pvt. Limited and CERC tariff order. | OK | OK |
| xx. If yes: | VVM | 113 | | | |
| i. has the FSR been the basis of the decision to proceed with the investment in the project, i.e. that the period of time between the finalization of the FSR and the | VVM | 113 | Project participant rely on the values from Detailed Project report which is prepared by third party engineering company M/s Fichtner Consulting Engineers (India) Pvt. Limited and | OK | OK |



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| investment decision is sufficiently short for the DOE to confirm that it is unlikely in the context of the underlying project activity that the input values would have materially changed? | | | CERC tariff order. | | |
| ii. Are the values used in the PDD and associated annexes fully consistent with the FSR? | VVM | 113 | The values used in the financial workings and its sources have to be assessed after the PP submits an revised and updated workings | OK | OK |
| iii. If not, was the appropriateness of the values validated? | VVM | 113 | Refer 6. c. xx. ii section above | OK | OK |
| iv. On the basis of its specific local and sectoral expertise, is confirmation provided, by cross-checking or other appropriate manner, that the input values from the FSR are valid and applicable at the time of the investment decision? | VVM | 113 | The values used in the financial workings and its sources have to be assessed after the PP submits an revised and updated workings . | OK | OK |
| d. Barrier analysis | | | | | |
| a. Has barrier analysis been used to demonstrated the additionality of the proposed CDM project activity? | VVM | 115 | The methodology does not prescribe Barrier analysis to demonstrate additionality. Hence not applicable. | OK | OK |
| b. If yes, does the PDD demonstrate that the proposed CDM project activity faces barriers that: | VVM | 115 | | | |
| i. prevent the implementation of this type of proposed CMD project activity? | VVM | 115 | The methodology does not prescribe Barrier analysis to demonstrate additionality. Hence not applicable. | OK | OK |
| ii. do not prevent the implementation of at least one of the alternatives? | VVM | 115 | The methodology does not prescribe Barrier analysis to demonstrate additionality. Hence not applicable. | OK | OK |



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| c. Are there any issues that have a clear direct impact on the financial returns of the project activity, other than: risk related barriers, for example risk of technical failure, that could have negative effects on the financial performance; or barriers related to the unavailability of sources of finance for the project activity? {If yes, these issues cannot be considered barriers and shall be assessed by investment analysis. [Refer to (6.c) above]} | VVM | 116 | The methodology does not prescribe Barrier analysis to demonstrate additionality. Hence not applicable. | OK | OK |
| d. Were the barriers determined as real by: | VVM | 117 | | | |
| i. assessing the available evidence and/or undertaking interviews with relevant individuals (including members of industry associations, government officials or local experts if necessary) to determine whether the barriers listed in the PDD exist? | VVM | 117 | The methodology does not prescribe Barrier analysis to demonstrate additionality. Hence not applicable. | OK | OK |
| ii. ensuring that existence of barriers is substantiated by independent sources of data such as relevant national legislation, surveys of local conditions and national or international statistics? | VVM | 117 | The methodology does not prescribe Barrier analysis to demonstrate additionality. Hence not applicable. | OK | OK |
| iii. Is existence of a barrier substantiated only by the opinions of the project participants? (If yes, this barrier cannot be considered as adequately substantiated) | VVM | 117 | The methodology does not prescribe Barrier analysis to demonstrate additionality. Hence not applicable. | OK | OK |
| e. Were the barriers determined as preventing the implementation of the project activity but not the implementation of at least one of the possible | VVM | 117 | The methodology does not prescribe Barrier analysis to demonstrate additionality. Hence not applicable. | OK | OK |



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| alternatives by applying local and sectoral expertise to judge whether a barrier or set of barriers would prevent the implementation of the proposed CDM project activity and would not equally prevent implementation of <i>at least one of</i> the possible alternatives, in particular the identified baseline scenario? | | | | | |
| e. Common practice analysis | | | | | |
| a. Is this a proposed large-scale, or first-of-its kind small-scale project activity? | VVM | 119 | The project activity is a large scale project. | OK | OK |
| b. If yes, was common practice analysis carried out as a credibility check of the other available evidence used by the project participants to demonstrate additionality? | VVM | 119 | Yes, common practice analysis carried out as a credibility check of the other available evidence used by the project participants to demonstrate additionality. | OK | OK |
| c. Was it assessed whether the geographical scope (e.g. defined region) of the common practice analysis is appropriate for the assessment of common practice related to the project activity's technology or industry type? (For certain technologies, the relevant region for assessment will be local and for others it may be transnational/global. | VVM | 120 | Yes, geographical scope of the common practice analysis is appropriate for the assessment of common practice related to the project activity's technology. | OK | OK |
| d. Was a region other than the entire host country chosen? | VVM | 120 | A region other than the host country is not chosen to demonstrate common practice analysis. | OK | OK |
| e. If yes, was the explanation why this region is more appropriate assessed? | VVM | 120 | Not applicable. | OK | OK |
| f. Using official sources and local and industry expertise, was it determined to what extent | VVM | 120 | PP has demonstrated Common practice analysis in section B.5 of webhosted PDD. PP to confirm | CL 07 | OK |



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| similar and operational projects (e.g., using similar technology or practice), other than CDM project activities, have been undertaken in the defined region? | | | how this is meeting the requirements of Paragraph 6 and 47 of the "Tool for the demonstration and assessment of additionality" Version 6.0.0 Annex 21 EB 65 | | |
| g. Are similar and operational projects, other than CDM project activities, already "widely observed and commonly carried out" in the defined region? | VVM | 120 | Refer CL 07 above | | |
| h. If yes, was it assessed whether there are essential distinctions between the proposed CDM project activity and the other similar activities? | VVM | 120 | Refer CL 07 above | | |
| 7. Monitoring plan | | | | | |
| a. Does the PDD include a monitoring plan? | VVM | 122 | The monitoring plan is described in section B.7.2 and Annex 4 of the PDD. | OK | OK |
| b. Is this monitoring plan based on the approved monitoring methodology applied to the proposed CDM project activity? | VVM | 122 | Yes, the monitoring plan is based on the approved monitoring methodology AM0029 | OK | OK |
| c. Were the list of parameters required by the the selected methodology identified? | VVM | 123 | Yes, list of parameters as per selected methodology identified in Section 7.1. | OK | OK |
| d. Does the monitoring plan contains all necessary parameters? | VVM | 123 | Yes, list of parameters as per selected methodology identified in Section 7.1. | OK | OK |
| e. Are the parameters clearly described? | VVM | 123 | The parameters in section B.7.1 of the PDD are clearly defined. | OK | OK |
| f. Does the means of monitoring described in the plan comply with the requirements of the methodology? | VVM | 123 | Refer 7.h & 7.j.ii below | | |
| g. Specific questions per methodology regarding parameters. | | | The PDD identifies, $FC_{f,y}$, $NCV_{f,y}$, $EG_{PJ,y}$ $EF_{grid,y}$ as monitoring parameters in line with the monitoring methodology. | OK | OK |
| h. Are the monitoring arrangements described in the | VVM | 123 | Section B.7.1 & B.7.2 of the webhosted PDD | | OK |



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| monitoring plan feasible within the project design? | | | specifies measurement of the parameter $EG_{PJ,y}$ through a energy meter installed in the 400 kV substation at Nunna. At the site, however, it was observed that the meters at Nunna Substation of PGCIL measures the electricity from two project i.e Phase II(which is not a part of CDM project activity) & Phase III transmitted through a common double circuit 400Kv transmission line. It is not clear how the net electricity from the project activity will be determined. | CAR 04 | |
| i. Does the monitoring plan provide details regarding calibration of monitoring equipments/ instruments or does it include zero check as a substitute for calibration. As per EB guidance related to calibration (monitoring) requirements, zero check can not be considered as a substitute for calibration? | EB 24 | 37 | Refer 7.j.ii below | | |
| j. Are the following means of implementation of the monitoring plan sufficient to ensure that the emission reductions achieved by/resulting from the proposed CDM project activity can be reported ex post and verified: | VVM | 123 | | | |
| i. data management procedures? | VVM | 123 | Data management procedures are provided in the monitoring plan. In section B.7.2, in event of start date of crediting period does not match with the billing cycles, PP to clarify how the Emission reductions for that period will be accounted | CL 08 | OK |



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| | | | for. | | |
| ii. quality assurance procedures? | VVM | 123 | <p>1) The table for monitoring the net electricity generated by the project activity $EG_{PJ,y}$</p> <ul style="list-style-type: none"> i. The calibration frequency of energy meters has not been specified ii. The source of data for crosschecking the value of the monitored parameter. <p>2) The tables for monitoring the Annual quantity & NCV of Natural gas does not clearly describes</p> <ul style="list-style-type: none"> i. the description of the measurement methods and procedures. ii. The description of the measurement equipment. iii. Person/entity responsible for measuring and recording. iv. The measurement interval v. The calibration frequency of | CAR 05 | OK |



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| | | | equipment. vi. The source of data for crosschecking the value of the monitored parameter | | |



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| iii. quality control procedures? | VVM | 123 | Refer 7.h & 7.i above | | |
| 8. Sustainable development | | | | | |
| a. Does the CDM project activity assists Parties not included in Annex I to the Convention in achieving sustainable development? | VVM | 125 | The project activity will lead to achieving sustainable development in India as described in section A.2 of the PDD. | OK | OK |
| b. Does the letter of approval by the DNA of the host Party confirm the contribution of the proposed CDM project activity to the sustainable development of the host Party? | VVM | 126 | The Host Country Approval from Ministry of Environment and Forests (MoEF) which is the DNA of India is not provided by M/s. Lanco Kondapalli Power Limited | (CL 01) | |
| 9. Local stakeholder consultation | | | | | |
| a. Were local stakeholders (public, including individuals, groups or communities affected, of likely to be affected, by the proposed CDM project activity or actions leading to the implementation of such an activity) invited by the PPs to comment on the proposed CDM project activity prior to the publication of the PDD on the UNFCCC website? | VVM | 128 | The PDD indicates, the stakeholders were invited by personal invitation on 26/08/2011. The PDD also indicates, Stakeholders were also informed through banners and posters for the meeting to be held on 05/09/2011. | OK | OK |
| b. Have comments by local stakeholders that can reasonably be considered relevant for the proposed CDM project activity been invited? | VVM | 129 | The stakeholders comments were received in the local stakeholder meeting held on 05/09/2011. | OK | OK |
| c. Is the summary of the comments received as provided in the PDD complete? | VVM | 129 | The summary of comments provided in the PDD is complete. | OK | OK |
| d. Have the project participants taken due account of any comments received and described this process in the PDD? | VVM | 129 | The PDD indicates, "There were no adverse comments received during the stakeholders meeting". | OK | OK |
| 10. Environmental impacts | | | | | |
| a. Have the project participants submitted | VVM | 131 | Environ Impact Assesment has been conducted | CL 09 | OK |



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| documentation on the analysis of the environmental impacts of the project activity? | | | by M/s Pioneer Consultants Pvt. Ltd., Hyderabad. PP has not submitted the supporting documentation . | | |
| b. Have the project participants undertaken an analysis of environmental impacts? | VVM | 132 | The project participant has undertaken an analysis of environmental impacts for the project activity. | OK | OK |
| c. Does the host Party require an environmental impact assessment? | VVM | 132 | The Host party, India requires environmental impact assessment for the project activity. | OK | OK |
| d. If yes, have the project participants undertaken an environmental impact assessment? | VVM | 132 | The project participant has undertaken an environmental impact assessment. However, PP has not provided the EIA document to Validation team. | (CL 09) | OK |



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TABLE 2 RESOLUTION OF CORRECTIVE ACTION AND CLARIFICATION REQUESTS

| Draft report clarifications and corrective action requests by validation team | Ref. to checklist question in table 1 and 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| CL 01 Project Participant is requested to clarify, whether the Project activity has received the Letter of Approval (LoA) from the Host Party DNA. | Refer Table 1 1.a above | The application for Host Country Approval has been submitted to the MoEF; the approval has not been received yet. The approval letter will be shared with the DOE as and when it is received. | The project participant has submitted the host country approvals (letter of approval of DNA of host country) vide reference no. 4/6/2012-CCC dated 10/10/2012. Hence CL-1 is closed. |
| CAR 01 The Geographical Coordinates provided in the webhosted PDD are not the same as per actual project location. PP also to provide the documentary evidence for the coordinates. | Refer Table 1 3.f.ii | The geographical coordinates have been updated. | Project participant has corrected the geographical co-ordinates of the project activity in the revised PDD. Validation team has reviewed the same and found to be correct. Hence the CAR 01 is closed |
| CAR 02 The source provided for the EF _{BM,y} and EF _{OM,y} has | Refer | The source used is CEA database version | PP has corrected the |



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| been shown as CO2 Baseline Database for Indian Power Sector “ Version 6.0 dated 1st April 2011, where as the PDD also refers to version 7.0. The same is not consistent. | Table 1 3.q.iv | 7; the inconsistency in the version number referred has been rectified. | inconsistency in the revised PDD. Validation team had reviewed the PDD and found that the version of the CO2 Baseline Database for Indian Power Sector has been consistently quoted in the revised PDD. Hence, the CAR 02 is closed. |
| CL 02 The service order placed on “M/s. Fichtner Consulting Engineers India Pvt. Ltd”. Dated 11/09/2009, for preparation of DPR, for the proposed capacity of 770 MW Natural Gas based Combined Cycle Power plant, however in the webhosted PDD the capacity of Project Activity has been mentioned as 742 MW. PP is requested to clarify the difference in the capacities mentioned. | Refer Table 1 4.a | The capacity of 770 MW (2 x 385 MW) refers to the ISO rated capacity. Copy of the relevant section of the DPR in support of the same has been provided to the DOE. The capacity of the plant at site conditions is expected to be only 742 MW (2 x 371 MW). This is verifiable from the EPC contract and the NTP (copies of which have also been shared with the DOE). | PP has provided the DPR to the validation team. The validation team has noted that the capacity of the plant as per ISO condition is 770MW and the capacity of the plant as per site conditions is 742MW which can be crosschecked from the EPC contract and Notice to proceed. Hence the CL is closed |
| CL 03 In section B.2 of webhosted PDD it is not clear what is the year of publication of data for the Production of natural gas in India. | Refer Table 1 4.b.d.vi | The year of publication of data for natural gas availability in India is 2009, before the project decision date. The reference link for | PP has provided the year of publication of data and corrected the URL in the |



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| <p>It is not clear from which source the expected produce by RIL @ 80MMSCMD is taken.</p> <p>The URL provided in the foot notes: 9, 10, 13, 14, 15 are not accessible.</p> | | <p>RIL's production has been included.</p> | <p>footnotes 9,10,13,14,15 in the revised PDD version.</p> <p>CL 03 is closed.</p> |
| <p>CAR 03</p> <p>The project boundary described in the Webhosted PDD is not meeting the requirements of Guidelines for Completing the PDD EB 41 Annex 12.</p> <p>The project boundary diagram in the PDD does not depict:</p> <ol style="list-style-type: none"> The mass and energy parameters to be monitored (measuring points). The source for auxiliary power consumption. The depiction of the project boundary is not as per the actual site conditions observed during validation site visit. | <p>Refer Table 1 4.c.a</p> | <p>The project boundary diagram has been updated to show the points of monitoring of the energy generation and gas consumption. The source of auxiliary power has been explained in section B.7.2 of the PDD and the modified project boundary diagram is in-line with the same.</p> | <p>Project boundary has been correctly depicted in section B.3 of the revised PDD version 2 .</p> <p>Hence CAR 03 is closed.</p> |
| <p>CL 04</p> <p>The start dates mentioned in section B.5 of the webhosted PDD and section C.1 are not consistent and same is not meeting the requirement of CDM Glossary of Terms.</p> <p>PP is requested clarify why the date of</p> | <p>Refer Table 1 6.a</p> | <p>The date of NTP (01/01/2010) is the start date of the project activity; this has been made consistent in the sections cited by the DOE.</p> <p>According to the CDM Glossary, the start</p> | <p>With respect to CL 04, the project participant submitted following supporting documents:</p> <ol style="list-style-type: none"> EPC NTP |



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| <p>signing of EPC agreement with M/s Lanco Infratech Limited cannot be regarded as the start date for this project activity.</p> | | <p>date is defined as “the earliest date at which either the implementation or construction or real action of a CDM project activity or PoA begins”.</p> <p>In the context of the candidate project activity, the EPC agreement signed clearly specifies that the contractor (Lanco Infratech) would furnish a bank guarantee, based on which the PP (LKPL) would issue the NTP within a period of 15 days and also release the advance payment. In case either of these actions (submission of bank guarantee by contractor or issue of NTP by PP within 15 days of contractor furnishing the bank guarantee) not being fulfilled the EPC would be considered void. Only the fulfilment of the action by both parties as described above confirms the implementation of the project activity. Hence, in-line with the CDM glossary’s definition of start date, the date of the NTP has been considered as the start date of the candidate project activity.</p> | <p>The validation team reviewed the above-specified documents and noted that the for the fulfilment of the EPC, the contractor is required to submit the bank guarantee to the project participant within 15 days of the EPC contract signing and after the receipt of the bank guarantee, the project participant shall issue NTP along with the advance payment. Hence, the validation team confirms that though EPC contract was signed on 23/12/2009, the financial commitment was made by the project participant by releasing the advance payment at the time of the issue of the NTP (01/01/2010). Hence, the validation team confirms that earliest action that can be considered for the commitment towards implementation or</p> |
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| | | | <p>construction is date of release of the advance payment and the issue of the NTP to the contractor.</p> <p>Hence CL 04 is Closed.</p> |
| <p>CL 05 For all the plausible alternatives, the escalation in fuel prices has not been considered in computation of Levelized Tariff for electricity generation. PP to clarify.</p> | <p>Refer Table 1 6.b</p> | <p>In the context of decision making, the levelized cost of generation has been used only for the purpose of comparison of the various options available to the PP. Hence escalation has not been considered.</p> <p>Appropriate escalation factors have been considered for each of the alternatives while computing the levelized cost of generation.</p> | <p>The response is not OK.</p> <p>CL 05 is OPEN</p> <p>Validation team has check the financial nanlysis sheet and confirms that appropriate fuel cost escalation rates have been considered for each of the alternatives.</p> <p>Hence CL 05 is closed</p> |
| <p>CL 06 PP is requested to justify the basis & appropriateness of considering Levelised Tariff for calculation of Project IRR.</p> <p>PP is requested to justify, why the fuel escalation has not been considered in the</p> | <p>Refer Table 1 6.c.m</p> | <p>The computation of levelized 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>The project participant's response clarifies that the plant will sell power on a merchant basis. However, the merchant trading of power is subject to market conditions of demand and</p> |



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| IRR computation. | | <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 levelized 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 levelized 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 levelized 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 | <p>supply and it is not possible to arrive at one particular rate of merchant tariff. Hence, the PP has applied a levelised tariff that is based on various direct and indirect costs, inputs with corresponding rates of escalation (including fuel cost escalation) in the same and also a fixed Return on equity (RoE) on the investment made. The financial expert in the validation team has confirmed that this approach is acceptable.</p> <p>With the consideration of escalation in the fuel prices, the levelised cost of generation for all alternatives has gone up with respect to the corresponding values of the same that were presented in the wehhosted PDD. Project Participant has revised the</p> |
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| | | Drawing reference from the above the project proponent has estimated tariff following the levelized cost approach which is also in accordance with the guideline recommended by CEA. | <p>PDD to incorporate the changed values. The validation team has accepted the revised values since the increases have taken place for all alternatives as a result of fuel price escalation.</p> <p>Hence CL06 is closed</p> |
| <p>CL 07 PP has demonstrated Common practice analysis in section B.5 of webhosted PDD. PP to confirm how this is meeting the requirements of Paragraph 47 of the “Tool for the demonstration and assessment of additionality” Version 6.0.0 Annex 21 EB 65</p> | Refer Table 1 6.e.f | The Common Practice Analysis section has been revised. | <p>Project participant has submitted a Common practice analysis spreadsheet and has clearly carried out the analysis as per para 47 of “Tool for the demonstration and assessment of additionality” Version 6.0.0 Annex 21 EB 65 . Validation team has observed that the Common practice analysis is in line with para 47 of Tool for the demonstration and assessment of additionality” Version 6.0.0.</p> |



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| | | | Hence CL 07 is closed. |
| <p>CAR 04 The description in the PDD does not conform to actual site conditions:</p> <p>Section B.7.1 & B.7.2 of the webhosted PDD specifies measurement of the parameter $EG_{PJ,y}$ through a energy meter installed in the 400 kV substation at Nunna. At the site, however, it was observed that the meters at Nunna Substation of PGCIL measures the electricity from two project i.e Phase II(which is not a part of CDM project activity) & Phase III transmitted through a common double circuit 400KV transmission line. It is not clear how the net electricity from the project activity will be determined.</p> | Refer Table 1 7.h | <p>The monitoring plan for the project has been revised.</p> <p>The monitoring of the electricity generated at the plant from phase II and Phase III projects has been included in section B.7.1.</p> | <p>In response to CAR 04, PP has revised the monitoring description in section B.7.2 of the revised PDD. PP has included the apportioning procedure for calculation the net Electricity supplied to grid by Project activity.</p> <p>However PP has not included the monitoring of the Electricity monitored from the meters installed at Phase III(project activity) and Phase II .</p> <p>PP is requested to correct the information in the section B.7.1.</p> <p>CAR is open.</p> <p>The section B.7.1 of the PDD has been revised , now as per revised monitoring plan monitors</p> |



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| | | | <p>the electricity generated by the project activity $EG_{PhaseIII}$, electricity generated by the other project $EG_{PhaseII}$, and the electricity injected to the grid by both the projects $EG_{Substation}$, appropriate apportioning procedure has been adopted to calculate the net electricity supplied to grid by the project activity.</p> <p>Hence CAR 04 is closed.</p> |
| <p>CAR 05</p> <p>1) The table for monitoring the net electricity generated by the project activity $EG_{PJ,y}$</p> <ul style="list-style-type: none"> i. The calibration frequency of energy meters has not been specified ii. The source of data for crosschecking the value of the monitored parameter. <p>2) The tables for monitoring the Annual quantity & NCV of Natural gas does not clearly describes</p> <ul style="list-style-type: none"> i. the description of the measurement methods and procedures. | <p>Refer Table 1 7.j.ii</p> | <p>The tables in section B.7.1 have been updated.</p> | <p>PP has revised the monitoring plan and has give the calibration frequency and accuracy level of all the meters installed.</p> <p>PP has also provided the description for measurement methods and procedure, measurement interval, calibration frequency and crosschecking mechanism</p> |



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| ii. The description of the measurement equipment. | | | for the Quantity and NCV of natural gas combusted in the project activity. |
| iii. Person/entity responsible for measuring and recording. | | | Validation team has checked the revised PDD submitted by PP and found the information to be correct. |
| iv. The measurement interval | | | Hence CAR is closed. |
| v. The calibration frequency of equipment. | | | |
| vi. The source of data for crosschecking the value of the monitored parameter | | | |



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| <p>CL 08</p> <p>1) In section B.7.2, in event of start date of crediting period does not match with the billing cycles, PP to clarify how the Emission reductions for that period will be accounted for.</p> | <p>Refer Table 1 7.j.i</p> | <p>The energy supplied by the project activity will be made available in the SRLDC (Southern Regional Load Despatch Center) website – providing day - wise values; although the invoicing is done by the gas supplier on a fortnightly basis, daily gas tickets will also be available and hence estimation of emission reductions from the date of registration will be possible. In the event that documentary sources for the purpose of estimation of CERs is not available due to date of registration not coinciding with the billing cycle, CERs would be conservatively estimated by excluding the partial billing cycle. This approach will be followed for the first and the last billing cycles in the crediting period.</p> | <p>Since PP has choose to forego the CERs which are generated during periods not matching the billing cycle dates . Validation team has found this approach to be conservative and hence CL 08 is closed.</p> |
| <p>CL 09</p> <p>The documentation on the analysis of the environmental impacts of the project activity carried out by Pioneer Consultants Pvt. Ltd., Hyderabad is not submitted during validation visit.</p> | <p>Refer Table 1 10.a</p> | <p>The EIA statement is being provided to the DOE.</p> | <p>PP has not submitted the copy of EIA to validation team.</p> <p>CL 09 is OPEN</p> <p>PP has provide the copy of environment impact assessment report prepared by M/s Pioneer Enviro Consultants .</p> |



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| | | | Hence CL 09 is closed |
| CL 10 PP is requested to clarify why in section B.4 “New power plant (s) based on Solar technologies” cannot be considered as plausible baseline alternative | Refer Table 1 5.d.b.i | The candidate project is a utility scale 742 MW gas based power plant. As can be observed in the CEA database version – 7, there are no solar power plants (PV or Solar thermal) of comparable capacity. Hence, electricity generation based on solar technology has not been considered as a baseline alternative. | Validation team agrees with the justification by Project participant. Also solar power plants also would not meet base load demand due to their nature of operation at a low PLF. Hence excluding Power plant based on Solar technologies is appropriate. Hence CL 10 is closed |
| CL 11 Project participant is requested to explain the gas supply arrangements (i.e. supply sources) for the project activity; in particular quantities of gas that would be procured from cheaper (administered price sources) and from market sources (private parties, spot market, etc.). | Refer Table 1 3.h.ii | The total gas requirement of the project activity is expected to be procured from Reliance Industries Limited (RIL); the pipeline infrastructure for gas supply has already been installed by Reliance Gas Transport Infrastructure Limited. The gas supplied by RIL would be purchased at the price that has been recommended by the EGoM (\$4.2 per SCM). The project activity would not receive any gas at cheaper price under the ‘Administered Price Mechanism’ (APM). The Ministry of Power, vide OM 4/14/2010- | Validation team reviewed the documents provided by the project participant and noted that allocation of Gas to the project activity has been considered by the Empowered Group of Ministers(EGoM) , Central electricity authority has also performed a site visit to the project activity. The allocation of gas to the project activity will only be done once the project is |



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| | | <p>Th-1 had directed the CEA to collect information on upcoming projects. The Central Electricity Authority (CEA) visited the proposed power generation site in June 2010 in order to assess the project status. Following this, CEA recommended to Ministry of Power,</p> <p>Government of India to consider allocation of gas to the project vide their letter No. CEA/PLG/IRP/501/39/2010/1804 Dated 22nd June,2010.</p> <p>Based on the CEA recommendations, Ministry of Power (MoP), vide letter dated 16/05/2011, recommended to Ministry of Petroleum & Natural Gas (MoPNG) to allocate gas to the candidate project activity.</p> <p>While this being so, MoPNG, vide letter dated 11th Oct, 2010 informed the project proponent that as</p> <p>per Empowered Group of Ministers (EGoM) guidelines and policy, the gas will be allocated to the projects as and when they are ready to consume gas . The relevant point as specified in this communication is as follows</p> <p>“...consumers belonging to the priority sectors (which includes power) should be a position to actually consume gas as & when</p> | <p>commissioned and ready to operate. As soon the gas allocation is done PP will enter into a gas supply agreement for supply of natural gas to the project activity.</p> <p>Based on the document review validation team is concluded that the allocation of gas to project activity as been considered by CEA, Ministry of Power , Ministry of Petroleum and Natural Gas.</p> <p>Hence, CL11 is closed</p> |
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| | | <p>it becomes available..”</p> <p>The project is expected to be commissioned in the current financial year. Once it is “ready to consume gas”, gas will be allocated by MoPNG. Immediately on getting allocation, Supply Agreement will be Entered with the gas supplier.</p> | |
| <p>CL 12 <u>Observation in respect of the levelized cost and IRR working</u></p> <ol style="list-style-type: none"> 1. In computing the working capital, O&M expenses is added for arriving at Working capital Since O&M is an expense it would result in current liability and should be reduced from working capital. Please clarify 2. The MAT paid upto year 15 is allowed to be set off against the tax liability in year 16 and onwards. The effect of carry forward of MAT credit is not considered while computing the tax liability from year 16 onwards. 3. Salvage value of land and plant and machinery is not considered in IRR computation. | Refer Table 1 6.c.rr | <p>The levelized tariff models have been revised considering the O&M expense as liability.</p> <p>The IRR model has been revised to consider MAT credit carried forward.</p> <p>The IRR model has been revised to consider the salvage value.</p> | <p>PP in response to CL 12 has revised the financial analysis sheets . The same has been duly verified by the Financial Expert and found it correct. As a result of the revisions made to the levelised cost and IRR working, the values have undergone a change. The levelised cost of all alternatives has increased due to fuel price escalation considered. The IRR is also revised from 10.88% in the webhosted PDD to 11.91%. The revised computations of the IRR value have been validated by the financial expert in the validation team.</p> |



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| | | | Hence CL 12 is closed |
| CAR-06 In section B.6.3 of the PDD, the calculation of fuel consumption $FC_{f,y}$ (used further to determine the Project emissions PE_y), is based on “Net Power Generation” (5,359,184 MWh), which is incorrect. Fuel consumption should be based on the “Gross Generation by the project activity”, and not the net generation. | Refer Table 1 5-e-(e) | The fuel consumption has been corrected. Gas consumption has been calculated based on gross power generation, in-line with the DOE's comment. | Project participant has revised the calculations. The project emissions are worked out in the revised PDD on the basis of the gas that will be consumed for gross power generation of 5,524,932 MWh. The gas consumption by the Project activity was 1,085.25 Mcum in the webhosted PDD. This value has now been revised to 1193.78 Mcum . The corresponding Project emissions value is also revised to 2,400,732 tCO₂ from 2,182,484 tCO _{2e} in the webhosted PDD. The CAR is therefore closed. |
| CAR-07 The baseline emissions, project and leakage emissions can not be uniform for all years of operation of the project activity. For leap years, there is one extra day which has to be | 5-e | The baseline emissions, project and leakage emissions, and the emission reduction estimates have been updated for the leap-years, in line | The project participant has since revised the computations of baseline, project and leakage emissions to account for an |



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| accounted for. | | with the DOE's comment. | extra day of operation of the plant during leap years. As a result, the value of the average annual emission reduction is revised to 1388315 tCO ₂ per year in the ER spreadsheet and in the PDD. The validation team found the revised computation in order. The CAR-07 was therefore closed . |
| CL-13 The value of $\sum EG_j$ (35268 million kWh) used for the determination of the baseline upstream fugitive methane emission factor is not linked to the values in the source cells in the emission reduction spreadsheet. | Refer Table 1 5.e.(e) | The value $\sum EG_j$ used for baseline upstream fugitive methane emission factor has been linked to the values in the source cells as per the DOE's comment | The Project Participant re-submitted the ER spreadsheet in which the required change was made. However, it is observed that the value of $\sum EG_j$ (35268 million kWh) in the reviously submitted spreadsheet was incorrect. The correct value was found to be 32861 million kWh. As this value has changed, the corresponding value of $EG_{BL,y}$ also has undergone a change from 21.08 |



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| | | | <p>tCO₂/GWh to 22.60 tCO₂/GWh. This has resulted in a revision in the leakage emissions to 112,961 tCO_{2e} from 121,126 tCO_{2e}.</p> <p>The validation team has verified the revised calculations and found them to be correct. Hence, CL-13 was closed by the team.</p> |
| <p>CL-14 In the computation of WACC benchmark, the cost of debt is worked out with tax rate @11.33% (MAT). However, the MAT considered in the financial analysis is 17%. Please clarify.</p> | Refer Table 1 6-c-(bb) | The tax rate (MAT) considered in has been made consistent (17% in WACC calculation and financial analysis). | <p>The Project Participant has revised the WACC benchmark which is now re-computed with the tax rate considered @17% (MAT). Due to this the benchmark value has also changed from 13.32% in the webhosted PDD to 12.86%. The validation team and financial expert have validated the computations and hence the CL-14 is closed.</p> |



APPENDIX B : SUMMARY OF GLOBAL STAKE HOLDER COMMENTS

| <i>Sr. No.</i> | <i>Details of the commenter</i> | <i>Date of Comment</i> | <i>Comment [unedited]</i> | <i>Response by project participant</i> | <i>Explanation on how account is taken by DOE</i> |
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| 1 | Submitted by: M.Brutus, mrksbrts9@gmail.com | WITHIN THE COMMENTING PERIOD 03.04.2012 TO 02.05.2012 | <p>1) DOE to ensure that the PDD values are consistent and ensure that the CDM project is a genuine project.</p> <p>2) DoE to check the Detailed Project Report and Feasibility Report which is submitted to the other agencies and Banks by Project owner and ensure that the values match with the DPR/FR submitted to DoE also.</p> <p>3) Careful study must be done so that the DPR/FR is not in different versions made and submitted with different purposes to different agencies, which is totally unacceptable, illegal and unethical.</p> <p>4) Project owner should show some undertaking letter from bank manager to DoE stating that both DPR's are same. These kinds of letters should not be accepted and entertained by DoE at face value, but must be checked independently. While collecting the DPR/FR from banks and other agencies, all DPR/FR pages should be counter signed by Banks and other agencies so that the real DPR/FR given to other</p> | <p>1. The stakeholder's comment is addressed to the DOE; the project participant is unable to provide a response to this comment and requests the DOE to respond. All relevant project documents have been provided to the DOE for validation.</p> <p>2. The stakeholder's comment is addressed to the DOE; the project participant is unable to provide a response to this comment and requests the DOE to respond. Work order placed for the preparation of DPR and DPR has been provided to the DOE.</p> <p>3. The DPR was prepared by Fichtner Consulting Engineers</p> | <p>1. DOE has validated all the assumption and input values in the PDD.</p> <p>For Comments (2-7) DPR submitted by the project participant is prepared by a reputed third party engineering company. However Validation team has validated the inputs from the DPR and crosschecked with other sources. Detailed description is given in sections of the validation report above.</p> |



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| | | <p>parties by the PP/Consultant is same as the one submitted to DOE.</p> <p>5) DPR/FR values must be probed fully. DOE must take a written undertaking from the PP/Consultant about the list of parties to whom this DPR/FR is submitted and for what purposes. Then DOE should cross check with all the parties and confirm that the same DPR/FR is submitted to all the parties correctly without any changes. DOE must not accept any reports and undertakings from PP/Consultant. DOE must make independent evaluation and use totally different parties without informing the PP or Consultant to cross check the facts.</p> <p>6) DOE to write to the party who prepared the DPR/FR which is submitted to the banks and other agencies and the same is verified against the one submitted to the DOE by PP/Consultant.</p> <p>7) DOE must not entertain this project any more if found the DPR/FR is tampered with at any point in time. PP can not give different DPR's and FR's. They must submit only the one given to Banks and other agencies while obtaining loans and decision making time.</p> <p>8) Has the PP considered the CDM revenues while envisaging the project? Without CDM the project was</p> | <p>(India) Pvt. Ltd in October 2009 preceding the board meeting in which project investment decision was approved. This is the DPR that has been shared with financing institutions and DOE. Copies of the work order issued to Fichtner has also been provided to the DOE.</p> <p>4. The project participant affirms that the DPR submitted to the bank and the DOE are the same; providing a letter from the bank to this effect is not feasible and is also not a requirement as per the CDM framework.</p> <p>5. A copy of DPR has been provided to the DOE; the basis for assumptions (e.g. cost of natural gas, project cost etc) have also been substantiated with documentary evidence where necessary. The DPR has been provided to other stakeholders like financing institutions on</p> | <p>The actual project cost considered has been cross checked from the loan agreement letter with Axis Bank which is the lead arranger for the loan.</p> <p>The validation team affirms that all the input values for the financial analysis have been validated as per the requirements of paragraphs 111 & 114 of the VVM v1.2.</p> <p>8. Validation team during the office meeting with management of project participant had confirmed from the board register about the proceedings of meeting in which CDM revenue was seriously considered. The Project</p> |
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| | | | <p>not viable, is it right? This project is having a debt component? Then how bankers or lenders gave the loan? Have the bankers or lenders considered the CDM revenues while agreeing to give loan to this projects? If not this project should be rejected right away by DOE by terminating the contract forthwith. If yes, where is the proof? What is the date of the evidence document from bank? Is this document printed now a days or earlier. DOE to independently check the same. If the document is available from Bank it must be checked from all angles so that it is genuine and not forged and date changed by putting back dated. This is normally done, DOE to be aware of this please. Please check the communication the PP had during that time with banks, emails and postal receipts and the weights and dates mentioned on the receipts. Do not believe in courier bills and receipts since these can be cooked up easily. Insist on government owned postal service receipts only. If the project is fully equity project then on what basis the PP has invested full equity in to the project while considering the CDM revenue? DOE to check the same in detail and bring out the facts. Is there any past record of this PP to invest or not to invest at returns what he is talking about in this project? Proper evidences must be reviewed and</p> | <p>an as-needed basis. PP would also like to affirm that the copy of DPR shared with other stakeholders and the DOE are the same.</p> <p>6. The stakeholder's comment is addressed to the DOE; the project participant is unable to provide a response to this comment and requests the DOE to respond.</p> <p>7. The PP affirms that the copy of the DPR submitted to the banks and the DOE are the same.</p> <p>8. CDM revenues were considered as the time of project decision making; copy of relevant document relating to the board meeting has been provided to the DOE for validation. The project has debt component; while the project returns do not exceed the benchmark, there is adequate cash flow for re-payment of the debt. The financial model has been validated by the</p> | <p>Participant has presented the financial analysis that justifies the need for the project activity to be funded by CDM revenues which are essential to ensure its viability. The financial analysis has been validated by the financial expert in the validation team of BVCH.</p> <p>9. The project activity is a Greenfield project activity using new equipment at site. This has been verified during the physical site visit and from the EPC agreement signed with M/s Lanco Infratech Limited.</p> <p>10. The validation team would like to confirm that it has adhered to well</p> |
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VALIDATION REPORT

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| | | | <p>digged out by the DOE and take decision on the project based on established facts. Do not ask documents from PP, DOE to collect the same from different sources to do independent evaluation.</p> <p>9) Is the project equipment purchased second hand equipment or sourced from cheap foreign sources? If yes, the issue must be probed by DOE since invoices will invariably be inflated and forged. Total project costs mentioned by PP will not be the same as originals. Hence no additionality. These facts must be probed in full by DOE by checking all documents and money transactions along with bank statements and certified accounts by a legally acceptable financial analyst.</p> <p>10) From DOE side which auditor has done marketing and business development for acquiring this business of validating this project? With whom he or she was co-ordinating at PP or CER buyer? The same person who has done the marketing and business development to acquire the business do validation or participate in any manner what so ever in the validation process? One cannot do like that. It is against the accreditation rules and norms followed since ages. DOE should send auditors from different</p> | <p>DOE and their financial expert and found consistent. Other comments provided are not relevant/not requirements under the CDM framework.</p> <p>9. The proposed project is a green-field project; all equipments used in the project are new. EPC contract and other related documents have been validated by the DOE. Total project cost has also been validated by the DOE; loan sanction letter for proof of debt component considered has been provided to the DOE. EPC contracts for the project have also been validated by the DOE for assessment of project costs considered.</p> <p>10. The stakeholder's comment is addressed to the DOE; the project participant is unable to provide a response to this comment and requests the DOE to respond.</p> <p>11. The candidate project is not a de-bundled part</p> | <p>defined auditing procedure and practice defined under the EB 55 Annex 1 VVM v1.2 and also the EB 67 Annex 4 CDM Accreditation Standard for DOEs v4.</p> <p>The validation of the subject project activity has been carried out totally in accordance with the above guidance and standard of the CDM-EB. . Impartiality of the assessment has been carefully ensured throughout the validation process.</p> <p>11. The project is a large scale Greenfield project activity being developed by project participant, the project is not a debundled component. So this</p> |
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VALIDATION REPORT

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| | | <p>offices or countries to do this validation audit. DOE must take care of impartiality and accreditation rules. Due to the targets set by the DOE managements auditors are doing marketing and meeting clients and giving promises that the project will be taken care. Is it acceptable and fair? This must be stopped. No auditor should do marketing. Only non-auditing staff should do marketing. DOE to ensure the same please.</p> <p>11) If applicable only: Is these machines, equipment was a part of any bundle of CDM activity envisaged and developed earlier. DOE to check the same through independent sources also. Once some bundles are non-additional and getting negative validation from a DOE, PP is rolling out the same project as an individual project which is not a CDM project at all. DOE to verify the same from independent sources and also take undertaking in the form of an affidavit from the PP's that any misrepresentation or false statement with respect this would attract strict legal action from UNFCCC and DOE. Furthermore the registered project must be de-registered in case of any future findings contradicting the submissions made by the project owner.</p> | <p>of any other project; hence, this comment may not be applicable to the candidate project. 12. The total project cost details have been presented in the PDD; this has also been validated against the actual costs paid to the EPC contractor. 13. As required under AM0029, baseline has been selected based on <i>"Emissions from a technology that represents an economically attractive course of action, taking into account barriers to investment"</i>. An analysis of the levelized cost of generation revealed that generation of power by a coal-based sub-critical plant has the lowest cost and has been considered as the baseline in the</p> | <p>comment is not applicable.</p> <p>12. The project activity is an Greenfield project activity using new equipment at site. This has been verified during the physical site visit and from the EPC agreement signed with M/s Lanco Infratech Limited. The actual project cost considered has been cross checked from the loan agreement letter with Axis Bank who is the lead arranger for the loan and from the EPC agreements signed with the contractor. Each input value is validated in the validation report above.</p> |
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VALIDATION REPORT

12) DOE to be more careful so that this is a genuine CDM project. What is the exact project cost? The project cost is covering what? Each value considered must be validated with proof. The machinery is second hand purchased or fresh and new from an OEM? In either case DOE to check all the quotations, proposals, purchase orders, invoices, way bills, transport bills, proof of payments like bank statements. DOE to check with banks by way of written confirmation the amount transacted, to whom the money is paid, when the money is paid, is the party paid is the correct party as shown in the purchase orders. It may so happen that the values, party names, dates are fabricated and misrepresented in this project. DOE should terminate their contract for this project immediately. This is the only way out to protect the value of CDM process. If the PP is purchasing second hand or second quality equipment and inflating the purchase order values and invoices, this must be probed thoroughly and real values to taken for additionality calculation. Then I'm sure the additionality is not there at all in such a situation.

candidate project activity. Comments relating to the DPR and its distribution are repeated and have been responded to in earlier responses

13. Baseline is identified by the procedures laid down by the methodology AM 029 version03 and been validated in the section 3.6.3 of the validation report.



VALIDATION REPORT

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| | | | <p>13) How is the base line defined in this project? Is Base line hypothetically defined with no proper evidences and proper justification? In such case, DOE cannot take the base line as suggested by the PDD. Please check that there are real emission reductions beyond the real and factual base line. It may so happen that this project qualifies for no CER's. DOE cannot assume values and things as giving by this PP. Whatever values are considered throughout the project in all documents including the real DPR (not the one prepared for CDM, the one given to the banks and others), they must be validated, verified and double checked. Do not ask PP for DPR. Ask the parties who have been given DPR by the PP. Get directly from the bank and others by each page of the DPR and Feasibility report signed. Such document can be considered as a real DPR or FR. UNFCCC CDM process cannot be degraded by fabricating and misinterpreting the project base line and additionality.</p> | | |
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VALIDATION REPORT

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| 2 | Submitted by: M.Brutus, mrksbrts9@gmail.com | WITHIN THE COMMENTING PERIOD 03.04.2012 TO 02.05.2012 | <p>1. In India there is huge shortage of Natural Gas especially the irregular and interrupted supply of the Gas. At the same time the project proposed to use Natural gas which would further aggravated the problem. In that case the present user of the natural gas would be forced to switch to the alternative such as fossil fuel and ultimately the GHG would be released.</p> <p>2. No plan has been submitted regarding use of 2% of the net revenue accrued from the sale of CER toward achieving the sustainable development goals.</p> <p>3. The investment analysis is incomplete and fails to provide the data and assumptions necessary for reader to reproduce the result.</p> <p>4. No information has been provided regarding the cost of fuel switch in the PDD.</p> <p>5. As per the EIA report the noise level recorded in the individual process units exceeded the stipulated standards of Central Pollution Control Board</p> | <p>1. The surplus availability of gas has been presented in the PDD.</p> <p>2. LKPL would undertake discussions with the locals at the project site and commit the revenue towards society / community developmental activities in areas that are of most concern to the local population. These areas could include health, education, sanitation, skill development, infrastructure development, etc. LKPL has also planned to undertake annual review meetings The annual review process will detail the exact activities that would be undertaken using the 2% revenue and the detailed mode of implementation of the proposed activity. The information is available in the PDD.</p> | <p>1. It has been mentioned in the PDD that the supply natural gas for the project is envisaged from Krishna Godavari basin in Andhra Pradesh, which is a newly explored gas field. Further the surplus availability of natural gas in the region is justified and validated in validation report.</p> <p>2. PP in the PDD has mentioned that 2% of the revenue realized from sale of certified emission reduction arising from the candidate CDM project will be contributed towards sustainable development including initiatives towards society /</p> |
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VALIDATION REPORT

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| | | | <p>(CPCB).</p> <p>6. The PDD does not explain about identified training, monitoring and maintenance as per the Technology requirements for contractors / engineers by the client. There is no mention of field quality Assurance systems & procedures that are available at site, field quality plans and their approval.</p> <p>7. Chronology of events with corresponding emails, letters need to be validated by DOE.</p> <p>8. The leakage calculation is not correct as per applied meth AM29.</p> <p>9. What is the basis for arriving discount factor since it has more bearing on the levelised cost.</p> <p>10. The input values taken for calculation of levelised cost of generation are not provided. Pls. clarify.</p> <p>11. The argument for opting out of other energy sources from the baseline is not adequately demonstrated in the PDD. Where is the proof for each of the argument? PP has duty to provide to all</p> | <p>3. Complete information on the investment analysis has been provided in the PDD and in the excel models. The values and assumptions considered have also been substantiated. It is possible for stakeholders to consider the values presented and reproduce the results as presented by the project participant</p> <p>4. The candidate project is a green field gas based project. The stakeholder's comment may not be applicable.</p> <p>5. The EIA has been prepared by an independent third party (M/s Pioneer Enviro Laboratories & Consultants Pvt Ltd, Hyderabad). A copy of the EIA report has been provided to the DOE; The EIA does not make any observations as indicated by the stakeholder.</p> <p>6. Detailed information on monitoring & procedures</p> | <p>community development. The validation team is satisfied with the proposals presented in the PDD for utilisation of funds towards sustainable development. The project activity has also received approval from the DNA of India, which confirms that the project activity contributes to sustainable development in India.</p> <p>3. The inputs to the investment analysis have been validated in the validation report. The revised PDD also incorporates the details of all the inputs and there sources.</p> <p>4. The project is a Greenfield project based</p> |
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VALIDATION REPORT

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| | | <p>the points it raised to opting out of renewable and other sources.</p> <p>12. The reason for excluding the power generation using natural gas with different technologies is not clear. It is mentioned in the PDD that the project activity is a combined cycle power plant with the modern state of art technology and significant efficiency improvement is not possible with current technology status to reduce GHG intensity any further. As CCP is very efficient technology there are no higher efficient technologies available to the project proponent for power generation utilizing natural gas.</p> <p>13. Project proponent conveniently hides the past history of the project and presents it as if it is a new project. DOE to check the prehistory of the project.</p> <p>14. DOE to check the DPR, tender documents inviting proposals, tender correspondence, proposals etc. to clearly validate.</p> <p>15. The PP states that they have considered 80% accelerated depreciation. However the PDD is silent</p> | <p>is provided in the section B.7.1, B.7.2 and annex 4 of the PDD in line with the guidance in EB – 41, Annex – 12.</p> <p>7. Supporting documents related to the chronology of events have been provided to the DOE; these include copy of news paper advertisement inviting quotations (RFQ) dated 21/09/2009, work order for preparation of DPR dated 11/09/2009, extract of the board resolution dated 14/10/2009, EPC agreement dated 23/12/2009, copy of Notice to Proceed (NTP) dated 28/12/2009 etc.</p> <p>8. The leakage calculation has been provided in the PDD and the ER calculation excel model; the values and assumptions have also been substantiated. The leakage has been calculated in-line with the methodology.</p> <p>9. The discounting factor</p> | <p>on Natural gas, there is no fuel switch involved in project activity.</p> <p>5. Project activity has received the Consent to Establish from Andhra Pradesh pollution control board and got the Environmental Clearance from Ministry of Environment and Forest, India. These consents to the project activity imply that all statutory and regulatory requirements have been complied with by the project activity, including pollution limits. The State Pollution Control Boards also periodically check whether all pollution control norms are being adhered to.</p> |
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VALIDATION REPORT

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| | | | <p>on the tax shielding as a result from accelerated depreciation. PPs cleverly do not consider the accounting tax offsetting in their companies while calculating the IRR. This is evident from the recently registered projects and those requesting registration.</p> <p>16. The DOE is therefore requested to critically analyze how the accelerated depreciation benefit has been taken into account and confirm the accounting of the cash inflows as a result of the negative tax liability in the initial years. DOE should not be misguided by the financial presented by the PP or consultant which are custom made for CDM purposes and not the actual financial considered at the investment decision. Note that considering cash inflows results in an increase in the IRR making wind projects a profitable venture.</p> <p>17. Please also check the offer from WTG supplier and Purchase Order while validating the PLF. It may be so that the third party report which is made after investment decision making - indicates a lower PLF. The PLF seems to be very low. Also check the tariff order.</p> | <p>for computation of levelised cost has been sourced from Notification for Escalation rate Dated 30/09/2009 by Central Electricity Regulatory Commission (CERC). CERC is a regulatory authority and publishes this data periodically and is publicly available.</p> <p>10. The Inputs values with sources used for calculation of Levelized cost of generation for all the baseline alternatives have been provided in Appendix 3 of the PDD</p> <p>11. Justifications for not considering baseline alternatives other than the ones described have been provided in the PDD.</p> <p>12 Power stations using gas as fuel have two options – open cycle or closed cycle (in which the flue gas is used to operate a steam turbine). The operation of a gas based power plant in</p> | <p>6. In section B.7.1 & B.7.2 of the PDD PP has presented the organization structure of the company and their roles and responsibilities. QA/QC procedures adopted for each monitoring parameter is presented in section B.7.1 of PDD.</p> <p>7. Validation team has validated the evidences for the chronology given in the PDD.</p> <p>8. PP has provided a separate Emission Reduction calculation spreadsheet, validation team validated all the inputs and equations used to calculate leakage.</p> <p>9. Discounting factor has been sourced from the</p> |
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VALIDATION REPORT

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| | | | <p>18. methodology selection is wrong – applicability condition 1 of AM0029 requires 'The project activity is the construction and operation of a new natural gas fired grid-connected electricity generation plant.' This project plant is only a modification of an existing plant that operated for many years now.</p> <p>19. If the plant is just a retrofit, how baseline can be a coal based plant? Was it possible to retrofit this GTs to use coal? This is a ridiculous claim by behalf of PP and consultants.</p> <p>20. Whether project has got Environment Clearance from Ministry of Environment & Forest, New Delhi? What are major conditions stipulated in Clearance?</p> <p>21. Whether uninterrupted supply of Natural Gas has been ensured from suppliers for continuous operation? Whether gas will be provided from existing network of pipeline or modification is needed?</p> <p>22. Host country is already encouraging sustainable development on basis of clean technology and cleaner fuel, in this case how this project meet</p> | <p>open cycle has low efficiency (25-35%) making it economically unviable. It can also be observed that new thermal power stations coming up in the country, using gas as fuel operate in the combined cycle mode. Hence this has not been considered as a baseline alternative. The reason for excluding open-cycle gas based turbines has been clearly explained in the PDD.</p> <p>13. Candidate project is a green-field power plant still under commissioning. The stakeholder's comment may not be valid.</p> <p>14. The stakeholder's comment is addressed to the DOE; PP is unable to provide a response for this comment and requests the DOE to respond.</p> <p>15. There is no accelerated depreciation consideration in the candidate project. The</p> | <p>Notification on Escalation rates given by CERC dated 30/09/2012.</p> <p>10 . The Appendix 3 of the PDD includes the transparent description of all the input value for the financial analysis. Validation team has validated all the input values and found them appropriate.</p> <p>11. Justification to the each of the baseline alternatives considered has been given in the PDD. Validation team also from its own research and local knowledge found the justifications appropriate.</p> <p>12. There is no such statement in PDD , however PP has provided</p> |
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VALIDATION REPORT

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| | | | <p>additionality criteria of CDM process?</p> <p>23. Whether Environment Public Hearing as process of Environment Clearance was arranged for this gas based power plant? If yes, what were major discussion and decisions of Environment Public Hearing?</p> <p>24. Additionality</p> <p>The methodology considers a project additional under the following circumstances</p> <p>a) There is a more economically attractive and GHG intensive alternative available to the project activity (lower levelized cost when compared to the project activity); and</p> <p>b) The project on a standalone basis is not financially attractive (low IRR as compared to standard industry benchmark)</p> <p>While the PP has demonstrated that there is a more economically attractive option available as compared to the project activity, it has not demonstrated that the project on a standalone basis is not financially viable . As the project activity involves displacement of power on the grid and the alternative can be set</p> | <p>stakeholder's comment may not be valid.</p> <p>16. There is no accelerated depreciation consideration in the candidate project The stakeholder's comment may not be valid.</p> <p>17. Candidate project is a gas-based CCGT power plant; the stakeholder's comment may not be valid.</p> <p>18. The candidate project is a green-field project activity. EPC contracts and other relevant documents have been submitted to the DOE for validation. The project activity is in conformance to the requirements of the methodology.</p> <p>19. The candidate project is a green-field project activity and is not a retrofit. The stakeholder's comment may not be valid.</p> <p>20. Environmental clearance has been received by the project activity. Major conditions stipulated in the</p> | <p>adequate justifications to exclude the power generation using natural gas with different technologies.</p> <p>13. The project activity is a green field Project Activity as confirmed during the site visit by validation team.</p> <p>14. DOE has checked the DPR dated September 2009 , prepared by M/s FICHTNER Consulting Engineers (India) Pvt. Limited . The service order raised to M/s FICHTNER Consulting Engineers (India) Pvt. Limited for preparation of plant layout and Detailed feasibility cum project Report dated 11/09/2009 has also been checked.</p> <p>15. It is not mentioned anywhere in the PDD that project has considered 80% accelerated depreciation. The same is also not applicable to Gas based projects under Indian Tax Law.</p> |
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| | | | <p>up by any other entity as well, it needs to undertake a benchmark analysis. In order to perform benchmark analysis, the PP needs to take into account the tariff that it receives from the sale of power.</p> <p>The plant is being setup as a Merchant Power Plant (MPP) and hence may not enter into a long term PPA. It is a well known fact that merchant power plants are very attractive, because they get higher tariff than PPA based power plants. An article in Poweronomics is quoted here.</p> | <p>clearance and PP's conformance status to the same are – no additional land to be acquired for the project (project is being developed in the existing complex only), permission for the operation of the plant to be received from the Chief Controller of Explosives (copy submitted to DOE), water withdrawal not to exceed 9.0 cusecs (EIA done by third party estimates water requirement in the LKPL facility to be lesser than this) etc.</p> <p>21. PPs is yet to sign the Gas Supply Agreement; the reasons for the same are explained as: The Empowered Group of Ministers (EGoM) has issued guidelines stating that the gas will be allocated to the projects as and when they are ready to consume gas. Since there has been a delay in the commissioning of the plant, i.e., candidate</p> | <p>16. Accelerated depreciation is not applicable to project activity .</p> <p>17 . The proposed project activity is a Natural Gas based combined cycle power plant the query/comment by the stakeholder in not applicable.</p> <p>18. The project is a green field project , the same has been verified by the validation team during the physical site visit.</p> <p>19. There is no modification or retrofitting of old equipment involved in the project activity.</p> <p>20. Project has got environmental clearance from Ministry of Environment and Forest on 13/03/2008. The document has been reviewed by the validation.</p> <p>21. The Project Participant has provided their response to the comment made and the validation</p> |
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| | | | <p>project activity is not in a position to 'consume gas'; allocation of gas would be done by the Ministry of Petroleum and Natural Gas once plant is commissioned post which Gas Supply Agreement would be signed with the gas supplier. The relevant communications from the Ministries of Power, MNoPNG and CEA have been provided to the DOE.</p> <p>There is an existing line from gas transporter's line to LKPL facility (common to phase II and candidate project); within the boundaries of the PP's premises, separate lines have been laid for the candidate project activity.</p> <p>22. The project additionality has been demonstrated using the CDM Tool for Demonstration and Assessment of Additionality. The relevant information has been presented in section B.5</p> | <p>team agrees with the same.</p> <p>22. The additionality of the project activity is demonstrated in accordance with EB 65 Annex 21 Tool for the demonstration and assessment of additionality v6.0. Thus, requirements of the CDM have been followed in the demonstration of additionality for this project activity.</p> <p>23. The PP's response to the query is self-explanatory and accepted by the validation team. The project activity has received environmental consent to establish for which holding an</p> |
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| | | | | <p>of the PDD</p> <p>23. Yes; the project's features and the environmental merits were explained to the residents of the vicinity; the local populations welcomed the project as it would also lead to creation of jobs and overall improvements in local socio-economic conditions. Copy of the EIA has been provided to the DOE</p> <p>24. Benchmark analysis has been presented in the PDD to demonstrate additionality, Project IRR has been computed as financial indicator and WACC as benchmark. The results of the benchmark analysis show that the project on a stand-alone basis is not financially attractive. Merchant power plants do not always get higher tariff rates; tariff depends on the market conditions.</p> | <p>environmental public hearing is a mandatory requirement.</p> <p>24. The PDD has carried a benchmark analysis with the project IRR worked out and shown to be less than an investor benchmark to justify that the project activity remains an unviable investment on a standalone basis. The IRR computation was validated by the financial expert in the validation team, M/s. Sushil Budhia Associates who are practicing Chartered Accountants. Although the projet activity is a merchant power plant, it may not necessarily enjoy a higher tariff as the tariff is subject to market</p> |
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VALIDATION REPORT

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| | | | | | conditions of supply and demand. IN the recent past, tariffs from short term power sale are known to have exhibited highly volatile behavior and have also shown a declining trend. It can also be argued that with the addition of generation capacities over the years, the tariffs are likely to come down. This is also one of the objectives of the National electricity policy of the Government of India which is oriented towards lowering of tariffs through market mechanisms and the competitive bidding route. |
| ³ | Submitted by: Karthikeyan, | WITHIN THE COMMENTING | The project is not satisfying methodology. Natural Gas is not available in the country. If the DOE | Benchmark analysis has been presented in the PDD; the results of the | The description and validation on availability of |



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| | carthik2010@gmail.com | PERIOD 03.04.2012 TO 02.05.2012 | <p>Google the non-availability of gas for power projects in India, it will come across a number of websites which will prove that whatever the PP says is not correct. The Ministry of Power in its letter dated March 14th 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 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."</p> <p>The PP has accepted the non availability of gas and the report available in the web says, "Hyderabad-based Lanco Group has been unable to commission its 740MW power plant at Vijaywada 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</p> | <p>benchmark analysis show that the project on a stand-alone basis is not financially attractive. Merchant power plants are do not always get higher tariff rates; tariff depends on the market conditions. The adequate availability of natural gas has been demonstrated in the PDD. The tariff is dependent on the cost of generation; the PDD does not state otherwise. Step 2 for demonstration of Additionality under the AM0029 ("Identify the economically most attractive baseline scenario alternative") requires: "The economically most attractive baseline scenario alternative is identified using investment analysis. Calculate a suitable financial indicator for all alternatives remaining after Step 1. Include all relevant costs (including, for example, the</p> | <p>the natural gas in the region (Applicability condition 3) has been presented in validation report section 3.6.1 above. A detailed analysis of the supply-demand conditions has been made and on the basis of the same, the validation team has concluded that the requirement of AM 0029 methodology pertaining to the sufficient availability of natural gas is met by the project activity.</p> <p>The validation team is also of the opinion that the AM 0029 methodology seeks to demand that the availability of the gas in the country or region is assured, i.e. there must be</p> |
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VALIDATION REPORT

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| | | <p>several representations.” (http://www.livemint.com/2011/11/17233943/Decline-in-gas-supplies-makes.html).</p> <p>Annual Report of the company reveals that the project achieved capacity utilization of only 66%. When the PP has projected 85% PLF, why should the plant achieve only 66% PLF? The entire explanation given in sec. B.3 is unreliable and the project is not fulfilling the requirement of methodology.</p> <p>PDD states it is a merchant power plant. Hence, the tariff and the cost of generation are mutually exclusive. Then, how can levelised cost be considered as financial indicator for selecting the baseline? Ministry of power uses levelised cost for its project is not a valid reason for applying the levelised cost as Government projects are not merchant power plants. IRR should be the basis for selecting baseline.</p> <p>The logic given arguing the use of levelised cost as financial indicator in sec. B5 is not correct. If this argument is correct then all renewable energy power projects can use investment comparison analysis using levelised cost as the financial indicator. This is because PPs can set up any other renewable energy</p> | <p>investment cost, fuel costs and operation and maintenance costs), and revenues (including subsidies/fiscal incentives, ODA, etc. where applicable), and, as appropriate, non-market costs and benefits in the case of public investors.”</p> <p>LKPL has chosen levelized tariff i.e., levelized cost of generation as the financial indicator for identifying the economically most attractive baseline scenario of the 6 plausible alternatives. Levelized tariff accounts for all relevant costs, revenues and benefits that are available to investors in power sector in the country. Further, for all power generation projects in India, levelized cost of electricity generation is one way to perform comparisons among different technologies</p> | <p>sufficient gas available so that plants coming up in the future are not deprived of gas and are forced to turn to other more emission intensive fossil fuels. It has been established and is accepted that the KG basin off the coast of Andhra Pradesh has huge reserves of natural gas. The quantum of these reserves estimated by various entities and widely reported in the media from time to time, is much more than adequate to meet the demand for natural gas from all sectors including power, fertilizer, industry as well as consumers. The validation team therefore</p> |
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VALIDATION REPORT

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| | | | <p>based power project or fossil fuel based power projects. The argument is wrong. Step 1 of the methodology clearly states that the benchmark analysis should be used for additionality demonstration. Additionality tool gives benchmark only for NPV and IRR and not for levelised unit cost. Therefore, the argument given for levelised unit cost shows that the PP is misleading.</p> <p>PP has realized that the argument is not correct. It is for this reason that he has also given project IRR (calling it as equity IRR!) with WACC as benchmark. With the given input parameters, it is not possible to reproduce the analysis and arrive at the same results as required by the methodology. But one thing is certain that the PP has used levelised cost as tariff, which is not correct, as it is a merchant power plant and the tariff will be higher than the levelised cost. If the prevailing merchant power tariff is taken into account the project cannot be additional.</p> | <p>(alternatives) since it allows to quantify, the unitary cost of the electricity (the kWh) generated during the lifetime of all the alternatives being compared. The consideration of all the affecting components in present money worth in calculation of levelized cost of generation provides a level ground for comparison and justifies its use as a suitable indicator. It is also important to note that for all power generation projects in India which are evaluated by Ministry of Power, Government of India, levelized cost of generation is used as an evaluation criteria. The sources for all inputs considered for calculation of levelized cost of generation have been provided in the excel models/PDD.</p> | <p>agrees that the sufficiency of gas availability is established in terms of the existing reserves and that bottlenecks that are encountered in the supply are only of short term nature which would undoubtedly get eased out over time.</p> <p>The team believes, therefore, that the availability of gas is proven beyond doubt as far as the intent of the AM 0029 requirement is concerned.</p> <p>Benchmark analysis has been applied to demonstrate additionality, PP has chosen Project IRR and compared it with Weighted Average Cost of</p> |
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VALIDATION REPORT

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| | | | | | <p>Capital (Benchmark), which is as per the requirement of the applied methodology AM029 Version 03.</p> <p>The validation team noted during the course of validation that the project activity is being set up as a merchant power plant and has not entered into any long term Power Purchase Agreements. It relies on market opportunities for the sale of power, such as through the bidding process or electricity exchange trading.</p> <p>However, as the tariff is subject to market conditions of supply and demand, its exact value over the entire lifetime of</p> |
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VALIDATION REPORT

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| | | | | | <p>the project activity is very difficult to predict accurately. Hence, the Project Participant has applied a tariff that is based on the year to year cost of generation and the expected Return on Equity (RoE) and the same has been used to determine the IRR for the investment. In the absence of a definite value for the tariff, the approach taken is considered by the validation team to be appropriate and reasonable. The same was also validated by the financial expert in the validation team.</p> <p>The PP has also</p> |
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VALIDATION REPORT

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| | | | | | <p>presented the benchmark analysis using the Project IRR and has compared it with a benchmark based on the Weighted Average Cost of Capital (WACC). The validation team accepts that use of the WACC is an appropriate benchmark. A detailed validation justification of the same is provided in section 3.7.3 of the report. The demonstration of additionality is therefore, in accordance with Step 2 of the AM 0029 methodology and EB 65 Annex 21 Tool for the demonstration and assessment of additionality.</p> |
| 4 | Submitted by: Fleming, ranga.rajana.reddy@gm | WITHIN THE COMMENTING | Do send some auditors who are not in the business development and marketing with the PP. Bureau Veritas should | The stakeholder's comment is addressed to the DOE and the PP is | The validation team would like to confirm that it has |



VALIDATION REPORT

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| ail.com | PERIOD 03.04.2012 TO 02.05.2012 | <p>depute a team for any audit who is not involved in the marketing with the client. Bureau Veritas now a days is doing CDM audits in very short time and giving reports. Why and how? What has changed? Overnight have they become very knowledgeable? Same people, same systems and their attitude towards CDM validation has changed and BV auditors are giving request for registration without checking the full particulars of the project. Why the sudden change in attitude? Auditors want to milk CDM and spoil CDM system and then go for their regular inspection and ISO certification stuff when CDM dies? Because of DOE's like this only CDM is going to dogs. Auditors like HB Muralidhara, Sanjay Patankar and other likeminded auditors in BV are going very fast on CDM projects of their choice and certifying in a great hurry. Why? Bureau Veritas management should probe this? If BV management does not take real interest and keep the house in order, UNFCCC should check this issue. Why BV's all old projects which are published for comments in 2007 and 2008 are getting request for registration all of a sudden? What clients have shown and given off late which they have not done in the last 3 years or so? What is this? What is happening? What kind of TR is being done? Is TR done just for the</p> | <p>unable to provide a response to this comment; PP requests the DOE to respond to this comment.</p> | <p>adhered to well defined auditing procedure and practice defined under the EB 55 Annex 1 VVM v1.2 and also the EB 67 Annex 4 CDM Accreditation Standard for DOEs v4.</p> <p>The validation of the subject project activity has been carried out totally in accordance with the above guidance and standard of the CDM-EB. . Impartiality of the assessment has been carefully ensured throughout the validation process.</p> <p>The validation team also would like to add that the comment made is not specific in the context of the project activity and has been repeatedly witnessed in</p> |
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| | | | <p>sake of doing or is TR raising any true and genuine issues? HB Muralidhara and Sanjay Patankar should not be used for any large scale projects as LA as their independence is definitely questionable.</p> <p>They should be used only for TR and some “independent and new to consultants and large group companies” auditors to be used as LA’s. At least both of them should be sent to Inspection to save BV’s reputation on CDM business. BV auditors relationship with some of the big group of companies in India & other countries and some consultants is questionable and brings disrepute to CDM process. Names need not be written, everyone knows including BV’s management. If no credible corrective actions are initiated immediately by BV’s management then we have no other option except to come out openly with names of companies and consultants with whom BV is involved in wrong activities.</p> <p>How come HB Muralidhara and Sanjay Patankar do audits for clients and consultants when both are doing marketing and seeking business from market? Is this allowed in any third party certification business? Why BV is flouting rules, for disgrace? Why BV’s auditors themselves are giving suggestions how to close CAR’s and CL’s for CDM</p> | | <p>other project activities being submitted for global stakeholder comments. Also, the comment is directed at the DOE organization and individuals rather than the project activity itself, which amounts to a misuse of the forum for global stakeholder comments.</p> <p>The validation team reiterates that the assessment of the project activity has been carried out diligently and in accordance with applicable guidance and standards set by the CDM EB.</p> |
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VALIDATION REPORT

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| | | | projects? Why they are advising corrective actions? Is it acceptable? BV's management and UNFCCC should look into this matter and correct the things immediately in the interest of CDM process. Flavio Gomes is fit for counting revenues and does not have a proper oversight on his own business operations area, which is proven effectively now. It's time to set the business in order. Copy marked to UNFCCC. | | |
| 5 | Submitted by: Fleming, ranga.rajan.reddy@gmail.com | WITHIN THE COMMENTING PERIOD 03.04.2012 TO 02.05.2012 | <p>Is the project equipment purchased second hand equipment or sourced from cheap foreign sources? If yes, the issue must be probed by DOE since invoices will invariably be inflated and forged. Total project costs mentioned by PP will not be the same as originals. Hence no additionality. These facts must be probed in full by DOE by checking all documents and money transactions along with bank statements and certified accounts by a legally acceptable financial analyst.</p> <p>2. From DOE side which auditor has done marketing and business development for acquiring this business of validating this project? With whom he or she was co-ordinating at PP or CER buyer? The same person who has done the marketing and business development to acquire the business do validation or</p> | <p>1. Project is green-field project activity and project costs have been established by supporting documents provided to the DOE during validation. The rest of the comment from this stakeholder is addressed to the DOE; PP requests the DOE to respond.</p> <p>2. The comment is addressed to the DOE; PP is unable to respond to this comment and request the DOE to provide the response.</p> <p>3. The stakeholder's comment may not be applicable to the</p> | <p>Validation team has performed physical site visit for the project activity all the equipments installed at the project activity are new , validation team has also checked this from the EPC agreement signed with the EPC contractor . The total project cost assumed by PP in the financial analysis has been crosschecked from the Loan sanction</p> |



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| | | | <p>participate in any manner what so ever in the validation process? One cannot do like that. It is against the accreditation rules and norms followed since ages. DOE should send auditors from different offices or countries to do this validation audit. DOE must take care of impartiality and accreditation rules. Due to the targets set by the DOE managements auditors are doing marketing and meeting clients and giving promises that the project will be taken care. Is it acceptable and fair? This must be stopped. No auditor should do marketing. Only non-auditing staff should do marketing. DOE to ensure the same please.</p> <p>3. If applicable only: Is these machines, equipment was a part of any bundle of CDM activity envisaged and developed earlier. DOE to check the same through independent sources also. Once some bundles are non-additional and getting negative validation from a DOE, PP is rolling out the same project as an individual project which is not a CDM project at all. DOE to verify the same from independent sources and also take undertaking in the form of an affidavit from the PP's that any misrepresentation or false statement with respect this would attract strict legal</p> | <p>candidate project..</p> <p>4. The comment is addressed to the DOE; PP is unable to respond to this comment and request the DOE to provide the response..</p> <p>5. DPR which has been prepared y a third party engineering company(M/s Fitchner Consulting Engineers) has been provided to the DOE. The same was available to PP at the time of decision making .</p> <p>6. PP would like to assure that the DPR provided to the DOE is the single and only version. The same version has been submitted to Banks for Loan sanction.</p> <p>Moreover, the copies of EPC contact with EPC contractor , Loan Sanction letter have also been provided to DOE for crosschecking of financial inputs.</p> <p>7. The DPR was</p> | <p>letter from Axis Bank.</p> <p>2. Please refer to the response from the validation team to comment no. 4 above.</p> <p>3. This comment is not applicable to project activity as the equipment used in the project activity is new as confirmed during physical site visit and EPC agreement signed with Lanco Infratech Limited.</p> <p>For comments 4-9</p> <p>The input values in the financial analysis and the project information in PDD have been sourced from authentic documents . The list of documents reviewed are listed in section 6 of the validation report.</p> |
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VALIDATION REPORT

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| | | | <p>action from UNFCCC and DOE. Furthermore the registered project must be de-registered in case of any future findings contradicting the submissions made by the project owner.</p> <p>4. DOE to ensure that the PDD values are consistent and ensure that the CDM project is a genuine project</p> <p>5. DoE to check the Detailed Project Report and Feasibility Report which is submitted to the other agencies and Banks by Project owner and ensure that the values match with the DPR/FR submitted to DoE also.</p> <p>6. Careful study must be done so that the DPR/FR is not in different versions made and submitted with different purposes to different agencies, which is totally unacceptable, illegal and unethical.</p> <p>7. DPR/FR values must be probed fully. DOE must take a written undertaking from the PP/Consultant about the list of parties to whom this DPR/FR is submitted and for what purposes. Then DOE should cross check with all the parties and confirm that the same DPR/FR is submitted to all the parties correctly without any changes. DOE must not accept any reports and undertakings from PP/Consultant. DOE</p> | <p>prepared by an independent third party (m/s Fichtner Consulting Engineers (India) Pvt. Ltd in October 2009). The PP affirms that the same DPR has been provided to the financing institutions and the DOE. The rest to the comment is addressed to the DOE and the PP is unable to comment on the same and requests DOE to respond.</p> <p>8. The stakeholder's comment is addressed to the DOE and the PP is unable to respond to this comment; PP request DOE to respond to this comment of the stakeholder.</p> <p>9. The stakeholder's comment is addressed to the DOE and the PP is unable to respond to this comment; PP request DOE to respond to this comment of the stakeholder.</p> <p>10. As required under AM0029, baseline has</p> | <p>BVCH has validated and crosschecked all the assumption and input values in the PDD .</p> <p>DPR submitted by the project participant is prepared by a reputed third party engineering company. However validation team has validated the inputs from the DPR and also crosschecked the same with other sources. Detailed description is given in section 3.7.3 of the validation report above.</p> <p>The actual project cost considered has been cross checked from the loan agreement letter with Axis</p> |
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| | | <p>must make independent evaluation and use totally different parties without informing the PP or Consultant to cross check the facts.</p> <p>8. DOE to write to the party who prepared the DPR/FR which is submitted to the banks and other agencies and the same is verified against the one submitted to the DOE by PP/Consultant.</p> <p>9. DOE must not entertain this project any more if found the DPR/FR is tampered with at any point in time. PP can not give different DPR's and FR's. They must submit only the one given to Banks and other agencies while obtaining loans and decision making time.</p> <p>10. How is the base line defined in this project? Is Base line hypothetically defined with no proper evidences and proper justification? In such case, DOE cannot take the base line as suggested by the PDD. Please check that there are real emission reductions beyond the real and factual base line. It may so happen that this project qualifies for no CER's. DOE cannot assume values and things as giving by this PP. Whatever values are considered throughout the project in all documents including the real DPR (not the one prepared for CDM, the one</p> | <p>been selected based on "Emissions from a technology that represents an economically attractive course of action, taking into account barriers to investment". An analysis of the levelized cost of generation revealed that generation of power by a coal-based sub-critical plant has the lowest cost and has been considered as the baseline in the candidate project activity. Values consider dint eh PDD have been validated by the DOE. Comments relating to the DPR and its distribution are repeated and have been responded to in earlier responses</p> <p>11. EPC contract and other related documents have been provided to the DOE in support of the total project cost. Further, loan sanction letter has also been provided to the DOE for proof of debt component considered. The rest of</p> | <p>Bank which is the lead arranger for the loan.</p> <p>PP has provided the DPR prepared by M/s Fitchtner consulting Engineers , all inputs are sourced from DPR . Validation has also crosschecked each input value in the validation report above.</p> <p>10. Baseline is identified by the procedures laid down by the methodology AM 029 version03 and been validated and justified in section 3.6.3 of the validation report above.</p> <p>11. The project activity is an Greenfield project activity using new equipment at site. This has</p> |
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| | | | <p>given to the banks and others), they must be validated, verified and double checked. Do not ask PP for DPR. Ask the parties who have been given DPR by the PP. Get directly from the bank and others by each page of the DPR and Feasibility report signed. Such document can be considered as a real DPR or FR. UNFCCC CDM process cannot be degraded by fabricating and misinterpreting the project base line and additionality.</p> <p>11. DOE to be more careful so that this is a genuine CDM project. What is the exact project cost? The project cost is covering what? Each value considered must be validated with proof. The machinery is second hand purchased or fresh and new from an OEM? In either case DOE to check all the quotations, proposals, purchase orders, invoices, way bills, transport bills, proof of payments like bank statements. DOE to check with banks by way of written confirmation the amount transacted, to whom the money is paid, when the money is paid, is the party paid is the correct party as shown in the purchase orders. It may so happen that the values, party names, dates are fabricated and misrepresented in this project. DOE should terminate their contract for this project immediately. This</p> | <p>the comment is addressed to the DOE and the PP requests the DOE to respond.</p> <p>12. The DPR was prepared by an independent third party (m/s Fichtner Consulting Engineers (India) Pvt. Ltd in October 2009). The PP affirms that the same DPR has been provided to the financing institutions and the DOE. The rest of the comment is addressed to the DOE and the PP requests the DOE to respond.</p> <p>13. CDM revenues were considered as the time of project decision making; copy of relevant document relating to the board meeting has been provided to the DOE for validation. The project has debt component; while the project returns do not exceed the benchmark, there is adequate cash flow for re-payment of the debt. The financial model has</p> | <p>been verified during the physical site visit and from the EPC agreement signed with M/s Lanco Infratech Limited. The actual project cost considered has been cross checked from the loan agreement letter with Axis Bank who is the lead arranger for the loan and from the EPC agreements signed with the contractor. Each input value is validated in the section 3.7.3 of the validation report above.</p> <p>12. The input values for the financial analysis are based on the DPR prepared by a reputed third party consultant who</p> |
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| | | | <p>is the only way out to protect the value of CDM process. If the PP is purchasing second hand or second quality equipment and inflating the purchase order values and invoices, this must be probed thoroughly and real values to taken for additionality calculation. Then I'm sure the additionality is not there at all in such a situation.</p> <p>12. Project owner should show some undertaking letter from bank manager to DoE stating that both DPR's are same. These kinds of letters should not be accepted and entertained by DoE at face value, but must be checked independently. While collecting the DPR/FR from banks and other agencies, all DPR/FR pages should be counter signed by Banks and other agencies so that the real DPR/FR given to other parties by the PP/Consultant is same as the one submitted to DOE.</p> <p>13. Has the PP considered the CDM revenues while envisaging the project? Without CDM the project was not viable, is it right? This project is having a debt component? Then how bankers or lenders gave the loan? Have the bankers or lenders considered the CDM revenues while agreeing to give loan to this projects? If not this project should be rejected right away by DOE by terminating the contract forthwith. If yes, where is the proof? What is the date of</p> | <p>been validated by the DOE and their financial expert and found consistent. Other comments provided are not relevant/not requirements under the CDM framework.</p> | <p>was appointed by the PP. The validation team of BVCH has confirmed the same. Also, it has also ensured that the values are cross-checked against independent sources accessible in the public domain. The assessment procedure followed by the team is as per paragraphs 111 & 114 of the VVM v1.2.</p> <p>13. The Project Participant has presented the financial analysis that justifies the need for the project activity to be funded by CDM revenues which are essential to ensure its viability. The financial analysis has been validated by the financial</p> |
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| | | | <p>the evidence document from bank? Is this document printed now a days or earlier. DOE to independently check the same. If the document is available from Bank it must be checked from all angles so that it is genuine and not forged and date changed by putting back dated. This is normally done, DOE to be aware of this please. Please check the communication the PP had during that time with banks, emails and postal receipts and the weights and dates mentioned on the receipts. Do not believe in courier bills and receipts since these can be cooked up easily. Insist on government owned postal service receipts only. If the project is fully equity project then on what basis the PP has invested full equity in to the project while considering the CDM revenue? DOE to check the same in detail and bring out the facts. Is there any past record of this PP to invest or not to invest at returns what he is talking about in this project? Proper evidences must be reviewed and digged out by the DOE and take decision on the project based on established facts. Do not ask documents from PP, DOE to collect the same from different sources to do independent evaluation.</p> | | expert in the validation team of BVCH. |
| 6 | Submitted by: alexander, | WITHIN THE COMMENTING | Lanco is fundamentally a cheating company. Just one example is the about their dishonest and illegal working in | Project is being developed by LKPL . The project activity has been | The comments by the stake holder are by nature |



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| lxndr2840@gmail.com | PERIOD 03.04.2012 TO 02.05.2012 | <p>solar business. Read the link: http://www.rechargenews.com/energy/solar/article312295.ece</p> <p>Unless the DOE does a thorough investigation of Lanco's behaviour it cannot process this validation. How come a DOE is doing this CDM validation? DOE to check all payments done by Lanco and DOE to be very careful of any documents given by Lanco since it is an unethical company with only profits in mind. Lanco's CDM documentation is cooked up and totally false. How come this DOE is undertaking validation of this project without the CDM registration of the first two phases of this project? What is this? DOE to immediately suspend this validation work. Is the DOE sold out to Lanco? DOE (BVQI) management must investigate and submit a report to CDM AT and CDM EB regarding this validation project. What values Lanco is showing in PDD is all cooked up and not genuine. All assumptions are not shown and there is no way that this project will complete a genuine GSCP process with this webhosting. Hence the PDD need to be rewebhosted. DOE to personally investigate the values and ask Lanco to rewebhost the PDD for GSCP again if at all DOE wish to proceed with CDM validation. Without rewebhosting the PDD if DOE is continuing with the</p> | <p>developed considering CDM benefits; this is evidenced in the extract of the board resolution dated 14/10/2009 (copy of which has been provided to the DOE) . The PDD is developed in-line with the requirements of the applicable methodology and tools. Authentic sources to all the input value and information in PDD, has been provided to DOE.</p> | <p>of allegations leveled against the Project Participant. As far as the role of BVCH in this validation assignment is concerned, the team of BVCH wishes to affirm that it has carried out the assessment diligently and in accordance with all the methodology requirements, guidance and standards prescribed by the CDM EB, including the EB 55 annex 1 VVM v1.2 and the EB 67 Annex 4 CDM accreditation standard for DOEs. Impartiality of the assessment has been assured throughout the validation process and also by means of the</p> |
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| | | | validation that means the DOE is sold out to Lanco. This project is a fake CDM project and because of this kind of projects only the CDM business has gone bad and genuine projects are suffering. | | DOE's own internal process and quality norms and standards. Hence, the validation team finds the comment unjustified. |
| 7 | Submitted by: alexander, lxndr2840@gmail.com | WITHIN THE COMMENTING PERIOD 03.04.2012 TO 02.05.2012 | <p>India says developer Lanco 'flouted' NSM rules, but 'no scam'</p> <p>The Indian government has indicated it will treat Lanco Infratech leniently, despite acknowledging that the developer "flouted" some rules in pursuing projects under the National Solar Mission (NSM). Related Stories</p> <p>India may fine most PV projects for delays in messy start to NSM India probes 'front company' claims over Lanco NSM share Update: PV power prices plumb new depths in India's NSM</p> <p>The admission may deepen scepticism about the strength of the regulatory regime in one of the world's fastest-growing solar markets.</p> <p>In February the Centre for Science and</p> | Project is being developed by LKPL . The project activity has been developed considering CDM benefits; this is evidenced in the extract of the board resolution dated 14/10/2009 (copy of which has been provided to the DOE). The stakeholder's comment does not have any reference to the candidate project. | The project activity is Natural Gas based combined cycle power plant, the comments made by the stakeholder are in respect of other renewable energy projects being developed by the Project Participant and are therefore not in any way related to the project activity. |



VALIDATION REPORT

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| | | | <p>the Environment (CSE), a Delhi-based green group, alleged that Lanco had broken the rules governing the NSM's first batch of projects by winning at least seven PV arrays – in addition to a 100MW solar-thermal project.</p> <p>Developers were only allowed to win one project of 5MW in the first 140MW batch, with the government intending to bring as many new players into the sector as possible.</p> <p>The CSE claims Lanco gained a controlling interest in numerous developers through its employees and their children, and alleges that state-run agencies have since attempted to hush-up the situation.</p> <p>Lanco has denied the allegations, saying its stakes in the various developers fall within “permissible levels”.</p> <p>In its first public statements about the case, the government says Lanco did break some rules – though not in an egregious manner.</p> <p>“Our investigation concludes that the company did flout some guidelines, but there is no scam as such,” says Tarun Kapoor, joint secretary at the Ministry of New and Renewable Energy (MNRE).</p> | | |
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Kapoor says the results of a formal investigation into Lanco's behaviour will be published in "a week or two".

Delhi is being forced to walk a fine line between cracking down on developers who break the rules or miss their commissioning deadlines, while at the same time avoiding being so draconian that it scares off potential investors.

Kapoor adds that 125MW of the 140MW awarded in the first batch of NSM projects in late 2010 is now operational.

All 140MW was supposed to be commissioned by 9 January, but the government was forced to admit earlier this year that almost none of the capacity would be completed on time.

Many outside observers believe the government has been too lenient with developers to date, and must become more transparent on issues like how far along projects have come, and how they are performing.

Kapoor says the government learned lessons from the first batch of projects and is being "more cautious" with the second 340MW batch, which are due for commissioning early next year.



VALIDATION REPORT

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| | | | India's installed PV base grew from 17.8MW at the end of 2010 to nearly 510MW in March 2012, with more than \$2.5bn invested into the sector last year. | | |
| 8 | Submitted by: jindal, jindaljindal29@yahoo.in | WITHIN THE COMMENTING PERIOD 03.04.2012 TO 02.05.2012 | Lanco, This is a fake CDM project. How come this project which is a phase 3 of the same site be validated now? How? What is the status of CDM for the last two phases? If both phases are not CDM registered and how come PP wants CDM for third phase? Why? PP's this project and this site is already viable without CDM benefits and CDM cannot be given to this phase also. It's proven. The validation of this project must stop and DOE must investigate why the PP wants CDM for this phase while PP is running both earlier phases for many years without CDM. They wish to make more losses? The fact is they are already making profits and wish to make more projects by CDM windfall benefits. This cannot happen in the interest of CDM process itself. CDM EB must notice this. This DOE is not professional. Why the approach of PDD, deciding of base line, and additionality argument is different in different phases of this Lanco project? Phase 2 PDD and Phase 3 PDD? Why? Has meth changed or what changed? It clearly shows that the project is cooked up. DOE to check this thoroughly and only after CDM | Candidate project is a green field project activity. There are two more power project Phase I and Phase II which are operating at same location . LKPL Phase II project activity has already been submitted for RFR (Ref No. 5544) and LKPL Phase 1 combined cycle power plant operating under a different tariff regime as compared to Phase II and Phase III (operates under a PPA with the state utility – fixed and variables costs covered). Phase I of LKPL may not qualify for CDM benefits. PHASE .. The financial additionality of the candidate project activity has been established. Baseline is chosen in-line with the methodology AM0029 for the project. Assumptions | The project activity i.e Phase III of Lanco Kondapalli Power Limited has been seriously considered as CDM project. Validation team from review of the PP's Board decision and project participant's intimations to UNFCCC and NCDMA confirms serious consideration of CDM for project activity. Validation team during the meeting with Management of Lanco Kondapalli Power Limited noted that another project by project participant LKPL Phase II |



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| | | | <p>registration of both earlier phases this phase site visit can be conducted. If BV is doing the site visit audit before that means it is conniving with PP and indulging in unethical activities. Why TUV Nord is not hired for this project validation? Is it because of some reasons? BV has given any assurances to Lanco? BV's management must investigate this. Looks like BV's management is interested in signing contracts left and right without any proper due diligence. What is the basis of marketing CDM services in BV. Why are you doing unethical practices? No validation can happen on this project unless both the earlier phases of the project are CDM registered. If the DOE continue to proceed with the CDM validation that means the DOE is misbehaving and violating the rules. This PDD must be re webhosted with all proper calculations and assumptions. Fuel costs assumed are wrong and no proper verifiable links are provided. Heat rate as per EPC mentioned is wrong and cooked up to earn more CER's. How did PP and Consultant arrived at levelised cost is not clear. What is the point in cooking up the PDD and cheating the CDM system. DOE must check this and reject this project since it is a cooked up project to earn CER's. No proper local stake holder consultation process is</p> | <p>in the PDD and their sources have also been provided.. Local Stakeholder Consultation meeting was conducted as per the CDM's modalities. Proof for the same has been presented to the DOE during validation.</p> | <p>is in under request for registration and Phase 1 of LKPL operates on mixed fuels like Naphtha, Natural Gas and is under a different tariff structure(Fixed cost and variable cost).and has a different arrangement for sale of power through a long term PPA. The validation team believes, therefore, thatthe phase 1 of LKPL cannot be compared with other two Phases of LKPL. Moreover, it is the Phase- III i.e. the project activity which is presented to BVCH for validation and is therefore required to be validated strictly in accordance with the applicable CDM rules and</p> |
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| | | | <p>done for this project. It's a stage managed, cooked up and closely held affair. The same must be conducted again by giving newspaper notice and the PDD to be re webhosted again for GSCP. The DOE cannot continue the validation using this PDD. The PDD must be updated with all full & proper information. This is a totally unfit project for CDM registration. What is this? DOE's accepting this kind of useless PPD must be suspended. This DOE has done enough damage to CDM. They should now concentrate on their old inspection and ISO stuff rather than spoiling CDM anymore. They any way made ISO 9001 and inspection non-value adding and worth less activities. Now they want to make CDM also the same. Is DOE playing with the system to get CDM status for undeserved projects? DOE must not use the local office employees and must use the totally independent auditors, financial expert and technical reviewer.</p> | | <p>guidance and the requirements of the EB 55 annex 1 VVM v1.2. As such, in the opinion of the validation team of BVCH, it is not a requirement under the CDM rules that a subsequent expansion phase of a power plant cannot be validated unless the previous phases are also qualified and are eligible as CDM project activities. In the validation team's opinion, every project activity needs to be assessed independently to determine its compliance to the CDM requirement, regardless of its antecedent phases as it is possible that each of such projects could operate</p> |
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| | | | | | <p>under a different set of circumstances and conditions. The same has also happened in this case, as it can be seen that the two phases of LKPL, viz., phase- 1 and phase –III (i.e. the project activity) would operate under different tariff structures and therefore would have to be treated as different from each other.</p> <p>The validation team affirms that the assessment of the project activity has been carried out in a diligent manner in accordance with applicable guidance and CDM requirements mandated by the CD EB.</p> |
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| 9 | Submitted by: jindal, jindaljindal29@yahoo.in | WITHIN THE COMMENTING PERIOD 03.04.2012 TO 02.05.2012 | Lanco, This is a fake CDM project. How come this project which is a phase 3 of the same site be validated now? How? What is the status of CDM for the last two phases? If both phases are not CDM registered and how come PP wants CDM for third phase? Why? PP's this project and this site is already viable without CDM benefits and CDM cannot be given to this phase also. It's proven. The validation of this project must stop and DOE must investigate why the PP wants CDM for this phase while PP is running both earlier phases for many years without CDM. They wish to make more losses? The fact is they are already making profits and wish to make more projects by CDM windfall benefits. This cannot happen in the interest of CDM process itself. CDM EB must notice this. This DOE is not professional. Why the approach of PDD, deciding of base line, and additionality argument is different in different phases of this Lanco project? Phase 2 PDD and Phase 3 PDD? Why? Has meth changed or what changed? It clearly shows that the project is cooked up. DOE to check this thoroughly and only after CDM registration of both earlier phases this phase site visit can be conducted. If BV is doing the site visit audit before that | Candidate project is a green field project activity. There are two more power project Phase I and Phase II which are operating at same location . LKPL Phase II project activity has already been submitted for RFR (Ref No. 5544) and LKPL Phase 1 combined cycle power plant operating under a different tariff regime as compared to Phase II and Phase III (operates under a PPA with the state utility – fixed and variables costs covered). Phase I of LKPL may not qualify for CDM benefits. PHASE .. The financial additionality of the candidate project activity has been established. Baseline is chosen in-line with the methodology AM0029 for the project. Assumptions in the PDD and their sources have also been provided.. Local | The validation team's response is the same as for the comment no. 8 above. |
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VALIDATION REPORT

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| | | | <p>means it is conniving with PP and indulging in unethical activities. Why TUV Nord is not hired for this project validation? Is it because of some reasons? BV has given any assurances to Lanco? BV's management must investigate this. Looks like BV's management is interested in signing contracts left and right without any proper due diligence. What is the basis of marketing CDM services in BV. Why are you doing unethical practices? No validation can happen on this project unless both the earlier phases of the project are CDM registered. If the DOE continue to proceed with the CDM validation that means the DOE is misbehaving and violating the rules. This PDD must be re webhosted with all proper calculations and assumptions. Fuel costs assumed are wrong and no proper verifiable links are provided. Heat rate as per EPC mentioned is wrong and cooked up to earn more CER's. How did PP and Consultant arrived at levelised cost is not clear. What is the point in cooking up the PDD and cheating the CDM system. DOE must check this and reject this project since it is a cooked up project to earn CER's. No proper local stake holder consultation process is done for this project. It's a stage managed, cooked up and closely held affair. The same must be conducted</p> | <p>Stakeholder Consultation meeting was conducted as per the CDM's modalities. Proof for the same has been presented to the DOE during validation.</p> | |
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| | | | <p>again by giving newspaper notice and the PDD to be re webhosted again for GSCP. The DOE cannot continue the validation using this PDD. The PDD must be updated with all full & proper information. This is a totally unfit project for CDM registration. What is this? DOE's accepting this kind of useless PPD must be suspended. This DOE has done enough damage to CDM. They should now concentrate on their old inspection and ISO stuff rather than spoiling CDM anymore. They any way made ISO 9001 and inspection non-value adding and worth less activities. Now they want to make CDM also the same. Is DOE playing with the system to get CDM status for undeserved projects? DOE must not use the local office employees and must use the totally independent auditors, financial expert and technical reviewer.</p> | | |
| 10 | Submitted by: Dore singam, doresingam@gmail.com | <p>WITHIN THE COMMENTING PERIOD 03.04.2012 TO 02.05.2012</p> | <p>The website of Lanco mentions that Lanco has a power trading unit called Lanco Power Trading Limited which has been awarded the National Power Trading Licence of CERC. It also says that on 21st May 2008, LPTL transacted 19.81 MUs, the highest for any single day transaction since its inception (http://www.lancogroup.com/power/powertrading/powertrading.html). The DOE should strictly verify the documentary</p> | <p>The stakeholder's comment is addressed to the DOE; PP is unable to comment on the same and request the DOE to respond.</p> <p>Debt equity ratio of the project is 70:30; documentary evidence (Loan Sanction letter from</p> | <p>The validation team has not observed any such comment made in the PDD by the Project Participant. However, the comment made essentially pertains to the perceived</p> |



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| | | <p>evidence behind the statement made by the PP that the “project activity is quite susceptible to issues like nature of its sale contracts, pricing of merchant power and regulatory risk, development of adequate transmission corridor for evacuation of merchant power...”</p> <p>Debt Equity</p> <p>The project is apparently, 100% debt funded as is the case with most MPPs (www.lancogroup.com/Lanco_News_Is27.pdf). This is contrary to the debt equity ratio of 75:25 assumed in the PDD. Apparently, the PP has used standard parameters rather than project specific value. Additionality has to be project specific and each and every parameter should be project specific. The DOE should verify</p> <p>a) The assumptions used by the banks for project appraisal in particular the tariff and the PLF for the plant. Since the loan has already been sanctioned, the plant load factor should be taken from the project report submitted to the banks based on which the term loan has been sanctioned. (The PLF should essentially be verified as there is a chance that the PP would reduce the PLF claiming uncertainty in sales on a short term basis).</p> <p>b) Was the debt funding</p> | <p>AxisBank) in support of the same (i.e for project cost and debt component) have been provided to the DOE for validation.</p> <p>The value of PLF has been considered from the DPR that was prepared by an independent third party (Fichtner Consulting Engineers pvt. Ltd). A copy of the DPR has been provided to the bank. The same PLF has been considered by the bank in their appraisal. Further, the PLF considered as stated in the DPR (85%) is also in-line with the guidelines provided the Central Electricity Regulatory Committee (CERC) in its tariff order of 2009. While the project returns do not exceed the benchmark, there is adequate cash flow for re-payment of the debt. The financial model has been validated by the DOE and their financial</p> | <p>risks of power pricing as well as other risks. The validation team notes that the project activity, as a merchant plant would certainly face such risks since there is no firm PPA signed by the PP with any state utility or private trading entity and the tariffs for the power sale would be influenced by market conditions only.</p> <p>The team of BVCH does not agree that the project activity is 100% debt funded. It has been able to validate from bank loan sanction documents that the debt-equity ratio for this project activity is 70%:30%.</p> |
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| | | | <p>approved after taking into account CDM and if so, is there an explicit mention of it in the loan agreement signed with the 21 banks. It would be a little difficult to believe that the bank sanctioned the loan assuming CDM funds and then fails to incorporate anything related to CDM in the loan agreement)</p> <p>Gas Availability</p> <p>At the time when Lanco was conceptualizing the project activity, it was running its existing project on Naphtha. The cost of Naphtha is multiple times that of Natural Gas. Still Lanco chose to run its power on Naphtha rather than on Natural Gas. The reason for this most likely should be non availability of Natural Gas. There are multiple other power plants which could not be operational for want of gas. In such an event, the applicability of the methodology itself would need to be questioned.</p> | <p>expert and found consistent.</p> <p>The availability of gas at the time of project decision making has been established clearly in the PDD.</p> | <p>The PP has already considered the operation of the project activity at 85% PLF. The validation team accepts that the PLF considered is appropriate. It has referred to CERC tariff order of 2009, which also has specified the same PLF.</p> <p>The validation team agrees with the Project Participant's explanation that while the Project IRR may not reach an expected benchmark, the project activity is capable of generating cash flows sufficient to repay its debt obligations, which in itself meets the bank's loan</p> |
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| | | | | | <p>sanction criteria, without the CDM revenues having to specifically form part of any loan agreement with the bank.</p> <p>Gas availability has been demonstrated through the presentation of authentic supply-demand statistics that establish the sufficient availability of natural gas in the country or region. The validation team does not agree with the suggestion that use of naphtha for the already running phase-I of LKPL would necessarily imply a shortage or non-availability of gas, as there could be other reasons for the use</p> |
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| | | | | | <p>of naphtha, which do not fall within the ambit of the validation assessment of the subject project activity. The team reaffirms that the data and justification provided in the validation report indicate the sufficient availability of natural gas to satisfy the applicability requirements of AM 0029 methodology.</p> |
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