



VALIDATION REPORT
JSW STEEL LIMITED

VALIDATION OF THE
**INSTALLATION OF TOP-
PRESSURE RECOVERY TURBINE
AT BLAST FURNACE -4**

REPORT NO. INDIA-VAL/377.49/2012
REVISION No. 01

BUREAU VERITAS CERTIFICATION

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VALIDATION REPORT

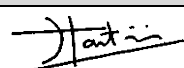
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JSW Steel Limited	Mr. Naresh Lalwani	
Summary:		
<p>Bureau Veritas Certification has made the validation of the Installation of Top-Pressure Recovery Turbine at Blast Furnace -4 project of JSW Steel Limited located at Toranagallu, Taluka: Sandur, District-Bellary. 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 ACM 0012 version 04 and meets the relevant UNFCCC requirements for the CDM and the relevant host country criteria.</p>		
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Installation of Top-Pressure Recovery Turbine at Blast Furnace -4	Matthieu Martini 	
Work carried out by:		
Mr.HB Muralidhar (Team leader) Mr.Vishwanath Sule (Team member) Karthikeyan & Jayaram (Financial expert)	<input checked="" type="checkbox"/> No distribution without permission from the Client or responsible organizational unit	
Internal Technical Review carried out by:		
Mr. Bhavesh Prajapati	<input type="checkbox"/> Limited distribution	
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Abbreviation used:

BF	Blast Furnace
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)
I	Interview
IRR	Internal rate of return
MoEF	Ministry of Environment & Forests
M & P	Modalities and Procedure
MoV	Means of Verification
MP	Monitoring Plan
MW	Mega Watt
NCV	Net Calorific Value
NGO	Non Government Organization
O & M	Operation and Maintenance
OM/ BM/CM	Operating Margin / Build Margin /Combined Margin
MTPA	Million Tonnes Per Annum
PDD	Project Design Document
PLF	Plant Load Factor
PP	Project Participant
PPA	Power Purchase Agreement
SLM	Straight Line Method
TRT	Top pressure Recovery Turbine
VVM	Validation and Verification Manual
UNFCCC	United Nations Framework Convention for Climate Change



1 INTRODUCTION

The JSW Steel Limited has commissioned Bureau Veritas Certification to validate its CDM project Installation of Top-Pressure Recovery Turbine at Blast Furnace -4 (hereafter called “the project”) at Toranagallu, Taluka: Sandur, District-Bellary.

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 meets the stated requirements and identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

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

1.2 Scope

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

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	HB Muralidhar	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> DR <input checked="" type="checkbox"/> SV <input type="checkbox"/> RI
Verifier	Vishwanath Sule	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> DR <input checked="" type="checkbox"/> SV <input type="checkbox"/> RI
Technical Specialist	N.A.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> DR <input type="checkbox"/> SV <input type="checkbox"/> RI



Financial Specialist	Karthikeyan Jayaram &	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> DR <input type="checkbox"/> SV <input type="checkbox"/> RI
Internal Technical Reviewer (ITR)	Bhavesh Prajapati	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> DR <input type="checkbox"/> SV <input type="checkbox"/> RI
Specialist supporting ITR	Surendra Mohan.	<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 JSW Steel Limited 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, JSW Steel Limited revised the PDD and resubmitted it on 12/2012.

The validation findings presented in this report relate to the project as described in the PDD version 05



2.2 Follow-up Interviews

On 24/10/2011 and on 28/11/2012 Bureau Veritas Certification performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of JSW Steel Limited were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
JSW Steel Limited	<ul style="list-style-type: none"> ➤ Implementation of the Project activity ➤ Technology, operation and maintenance ➤ CDM awareness and serious consideration of CDM benefits ➤ Additionality ➤ Baseline determination ➤ Monitoring ➤ Local stake holder consultation ➤ Contribution to the sustainable development ➤ Approvals for the project activity (consent to establish and operate , EIA and DNA approval)
Local Stakeholder	<ul style="list-style-type: none"> ➤ Opinion about the project activity ➤ Stakeholder meeting and the consultation project activity
General Carbon Private Limited	<ul style="list-style-type: none"> ➤ Project Design Document ➤ Applicability of CDM methodology ➤ Baseline determination ➤ Emission reduction calculations ➤ Emission reduction monitoring plan

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 a 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 18 Corrective Action Requests (CARs) and 13 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)

A letter of approval has been received along with the following supporting documentation:

- letter of application for Host Country Approval (Ref /3/)
- Invitation letter by the Host country DNA (Ref/5/)
- Host country approval dt 14th March 2012 Ref No. 4/22/2011- CCC (Ref/4/)

Bureau Veritas Certification received this letter from the project participant and does not doubt its authenticity.

The project activity is titled as "Installation of Top-Pressure Recovery Turbine at Blast Furnace -4" in the webhosted PDD and the exact title is mentioned in the following documents

- letter of application for Host Country Approval (Ref/3/)
- Invitation letter by the Host country DNA (Ref/5/)
- Approval from the host country DNA Ministry of Environment and Forestry,
- Webhosted PDD version 02 (Ref/1/)
- PDD being submitted for the Request for Registration version 04 (Ref/2/)

The project participant, JSW Steel Limited has provided all the communiqué from the host country DNA, based on which the validation team confirms that the only party involved in the project activity is INDIA at this stage and same has approved the project activity. The validation team confirmed the authenticity of the approval from the website of DNA of India. The website confirms approval by DNA under project ID no. 650/07/2011 (Ref/30/)

The approval letter manifests the following with regards to project activity



- The Government of India has ratified the Kyoto Protocol in August 2002
- This is approval of voluntary participation in the CDM project activity
- The project contributes to sustainable development in India

The approval letter is unconditional with regards to the above mentioned manifesto. Bureau Veritas Certification considers the letters are in accordance with paragraphs 45 - 48 of the VVM.

3.2 Participation (54)

The participation for each project participant has been approved by a Party of the Kyoto Protocol. The host party for this project is India. India has ratified the Kyoto Protocol on 26th Aug 2002. This was checked from UNFCCC website.

JSW Steel Limited is the only project participant in this project activity. The participation for this project participant has been approved by the host country India, a Party to the Kyoto Protocol. The details are as stated above in section 3.1

The project was webhosted on the UNFCCC for global stakeholder's comments as per CDM requirements. The project was webhosted from 19/07/2011 to 17/08/2011. The details of the comments received, responses by the project participant/s and the explanation of how due account of these is taken by the validation team are attached as Appendix B with this validation report.

3.3 Project design document (57)

The validation team hereby confirms that the PDD complies with the latest forms and guidance documents for completion of PDD. The PDD is as per Guidelines for Completing the Project Design Document (CDM-PDD) (EB41 Annex 12)

The PDD has been prepared in accordance with the latest template (Version 03) (Ref/47/)

The PDD is in accordance with the applicable CDM requirements of for completing the PDD (Version 07) (Ref/46/).

The validation team hereby confirms that the PDD version 05 complies with the latest forms of the guidance documents for completion of PDD.



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:

During the course of validation the web hosted PDD did undergo changes and the final PDD version 06 dated 12.07.2013 (Ref/2/) has the following change as compared to the web hosted PDD:

1. The purpose of the project activity has been corrected as per the actual scenario Description of the expansion plan for project activity by the JSW steel Limited has been corrected in section A.4.2 with respect to consent to operate
2. Justification of the methodology applicability conditions has been detailed in section B.2 of the revised PDD with respect to the applied methodology ACM0012, version 4.
3. Project boundary description has been updated in line with the applicable methodology requirement in section B.3.
4. Section B.4 has been updated to modify the determination of baseline in line with the applicable methodology requirement.
5. Section B.5 has been updated to bring in more clarity on the decision making of the project activity, project start date and chronology of events of the proposed project activity as per latest guidelines of prior consideration of CDM benefits.
6. IRR calculations have been revised in line with latest guidance on Investment Analysis and Tool for the demonstration and assessment of additionality. Accordingly IRR value has been corrected from 10.74% in the webhosted PDD to 6.45% in the PDD being submitted for registration.
7. Benchmark value has been revised from WACC of 14.98% to 12.68% in line with latest guidance on Investment Analysis and Tool for the demonstration and assessment of additionality.
8. Common practice has been updated in the Section B.5 in accordance with latest version of 'Tool for the demonstration and assessment of additionality'.
9. Sections B.6 have been updated to modify the determination of emission reductions in line with the applicable methodology requirement and applicable tools as prescribed in the methodology.



10. Monitoring plan and description of monitoring parameters have been revised by the project participant in accordance with the applied monitoring methodology ACM0012 version 04.
11. The baseline emission factor was an ex-ante determined value in the webhosted PDD but was revised to an ex-post monitored value in version 06 of the PDD.

3.5 Project description (64)

The project activity is installation of Top-pressure Recovery Turbine (TRT) in the integrated steel plant of JSW Steel Limited. The project activity is part of capacity expansion of steel production from 7 Million Tonnes per Annum (MTPA) to 10 Million Tonnes per Annum (MTPA). The capacity expansion plan includes the installation of a Coke Oven (CO-4) Blast Furnace (BF-4) and a Captive Power Plant (CPP-4). The 7 MTPA to 10 MTPA expansion plan also includes the installation of Sinter plant, Basic Oxygen furnace and ancillary system.

The expansion history of the JSW steel limited has been explained in the A.2 section of the revised PDD and validation team confirms the same after reviewing the board note dated 03rd April 2007.

The project activity is implemented in the Greenfield facility, i.e Blast Furnace- 4 (BF-4). The Blast Furnace gas at 2.5 bar (g) is expanded over the turbine to reduce the pressure to 0.125 bar(g) and generate electricity. The design capacity of the TRT is 12.4 MW. The generated electricity is supplied to the Blast Furnace-4 for captive consumption in its auxiliaries through the internal grid of JSW. Hence the Blast Furnace-4 (BF-4) is the “recipient facility” as per the ACM 0012 version 4.0. The project activity utilises the waste pressure of the blast furnace gas which otherwise would have remained unutilised. The entire BF gas from the Blast Furnace-4 is passed through the Top pressure Recovery Turbine 4 (TRT-4). The TRT-4 is only dedicated to the BF-4 and no other streams of WECM are involved. The pressure of the blast furnace gas would have been reduced using septum valve mechanism in the absence of TRT-4. The same is demonstrated using Annex 01 of ACM 0012 Version 4.0. The septum valve mechanism is installed in the project activity for normal operation as well for the emergency purposes. The pressure of the BF gas will be reduced using the septum valve mechanism in the event of abnormal conditions of BF gas generation or when the TRT is not under operation. The TRT is designed to operate at 2.4 bar (g) as evident from the technical specifications. Any variation in the BF gas pressure will trigger the by-pass system; pressure will be reduced using septum valve and TRT will be shut down.

The Top-pressure Recovery Turbine is a wet type horizontal axis pressure reducing turbine of **rated capacity 12.4 MW** coupled with generator. It may be noted here that although the generator is 15 MW in capacity, it

can be at best generate only 12.4MW of power due to the lesser capacity of the turbine.

The technical specifications of TRT-4 and the Generator are tabulated below

Top-pressure Recovery Turbine	
Turbine Type	Wet type axial flow reaction turbine with horizontal split casing.
Shaft speed	3000 rpm
Output power	12.4 MW
Stator Blade Mechanism	Adjustable construction and automatically positioned by hydraulic cylinder during operation
Shaft sealing	Labyrinth seal using N ₂ as buffer

Generator	
Parameter	Value
Rated Voltage	6.6 kV
Rated Power	15000 KW (MW)
Power Factor	0.9
Rotation Speed	3000 rpm
Number of Phase	3-phase
Frequency	50 Hz
Connection	Y
Insulation Class	Class F (Class B as acceptance test)
Efficiency	97%

The generator is connected to the internal grid of JSW. The electricity generated from the project activity after the auxiliary consumption is fed to the BF-4 through internal grid for captive consumption. The electricity supplied to the BF-4 is monitored using separate electronic meter. The electricity produced by the project activity would have been generated by the coal based power plant commissioned in the JSW Steel plant. Thus resulting in reduction of GHG from the coal based thermal Captive Power Plant (CPP-4).

Validation team referred the following documents to confirm the project description

- Webhosted PDD version 02 (Ref/1/)
- Board Note (Ref/8/)
- DPR dated Feb 2007 prepared by DESCON LIMITED (Ref/6/)
- Commissioning Certificates for TRT-4 (Ref/15/), and BF-4 (Ref/22/),

The DOE hereby confirms that the project description in PDD version 05 (Ref/2/) 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 are described below.

The project activity has applied the approved consolidated methodology ACM 0012 Ver. 04 EB 60 "Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects" valid from 15 April 2011 (REF /45/)

1. The consolidated methodology is applicable to project activities implemented in an existing or Greenfield facility converting waste energy carried in identified WECM stream(s) into useful energy. The WECM stream may be an energy source for:
 - a) Generation of electricity;
 - b) Cogeneration;
 - c) Direct use as process heat source;
 - d) Generation of heat in element process;
 - e) Generation of mechanical energy; or
 - f) Supply of heat of reaction with or without process heating

It needs to be mentioned here about how the validation team has viewed the WECM stream generated from Blast Furnace (BF4).
According to the definitions in the methodology (ACM 0012):

Waste Energy. Energy contained in a residual stream from industrial processes in the form of heat, chemical energy or pressure, for which it can be demonstrated that it would have been wasted in the absence of the project activity. Examples of waste energy include the energy contained in gases flared or released into the atmosphere, the heat or pressure from a residual stream not recovered (i.e. wasted).

Waste Energy Carrying Medium (WECM). The medium carrying the waste energy in form of heat, chemical energy or pressure. Examples of WECM include gas, air or steam carrying waste energy.

BF gas is not a waste gas. It is a fuel because of its calorific content and is used for different applications (such as power generation, process heating) in an integrated steel plant.

However, the pressure component of the blast furnace gas is generally wasted the recipient facilities generally do not need the gas input as such pressures (> 2 bar) .The normal practice is to reduce the pressure



through pressure reducing system /septum valves and then utilize it in different processes. Therefore the medium carrying the waste energy in this project is the pressure in the BF gas which would have otherwise been wasted.

The project activity involves installation of Top pressure Recovery Turbine (TRT-4) to utilize the waste pressure of the Blast Furnace-4 (BF-4) gas to generate electricity for the captive consumption of JSW Steel Ltd. The project activity is implemented in the Greenfield facility i.e expansion by 3 Million Tonnes Per Annum (MTPA) of JSW Steel Ltd. The pressure of the BF-4 gas would have been vented through the pressure reducing valve in the absence of the project activity

The Validation team reviewed the following documents to confirm the applicability condition

- DPR dated Feb 2007 (Ref/7/) prepared by DESCON LIMITED
- Commissioning Certificates for TRT-4 and BF-4 (Ref /15/ (Ref /23/),
- Consent to Establish issued by the State Pollution Control Board for TRT-4 (Ref /26/),
- Consent to Operate issued by the State Pollution Control Board for TRT-4 and 10 MTPA steel plant (Ref /28/), (Ref /29/).The Blast Furnace-4 was commissioned on 18th July 2011 and Top pressure Recovery Turbine (TRT-4) was commissioned on 14th September 2011. Therefore it is confirmed that the project activity is implemented in Greenfield facility and utilizing the waste pressure of BF-4 gas for power generation. Hence this applicability criterion is fulfilled by the project activity

2. In the absence of the project activity, the WECM stream:
 - a. Would not be recovered and therefore would be flared, released to atmosphere, or remain unutilized in the absence of the project activity at the existing or Greenfield project facility; or
 - b. Would be partially recovered, and the unrecovered portion of WECM stream would be flared, vented or remained unutilized at the existing or Greenfield project facility.

Since the project activity is being implemented in the Greenfield facility, the project design was reviewed by the validation team to confirm that there exist no provisions in the project design to utilize the waste pressure from the Blast Furnace -4 gas. The provision of pressure reducing value (septum valve mechanism) is provided in the project design and same is also implemented in the project activity as well for emergency purposes.

Validation team reviewed following documents to confirm the applicability condition

- DPR dated Feb 2007 (Ref/7/) prepared by DESCON LIMITED



- Approval note and Board Note (Ref/8/)

The validation team also noticed during the site visit that the pressure from BF-1 and BF-2 is not utilized and same is reduced using septum valve. Hence the applicability condition of WECM would not be utilized in the absence of the CDM project activity has been justified

3. Project activities improving the WECM recovery may
 - a) Capture and utilise a larger quantity of WECM stream as compared to the historical situation in existing facility, or capture and utilise a larger quantity of WECM stream as compared to a “reference waste energy generating facility”; and/or
 - b) Apply more energy efficient equipment to replace/modify/expand waste energy recovery equipment, or implement a more energy efficient equipment than the “reference waste energy generating facility”.

The Validation team reviewed the following documents to confirm the non-applicability of this condition

- DPR dated Feb 2007 (Ref /7/) prepared by DESCON LIMITED
- Commissioning Certificates for TRT-4 and BF-4 (Ref /15/), (Ref /23/),
- Consent to establish for TRT-4 and (Ref /26/)
- Consent to operate for TRT-4 (Ref /28/),

The project activity is implemented in the Greenfield facility and the extent of use of WECM in the baseline is identified in accordance with the Annex 1 of ACM 0012 version 04. The project activity does not involve any improvement of WECM usage, hence this condition does not apply.

4. The methodology is applicable under the following conditions:
 - a. For project activities which recover waste pressure, the methodology is applicable where waste pressure is used to generate electricity only and the electricity generated from waste pressure is measurable;
 - b. Regulations do not require the project facility to recover and/or utilize the waste energy prior to the implementation of the project activity;
 - c. The methodology is applicable to both Greenfield and existing waste energy generation facilities. If the production capacity of the project facility is expanded as a result of the project activity, the added production capacity must be treated as a Greenfield facility;



- d. Waste energy that is released under abnormal operation (for example, emergencies, shut down) of the project facility shall not be included in the emission reduction calculations.

The project activity involves generation of electricity by expanding the BF-4 gas in the Top pressure Recovery Turbine. The pressure at the inlet of the turbine 2.2 bar (g) and the quantity of 512,000 Nm³/hr is measured and recorded using DCS system. In the host country (India) there exists no governmental mandate for the utilisation of waste pressure. The project activity is installed in a Greenfield facility under the expansion plan of 7 MTPA to 10 MTPA hence the added capacity of 3 MTPA has been considered as Greenfield expansion project. The septum valve mechanism has been installed by the project proponent to by-pass pressure higher than 2.2 bar(g). Validation team after reviewing the following documents confirms the applicability condition.

- DPR dated Feb 2007 (Ref /7/) prepared by DESCON LIMITED
- Commissioning Certificates for TRT-4 and BF-4 (Ref /15/), (Ref /23/),

5. If multiple waste gas streams are available in the project facility and can be used interchangeably for various applications as part of the energy sources in the facility, the recovery of any waste gas stream, which would be totally or partially recovered in the absence of the project activity, shall not be reduced due to the implementation of CDM project activity. For such situations, the guidance provided in Annex 3 shall be followed.

The project activity involves utilisation of the pressure from Blast Furnace-4 gas and since the TRT-4 is only connected to the BF-4. Multiple waste gas streams are not involved. It would not be possible to use the gas from any other blast furnace in this project, since TRT 3 is a part of BF3 and during the site visit it was confirmed such interchangeability is not possible. The validation team also observed during the site visit that the BF-4 gas after passing through the TRT was fed to the gas network without any changes in the composition and quantity of the gas. The gas is intended to be used in the processes as seen from the Gas Balance Table (Ref /42/) in the PDD.

Since the pressure of the BF-4 gas will remain unutilised in the absence of the CDM project activity guidance in the Annex 1 of ACM 0012 version 04 is applied.

The validation team reviewed the following documentary evidence to confirm the non-applicability of this condition.

- Commissioning Certificates for TRT-4 and BF-4 (Ref /15/), (Ref /23/),
- DPR dated Feb 2007 (Ref /7/) prepared by DESCON LIMITED



6. The methodology is not applicable to the cases where a WECM stream is partially recovered in the absence of the CDM project activity to supply the heat of reaction, and the recovery of this WECM stream is increased under the project activity to replace fossil fuels used for the purpose of supplying heat of reaction.

The project activity involves utilisation of waste pressure from BF-4 to generate electricity hence no heat recovery is involved. The WECM (pressure from the BF-4 gas) would have been unutilised in the absence of the project activity, the same is justified using Annex 01 of ACM 0012 version 04. Hence this applicability condition is not applicable to the project activity

The validation team confirms the non-applicability of this condition after reviewing the following documentary evidence

- DPR dated Feb 2007 (Ref /7/) prepared by DESCON LIMITED
- Commissioning Certificates for TRT-4 and BF-4 (Ref /15/), (Ref /23/),

7. This methodology is also not applicable to project activities where the waste gas/heat recovery project is implemented in a single-cycle power plant (e.g. gas turbine or diesel generator) to generate power. However, the projects recovering waste energy from single cycle and/or combined cycle power plants for the purpose of generation of heat only can apply this methodology.

The validation team confirms the non-applicability of this condition after reviewing the following documentary evidence as it only recovers the waste pressure from the WECM and does not involve any conversion.

- DPR dated Feb 2007 (Ref /7/) prepared by DESCON LIMITED
- Commissioning Certificates for TRT-4 and BF-4 (Ref/15/), (Ref/23/),

8. The emission reduction credits can be claimed up to the end of the lifetime of the waste energy generation equipment. The remaining lifetime of the equipment should be determined using the latest version of the "Tool to determine the remaining lifetime of equipment".

The project activity is implemented in the Greenfield facility which has an operational time of 20 years and the carbon credits are claimed only for 10 years crediting period within the operational life time of BF-4 hence this applicability condition is justified.



The validation team confirms the applicability of this condition after reviewing the following documentary evidence

- Technical details of BF-4 (Ref/32/)
- Commissioning Certificate BF-4 (Ref /23/)
- PDD version 05 (Ref/2/),

9. The extent of use of waste energy from the waste energy generation facilities in the absence of the CDM project activity will be determined in accordance with the procedures provided in Annex 1 (for Greenfield project facilities) and in Annex 2 (for existing project facilities) to this methodology.

The PDD version 05 annex 03 describes the extent of use of waste energy from the energy generation facilities in the absence of CDM project activity for Greenfield facilities in accordance with the annex 1 of ACM 0012 version 04.

The validation team confirms the applicability of this condition after reviewing the following documentary evidence

- PDD version 05 (Ref/2/),
- DPR dated Feb 2007 (Ref /7/) prepared by DESCON LIMITED
- Commissioning Certificates for TRT-4 and BF-4 (Ref/15/), (Ref/23/),

10. In addition, the applicability conditions included in the tools referred to above apply.

The PDD version 05 uses the following tools and the applicability conditions have been justified

- Tool for the demonstration and assessment of additionality”
Version: 06.1.0
- Tool to calculate the emission factor for an electricity system”
Version: 02.2.1

The validation team confirms the applicability of this condition after reviewing the following documentary evidence

- PDD version 05 (Ref/2/),
- CER calculation sheet version 03 (Ref/33/),

CL 1, clarification was sought on the applicability of large scale methodology for the small scale project. The electricity generation capacity by the project is less than 15 MW in response project participant clarified as:

The project activity is implemented in a new facility which has come up under the capacity expansion programme of 7 MTPA to 10 MTPA. For



waste energy recovery projects, there is a Small-Scale CDM methodology titled AMS III.Q. "Waste energy recovery (gas/heat/pressure) projects". This methodology is applicable to the project activity that utilizes waste energy in an existing facility. Since the project activity is implemented in a new facility, this small-scale CDM methodology is not applicable. It is also clarified by EB that the Greenfield projects cannot apply AMS III. Q and can apply ACM0012 through clarification: SSC 413

Validation team confirmed above clarification and concluded that due to unavailability of the applicable small scale methodology Project participant has opted for the Large scale Methodology ACM 00012 Version 4. This is evident from the SSC 413 hence the CL 1 was closed.

The DOE hereby confirms that the selected baseline and monitoring methodology ACM 0012 version 04 (Ref /45/), Tool for the demonstration and assessment of additionality" version: 06.1.0 (Ref /51/) and "Tool to calculate the emission factor for an electricity system", version: 02.2.1(Ref /46/) is previously approved by the CDM Executive Board, and is applicable to the project activity, which, complies with all the applicability conditions therein.

The DOE 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, 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)

In accordance with the applied methodology ACM 0012 version 4.0 The geographical extent project boundary shall include the relevant WECM stream(s), equipment and energy distribution system.

The project participant has defined the project boundary as below

- The .project facility- Top pressure Recovery Turbine 4 (TRT-4)
- The .recipient facility- Blast Furnace 4 (BF-4)
- The spatial extent of the JSW Steel Limited internal grid is considered in the project boundary in accordance with, ACM 0012 version 04 and "Tool to calculate the emission factor for an electricity system" version 2.2.1.

The DOE validated the project boundary by assessing the following documentation

- Webhosted PDD version 02 (Ref /1/)



- PDD version 05 (Ref/2/),
- DPR dated Feb 2007 (Ref /7/) prepared by DESCON LIMITED
- Commissioning Certificates for TRT-4 and BF-4 (Ref/15/), (Ref/23/),

The validation team conducted a physical site visit to confirm the project boundary on 19/10/2011. The validation team confirms that the project boundary has been appropriately defined by the project participant in accordance with the guidance provided in the applied methodology ACM0012, version 04.

However, it was observed by the validation team that the flow diagram provided in the section B.3 of the webhosted PDD was incomplete as the WECM generating process (BF4) and other energy generating/measuring equipments were not included. Hence CAR 02 was raised. In response to the CAR 02, the project participant has included the energy generating equipments, monitoring variables, monitoring equipments and their locations in the schematic diagram of project boundary in the revised PDD. The validation team accepted the correction in accordance with the ACM 0012 version 04 and CAR 02 was closed.

Based on the above assessment, the DOE 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 project participant has identified the baseline scenario in accordance with the stepwise approach mentioned in the ACM 0012 version.

Step 1: Define the most plausible baseline scenario for the generation of heat, electricity and mechanical energy using the following baseline options and combinations

The proposed project is implemented in a greenfield facility which is a part of expansion plan. The project activity will recover the waste pressure from the blast furnace gas to produce electricity. Therefore, the approach for baseline scenario should be of the greenfield facility.

As the proposed project does not involve the heat generation (H) and the mechanical energy (M), the heat generation (H) and mechanical energy (M) alternatives are excluded.

Baseline scenario for (WECM) Waste Heat or Waste Pressure	Description as per ACM 0012 version 04
W 1	WECM is directly vented to the atmosphere without incineration



Validation team`s conclusion

The project activity is utilization of pressure and does not include any incineration of BF-4 gas hence this cannot be a part of the baseline.

Validation team after reviewed the following documents to confirm that there is no incineration of BF-4 gas involved in the project activity

- DPR dated Feb 2007 (Ref /7/) prepared by DESCON LIMITED
- Commissioning Certificates for TRT-4 and BF-4 (Ref /15/), (Ref/23/),

Hence : W1 option cannot be considered as realistic and credible baseline alternative

W 2

WECM is released to the atmosphere (for example after incineration) or waste heat is released (or vented) to the atmosphere or waste pressure energy is not utilized

Validation team`s conclusion

The project activity involves the utilization of waste Pressure of BF-4 gas for electricity generation. However in the absence of the project activity the pressure would have been reduced using septum valve. Hence the pressure of the BF-4 gas would have remained unutilized. This is also demonstrated in accordance with annex 01 of ACM 0012 version 4.0

Validation team reviewed the following documents to confirm that the pressure of the BF-4 gas would have remained unutilised

- DPR dated Feb 2007 (Ref /7/) prepared by DESCON LIMITED
- Annex 01 analysis described in the PDD version 05 (Ref /2/)

Hence : W2 option is considered as realistic and credible baseline alternative

W 3

Waste energy is sold as an energy source

Validation team`s conclusion

The waste energy in this project activity is in the form of pressure which is difficult to transport. Due to non-availability of mechanisms / industry processes wherein the pressure of 2.5 bar(g) is required. This scenario is not considered as the baseline alternative.

Validation team reviewed the following documents to confirm that the pressure of the BF-4 gas can not be sold to any other entity.

- DPR dated Feb 2007 (Ref /7/) prepared by DESCON LIMITED

Hence W3 option is not a realistic and credible baseline alternative	
W 4	Waste energy is used for meeting energy demand at the recipient facility(ies)
<p>Validation team`s conclusion</p> <p>The project activity is a Greenfield activity and is being installed in Greenfield facility. In the absence of the project activity the waste energy (BF gas pressure) would have been released through septum valve (remain unutilised) and useful electrical power would have not been generated. There is no possibility for utilization of BF gas pressure in the absence of project activity. This option is considered as project activity without CDM benefits</p> <p>Hence W4 option is a realistic and credible baseline alternative.</p>	
W 5	A portion of the quantity or energy of WECM is recovered for generation of heat and/or electricity and/or mechanical energy, while the rest of the waste energy produced at the project facility is flared/released to atmosphere/ unutilised
<p>Validation team`s conclusion</p> <p>The entire waste pressure is utilised in the TRT as seen from the DPR as well as during the site visit.</p> <p>Hence W5, option is not a realistic and credible baseline alternative.</p>	
W 6	All the waste energy produced at the facility is captured and used for export electricity generation or steam
<p>Validation team`s conclusion</p> <p>The validation team assessed the common practice analysis for use of pressure of blast furnace gas in the steel sector; validation team opines that the steel industries are not utilizing the pressure of blast furnace gas.</p> <p>Hence W5, option is not a realistic and credible baseline alternative</p>	

Conclusion: From the above discussion W2 and W4 are considered as realistic and credible baseline alternatives for the use of waste pressure.



Alternative W2: WECM is released to the atmosphere (for example after incineration) or waste heat is released (or vented) to the atmosphere or waste pressure energy is not utilized.

Alternative W4: Waste energy is used for meeting energy demand at the recipient facility. (This scenario represents the Proposed project activity not undertaken as a CDM project activity)

Baseline scenario for power generation	Description as per ACM 0012 version 04
P1	Proposed project activity not undertaken as a CDM project activity
<p>Validation team`s conclusion</p> <p>The proposed project activity is in compliance with the laws and regulations of the host country. However the project participant has justified the existence of investment barrier to demonstrate that project activity is not financially attractive without CDM benefits. The same is detailed in the additionality section 3.7.3 of this validation report.</p> <p>Hence, P1 option is a realistic and credible baseline alternative.</p>	
P2	On-site or off-site existing fossil fuel fired cogeneration plant
<p>Validation team`s conclusion</p> <p>The project activity involves only electricity generation using the pressure of BF-4 gas. There is no substantial steam requirement in a steel industry Validation team during the site visit observed that JSW Steel Ltd does not have any fossil fuel based co-generation plant in their integrated steel plant premises. Validation team also reviewed the annual report of JSW Steel (Ref/21/) to confirm the existence of off-site cogeneration plant.</p> <p>Hence, P2 option is not a realistic and credible baseline alternative.</p>	
P3	On-site or off-site Greenfield fossil fuel fired cogeneration plant
<p>Validation team conclusion</p> <p>The project activity involves only electricity generation using the pressure of BF-4 gas. The alternative does not provide same level of services as of</p>	



project activity	
Hence, P3 option is a not a realistic and credible baseline alternative.	
P4	On-site or off-site existing renewable energy based cogeneration plant
<p>Validation team`s conclusion</p> <p>The project activity involves only electricity generation using the pressure of BF-4 gas. There is no substantial steam requirement in a steel industry The alternative does not provide same level of services as of project activity</p> <p>Validation team during the validation site visit observed that JSW Steel Ltd does not have any fossil fuel based co-generation plant in their integrated steel plant premises. Validation team also reviewed the annual report of JSW steel (Ref/21/) to confirm the existence of off-site cogeneration plant.</p> <p>Hence, P4 option is not a realistic and credible baseline alternative.</p>	
P5	On-site or off-site Greenfield renewable energy based cogeneration plant
<p>Validation team`s conclusion</p> <p>The project activity involves only electricity generation using the pressure of BF-4 gas. The alternative does not provide same level of services as of project activity</p> <p>Validation team during the validation site visit observed that JSW Steel Ltd does not have any renewable energy based co-generation plant in their integrated steel plant premises. Validation team also reviewed the annual report of JSW steel (Ref/21/) to confirm the existence of off-site cogeneration plant.</p> <p>Hence, P5 option is not a realistic and credible baseline alternative.</p>	
P6	On-site or off-site existing fossil fuel based existing identified captive power plant
<p>Validation team conclusion</p> <p>At the time of investment decision the project participant did not have any fossil fuel based power plant on-site. There were only two BF/Corex gas based Captive Power Plants (CPP1, CPP2) to cater energy demand of 4 MTPA facility.</p>	



The existing power plants (CPP1 & 2) within the facility are operated by BF gas and Corex gas which are by-products of the existing Blast Furnaces and Corex processes. Pressures are not utilised but the calorific/heat content of the gases are used in existing power plants. As explained in Section 3.6.1, these gases are not fossil fuels.

Also a 300MW coal based power plant was implemented for meeting the expansion plans from 4MT to 7 MT which includes BF3 and other downstream processes.. BF gas generated from BF3 would be used for supply to the existing CPP1 and CPP2 as well as downstream processes.

However as seen from the Power Balance Chart and verified at the site, this power will be sufficient to meet the requirements of the BF3 and downstream plants. The captive power plant (CPP3) was not commissioned at the time of investment decision. It was commissioned in 2011, but has been considered as an existing fossil fuel based power plant, since the decision was to implement the 7 MTPA expansion was already taken in 2006

CPP3 has been commissioned in September 2010 and the import of any power from JSWEL has been completely stopped from 2010 onwards. It has also cross checked the following documents to confirm the above

- Annual reports of 2005-2006/2009-10/2010-12 (Ref/21/)
- Power Balance diagram (Ref/23/)

Hence, P6 option is not a realistic and credible baseline alternative.

P7	On-site or off-site existing identified renewable energy or other waste energy based captive power plant
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Validation team conclusion

Validation team during the validation site visit observed that JSW Steel Limited has another TRT (TRT 3) based power plant of the same capacity as the project activity which is a part of the 7MTPA expansion capacity (attached to BF 3) and has been considered as a CDM project

Reference:

<http://cdm.unfccc.int/Projects/Validation/DB/UU4PSSWDP26L57L55ZN9P8M3DY9WT/view.html>

The waste pressure from BF3 cannot be used in TRT 4 because these are separate entities and the transfer of pressure component of the gas is not technically feasible, since the TRT is expected to be close proximity of

the BF to ensure minimum loss of pressure.

There are no renewable energy captive power plant either onsite or off-site to cater the added demand due to expansion. During the interview with the project participant it was understood that the steel industry needs continuous uninterrupted supply of electricity, which cannot be guaranteed by renewable energy projects due to lower load factors (PLF).

Hence, P7 option is not a realistic and credible baseline alternative.

P8

On-site or off-site Greenfield fossil fuel based captive plant

Validation team's conclusion:

The board note (Ref/8/) manifests that the expansion plan will have a 300 MW coal based power plant. The validation team reviewed DPR for 10 MTPA expansion which states that the power requirement to be sourced 300MW coal based captive power plant. Based on DPR recommendation board has approved 300MW coal based captive plant as a part of 10MTPA expansion.

Although the comparison of 12.4 MW plant (project activity) with the 300 MW plant may appear to be not realistic, the validation team is of the opinion that it is credible because of the following reasons:

Blast Furnace 4 is a part of the expansion of JSW Steel from 7 MTPA to 10 MT. The expansion will involve a massive investment of about INR 120000 million which include downstream process such as Hot Strip Mills, Cold Rolling Mills, Wire and Rod Mill and other steel production related manufacturing processes. The total power requirement for this expansion is about 310 MWs as shown in Annex 7 of the PDD. This has also been cross checked with the Detailed Project Report.

The gas generated from BF4 will be not be utilised for power generation but only for process applications as seen from the Gas Balance Report Annex 8. The validation team has also reviewed the power requirement of the entire facility of JSW Steel, which includes the already three existing furnaces and manufacturing plants as well as associated units such the oxygen and coal beneficiation plants. The total power requirements will be about 784 MW and the installed capacity of the power plants within the facility is about 830 MW. However, the net power assuming 95% utilisation will be about 788 MW. Thus there is an available excess supply of about 4MW in the absence of the project. The project activity will augment the capacity by another 7.5 MW (at a PLF of 60%). The total power availability would be about 803 MW. In an integrated steel plant of 10 Million Tonne manufacturing capacity, an excess power capacity of about 2% (803 MW/788MW) is insignificant.



The TRT power plant will operate only during the availability of BF gas. There can be no control over the generation of gas, since this is by-product from the BF smelting process. Therefore, the PP would prefer to make full use of the availability of gas.

However, the usage of coal is within the control of the Project Participant and therefore its usage can always be minimised depending on the power demand.

Thus, the operation of the TRT based power plant will lead to optimisation in the consumption of coal in the CPP and thus contribute to emissions reductions.

Validation team reviewed the following documents to confirm this option

- Board note (Ref/8/)
- Commissioning certificate for 300 MW (CPP-4) coal based power plant (Ref/25/)
- Detailed project report prepared by MECON for 10 MTPA expansion project (Ref/6/)

Hence, P8 option is a realistic and credible baseline alternative

P9	On-site or off-site Greenfield renewable energy or other waste energy based captive plant
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Validation team`s conclusion

During the interview with the project participant it was understood that the steel industry needs continuous supply of electricity which cannot be guaranteed by the low PLF based renewable energy projects. Hence, JSW Steel Limited does not have any plans for renewable not having any approved renewable energy projects for the captive usage.

There is no sufficient waste energy to generate power which can cater the energy demand of 10 MTPA expansion this has been validated by reviewing the DPR (Ref /7/) and BF gas balance (Ref /42/)

Hence, P9 option is not a realistic and credible baseline alternative.

P10	Sourced from grid-connected power plants
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Validation`s team conclusion

Validation team during the validation site visit observed that JSW Steel Limited does not have grid connection with the state electricity grid (KPTCL).

Validation team reviewed the annual reports (Ref/21/) of the JSW steel limited to confirm that there are no electricity imported from the state electricity grid.

There is an internal network within the facility, which distributes power generated from CPP1, CPP2 and CPP3. CPP4 will also be connected to the internal grid. Also this grid is used

Hence, P10 option is not a realistic and credible baseline alternative.

P11	Existing captive electricity generation using waste energy (if the project activity is captive generation using waste energy, this scenario represents captive generation with lower efficiency or lower recovery than the project activity)
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Validation team`s conclusion

The project activity is the Greenfield captive electricity generation using waste energy. There is no existing captive electricity generation using waste energy with lower efficiency or lower recovery than project activity prior to project activity. However JSW Steel Limited has another TRT (TRT 3) based power plant of the same capacity as the project activity which is a part of the 7MTPA expansion capacity (attached to BF 3) and has been considered as a CDM project hence cannot be considered as the baseline alternative.

Hence, P11 option is not a realistic and credible baseline alternative.

P12	Existing cogeneration using waste energy, but at a lower efficiency or lower recovery
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Validation team`s conclusion

The project activity involves only electricity generation using the pressure of BF-4 gas. The alternative does not provide same level of services as of project activity

Validation team during the site visit observed that JSW Steel Ltd does not have any fossil fuel based co-generation plant in their integrated steel plant premises. Validation team also reviewed the annual report of JSW steel (Ref/21/) to confirm the existence of off-site cogeneration plant.

Hence, P12 option is not a realistic and credible baseline alternative.

Outcome of step 1a

The analysis leads to the Baseline scenario 1 (combination of W2 and P8) as the most likely baseline option for the project promoter as per Table 2 of ACM0012 version 04

Scenario	Baseline Options		Description of Situation
	Waste energy	Power	
1	W2	P8	In the absence of the project activity the waste pressure would have been lost in the septum valve and the captive power demands would have been met from the Greenfield 300MW coal based captive power plant of JSWSL.
2	W4	P1	<p>This scenario corresponds to the project activity not undertaken as a CDM project activity.</p> <p>W4: waste heat is used for meeting energy demand at the recipient facility(ies)</p> <p>P1: proposed project activity not undertaken as a CDM project activity</p>

Sub-step 1b: Consistency with mandatory laws and regulations

The identified alternatives W2, W4 and P1, P8 are in compliance with all mandatory applicable legal and regulatory requirements.

Validation team after reviewing the consent to operate the BF-4 issued by the Karnataka Pollution Control Board (Ref /29/) confirms that there exists no mandatory regulation for installation of pressure recovery system.

Outcome of Step 1b:

Validation team hence confirms that the credible identified alternative scenario to the project activity is W2, W4 & P1, P8 which is in compliance with mandatory legislation and regulations.

Step 2: Step 2 and/or Step 3 of the latest approved version of the “Tool for the demonstration and assessment of additionality”



As the proposed project is to recover the pressure from the blast furnace gas to produce the electricity, which is supplied to the blast furnace (BF-4) for the captive consumption.

The project participant has compared the per unit cost of generation for the project activity and the baseline Greenfield Captive Power plant CPP-4. The analysis presented in the B.4 section of revised PDD was verified by the financial expert.

levelised cost of electricity generation for CPP-4 = 1.74 INR/kWh

levelised cost of electricity generation for project activity (without CDM)= 2.02 INR/kWh

levelised cost of electricity generation for project activity (with CDM revenues) = 1.44 INR/kWh

The validation team after reviewing the levelised cost of electricity generation for the project activity found to be higher than that of CPP-4 (identified coal based captive baseline power plant). Hence, validation team confirms that Scenario (W4/P1) is not economically attractive.

Hence validation team confirms that Scenario 1 (W2/P8) is identified as the most plausible baseline scenario of the proposed project activity.

The project participant has demonstrated the additionality as per the option III of the additionality tool. The section 3.7.3 of this report will demonstrate the same.

Step 3: If more than one credible and plausible alternative scenario remain, the alternative with the lowest baseline emissions shall be considered as the baseline scenario

Scenario 1 (W2/P8) identified by the PDD is one of the scenarios described in Table 2, where the proposed project falls, of the methodology. Therefore, the methodology ACM 0012 version 4.0 is to be applicable to the proposed project.

Hence the validation team confirms the baseline as W2 and P8 that is in the absence of the project activity the gas pressure would have remained unutilized and the power would have been generated by the coal based captive power plant.

**Assessment to determine the extent of use of the waste pressure in the baseline scenario**

The project participant has carried out an assessment in the PDD to determine the extent of use of the waste pressure in the baseline scenario. The project activity is implemented in a Greenfield facility (i.e. in the Blast Furnace-4), as per Annex 1 of ACM 0012. The option 1 applied to determine the extent of use of the WECM in other existing facilities was chosen in version 5 of the PDD. The number of other facilities that meet the Option 1 criteria is 5 and were identified as below :

1. Tata Steel Blast Furnace H
2. Tata Steel Blast Furnace I
3. RINL
4. Bhushan Steel
5. JSW Steel BF-3

CAR 06 was raised by the validation team as the project participant did not justify the selection of Industries for the baseline analysis with respect to the capacities of the selected industries in comparison to project activity in accordance with Annex 1 of ACM0012 ver. 4.0

The project participant responded with revised PDD with explanation for baseline analysis as per the Annex 01 of ACM0012 version 4.0.0. The analysis was cross checked the validation team with the information available on the UNFCCC website and concluded that all projects compared are in the range of $\pm 10\%$ of the project capacity. Hence CAR 6 was closed.

After the submission of the Request for Registration of the project activity, a Request for Review was raised by UNFCCC in which BVCH was requested to substantiate the appropriateness of using annex 1 of ACM0012 to assess the extent of use of waste energy from the waste energy generation facilities in the absence of the CDM project activity given the fact that there appears to have less than five similar facilities without including the facilities with CDM projects.

One of the 5 above listed facilities is an already registered CDM project activity (Tata Steel Blast Furnace H), while another 3 facilities (Tata Steel Blast Furnace I, RINL & JSW Steel BF-3) are already under validation for CDM. This leaves only one facility (Bhushan Steel) for the analysis of the assessment of use of WECM. But even Bhushan Steel's TRT was not in commercial operation at the time of the start date of the project activity.

For the use of Option 1, it is necessary, however, that at least five facilities are analysed to arrive at reference facility practice. The number of facilities analysed (only one) is therefore insufficient for the assessment to be carried out as per Annex 1 of ACM 0012,



and hence, the validation team accepted the issue raised by the query in the Request for Review.

Since the use of Option 1 could not be permitted under the methodology as the minimum number of facilities analysed would have to be at least five or more, the Project Participant has now demonstrated the assessment of use of WECM as per Option 2 of the methodology. Option 2 requires the manufacturer of the project facility to be invited to submit an alternative design including the usage of WECM that is recovered under project. The project participants are required to demonstrate through investment analysis that the use (or no use) of WECM(s) of such alternative design would have been the baseline scenario for the waste energy generated in the Greenfield facility. The alternative design provides the value of factor f_{practice} that is referred in Option 1 above.

The Project participant furnished a letter from the manufacturer of the project facility, M/s. Siemens (Ref /44/) in which it is confirmed by the manufacturer that utilisation of the pressure energy from the off gases of the blast furnace by expanding these gases through a recovery turbine and the subsequent power generation that would result, is the only alternative feasible for the utilisation of pressure energy that would otherwise be wasted. The letter from M/s. Siemens effectively states that there is no alternative design possible for the use of WECM other than the TRT that is used in the project activity.

M/s. Siemens has also stated in their letter that in conventional blast furnaces, the pressure energy is not recovered unlike the project activity, but dissipated in valves. Thus, it is confirmed by the manufacturer of the project equipment that wastage of the pressure energy of the top gases exiting the blast furnace in conventional blast furnaces is the only possible alternative to the project activity and hence, can be regarded as the baseline scenario.

The Project participant has analysed and concluded the baseline alternative in section B.4 of the PDD to be W2 (i.e. the wastage of pressure energy without utilization). This alternative for the use of WECM in the baseline is therefore coincident with the inference that can be drawn from the letter of M/s. Siemens. In the baseline scenario, therefore, with no utilization of the WECM and no power generation taking place from the same, the power needs for the expansion would be supplied entirely by the 300 MW Captive Power Plant (CPP) to be set up to meet the requirement of power for the capacity expansion from 7 MTPA to 10 MTPA.

The baseline use of WECM is already inherent in the investment analysis conducted and presented in the PDD, since this analysis is based on costs that would have been incurred by the Project participant had the project activity not been set up (the power generated by the project activity would then be generated by the identified captive power plant (CPP) of 300 MW) and the cost of power generation by the 300 MW CPP is included as the cost saved by the project activity (and therefore the revenue component of the investment analysis). The investment analysis through the use of IRR as a financial indicator has demonstrated that investment in the project activity would



realize an IRR that is lower than the WACC benchmark and therefore, investment in the project activity is not any more viable a proposition for the Project participant than not to invest at all, viz., a continuation of the baseline scenario.

Thus, the investment analysis establishes conclusively that the baseline practice was not to utilize the waste energy, as demonstrated in line with the requirement in Option 2 of annex 1 of ACM 0012 and hence, the baseline practice factor f_{practice} is taken as 0 by the Project participant.

Based on the above assessment, the DOE hereby confirms that:

- (a) All the assumptions and data used by the project participants are listed in the PDD, including their references and sources;
- (b) All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;
- (c) Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable;
- (d) Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD;
- (e) 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.

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 the VVM are described below:

The baseline emissions for the year y shall be determined as follows:

$$BE_y = BE_{En,y} + BE_{flst,y}$$

Where:

- BE_y = The total baseline emissions during the year y in tCO₂
- $BE_{En,y}$ = The baseline emissions from energy generated by the project activity during the year y in tCO₂
- $BE_{flst,y}$ = Baseline emissions from fossil fuel combustion, if any, either directly for flaring of waste gas or for steam generation that



would have been used for flaring the waste gas in the absence of the project activity (tCO₂), calculated as per equation 26. This is relevant for those project activities where in the baseline steam is used to flare the waste gas

$BE_{flst,y}$ = Baseline emissions from fossil fuel combustion, if any, either directly for flaring of waste gas or for steam generation that would have been used for flaring the waste gas in the absence of the project activity (tCO₂), calculated as per equation 26 of the methodology. For this project activity,

$BE_{flst,y}=0$ because steam or fossil fuel was not used to flare the waste gas in the pre-project scenario.

The Validation team reviewed the following documents to confirm there is no steam or fossil fuel used in the project activity and the project activity uses only waste pressure

- DPR dated Feb 2007 (Ref /7/) prepared by DESCON LIMITED
- Commissioning Certificates for TRT-4 and BF-4 (Ref/15/), (Ref/23/),

The project activity justifies the baseline scenario 1 of the table 02 in ACM 0012 version 4.0

Hence baseline emission from energy generated by the project activity during the year y in tCO_2 was determined by the algorithm as per equation 02 of the methodology:

$$BE_{\text{Eny}} = BE_{\text{Elec},y} + BE_{\text{Ther},y}$$

Where,

$BE_{\text{Elec},y}$ = Baseline emissions from electricity during the year y in tCO_2

$BE_{\text{Ther},y}$ = Baseline emissions from thermal energy (due to heat generation by elemental processes) during the year y (tCO_2)

The project activity involves utilization of waste pressure only to generate and no thermal energy is involved in the project activity hence $BE_{\text{Ther},y} = 0$

Baseline emissions from electricity during the year y in tCO_2 was estimated by the algorithm given in the equation 03 of the methodology

$$BE_{\text{Elec},y} = f_{\text{cap}} * f_{\text{wcm}} * \sum_j \sum_i (EG_{i,j,y} * EF_{\text{Elec},i,j,y})$$

Where

$BE_{\text{elec},y}$ = Baseline emissions due to displacement of electricity during the year y (tCO_2)

$EG_{i,j,y}$ = The quantity of electricity supplied to the recipient j by generator, which in the absence of the project activity would have been sourced from source i (the grid or an identified source) during the year y in MWh

$EF_{\text{elec},i,j,y}$ = The CO_2 emission factor for the electricity source i (gr for the grid, and is for an identified source), displaced due to the project activity, during the year y (tCO_2/MWh)

f_{wcm} = Fraction of total electricity generated by the project activity using waste energy. This fraction is 1 if the electricity generation is purely from use of waste energy. Depending upon the situation, this factor is estimated using the equations in section 3.1

Note: For a project activity using waste pressure to generate electricity, the electricity generated from waste pressure should be measurable and this fraction is 1

f_{cap} = Factor that determines the energy that would have been produced in project year y using waste energy generated at a



historical level, expressed as a fraction of the total energy produced using waste source in year y . The ratio is 1 if the waste energy generated in project year y is the same or less than that generated at a historical level. The value is estimated using the equations in section 3.2. For Greenfield facilities, f_{cap} is 1. If the procedure in Annex 1 concludes that the waste energy would have been partially utilised in the “reference waste energy generating facilities” this fact will be captured in the factor $f_{practice}$ (refer to equations 22, 23, 24 and 25 for the use of factor $f_{practice}$)

The project activity involves electricity generation using waste pressure of the BF-4 gas which otherwise would have remained unutilized in the baseline hence $f_{wcm} = 1$ which is default value

The project activity is implemented in the Greenfield facility and in the PDD version 05 the project participant has justified that reference facilities do not utilise BF gas pressure for electricity generation in accordance with Annex 01 of methodology, hence $f_{cap} = 1$ which is default value.

The project activity supplies electricity to the recipient facility (BF-4) for captive consumption using internal grid of JSW steel. Hence the $EF_{elec,i,j,y}$ is calculated as per ACM0012 version 04, the CO2 emission factor of the internal grid $EF_{elec,i,j,y}$ is determined by following the guidance provided in the “Tool to calculate the emission factor for an electricity system”. Since the generation mix of the internal grid varies due to new installation project participant has chosen the ex-post approach for the emission factor, this is conservative and will result in accurate calculation of emission reductions.

Internal grid of JSW Steel Limited

The project activity is supplying electricity to the recipient facility BF-4 through internal grid of JSW steel plant. Hence the validation team is of the opinion that the emission factor of the internal grid to be considered for the emission reduction calculations in accordance with the ACM 0012 version 4.0. baseline greenfield 300 MW coal based power plant (CPP-4) is also connected to the internal grid. The internal grid receives the power from other captive power plants as well (CPP 1,2,3 and TRT-3) the internal grid is also connected with JSW energy hence the emission factor of the internal grid considered is appropriate.. The emission factor for the internal grid is also conservative compared to the emission factor of coal based captive power plant hence validation team accepts the internal grid approach selected by the project participant for the emission reduction calculations.



Project participant has calculated emission factor for internal grid as per “Tool to calculate the emission factor for an electricity system”. Version 2.2.1 (Ref /46/)

Detailed calculation spread sheet for emission factor of internal grid is provided separately (Ref /34/)

The stepwise justification for the calculation of emission factor of internal grid is detailed below

STEP 1. Identify the relevant electricity systems

Internal grid of JSWSL is identified as relevant electricity systems where CPP-1, CPP2, CPP3, SBU-I & SBU-II are connected. CPP-1, CPP-2 are BF gas fired, CPP-3 is coal fired, SBU-I is coal & Corex fired and SBU-II is coal fired power plant.

Project participant has included the JSW energy's SBU-I and SBU-II in the emission factor calculations. This is a conservative approach as the SBU-I and SBU-II are connected to internal grid. Hence validation team after reviewing the annual reports of the JSW Steel Limited and as per the site visit confirms that identified grid system is appropriate and in accordance with the “Tool to calculate the emission factor for an electricity system”. Version 2.2.1 (Ref/49/)

STEP 2. Choose whether to include off-grid power plants in the project electricity system (optional)

All the plants connected to the JSW internal grid are considered. And there are no offgrid power plants therefore the validation team confirms it to be reasonable and correct.

$EF_{elec,i,j,y}$ is determined by Step 3 and Step 4 of the tool

Step 3 : Select a method to determine the operating margin (OM), Simple OM is used and the emission factor is calculated using Ex post option.

- A) The method (a) Simple OM method was chosen for the proposed project. Simple OM method appropriately applied satisfying the applicable conditions specified by the relevant tool and the generation data in JSW internal grid and a table describing the calculation process has been added to Annex 8 of PDD version 05
- B) *Ex-post* option selected is conservative and applicable to the project activity as the composition of internal grid may change during the crediting period of project activity hence validation team confirms the selection.

- C) 3-year generation average, based on the most recent available data at the time of submission of the PDD for validation is appropriately worked out using grid data from year 2009 through 2012 derived from
- Annual reports JSW Steel Limited (Ref /21/)
 - Plant log books of JSW Steel Limited.
 - 2006 IPCC Guidelines for National Greenhouse Gas Inventories
 - CEA CO₂ Baseline Database Version 07 (The emission factor for fuels in the CPP are referred from this database)

Step 4 : Calculate the operating margin emission factor according to the selected method .

The data parameters such as net electricity generation and CO₂ emission factor for each power generating unit connected to the JSW internal grid is available and can be monitored ex-post the selected option is correct.

Under this option, the simple OM emission factor is calculated based on the net electricity generation of each power unit and an emission factor for each power unit, as follows:

$$EF_{\text{grid,OMsimple},y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}} \quad (1)$$

Where:

- $EF_{\text{grid,OMsimple},y}$ = Simple operating margin CO₂ emission factor in year y (tCO₂/MWh)
 $EG_{m,y}$ = Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
 $EF_{EL,m,y}$ = CO₂ emission factor of power unit m in year y (tCO₂/MWh)
 m = All power units serving the grid in year y except low-cost/must-run power units
 y = The relevant year as per the data vintage chosen in Step 3

Determination of $EF_{EL,m,y}$

The emission factor of each power unit connected to the internal grid is determined as per Option A1 since fuel consumption and electricity generation is available for all power units:

The emission factor ($EF_{EL,m,y}$) is determined using following equation:

$$EF_{EL,m,y} = \frac{\sum_i FC_{i,m,y} \times NCV_{i,y} \times EF_{CO_2,i,y}}{EG_{m,y}} \quad (2)$$

Where:

- $EF_{EL,m,y}$ = CO₂ emission factor of power unit m in year y (tCO₂/MWh)
 $FC_{i,m,y}$ = Amount of fossil fuel type i consumed by power unit m in year y (Mass or volume unit)
 $NCV_{i,y}$ = Net calorific value (energy content) of fossil fuel type i in year y (GJ/mass or volume unit)
 $EF_{CO_2,i,y}$ = CO₂ emission factor of fossil fuel type i in year y (tCO₂/GJ)
 $EG_{m,y}$ = Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
 m = All power units serving the grid in year y except low-cost/must-run power units
 i = All fossil fuel types combusted in power unit m in year y
 y = The relevant year as per the data vintage chosen in Step 3

Project emissions

Project Emissions include emissions due to (1) combustion of auxiliary fuel to supplement waste gas/heat and (2) electricity emissions due to consumption of electricity for cleaning of gas before being used for generation of energy or other supplementary electricity consumption.

$$PE_y = PE_{AF,y} + PE_{EL,y}$$

Where:

- PE_y = Project emissions due to the project activity (tCO₂)
 $PE_{AF,y}$ = Project activity emissions from on-site consumption of fossil fuels by the unit process (es) and/or co-generation plant(s) if they are used as supplementary fuels due to non-availability of waste energy to the project activity or due to any other reason (tCO₂). Since the project activity does not involve recover of waste gas or heat, this emission source is not applicable.
 $PE_{EL,y}$ = Project activity emissions from on-site consumption of electricity for gas cleaning equipment or other supplementary electricity consumption (tCO₂). Since these emissions would have also occurred in the baseline, the emission source is neglected from baseline as well as project emissions.

Leakage

No leakage is applicable under this methodology.

Emission reductions

Emission reductions due to the project activity during the year y are calculated as follows:

$$ER_y = BE_y - PE_y$$

Where:

- ER_y = Total emissions reductions during the year y in tons of CO₂
 PE_y = Emissions from the project activity during the year y in tons of CO₂
 BE_y = Baseline emissions for the project activity during the year y in tons of CO₂

Validation team assessed the calculations of estimated CERs as provided by project participant in the emission reduction spreadsheet (Ref/33/). The assumptions considered for the emission reduction calculations in the spreadsheet were validated as follows -

Parameter/Value	Source of information	Validation justification
Quantity of BF gas generated prior to the start of the project activity-, $Q_{wcm,BL} = 5,12,000$ Nm^3/hr ,	Measured by flow meter and recorded in the plant Log Book	This is a monitoring parameter. The data will be recorded daily by an operator. The data will also be reflected continuously in the power plant Distributed Control System (DCS). The data from the DCS will also be archived daily. For estimation of emission reduction value of $Q_{wcm,BL}$ is estimated as per DPR Hence, accepted by the validation team.
Quantity of electricity supplied to the recipient j (BF-4) by generator (TRT-4), which in the absence	Measured by energy meters and recorded in the Plant Log Book	This is a monitoring parameter. The data will be recorded daily by an operator. The data will also be reflected continuously in the power

of the project activity would have been sourced from JSW Steel Limited coal based power plant. $EG_{i,j,y} = 53032$ MWh/year		plant Distributed Control System (DCS). The data from the DCS will also be archived daily. For estimation of emission reduction value of $EG_{i,j,y}$ is estimated as per DPR Hence, accepted by the validation team.
Energy that would have been produced in project year y using waste gas generated in base year expressed as a fraction of total energy produced using waste gas in year y, $f_{cap} = 1$	ACM 0012 version 04	This is a default value $F_{cap} = 1$ for the Greenfield project activity as per ACM 0012 version 04 hence validation team accepts the value.
Fraction of total electricity generated by the project activity using waste gas, $f_{wcm} = 1$	ACM 0012 version 04	This is a default value $F_{wcm} = 1$ for the project activities generating electricity using waste pressure only as per ACM 0012 version 04 hence validation team accepts the value
CO ₂ emission for the electricity source i (i.e. the JSW Steel Limited internal grid), displaced due to the project activity during the year y, $EF_{elec,i,j,y} = 0.95$ tCO ₂ /MWh	Internal grid emission factor sheet (monitored ex-post parameter)	The project activity is displacing the electricity over the internal grid of JSW Steel Limited hence the emission factor for the internal grid has been calculated in accordance with "Tool to calculate the emission factor for an electricity system". The project participant has chosen the ex-post option hence this parameter will be monitored ex-post. The validation team verified the internal grid emission factor excel sheet to confirm the emission factor $EF_{elec,i,j,y} = 0.95$ tCO ₂ /MWh



The following parameters are used for calculating the emission factor of internal grid		
Amount of fuel type <i>i</i> (Corex) consumed by power plant/unit <i>m</i> (CPP1), (or in the project electricity system in case of $FC_{i,y}$) in year <i>y</i> or hour <i>h</i> $FC_{corex,m,y} = 685250 \text{ KNm}^3$	Plant log book or measured electronic readings.	This parameter is monitored during the crediting period and recorded electronically in the DCS system. The validation team reviewed the plant records submitted to confirm the values used in the calculation of emission factor for internal grid.
Amount of fuel type <i>i</i> (Blast Furnace Gas) consumed by power plant/unit <i>m</i> (CPP1), (or in the project electricity system in case of $FC_{i,y}$) in year <i>y</i> or hour <i>h</i> $FC_{BFG,m,y} = 853397 \text{ KNm}^3 / \text{annum}$	Plant log book or measured electronic readings.	This parameter is monitored during the crediting period and recorded electronically in the DCS system. The validation team reviewed the plant records submitted to confirm the values used in the calculation of emission factor for internal grid.
Amount of fuel type <i>i</i> (Blast Furnace Gas) consumed by power plant/unit <i>n</i> (CPP2), (or in the project electricity system in case of $FC_{i,y}$) in year <i>y</i> or hour <i>h</i> $FC_{BFG,n,y} = 1385909 \text{ KNm}^3 / \text{annum}$	Plant log book or measured electronic readings.	This parameter is monitored during the crediting period and recorded electronically in the DCS system. The validation team reviewed the plant records submitted to confirm the values used in the calculation of emission factor for internal grid.
Amount of fuel type <i>i</i> (Corex gas) consumed by power plant/unit <i>k</i> (SBU I), (or in the project electricity system in case of $FC_{i,y}$) in year <i>y</i> or hour <i>h</i> $FC_{Corex,k,y} = 984956 \text{ KNm}^3 / \text{annum}$	Plant log book or measured electronic readings.	This parameter is monitored during the crediting period and recorded electronically in the DCS system. The validation team reviewed the plant records submitted to confirm the values used in the calculation of emission factor for internal grid.
Amount of fuel type <i>i</i> (Coal) consumed by	Plant log book or measured electronic readings.	This parameter is monitored during the crediting period and recorded electronically in



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power plant/unit k (SBU I), (or in the project electricity system in case of $FC_{i,y}$) in year y or hour h $FC_{Coal,k,y} = 478090$ Tons/annum		the DCS system. The validation team reviewed the plant records submitted to confirm the values used in the calculation of emission factor for internal grid.
Amount of fuel type i (Coal) consumed by power plant/unit L (SBU II), (or in the project electricity system in case of $FC_{i,y}$) in year y or hour h $FC_{Coal,L,y} = 1568446$ Tons/annum	Plant log book or measured electronic readings.	This parameter is monitored during the crediting period and recorded electronically in the DCS system. The validation team reviewed the plant records submitted to confirm the values used in the calculation of emission factor for internal grid.
<i>Amount of fuel type i (Coal) consumed by power plant/unit j (CPP III), (or in the project electricity system in case of $FC_{i,y}$) in year y or hour h</i> $FC_{Coal,j,y} = 874265$ Tons/annum	Plant log book or measured electronic readings.	This parameter is monitored during the crediting period and recorded electronically in the DCS system. The validation team reviewed the plant records submitted to confirm the values used in the calculation of emission factor for internal grid.
<i>Net calorific value (energy content) of fuel (Corex gas) type i in year y at CPP 1</i> $NCV_{corex,m,y} = 0.00705$ (1870 Kcal/Nm ³)	GCV is measured by Gas Chromatography and its done by plant management. NCV is calculated based on measured GCV value.	This parameter is monitored during the crediting period and recorded electronically in the DCS system. The validation team reviewed the plant records submitted to confirm the values used in the calculation of emission factor for internal grid.
Net calorific value (energy content) of fuel (Blast Furnace gas) type i in year y at CPP 1 $NCV_{BFG,m,y} = 0.00301$ (800 Kcal/Nm ³)	GCV is measured by Gas Chromatography and its done by plant management. NCV is calculated based on measured GCV value.	This parameter is monitored during the crediting period and recorded electronically in the DCS system. The validation team reviewed the plant records submitted to confirm the values used in the calculation of emission factor for internal grid.



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<p>Net calorific value (energy content) of fuel (Corex gas) type i in year y at CPP 2</p> <p>$NCV_{corex,n,y} = 0.00704$ (1869.19 Kcal/Nm³)</p>	<p>GCV is measured by Gas Chromatography and its done by plant management. NCV is calculated based on measured GCV value.</p>	<p>This parameter is monitored during the crediting period and recorded electronically in the DCS system. The validation team reviewed the plant records submitted to confirm the values used in the calculation of emission factor for internal grid.</p>
<p>Net calorific value (energy content) of fuel (Blast Furnace gas) type i in year y at CPP 2</p> <p>$NCV_{BFG,m,y} = 0.00322$ (854.22 Kcal/Nm³)</p>	<p>GCV is measured by Gas Chromatography and its done by plant management. NCV is calculated based on measured GCV value.</p>	<p>This parameter is monitored during the crediting period and recorded electronically in the DCS system. The validation team reviewed the plant records submitted to confirm the values used in the calculation of emission factor for internal grid.</p>
<p>Net calorific value (energy content) of fuel (coal) type i in year y at SBU I</p> <p>$NCV_{Coal,k,y} = 0.023$ (5705.45 Kcal/Kg)</p>	<p>GCV is measured by bomb calorimeter and its done by plant management cum fuel supplier. NCV is calculated from measured GCV value.</p>	<p>This parameter is monitored during the crediting period and recorded electronically in the DCS system. The validation team reviewed the plant records submitted to confirm the values used in the calculation of emission factor for internal grid.</p>
<p>Net calorific value (energy content) of fuel (coal) type i in year y at SBU II</p> <p>$NCV_{Coal,L,y} = 0.0211$ (5052.73 Kcal/Kg)</p>	<p>GCV is measured by bomb calorimeter and its done by plant management cum fuel supplier. NCV is calculated from measured GCV value.</p>	<p>This parameter is monitored during the crediting period and recorded electronically in the DCS system. The validation team reviewed the plant records submitted to confirm the values used in the calculation of emission factor for internal grid.</p>
<p>Net calorific value (energy content) of fuel (coal) type i in year y at CPP 3</p> <p>$NCV_{Coal,j,y} = 0.022$ (5322.66 Kcal/Kg)</p>	<p>GCV is measured by bomb calorimeter and its done by plant management cum fuel supplier. NCV is calculated from measured GCV value.</p>	<p>This parameter is monitored during the crediting period and recorded electronically in the DCS system. The validation team reviewed the plant records submitted to confirm the values used in the calculation of emission factor for internal grid.</p>



The estimated annual average emission reduction is approximately 50,380 tCO₂e and crediting period of the project is 10 year fixed. The validation team confirms that the estimates of baseline emissions can be replicated using the information provided in the PDD and emission reduction spreadsheet being submitted for registration. The validation team further confirms that assumptions have been consistently applied in both emission reduction calculations and investment analysis spreadsheet

Based on the above assessment, the DOE 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 project emissions, baseline emissions, leakage 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 by the validation team to assess the additionality of the Project activity include review of documents indicated in the assumptions in IRR spreadsheet (Ref /35/) and source of Benchmark taken for the project activity. The steps taken and sources of information used, to cross-check the information contained in the PDD on this matter are described in Sections 3.7.1 through 3.7.5 below:

3.7.1 Prior consideration of the clean development mechanism (104)

The project participant has signed a contract with the technology supplier Shaanxi Blower Group (Co) Ltd. on 20th Nov 2007 (REF//) as per the CDM glossary of terms (Ref/58/) this is considered as the start date of the project activity and same is reflected in the webhosted PDD. The project activity is the part of expansion plan by the project participant for the steel generation facility from 7 Million Tonnes Per Annum (MTPA) to 10 MTPA. The earliest real action taken for the implementation of the project activity is the equipment supply contract between Shaanxi Blower Group (Co) Ltd. and the project participant. The validation team confirms the start date 20th Nov 2007 after reviewing the actual contract signed (REF//)

As per the paragraph 6 of EB 62 Annex 13 "Proposed project activities with a start date before 2 August 2008, for which the start date is prior to



the date of publication of the PDD for global stakeholder consultation, are required to demonstrate that the CDM was seriously considered in the decision to implement the project activity. Such demonstration requires the following elements to be satisfied:

- a) CDM awareness*
- b) CDM benefits were decisive in the implantation of the project activity*
- c) The project participant must indicate, by means of reliable evidence, that continuing and real actions were taken to secure CDM status for the project in parallel with its implementation*

The validation team confirms the prior consideration of the CDM benefits for the project activity by the project participant which was validated in the following steps

- a) CDM awareness :
 - The project participant JSW steel limited has a registered CDM project with ref no 0325, Title :Generation of Electricity through combustion of waste gases from Blast furnace and Corex units at JSW Steel Limited (in JPL unit 1), at Torangallu in Karnataka, India". The validation team further verified that the CDM project was registered on 12th Jan 2007 prior to decision date 03rd April 2007 for current CDM project activity.
 - The validation team had a meeting with higher management of the JSW steel ltd. on 24th Oct 2011. Mr. Seshagiri Rao MVS Joint. MD and Group CFO informed the validation team about the Carbon portfolio of the JSW steel ltd and the successful registration of two CDM projects (Ref: 0325 and Ref: 0350) had influenced the decision of implementing the current project activity.
- b) CDM benefits were decisive in the implementation of the project activity
 - The project participant submitted the approval note dated 03rd April 2007 (Ref/8/) for current project activity which is part of capacity expansion for the production of steel. The Board note No.1072 was also submitted wherein the project participant has resolved the capacity expansion for the steel production. The approval note states that based on the prior experience of the Top-pressure Recovery Turbine (TRT) for the Blast Furnace-3, TRT installation is not a viable project and the CDM benefits should be considered to make it viable. The recommendation from DPR prepared by the DESCON Limited has also been considered while approving the project activity with CDM benefits. After reviewing the actual board note as well as the approval note validation team opines that the CDM benefits were decisive in the decision making for the project activity.
 - CAR 9 was raised by validation team as the webhosted PDD did not have a clear description about awareness of the CDM and how the CDM benefits were decisive for the implementation of the project activity.

In response the project participant has provided the explanation in detail for the prior consideration of CDM benefits in the revised PDD (REF/2/)



Continuing and real actions were taken to secure CDM status for the project in parallel with its implementation:

- The revised PDD has been updated with the chronology of the events for the CDM project activity. The chronology illustrates steps taken by the project participant to achieve the CDM status for the project activity. The references and evidences provided for each event in the chronology are in line with the annex 13 EB 62. Validation team after vetting the documentary evidences confirms the real and continuing actions were taken by the project participant to achieve the CDM status for the project activity.

The assessment of the Prior Consideration of the project activity “Installation of Top-Pressure Recovery Turbine at Blast Furnace -4” is conducted by consulting the UNFCCC website, and the DOE hereby confirms that the Period for Comments related to this project activity is from 19 Jul 11 – 17 Aug 11, and that the CDM benefits were considered necessary in the decision to undertake the project as a proposed CDM project activity.

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

3.7.1.1 Historical information on project timeline

The project participant, JSW Steel Limited under the capacity expansion plan of 7 MTPA to 10 MTPA has implemented the Top Pressure Recovery Turbine to generate electricity from waste pressure of BF gas for the captive consumption.

The JSW Steel Limited company's board of directors signed a board resolution of expansion plan on 03rd April 2007 after reviewing the Detailed project report prepared by the MECON consultants (Ref /6/).

A supply agreement (Ref/10/) was executed between the SHAANXI BLOWER (GROUP) COMPANY LIMITED, company duly incorporated and existing in P.R. China and JSW Steel Limited. (i.e. the project participant), on 20th Nov 2007, this has been considered as the start date of the project activity in accordance with the CDM glossary. The said agreement laid down the terms and conditions for the execution and implementation of the project activity by the project participant.

The revised PDD provides the chronology of events which have occurred at different intervals of time. The validation team during the document review and site visit checked the documents with respect to the events mentioned in the PDD. The documentary evidence and dates mentioned in the table provided in the B.5 section of the PDD were cross checked and verified to be correct.

The evidences for real and continuing action of the CDM that were assessed are listed below:



- a) Detailed Project Report for expansion of the steel facility to 10MTPA by MECON (REF/6/) Jan 2007
- b) Detailed Project Report for installation of TRT at Blast Furnace 4 by DESCON (REF/7/) Feb 2007
- c) Approval of the TRT 4 considering CDM revenue. Approval note dated 03rd April 2007 and Extracts of Minutes of Meeting of Board of Directors held on 03rd April 2007 Board note 1057 (REF/8/)
- d) Local Stakeholder Consultation Meeting dated 26th May 2007 (REF/9/)
- e) Equipment Supply Contract with Shaanxi Blower Group (Co) Ltd dated 20th Nov 2007 (REF/10/)
- f) Purchase order was placed on 09th Jan 2009 (REF/11/)
- g) Appointment of CDM consultant; Copy of contract dated 03rd March 2008 (REF/12/)
- h) Emission Reduction Purchase Agreement dated 21st July 2009 (REF/13/)
- i) Appointment of DOE ; Contract with DOE 28th March 2011 (REF/14/)
- j) Commissioning of the project activity ; commissioning certificate dated 14th Sept 2011 (REF/15/)
- k) Meeting with NCDMA for Host Country Approval; of email from NCDMA regarding invitation for meeting 15th Nov 2011(REF/16/)

3.7.2 Identification of alternatives (107)

Project participant has provided the steps for identification of the alternative scenario in section B.5 of the PDD. It is stated in Para 105 of VVM manual ver. 1.2, that the PDD shall identify credible alternatives to the project activity in order to determine the most realistic baseline scenario, unless the approved methodology that is selected by the proposed CDM project activity prescribes the baseline scenario and no further analysis is required. ACM 0012 version 04 has listed alternatives for use of Waste energy, Power generation, Heat generation and Mechanical energy. Out of these alternatives,

The project participant has justified the baseline scenario as a combination of W2 and P8 which is prescribed in the Table 2 of the methodology.

The baseline of the project activity is the BF-4 gas pressure would have remained unutilized and electricity would have been generated by the onsite-offsite Greenfield fossil fuel based power plant. The validation team is of the opinion that requirement of identification of alternatives is met as per VVM version 1.2.

3.7.3 Investment analysis (114)

Project participant has justified the investment analysis in accordance with the Step 2: Investment Analysis of the “Tool for the demonstration and assessment of additionality” Version 06.1.0



As per the tool, Project Participant has to identify whether the project activity is not:

- The most economically or financially attractive or
- Economically or financially feasible, without the revenue from the sale of certified emission reductions (CERs).

To conduct the investment analysis, Project Participant has used the following Sub-steps:

Sub-step 2a: Determine appropriate analysis method

This step determines the whether to apply simple cost or investment comparison or benchmark analysis.

- Simple cost analysis

Validation team observed that the project activity results in saving of cost of power generation (project activity supplies electricity for captive usage) and hence simple cost analysis cannot be applied.

- Investment comparison analysis

As per guidance 19 of Annex 5 of EB 62, Investment Comparison Analysis is applicable in the cases where Project Participant has no other choice than to invest in the baseline scenario that provides same level of output. Since the baseline scenario selected is 300 MW power plant of JSWSL, comparing the investment in this plant against the project activity will not be appropriate as the magnitude of the baseline plant is not equivalent to that of the project activity. Therefore, this analysis is not done by the project participant.

However the project participant has calculated the levelised cost of generation for the alternative of power generation based on coal. The unit cost of electricity generation in CPP-4 with coal as fuel is lowest among all the alternatives. The results imply, 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.

- Benchmark analysis

The methodology ACM 0012 version 04 requires project participants to demonstrate additionality of the project activity through an investment analysis. The project participant has demonstrated the benchmark analysis based on project IRR compared against the investment benchmark this is in accordance with the paragraph 9 of EB 51 annex 59

Validation team also noted that the Board note dated 03rd April (Ref /8/) also considers the return on Equity investment and not the cost comparison

Hence the validation team is of the opinion that benchmark analysis can be used for the project activity.



Sub-step 2b: Option III. Apply benchmark analysis

The benchmark applied by the project participant is company specific in accordance with the paragraph 13 of the Annex 5 to EB 62. Since the project activity cannot be developed by any other investor the option left with the project participant is to invest into their own organization. The board note dated. 03rd April 2007 manifests the return on equity of 30% for overall expansion project. The project participant has chosen to justify the benchmark based on the market returns from the steel sector only which is less than 30% and hence conservative. Validation team confirms the approach in accordance with the paragraph 9 of the EB 51 annex 59

The benchmark selected by project participant is Weighted Average Capital Cost (WACC). The WACC is calculated using CAPM model using the following formula:

$$WACC = E/V * Re + D/V * Rd * (1 - Tc)$$

Where:

Re = Cost of equity

Rd = Cost of Debt

E = Market value of firm's equity

D = Market value of the firm's debt

V = E + D

E/V = Percentage of financing that is equity

D/V = Percentage of financing that is debt

Tc = Corporate tax rate

Re = Cost of Equity:

The Capital Asset Pricing Model (CAPM) approach is a generally accepted methodology for determining the Cost of Equity. CAPM is based on the portfolio theory of finance in which risks are classified into:

Systematic Risk: Risk applicable to the market as a whole, such as inflation, tax rises, interest rates, etc.

Specific Risk: Residual risk unique to an individual firm or a small group of companies that form a subset of the market.

Hence validation team confirms the CAPM model applicable to the project and correct.

The project participant has calculated the return on equity using the following formula in accordance with CAPM model

$$E(re) = rf + \text{Equity Beta } (\beta) * [E(rm) - rf]$$

Where:



$E(re)$ - the expected rate of return on equity (cost of equity)

r_f - the risk-free rate of return (e.g. return on government bonds)

$E(r_m)$ - the expected rate of return on a market portfolio

Equity Beta (β) - coefficient reflecting the volatility (risk) of the stock relative to the market, which measures the systematic risk of the stock

The Risk free rate (r_f) has been taken from the long term government bond rates at the time of the investment decision of the project activity in 2007. The weighted average yield on Central Government date Securities i.e. bond rate during the financial year March 2007 is 7.92%.

Validation team confirms the value of Risk free rate (r_f) 7.92% after reviewing the Reserve Bank of India publications which is publically available at following web-link

<http://rbidocs.rbi.org.in/rdocs/AnnualReport/PDFs/72286.pdf>
(Page no. 182, table 6.4, see weighted average yield of 2006-07)

The Market Risk Premium ($E(r_m) - r_f$), as measured and applied in practice, is the premium above the risk-free rate of return that investors expect to earn on a well-diversified portfolio of equities.

CAR 16 was raised by the validation team as the webhosted PDD did not have the justification for *the following with reference to the EB 62 annex 5*

- Selection of BSE 30
- Vintage data for the Beta calculations
- Conservativeness of the benchmark
- Selection of the companies for the Beta analysis

Project participant in response has justified selection in accordance with annex 5 of EB 62 in the revised PDD, same is elaborated as below.

The expected rate of return on a market portfolio ($E(r_m)$) has been calculated as the compounded annual growth rate (CAGR) of the market portfolio. In calculating market risk premium, it is usual to use an established stock market index as a proxy for the market portfolio. In India, a choice of possible indices are available – BSE 30, BSE 100, BSE 500, S&P CNX 500, Nifty etc.

Choice of stock market index will also be considerably influenced by the availability of historical data. The base year of BSE 100 is taken as 1983-84 and thus it has the sufficient historical data available. The index comprises of 100 component stocks representing large, well established



and financially sound companies across key sectors. Moreover, it is designed based on the “free-float market capitalization-weighted” methodology which is a widely followed index construction methodology on which the majority of the global equity indices are based. This can be confirmed from

<http://www.bseindia.com/about/abindices/bse100.asp> .

There are other indices like BSE 30, BSE 500 available in the market. BSE 30 and BSE 500 has inception year of 1979 and 1999 and consists of 30 and 500 stocks respectively. As long term return of the market is being measured, it is important to select a longer time period that covers all phases of economy and various types of investors, while also including a broad set of stocks so as to be representative of the economy. BSE 100 reflects longer available time period from the date of investment decision (23 years) and contains sufficient stocks (100) including power sector stocks (3 companies) and is therefore considered more appropriate than BSE 30 (Which offers longer vintage but less number of power companies (only 2) listed in power sector) or BSE 500 (which contains more number of power companies but sufficient vintage of 6 years).

Validation team after reviewing the clarification from the project participant confirms the approach for stock market in accordance with the EB 62 annex 05. Validation team also consulted the same with the financial expert to confirm the beta value. The financial expert engaged for the project activity has certified the IRR and Benchmark analysis based to confirm the analysis and its results (Ref /36/)

Equity Beta is the measure of the expected volatility of a particular stock relative to a well-diversified market portfolio. It measures the systematic risk of a stock, i.e. the risk that cannot be eliminated in a well-balanced, diversified portfolio. The beta of equity is calculated as the covariance between its return and the return on a well-diversified market portfolio, divided by the variance of the return on a well-diversified market portfolio.

As the project activity is supplying power for the captive purposes, as per Annex 59 of EB51, the investment was considered to be in the steel sector and hence beta for listed steel sector companies has been taken into account.

The listed companies whose beta value available at the time of investment decision (year 2007) is given in the table below. Beta value for the period of three years has been used by the project participant for the computation of Expected Return on Equity. Validation team reviewed the publically available market portfolio of the selected companies to cross check and confirm their equity beta values.

Companies	Equity beta value	Period
TATA Steel	1.35	01/04/2004 to
SAIL	1.04	01/04/2007



Mahindra Ugine Steel Co. Ltd.	1.51	
Kalyani Steel Ltd.	1.54	
JSW Steel and Power Ltd	1.01	
Average	1.29	

The equity beta of the each stock is then un-levered with the help of tax rate and D/E of each stock. The average of the un-levered beta is then re-levered with the D/E and tax rate of the project activity. The re-levered beta value comes to 2.29. Therefore, on a conservative basis average of equity beta i.e. 1.29 is used. The validation team confirms the average of equity beta in accordance with the EB 62 annex 5, hence the equity beta value of 1.29 is conservative and appropriate.

The project participant has considered Cost of Debt as Prime Lending Rate (PLR) available at the time of investment decision of the project activity. The PLR as published by Reserve Bank of India (RBI) is in the range of 11.50% to 12%. The average of the PLR which is 11.75% is used for calculation.

Validation team reviewed the RBI publications for the PLR which is publically available to confirm the value.

http://www.rbi.org.in/scripts/BS_ViewBulletin_Test.aspx?Id=8261

Since the RBI PLR forms the basis for the lending rates used by the banks in host country India. The validation team confirms the cost of debt considered by the project participant is conservative and correct.

The Debt Equity ratio has been considered as 70:30 which is standard practice in the market however validation team confirms the ratio after reviewing the CERC guidelines (Ref /39/) and the Board note (Ref /8/) in accordance with the paragraph 18 of EB 62 annex 05

Calculation of WACC:

$$\begin{aligned} \text{WACC} &= E/V * Re + D/V * Rd * (1-Tc) \\ &= 12.68\% \end{aligned}$$

Sub-step 2c: Calculation and comparison of financial indicators

Project IRR as a financial indicator has been selected by project participant to evaluate the financial viability of the project activity. The project IRR is considered to be appropriate investment indicator for the



project activity as project activity involves revenue generation other than CDM benefits in terms of energy savings for the captive consumption. Validation team confirms the Project IRR as a financial indicator in accordance with the EB 62 annex 05

The IRR of the project activity was found to be less than the benchmark value of 6.45%.

The approach adopted by the validation team for verifying the assumptions and their references are as follows:

- Appropriateness of the sources of reference & assumptions and their relevance to the period in which the decision was made;
- Whether access to the references and information is provided;
- Whether the references and information are publicly available;
- Authenticity & credibility of the sources of information.

The detailed assessment incorporating the means of validation is provided below:

Key Parameters	Value-Units	Validaiton team Conclusion / Justification
Total Project Capacity	12.4 MW	Validation team reviewed the Detailed Project Report dated Feb 2007 prepared by DESCON (Ref/7/) and the Supply Agreement (Ref /10/) to confirm the project capacity. This was also cross checked during the site visit
Operations		
Plant Load Factor	60%	Validation team reviewed the Detailed Project Report dated Feb 2007 prepared by DESCON (Ref /7/) and also cross checked the actual annual generation report of TRT-3 having same capacity and technology (Ref /37/) which has 12 month record. Hence the validation team accepts the plant load factor of 60% which was considered at the time of investment decision and cross checked with the actual data with similar project owned by project participant
Operation & Maintenance Cost	48.9 (INR Million)	Validation team reviewed the Detailed Project Report dated Feb 2007 prepared by DESCON (Ref/7/) and also cross checked the value with TRT-3 (Ref /37/) which is owned by the



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		<p>project participant and has the same capacity same technology. However the value for the TRT-3 is 46.0 INR Million which is 6% lesser than the assumed value. The project participant has demonstrated using the sensitivity analysis that even 10% increase in the Operation and Maintenance will not make the project viable.</p> <p>Hence validation team accepts the O&M cost for the project activity.</p>
Escalation in O&M cost	4%	<p>The escalation rate of O&M costs @4% is a normative assumption that is considered in the investment analysis by the Project participant and is supported by a CERC (Central Electricity Regulatory Commission) tariff regulations dated 26.03.2004 that have stipulated the annual escalation on O&M to be @4% for power generation plants. This was accepted by the validation team as a broad assumption for cost escalation in the O&M cost. The same was also cross-checked against the actual costs incurred by the Project participant in 2011-12 and 2012-13. The actual cost figures are available from the account statements (Ref /43/) prepared by the Project participant that indicate the costs for these two years as follows :</p> <p>Financial year 2011-12 : O&M cost INR 49.55 million</p> <p>Financial year 2012-13: O&M cost INR 52.99 million</p> <p>Thus it is seen that the actual increase in the O&M cost during the first two years of the operation of the project activity since its date of commissioning is almost 7%. The assumption of 4% in the investment analysis is therefore acceptable as a more conservative estimate.</p>
Tariff		
Cost of power generation from 300MW coal fired power plant of JSWSL	1.53 INR./kWh	<p>Validation team reviewed the financial model for 10 MTPA expansion project appraised by State Bank of India Capital (Ref /38/) to confirm the cost of power.</p> <p>State Bank of India is leading the consortium</p>

* http://cercind.gov.in/28032004/finalregulations_terms&condition.pdf



		<p>of banks as the lead lender for the 10 MTPA expansion of JSW Steel Limited.</p> <p>The Approval Note (Ref /8/) dated 03-April-2007 was presented before the Board for its decision on the project activity. The Approval Note includes financial data and workings that had been prepared for the review of the Board during the meeting and the investment decision that followed. The tariff values applied in the investment analysis are actually the cost of power that would be produced by the 300 MW CPP_4 plant generating the equivalent amount of power by the project activity in its absence. This cost is saved as a result of the setting up of the 12.4 MW project activity power plant and therefore considered as revenue accruing to the Project Participant</p> <p>The rate of tariff escalation is evident from the financial working sheet that forms part of the above said approval note presented to the Board. The tariff starts with INR 1.53/kWh for the first year of start of operation of the project activity and escalates annually, reaching a value of INR 1.92/kWh in the final year of the analysis. The average of the annual tariff escalation is then 1.23% over the investment timeframe, viz., 20 years.</p> <p>Hence validation team accepts the tariff for electricity considered for the project activity.</p>
Project Cost		
Total Project Cost	583.2 INR Million	Validation team reviewed the Detailed Project Report dated Feb 2007 prepared by DESCON (Ref/7/) and also cross checked with the actual Purchase orders to confirm the project cost. However the actual project cost works out to be 622.21 INR Million which is higher than the cost considered at the time of investment. However, the validation team has accepted the conservative value available at the time of investment decision.
Means of Finance		
Equity	30 %	The Debt Equity ratio has been considered as 70:30 which is standard
Debt	70 %	



		practice in the market however validation team confirms the ratio after reviewing the CERC guidelines (Ref /39/) and the Board note (Ref /8/) dated 30/04/2007
Equity	175.0 INR Million	Calculated
Debt	408.2 INR Million	Calculated

The IRR for the project activity has been calculated and the summary is provided in the table below:

Project IRR (Without CDM revenues)	Benchmark	Project IRR (With CDM revenues)
6.45%	12.68%	12.77%

The validation team has verified the assumptions as above and observed that they are correct and based on conservative values that are applicable at the time of investment decision making. All the input assumptions verified above are applicable at the time of investment decision as per the paragraph 6 of Guidelines on the assessment of Investment Analysis, EB 62 Annex 5 (Ref /48/)

The financial expert has verified the IRR calculations and observed them to be in order. The validation team hereby confirms that the project participant has applied all the statutory levies and taxes as per the then valid rules.

Sub-Step 2d: Sensitivity Analysis –

In order to verify the robustness of investment analysis, the guidelines for the assessment of investment analysis prescribes that a sensitivity analysis should be conducted on all the parameters constituting more than 20% of either total project costs or total project revenues and the value of such parameters should be subjected to reasonable variation.

The project participant has carried out sensitivity analysis for $\pm 10\%$ variation in project cost, tariff, O&M cost and PLF which is in line with para 20 and 21 of Guidelines for Assessment of Investment Analysis (EB 62 Annex 5) (Ref/51/). Also, in accordance with para 21 of Guidelines for Assessment of Investment Analysis,

In cases where a scenario will result in the project activity passing the benchmark or becoming the most financially attractive alternative the DOE shall provide an assessment 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.

In line with the above guidelines, the investor have included the breaching value (% change in the value of a particular parameter at which it crosses the benchmark) of all the parameters considered for the sensitivity analysis and have also included a justification on the likelihood of a parameter reaching its breaching value.

The results of equity IRR for the sensitivity analysis carried out on the parameters viz., project cost, O & M cost, tariff and PLF is tabulated below:

Benchmark	Project IRR (base case)	Parameter	Equity IRR (%)		
			+10%	-10%	% Breaching value
12.68 %	6.45%	Project cost	2.8	5.48	-42.10%
		PLF	6.93	0.51	+33.30%
		O & M cost	1.99	5.85	-59.50%
		Tariff	5.73	2.27	+63.70%

Outcome of sensitivity analysis-

Project cost – The breaching value for capital cost is -42.1% i.e. at this change in value of project cost becomes INR 337.7 million, the project IRR becomes 12.72%, the project IRR crosses the benchmark. The actual project cost incurred by Project Participant is INR 570.9 million and thus this scenario is unrealistic. The actual cost incurred by Project Participant is verified from the purchase orders placed by the Project Participant for the project activity.

Plant Load Factor (PLF) – The breaching value for PLF is +33.3% i.e. at this change in value of PLF is 81.84, the project IRR crosses the benchmark. PLF value is taken as per EB 48/Annex 11 guidelines). Project Participant is presently operating a similar kind of project where the pressure of the blast furnace 3 gas is used to generate power of 12.4 MW through TRT. The technology supplier for TRT in both the projects is same. Thus, the data of this project can be used to study the expected PLF of the project activity. From the historic data of TRT-3 project, it can be seen that the PLF for period of Feb 2010 to Dec 2010 is around 60.62%. Hence, this scenario is unlikely to happen

Operation & Maintenance cost – The IRR breaches the benchmark value for O & M cost when the O&M cost is de-escalated by -63.7% i.e. when it becomes INR 17.8 million, the IRR becomes 12.7% and thus crosses the WACC. This is unlikely since the O&M cost is expected to escalate.

Tariff rate: When the tariff rate is increased by 63.7% i.e. when it becomes INR 2.17/kWh in the base year, the IRR becomes 12.7% and crosses the WACC. From the data available on the tariff rate of similar coal based power plant, the tariff rate is INR. 1.53/kWh and therefore this is an unrealistic scenario



The validation team has verified the correctness of the assumptions and the calculation approach adopted for the sensitivity analysis and confirms that they are correctly considered.

Even with sensitivity analysis carried out as per the guidelines on assessment of investment analysis (EB 62 Annex 5), the values of project IRR does not cross the benchmark adopted. Based on assessment as per the requirements of paragraph 111 (e) of VVM 01.2, the validation team therefore concurs with the project participant that the project activity is additional since it is not financially viable without the benefits from CDM.

The DOE, 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 barrier analysis has not been used for demonstration of additionality.

3.7.5 Common practice analysis (121)

Describe how the geographical scope of the common practice analysis has been validated.

The project participant has demonstrated the common practice analysis in accordance with Step 4a and 4b of the common practice analysis as prescribed in the Tool for “Demonstration and assessment of additionality”, version 06.1.0, EB 69 Annex 20, (Ref /51/) The project participant has selected the entire host country, India for common practice analysis as per the Tool for “Demonstration and assessment of additionality”, version 06.1.0, EB 69, Annex 20.

The assessment of common practice analysis has been detailed below for the Alternative 1. (W2, P8)

As per the Sub-step 4a: Analyze other activities similar to the proposed project activity:

Project participant has identified the similar activities to the project activity and analysed. Projects considering similar if they are in the same country/region and/or rely on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology

The following steel manufacturing industries were considered for the analysis

1. SAIL
2. TATA Steel
3. RINL



1. Steel Authority India Limited (SAIL) is one of the leading public sector steel making company in India. SAIL consists of the following integrated steel plants: Bhilai Steel Plant (BSP), Durgapur Steel Plant (DSP) Rourkela Steel Plant (RSP), Bokaro Steel Plant (BSP), and IISCO Steel Plant (ISP). After reviewing the references provided in PDD validation team confirms that SAIL is planning to install the TRT at BF 7 & 8 at BSP, BF 5 at RSP, BF 2 at BSL and BF 5 at ISP. SAIL.
2. TATA Steel a pioneer steel company in India utilises the top pressure recovery turbine (TRT) technology in its many plants across India. Validation team reviewed the Annual report of TATA steel 2010-2011 which is publically available to confirm that BF- G installed (TRT) in Jharkhand plant is under CDM. The validation team also confirmed that TATA steel is having TRT installation under the planning for other BF H and I.
3. Rashtriya Ispat Nigam Limited (RINL) is a public sector crude steel company having its plant at Vishakhapatnam. Validation team reviewed the press note released by the RINL to confirm that the company is planning to install TRT at BF 3 at Vishakhapatnam steel plant and undertaken the same as CDM project
RINL also has two Gas expansion turbines installed in their facility which are operating since 1993. The gas expansion turbines installed at the RINL use a different technology than the project activity. In these turbines the coke oven/BF gas is fired. This has been observed by the validation team of BVCH during the site of another CDM project. Hence these turbines are not considered for the common practice analysis.
4. The validation team reviewed the following publically available data to confirm the existence of similar projects analysed in the common practice analysis
 - <http://www.sail.co.in/aboutus.php?tag=company-aboutus>
 - http://www.teamorissa.org/Convention_%20Presentations_%20Sessionwise/Session-1/Session1-2%20Energy_Efficiency%20_PPT_2.pdf
 - <http://www.tatasteel.com/>
 - <https://cdm.unfccc.int/Projects/DB/DNV-CUK1204542486.08/view>
 - <http://www.vizagsteel.com/index.asp>
 - <https://cdm.unfccc.int/Projects/Validation/DB/RHHY5P68N9YML6KY3BZOVMT71BCDT1/view.html>

Validation team after reviewing the data available in the public domain confirms that projects considered in the common practice analysis are similar in accordance with criteria prescribed by the Tool for “Demonstration and assessment of additionality”, version 06.1.0, EB 69, Annex 20

Sub-step 4b Discuss any similar options that are occurring:



Validation team after assessing the projects identified in the Sub-step 4a found out that all the projects are under CDM pipeline (at different stages of validation) and hence step 4b is not required.

However the Project proponent has also demonstrated the common practice analysis in accordance with the paragraph 47 of Tool for “Demonstration and assessment of additionality”, version 06.1.0, EB 69, Annex 20

Step wise analysis in accordance with the EB 69, Annex 8 Guidelines on Common Practice and step wise analysis is presented in the revised PDD.

In accordance with the guidelines on common practice (version 02.0), the following definitions are described by the project participant:

1) Applicable geographical area: India

2) Measure:

The project activity waste pressure recovery for electricity generation in JSW Steel industry corresponds to (b) fuel and feedstock switch with and without energy source (including energy efficiency improvement).

3) Output:

Electricity generated by Top Pressure Recovery Turbine

4) Different technologies:

Different technologies are those that deliver the same output and differ by at least one of the following (as appropriate in the context of the measure applied in the proposed project and applicable geographical area):

(i) Energy source/fuel: Waste pressure from Blast Furnace gas

(ii) Feed stock: Not applicable

(iii) Size of installation: 12.4 MW

(iv) Investment climate in the date of the investment decision: Without subsidies or other financial flows

(v) Other features: Not applicable



Validation team after reviewing revised PDD with all the corrections confirms the definitions in conformance with the guidelines EB 69 Annex 20 (Ref /51/) and of EB 69 Annex 08 (Ref /52/)

Stepwise approach for Common Practice

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

The project activity is a 12.4 MW power plant. Thus, the applicable range in $\pm 50\%$ of this capacity is 6.2 MW and 18.6 MW.

Validation opinion - The total capacity of the project activity is 12.4 MW and hence the PP has appropriately calculated the output range as **6.2 MW to 18.6 MW**

2) Step 2: identify similar projects (both CDM and non-CDM) which fulfil all of the following conditions:

(a) The projects are located in the applicable geographical area;(India)

Validation opinion - The applicable geographical area selected by the Project Participant for common practice analysis is the entire host country viz. India. The same is in accordance with paragraph 5 of the additionality tool according to which the applicable geographical area should cover the entire host country as a default.

(b) The projects apply the same measure as the proposed project activity; (TRT)

Validation opinion – The project activities using Top pressure Recovery Turbine for the blast furnace have been considered, this is in line with the EB 69 annex 8

(c) The projects use the same energy source/fuel and feedstock as the proposed project activity, if a technology switch measure is implemented by the proposed project activity; (Blast Furnace Gas pressure)

Validation opinion – The project participant has considered the project activities utilizing the same source as the project activity which Blast Furnace Gas pressure in accordance with EB 69 annex 8

(d) The plants in which the projects are implemented produce goods or services with comparable quality, properties and applications areas (e.g. clinker) as the proposed project plant;



Validation opinion – The project participant has considered the project activities producing steel using the similar technology i.e Blast furnace in accordance with EB 69 annex 8

(e) The capacity or output of the projects is within the applicable capacity or output range calculated in Step 1;

Validation opinion – The project participant has considered the project activities producing electricity having the capacity +/- 50% of 12.4 MW in accordance with EB 69 annex 8

(f) The projects started commercial operation before the project design document (CDM-PDD) is published for global stakeholder consultation or before the start date of proposed project activity, whichever is earlier for the proposed project activity

Validation opinion – The project participant has considered the project activities which has started commercial operation before the 19th Jul 11 in accordance with EB 69 annex 8

The common practice analysis has been tabulated below

Date		Company	BF	BF Capacity (MTPA)	TRT	TRT Capacity, MW	CDM Project
Commissioning Date	Apr-05	Tata Steel	BF - G	2.20	Yes	8.10	Yes
Commissioning Date	1-May-08	Tata Steel	BF - H	2.50	Yes	14.50	Yes
Commissioning Date	18-Feb-09	JSW Steel	BF - 3	2.80	Yes	12.40	Yes

Validation team verified the references submitted by the project participant in the revised PDD to confirm the above mentioned information. Validation team after reviewing the data available in the public domain for the steel sector confirms that there are only 3 projects in the steel industry at the time of webhosting of the PDD for global stakeholder comments. The three projects identified by the project participant are having TRT for electricity generation.

Step 3: within the projects identified in Step 2, identify those that are neither registered CDM project activities, project activities submitted for



registration, nor project activities undergoing validation. Note their number N_{all} .

Validation opinion: All the projects are under CDM ,hence $N_{all} = 0$

Validation team referred the UNFCCC website to confirm that projects identified in the step 2 are under CDM pipeline

Step 4: within similar projects identified in Step 3, identify those that apply technologies that are different to the technology applied in the proposed project activity. Note their number N_{diff} .

Validation opinion: Validation team confirms that within the identified projects in the step 2 there are no project activities which utilise different technology to generate electricity. All the projects identified in the step 2 utilise TRT technology to produce electricity from the Blast Furnace gas pressure.

Hence $N_{diff} = 0$

Step 5: calculate factor $F = 1 - N_{diff} / N_{all}$ representing the share of similar projects (penetration rate of the measure/ technology) using a measure/technology similar to the measure/technology used in the proposed project activity that deliver the same output or capacity as the proposed project activity.

Validation opinion

factor “F” cannot be computed since N_{all} & N_{diff} are zero.

It's clear that $N_{all}=0$ and $N_{diff} = 0$

The proposed project activity is a “common practice” within a sector in the applicable geographical area if the factor F is greater than 0.2 and $N_{all}-N_{diff}$ is greater than 3.

$N_{all}-N_{diff} = 0$

The validation team reviewed the following publically available data to confirm the existence of similar projects analysed in the common practice analysis

- <https://cdm.unfccc.int/Projects/DB/DNV-CUK1204542486.08/view>
- http://www.cdmindia.in/reports_list_details.php?id=Jharkhand&reporttype=2&page=2
- <https://cdm.unfccc.int/Projects/Validation/DB/UU4PSSWDP26L57L55ZN9PP8M3DY9WT/view.html>
- <https://cdm.unfccc.int/Projects/Validation/DB/2Q2WOBBOCA0MX5A3WGJGHCUEHKZPEKU/view.html>
- <https://cdm.unfccc.int/Projects/Validation/DB/RHHY5P68N9YML6KY3BZOVMT7IBCDT1/view.html>



Validation opinion:

Since both the conditions stipulated in Step 5 are not met by the project activity, hence the project activity is not considered as a common practice. Hence the validation team confirms that project activity is not common practice. The separate excel sheet for common practice analysis has been submitted (Ref /24/)

CAR 07 was raised as the common practice analysis in the webhosted PDD did not reflect the analysis in accordance with the paragraph 47 of latest Tool for “Demonstration and assessment of additionality”, version 06.1.0, EB 69, Annex 20. The project falls under the category measure b). Switch of technology with or without change of energy source (including energy efficiency improvement as well as use of renewable energies);

In response Project participant has updated the common practice analysis in the revised PDD as per the latest version of tool and guidelines on common practice version 02.0 Annex 08 of EB 69.

The DOE hereby confirms that the proposed CDM project activity is not common practice.

3.8 Monitoring plan (124)

The DOE hereby confirms that the monitoring plan complies with the requirements of the methodology. The project activity uses the approved baseline and monitoring methodology ACM 0012, Version 04. Validation team considers the monitoring plan to be complying with the requirements of the methodology based on the following assessment.

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

In accordance with the methodology ACM 0012 version 04 the following data to be monitored

Baseline emissions:

1. *The heat/power/mechanical energy supplied by the project facility to recipient facility(ies) by recovering waste energy from WECM stream(s);*

For the project activity the Quantity of electricity supplied to the recipient BF-4 by generator TRT-4, $EG_{i,j,y}$ MW h / Year is monitored, is included in the section B.7.1 of PDD and described in the monitoring plan

EG_{i,j,y}	Quantity of electricity supplied to the recipient <i>BF-4</i> by generator TRT-4
	Measurement Equipment- Energy meter.
	Measurement process – DCS

	Calibration procedure – As per applicable ISO standard procedure Accuracy of the measurement – $\pm 0.5\%$ Responsible person for measurement – Recording by Shift in charge Measurement interval– Every hour
	Measured by energy meters and recorded in the Plant Log Book The data will be archived both electronically and in paper (Plant log book) for the entire crediting period and two years after or the date of last issuance whichever is later.
$EF_{elec,i,j,y}$	The baseline emission factor is a monitored parameter that will be computed ex-post. It reflects the emission factor for the internal grid comprising of captive power plants CPP-1, CPP-2, CPP-3, CPP_4 and JSW Energy Ltd.'s SBU-I and SBU-II plants.

2. Energy generation using WECM, in absence of project activity;

The project activity is a Greenfield project and being installed in the Greenfield facility hence no energy generation using WECM in the absence of project activity, hence this parameter is not monitored.

3. Quantity and energy content of WECM;

The energy content of the WECM is measured and monitored using the parameters $Q_{WCM,y}$ $P_{WCM,y}$ which are included in the section B.7.1 of PDD and described in the monitoring plan

$Q_{WCM,y}$	Quantity of Waste Gas used for energy generation during year y
	Measurement Equipment- Flow meter. Measurement process – DCS Calibration procedure – As per applicable ISO standard procedure Accuracy of the measurement – $\pm 1\%$ of flow rate Responsible person for measurement – Recording by Shift in charge Measurement interval– Every hour
	Measured by flow meter and recorded in the plant Log Book The data will be archived both electronically and in paper (gas measurement log book) for the entire crediting period and two years after or the date of last issuance whichever is later.
$P_{WCM,y}$	Pressure of the WECM in Kg/ cm^2 (g)
	Measurement Equipment- Pressure transmitter. Measurement process – DCS Calibration procedure – As per applicable ISO standard procedure

	Accuracy of the measurement – $\pm 0.065\%$ Responsible person for measurement – Recording by Shift in charge Measurement interval– Every hour
	The pressure will be measured by pressure transmitter and recorded continuously by DCS The data will be archived both electronically and in paper (Plant log book) for the entire crediting period and two years after or the date of last issuance whichever is later.

CO₂ emission factor of electricity or heat that would have been consumed by the recipient facility(ies) in the absence of the project activity;

The project activity is supplying electricity to the recipient facility BF-4 using the internal grid of JSW. The internal grid consists of different energy generating power plants. Since the project activity is displacing electricity over the internal grid of JSW the emission factor for the electricity generation of internal grid is considered to calculate the emission reductions. To calculate the emission factor of internal grid emissions from each power generating unit connected to the internal grid is considered. The emission factor of the internal grid of JSW is calculated in accordance with Tool to calculate the emission factor for an electricity system". Version 02.2.1.

The following parameters are included in the monitoring plan for the calculations emission factor of JSW internal grid in accordance with ACM 0012 version 4.0 and Tool to calculate the emission factor for an electricity system". Version 02.2.1.

$FC_{corex,m,,y}$	Amount of fuel type i (Corex) consumed by power plant/unit m (CPP1), (or in the project electricity system in case of $FC_{i,y}$) in year y or hour h
	Measurement Equipment- Flow meter. Measurement process – DCS Calibration procedure – As per applicable ISO standard procedure Accuracy of the measurement – $\pm 1\%$ of flow rate Responsible person for measurement – Recording by Shift in charge Measurement interval– Every hour
	The quantity of corex gas consumed will be measured by flow meter.



$FC_{BFG,m,y}$	Amount of fuel type i (BFG) consumed by power plant/unit m (CPP1), (or in the project electricity system in case of $FC_{i,y}$) in year y or hour h
	Measurement Equipment- Flow meter. Measurement process – DCS Calibration procedure – As per applicable ISO standard procedure Accuracy of the measurement – $\pm 1\%$ of flow rate Responsible person for measurement – Recording by Shift in charge Measurement interval– Every hour
	The quantity of BFG consumed will be measured by flow meter.

$FC_{corex,n,y}$	Amount of fossil fuel type i (Corex) consumed by power plant/unit n (CPP2), (or in the project electricity system in case of $FC_{i,y}$) in year y or hour h (KNm ³)
	Measurement Equipment- Flow meter. Measurement process – DCS Calibration procedure – As per applicable ISO standard procedure Accuracy of the measurement – $\pm 1\%$ of flow rate Responsible person for measurement – Recording by Shift in charge Measurement interval– Every hour
	The quantity of corex gas produced will be measured by flow meter.

$FC_{BFG,n,y}$	Amount of fuel type i (BFG) consumed by power plant/unit n (CPP2), (or in the project electricity system in case of $FC_{i,y}$) in year y or hour h
	Measurement Equipment- Flow meter. Measurement process – DCS Calibration procedure – As per applicable ISO standard procedure Accuracy of the measurement – $\pm 1\%$ of flow rate Responsible person for measurement – Recording by Shift in charge Measurement interval– Every hour

	The quantity of BFG consumed will be measured by flow meter.
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$FC_{Corex,k,,y}$	Amount of fuel type i (Corex gas) consumed by power plant/unit k (SBU I), (or in the project electricity system in case of $FC_{i,y}$) in year y or hour h
	Measurement Equipment- Flow meter. Measurement process – DCS Calibration procedure – As per applicable ISO standard procedure Accuracy of the measurement – $\pm 1\%$ of flow rate Responsible person for measurement – Recording by Shift in charge Measurement interval– Every hour
	The quantity of corex gas consumed will be measured by flow meter.

$FC_{Coal,k,,y}$	Amount of fuel type i (Coal) consumed by power plant/unit k (SBU I), (or in the project electricity system in case of $FC_{i,y}$) in year y or hour h
	Measurement Equipment- Weigh Meter. Calibration procedure – As per applicable standard procedure Accuracy of the measurement – $\pm 1\%$ Responsible person for measurement – Recording by Shift in charge Measurement interval– Every hour
	The quantity of Coal consumed will be measured by weigh meter.

$FC_{Coal,L,y}$	Amount of fuel type i (Coal) consumed by power plant/unit L (SBU II), (or in the project electricity system in case of $FC_{i,y}$) in year y or hour h
	Measurement Equipment- Weigh Meter. Calibration procedure – As per applicable standard procedure Accuracy of the measurement – $\pm 1\%$

	Responsible person for measurement – Recording by Shift in charge Measurement interval– Every hour
	The quantity of Coal consumed will be measured by weigh meter.

$FC_{Coal,j,,y}$	Amount of fuel type i (Coal) consumed by power plant/unit j (CPP III), (or in the project electricity system in case of $FC_{i,y}$) in year y or hour h
	Measurement Equipment- Weigh Meter. Calibration procedure – As per applicable standard procedure Accuracy of the measurement – $\pm 1\%$ Responsible person for measurement – Recording by Shift in charge Measurement interval– Every hour
	The quantity of Coal consumed by CPP III will be measured by weigh meter.

$NCV_{corex,m,,y}$	Net calorific value (energy content) of fuel (Corex gas) type i in year y at CPP 1
	Measured by Gas Chromatography
	Gas chromatography will be calibrated once in a year. The data will be archived both electronically and in paper (Plant log book) for the entire crediting period and two years after or the date of last issuance whichever is later.

$NCV_{BFG,m,,y}$	Net calorific value (energy content) of fuel (Blast Furnace gas) type i in year y at CPP 1
	Measured by Gas Chromatography
	Gas chromatography will be calibrated once in a year. The data will be archived both electronically and in paper (Plant log book) for the entire crediting period and two years after or the date of last issuance whichever is later.

$NCV_{corex,n,,y}$	Net calorific value (energy content) of fuel (Corex gas)
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	type <i>i</i> in year <i>y</i> at <i>CPP 2</i>
	Measured by Gas Chromatography
	Gas chromatography will be calibrated once in a year.

$NCV_{BFG,m,,y}$	Net calorific value (energy content) of fuel (Blast Furnace gas) type <i>i</i> in year <i>y</i> at <i>CPP 2</i>
	Calculated from the GCV figures GCV is measured by Gas Chromatography
	Gas chromatography will be calibrated once in a year.

$NCV_{Coal,k,y}$	Net calorific value (energy content) of fuel (Blast Furnace gas) type <i>i</i> in year <i>y</i> at <i>CPP 2</i>
	Calculated from the GCV figures GCV is measured by bomb calorimeter and its done by plant management cum fuel supplier.
	Bomb will be calibrated once in a year.

$NCV_{Coal,L,,y}$	Net calorific value (energy content) of fuel (coal) type <i>i</i> in year <i>y</i> at <i>SBU II</i>
	Calculated from the GCV figures GCV is measured by bomb calorimeter and it's done by plant management cum fuel supplier.
	Bomb will be calibrated once in a year.

$NCV_{Coal,j,,y}$	Net calorific value (energy content) of fuel (coal) type <i>i</i> in year <i>y</i> at <i>CPP 3</i>
	Calculated from the GCV figures GCV is measured by bomb calorimeter and it's done by plant management cum fuel supplier.
	Bomb will be calibrated once in a year.

4. Properties of heat (e.g. pressure and temperature of the inlet and outlet of the streams, concentrations of the reactant/product mix etc.) supplied to the recipient facility(s);



The project activity supplies electricity to the recipient and no heat supply is involved hence the parameters pertaining to the properties of heat supplied are not monitored

5. Properties of heat return to the element process (e.g. pressure and temperature of the condensate return) supplied by the recipient facility(s) to the project facility;

The project activity supplies electricity to the recipient and no heat supply is involved hence the parameters pertaining to the properties of heat return are not monitored

6. Efficiencies of element process, power plant, cogeneration plant or mechanical conversion equipment that would have been used in the absence of the project activity.

The WECM in the absence of the project activity would have been remained unutilized as justified in the baseline selection (W1). Hence this parameter is not included in the monitoring plan

Validation team confirmed during the validation site visit that all the monitoring equipments installed are maintained and regularly calibrated by the project operator. All the instruments will be calibrated using ISO standards and marked at regular intervals so that the accuracy of measurement can be ensured all the time. Installed meters will be initially calibrated by the manufacturer before installation of the meter and then recalibrated annually. Monitoring and measurement can be carried out internally and externally by independent laboratory which has been accredited by the government or internationally. Validation team conducted the interviews with the plant operators to confirm monitoring and recording procedures. The project participant during the interviews confirmed that the data for all the parameters will be monitored and documented. The data will be kept at least for 2 years beyond the crediting period. The DOE 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. Refer to item 3.1 of this report.

In the PDD, the project participant described contribution to sustainable developed as per four indicators of sustainable development stipulated by Ministry of Environment & Forests, Government of India.

- Social well being:
- Environmental well being:
- Economic well being:
- Technological well being:



As per the host country requirement the project proponent ensured to commit two percent (2%) of the CERs revenue every year for socio-economic development including society/community development.

Clarification CL 02 was requested to understand the mechanism by the virtue of which the CER revenue would be utilised for the sustainable development of the host country.

In response to the project participant has described the mechanism in annex 5 of the PDD and has provided an undertaking for the same. (Ref /40/)

As the host country DNA has approved the project activity on the basis of above mentioned indicators the validation team is of the opinion that the description is adequate. The validation team therefore considers that the project activity meets the sustainability criteria of the host country.

3.10 Local stakeholder consultation (130)

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

The project participant has conducted the local stakeholder consultation meeting at JMax, JSW Township, Vidyanagar, on 26th May, 2007 at 11.00 a.m.

Validation team reviewed the following documents to confirm the local stakeholder meeting.

- Personal invitation (sent on 7th May, 2007) (Ref/17/)
- Notice board publications (Ref /18/)
- Minutes of the meeting (Ref/19/)
- Records of attendance at the meeting (Ref/20/)

Based on the above, validation team has judged that the project activity is supported by local stakeholders and gives no adverse impacts on local environment, and contributes to the development of local economy and society.

Validation team also interviewed the local stakeholders during the validation site visit on 19th Oct 2011 and on 29th Nvo 2012 to confirm the consultation of the project activity and their opinion on the project.

The DOE hereby confirms that the process of local stakeholder consultation is observed to be adequate.

3.11 Environmental impacts (133)

The Ministry of Environment and Forests (MoEF), Government of India has issued the Environmental Impact Assessment Notification, 14th September 2006, which makes environmental clearance mandatory for the development



activities listed in its schedule. The details of these activities are available at:

<http://envfor.nic.in/divisions/iass/notif/notif.htm>

The project activity does not fall under this list and hence the EIA is not mandatory for the project activity.

However as corporate policy of project participant the EIA was undertaken on the voluntary basis. The objective of EIA-EMP study was to evaluate the benefits and/or the adverse impacts of the proposed activity on the neighbourhood environment.

The specific objectives were as follows:

- To assess the potential impacts associated with the proposed project on the Environment.
- To develop measures through which potential negative impacts can be mitigated and positive benefits can be enhanced;

EIA and Environmental Management Plan (EMP) for this project has been carried out by a third party Zenith Energy Services (P) Limited. (Ref /41/)

The EIA concludes that the proposed activity will not have any adverse impact on environment. It would result in benefits like socio-economic wellbeing, promotion of developmental activities due to additional power generation in the state and mitigation of greenhouse gas emissions.

The project participant has described impacts on air environment, water environment, soil, groundwater etc. The description on environment impact is satisfactory. None of these impacts is considered significant.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD using methodology ACM 0012 Version 04 was webhosted on the UNFCCC for global stakeholders comments as per CDM requirements. The project was webhosted from 19 Jul 11 to 17 Aug 11.

Comments were received from 01 person. 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/s 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 Installation of Top-Pressure Recovery Turbine at Blast Furnace -4 Project in India. The validation was performed on the basis of UNFCCC criteria and host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

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

Project participant has used the latest tool for demonstration of the additionality. In line with this tool, the PDD provides analysis of 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 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 50380 emission reductions.

The review of the project design documentation version 05, 04/12/2012 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 'Installation of Top-Pressure Recovery Turbine at Blast Furnace -4' as CDM project activity.



6 REFERENCES

Category 1 Documents:

Documents provided by JSW Steel Limited that relate directly to the GHG components of the project.

/1/	Webhosted PDD, Version 02, dated 06/07/2012
/2/	Revised PDD, Version 05, dated 04/12/2012 & version 6 dated 12.07.2013
/3/	Letter of application for Host Country Approval
/4/	Host country approval dated 14th March 2012 Ref No. 4/22/2011-CCC
/5/	Invitation letter by the Host country DNA
/6/	Detailed Project Report for expansion of the steel facility to 10MTPA by MECON Jan 2007
/7/	Detailed Project Report for installation of TRT-4 at Blast Furnace 4 by DESCON Feb 2007
/8/	Approval note dated 03rd April 2007 and Extracts of Minutes of Meeting of Board of Directors held on 03rd April 2007 No.1057
/9/	Local Stakeholder Consultation Meeting dated 26th May 2007
/10/	Equipment Supply agreement with Shaanxi Blower Group (Co) Ltd dated 20th Nov 2007
/11/	Purchase order placed on 09th Jan 2009
/12/	Appointment of CDM consultant; Copy of contract dated 03rd March 2008
/13/	Emission Reduction Purchase Agreement dated 21st July 2009
/14/	Appointment of DOE ; Contract with DOE (BVCI) 28th March 2011
/15/	Commissioning certificate for TRT-4 dated 14th Sept 2011
/16/	Meeting with NCDMA for Host Country Approval; of email from NCDMA regarding invitation for meeting 15th Nov 2011
/17/	Personal invitation (sent on 7th May, 2007)
/18/	Notice board publications for local stakeholder meeting
/19/	Minutes of the local stakeholder meeting
/20/	Attendance and comment sheets
/21/	Annual reports of JSW Steel limited 2005 to 2012
/22/	Commissioning certificate for BF-4.
/23/	Power Balance diagram for JSW Steel Limited (from 4 MTPA to 10 MTPA)
/24/	Common Practice Analysis sheet
/25/	Commissioning certificate of 300 MW coal based captive power plant (CPP-4)
/26/	Consent to Establish issued by the State Pollution Control Board for TRT-4
/27/	Work Order for TRT-4 installation
/28/	Consent to Operate issued by the State Pollution Control Board for TRT-4

/29/	Consent to Operate issued by the State Pollution Control Board 10 MTPA
/30/	Host country DNA website : NCDMA screenshot
/31/	The technical specifications of TRT-4 and the Generator
/32/	The technical details of BF-4
/33/	Emission reduction calculation sheet
/34/	Internal grid emission factor calculation sheet
/35/	IRR and benchmark calculation sheet
/36/	Financial expert certificate (issued by: Chartered Accountant Mr.Jayaram)
/37/	TRT-3 generation details for 1 year
/38/	SBI Cap project finance approval
/39/	CERC terms and conditions for tariff -2009
/40/	JSW steel limited undertaking for 2% CDM revenue utilisation for sustainable development in the host country
/41/	Environmental Impact Assessment report by Zenith Energy
/42/	Blast Furnace Gas balance chart for JSW Steel Limited (4 MTPA to 10 MTPA)
/43/	Accounts statements for O&M expenses for the year 2011-12 & 2012-13
/44/	Letter from the blast furnace manufacturer Siemens dated 30 th January 2011
/45/	Electrical Line Diagram for TRT –IV project

Category 2 Documents:

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

/46/	PDD completion guidance - Guidelines for completing the project design document (CDM-PDD) and the proposed new baseline and monitoring methodologies (CDM-NM), version 07
/47/	PDD Form, CDM-PDD, Version 03
/48/	ACM 0012, Version 04.0.0 -Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects
/49/	Emission Factor tool - Tool to calculate the emission factor for an electricity system, version 02.2.1
/50/	Validation and Verification Manual, version 1.2, EB 55; [VVM]
/51/	Guidance on the Assessment of Investment Analysis, Version 05, EB 62
/52/	Guidelines on the Demonstration and Assessment of Prior Consideration of the CDM, Version 04, EB 62
/53/	Demonstration and assessment of additionality, Version 05.2, EB 39, Annex 10
/54/	Demonstration and assessment of additionality, Version 06,1.0, EB 69, Annex 20
/55/	Guidelines on common practice version 02 EB 69 Annex 8
/56/	Tool to calculate project or leakage CO2 emissions from fossil fuel combustion,



	Version 02, EB 41, Annex 11
/57/	Tool to determine the remaining lifetime of equipment, version 01, EB 50, Annex 15
/58/	Glossary of CDM terms, version 06, EB 66, Annex 63

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. Seshagiri Rao MVS – Jt. Managing Director & Group CFO, JSW Steel Limited
/2/	Mr. Naresh Kumar Lalwani – Deputy General Manager Corporate Strategy & Development , JSW Steel Limited
/3/	Mr. Alok Vijayvergiya – Deputy Manager Carbon credits Corporate Strategy JSW Steel Limited
/4/	Ms. Aruna Kumarrankandath- Corporate Strategy & Development , JSW Steel Limited
/5/	Mr. R.S. Kulkarni – General Manager (Maintenance BF-3 & 4) JSW Steel Limited
/6/	Mr. R.A. Balla – General Manager (Maintenance BF-3) JSW Steel Limited
/7/	Mr. Dharmaveers (operations TRT 4) JSW Steel Limited
/8/	Mr. Meghnath (Jr. Engineer Operations BF-4) JSW Steel Limited
/9/	Mr. Arshad Vasam (Trainee Engineer Operations BF-4) JSW Steel Limited
/10/	Mr. Satish Kashyap – Director, General Carbon Advisory Services Pvt Ltd.
/11/	Mr. J.Elamathi Raja- CDM consultant General Carbon Advisory Services Pvt Ltd.



7 CURRICULA VITAE OF THE DOE'S VALIDATION TEAM MEMBERS

Mr. H.B. Muralidhar (Team Leader)

Bureau Veritas Certification, Lead Verifier Climate Change

Graduate in Electrical Engineering with 25 years of experience power generation and distribution related fields as well as in management system auditing. 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.

Mr. Vishwanath Sule (Team Member)

Bureau Veritas Certification Pvt. Ltd. Verifier Climate Change

A Mechanical Engineering with four year work experience in climate change services India. He has previously worked carbon advisory firm in India on CDM project development, CDM project due diligence and Execution of CDM projects. He has undergone training on Clean Development Mechanism and involved in the Validation and verification of CDM/VCS projects.

Mr. Bhavesh Prajapati (Internal Technical Reviewer)

Bureau Veritas Certification, Lead Verifier - Climate Change,

Graduate in the field of Chemical Engineering and post graduate in finance (MBA-Finance). He has more than 8 years of Industrial work experience in the field of environment audits, consultancy of HVAC (pharmaceutical industry as well as commercial air conditioning) and utility services and project management of various Greenfield as well as gray field projects. He has undergone lead verifier's training on Clean Development Mechanism. He is involved in the Validation/verification projects of CDM and VCS.

Mr. Surendra Mohan (ITR Specialist)

Bureau Veritas Certification,

holds Bachelor's degree in Mechanical Engineering and PGDIM. He has over 15 years of experience in Steel Manufacturing & Processing Industry. He is currently working with Bureau Veritas as a Lead Auditor. He is a certified Auditor for ISO 9001: 2008, BS EN 16001: 2009, ISO 50001: 2011, ISO 14001: 2004, BS OHSAS 18001: 2007.

APPENDIX A: JSW STEEL LIMITED CDM PROJECT VALIDATION PROTOCOL

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

Methodology ACM0012 (Version 4.0) - "Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects"

CHECKLIST QUESTION	Ref.	§	COMMENTS		Draft Concl	Final Concl
1. Approval			COUNTRY A (India)	COUNTRY B (insert the country name)		
a. Have all Parties involved approved the project activity?	VVM	44	Host country approval not submitted	Not Applicable	CAR 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 participatn or directly from the DNA)	VVM	45	Please refer CL 1 above	Not Applicable		OK
c. Does the letter of approval from DNA of each Party involved:	VVM	45	Host country approval not submitted	Not Applicable	(CAR1)	OK
i. confirm that the Party is a Party of the Kyoto Protocol?	VVM	45.a				
ii. confirm that participation is voluntary?	VVM	45.b				
iii. confirm that, in the case of the host Party, the proposed CDM project activity contributes to the	VVM	45.c				



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS			Draft Concl	Final Concl
sustainable development of the country?							
iv. refers to the precise proposed CDM project activity title in the PDD being submitted for registration?	VVM	45.d					
d. Is(are) the letter(s) of approval unconditional with respect to (i) to (iv) above?	VVM	46	Please refer above	CAR1			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	Please refer above	CAR1			OK
f. Is there doubt with respect to the authenticity of the letter of approval?	VVM	48	Please refer above	CAR1			OK
g. If yes, was verified with the DNA that the letter of approval is authentic?	VVM	48					
2. Participation			<i>PP1 (JSW Steel Limited)</i>	<i>PP2 (insert PP2 name)</i>			
a. Have all project participants been listed in a consistent manner in the project documentation?	VVM	51	The project participant (PP) has been identified as "JSW Steel Limited"		Not Applicable		OK
b. Has the participation of the project participants in the project activity been approved by a Party to the Kyoto Protocol?	VVM	51	The Host Country Approval (HCA) not submitted.		Not Applicable	(CAR1)	OK
c. Are the project participants listed in tabular form in section A.3 of the PDD?	VVM	52	project participant has been listed in the tabular form in section A.3 of the PDD		Not Applicable	OK	OK
d. Is the information in section A.3 consistent with the contact details provided in annex 1 of the PDD?	VVM	52	<ul style="list-style-type: none"> Yes, The information in the section A.3 is consistent with the Annex 1 of the PDD 		Not Applicable	OK	OK



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
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 separate letter specifically to approve participation? (Provide reference of the approval document for each of the project participants)	VVM	52	Please refer CAR 1 above.	Not Applicable (CAR1)	OK
f. Are any entities other than those approved as project participants included in these sections of the PDD?	VVM	52	Not Applicable	OK	OK
g. Has the approval of participation issued from the relevant DNA?	VVM	53	Please refer CAR1 above.	OK	
h. Is there doubt with respect to (g) above?	VVM	53	Please refer CAR1 above.	OK	
i. If yes, was verified with the DNA that the approval of participation is valid for the proposed CDM project participant?	VVM	53	Please refer CAR1 above.	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 has been prepared in accordance with the latest template (Version 03) and the latest guidance.	OK	OK
b. Is the PDD in accordance with the applicable CDM requirements for completing the PDD?	VVM	56	Yes, the PDD is in accordance with the applicable CDM requirements of for completing the PDD (Version 05).	OK	OK
c. In CDM-PDD section A.1 are the following provided?	EB 41	Ann 12			OK
i. Title of project	EB 41	Ann 12	Title :Installation of Top-Pressure Recovery Turbine at Blast Furnace -4	OK	OK



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
ii. Current version number and date of document	EB 41	Ann 12	Version: 01 Date: 01/07/2011	OK	OK
d. In CDM-PDD section A.2 are following provided (max. one page)?	EB 41	Ann 12			OK
i. A brief description of the project activity covering purpose which includes the scenario existing prior to the start of project, present scenario and baseline scenario	EB 41	Ann 12	Brief description of the project activity has been provided.	OK	OK
ii. Explanation on how the GHG emission reductions are effected	EB 41	Ann 12	Explanation on how the GHG emission reductions are effected by the project activity are provided in the A.2 section of the PDD.	OK	OK
iii. The PP's views on the contribution of project activity to sustainable development	EB 41	Ann 12	The PP's views on the contribution of project activity to sustainable development are provided. PP has stated that 2% of CDM revenues would be contributed towards the sustainable development as part of its commitment to Host Party DNA. The formal undertaking for the same to be provided by the PP.	CL 2	OK
iv. Are there any changes/modifications compared to the webhosted PDD?	EB 41	Ann 12			OK
e. In CDM-PDD section A.3 are following provided in the tabular format?	EB 41	Ann 12			OK
i. List of project participants and parties	EB 41	Ann 12	Yes, the list of PP and Party are provided.	OK	OK
ii. Identification of Host Party			Government of India has been identified as the host party.	OK	OK
iii. Indication whether the Party wishes to be considered as project participant	EB 41	Ann 12	Yes, the information has been provided.	OK	OK



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
f. In CDM-PDD section A.4.1 are following provided?	EB 41	Ann 12			OK
i. Technical description, location, host party(ies) and address as required	EB 41	Ann 12	Yes the same has been provided	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 physical location with unique identification for the project activity and approaches to the site (railway station, airport) are presented in the PDD. Section A.4.1.4 is spread across more than one page and hence not in accordance with guidance to complete CDM PDD.	CL 3	OK
iii. Are there any changes/modifications compared to the webhosted PDD?	EB 41	Ann 12			OK
g. In CDM-PDD section A.4.2 is the list of categories of project activities provided?	EB 41	Ann 12	Section A.4.2 contains a list of categories pertaining to the project activity	OK	OK
h. In CDM-PDD section A.4.3 are following provided?	EB 41	Ann 12			OK
i. A description of how environmentally safe and sound technology, and know-how, is transferred to the Host Party(ies)	EB 41	Ann 12	The section A.4.3 of the PDD describes the technology, its know-how and the environmental benefits of the project activity	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	The section A.4.3 explains the scenarios pre-project, project and the baseline scenario	OK	OK
iii. List and arrangement of the main manufacturing/production technologies, systems and equipments involved	EB 41	Ann 12	The main equipments of the project activity Top-Pressure Recovery Turbine and the Generator are explained with technical details	OK	OK
iv. The emissions sources and GHGs involved	EB 41	Ann 12	There are no Emissions sources and the GHG's involved (same as base line hence not accounted as per methodology options)	OK	OK
v. Are there any changes/modifications compared to	EB 41	Ann			OK



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
the webhosted PDD?		12			
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	Yes, The estimation of emission reductions has been tabulated in the A.4.4 section of the PDD	OK	OK
j. In CDM-PDD section A.4.5 is Information regarding Public funding provided?	EB 41	Ann 12	Section A.4.5 of the PDD mentions no involvement of the public funding in the project activity	OK	OK
k. In CDM-PDD section B.1 are following provided?	EB 41	Ann 12			OK
i. The approved methodology and version number	EB 41	Ann 12	Title: "Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects" ACM 0012 Ver. 04.0.0 EB 60 PP to justify the selection of large scale methodology	CAR 1	OK
ii. Any methodologies or tools which the above approved methodology draws upon and their version number	EB 41	Ann 12	The methodology refers to the latest approved versions of the following tools: <ul style="list-style-type: none"> • "Tool to calculate the emission factor for an electricity system"; • "Tool for the demonstration and assessment of additionality"; • "Tool to determine the baseline efficiency of thermal or electric energy generation systems"; • "Tool to determine the remaining lifetime of equipment"; and • "Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion". 	OK	OK
l. In CDM-PDD section B.2 are following provideFd?	EB 41	Ann 12			OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
i. Justification to the choice of methodology that the project activity meets each of the applicability conditions	EB 41	Ann 12	Yes, the B.2 section of the PDD has tabulated information about the applicable conditions of the ACM0012 ver. 04 EB 60 and the applicability justification with regards to the project activity. However in the first applicability condition the PDD mentions the expansion of steel plant by 3.2 MTPA but during the site visit it was noted that the expansion is only for 2.7 MTPA. PP to clarify the same	CL 4	OK
ii. Documentations with references that had been used. This can be provided in Annex 3 instead	EB 41	Ann 12			OK
m. In CDM-PDD section B.3 are following provided?	EB 41	Ann 12			OK
i. Description of all sources and gases included in the project boundary in the table	EB 41	Ann 12	The B.3 section of the PDD lists all the sources and gases included in the project boundary as per the ACM 0012 Ver. 04 EB 60	OK	OK
ii. A flow diagram of the project boundary physically delineating the project activity	EB 41	Ann 12	The flow diagram for the project activity does not depict the actual scenario which is not in line with the methodology ACM 0012 Ver. 4 EB 60	CAR 2	OK
iii. The flow diagram with all equipments, systems and flows of mass and energy etc	EB 41	Ann 12	Please refer to CAR 2 above		OK
n. In CDM-PDD section B.4 are following provided?	EB 41	Ann 12			OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
i. Explanation how the most plausible baseline scenario is identified in accordance with the selected baseline methodology	EB 41	Ann 12	<p>The most possible baseline scenarios for Waste pressure and Power generation as per ACM0012 are identified as</p> <p>For the use of waste pressure, the realistic and credible alternatives identified are</p> <ul style="list-style-type: none"> W2: Waste pressure energy is not utilized W4: Waste pressure is used for meeting energy demands at recipient facilities which represents project activity without undertaken as CDM activity <p>For power generation, the realistic and credible alternatives identified are</p> <ul style="list-style-type: none"> P1: Proposed project activity not undertaken as a CDM project activity P8: On-site or off-site Greenfield fossil fuel based captive plant 		OK
ii. Justification of key assumptions and rationales	EB 41	Ann 12	Justification of key assumptions and the rationales have been mentioned along with all the possible scenarios as per ACM 0012 Ver. 04 EB 60	OK	OK
iii. Transparent illustration of all data used to determine the baseline scenario (variables, parameters, data sources, etc.)	EB 41	Ann 12			OK
iv. A transparent and detailed description of the identified baseline scenario, including a description of the technology that would be employed and/or	EB 41	Ann 12	The section B.4 of the PDD identifies the installation of On-site or off-site Greenfield fossil fuel based captive plant as the most possible baseline scenario as per		OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
the activities that would take place in the absence of the proposed project activity			the ACM 0012 Ver. 04 EB 60		
v. Are there any changes/modifications compared to the webhosted PDD?	EB 41	Ann 12			OK
o. In CDM-PDD section B.5 are following provided?	EB 41	Ann 12			OK
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	Section B.5 of the PDD explains the additionality of the project activity in accordance with the Methodology ACM 0012 Ver. 04. EB 60. However the same is discussed in detail in later sections of the validation report.	OK	OK
ii. Justification of key assumptions and rationales	EB 41	Ann 12	Justifications for all the key assumptions and rationales to the applicable conditions as per the tool have been provided.	OK	OK
iii. Transparent illustration of all data used to determine the baseline scenario (variables, parameters, data sources etc)	EB 41	Ann 12	The data parameters have been illustrated as per the <i>"Tool for the demonstration and assessment of additionality"</i>	OK	OK
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 section B.5 of the PDD explains the chronology of the events to justify the continuous actions to secure the CDM status for the project activity, However the date mentioned for "Copy of extracts of Minutes of Meeting of Board of Directors held on 30.04.2007" does not match with the document provided, PP to justify the same	CAR 3	OK
p. In CDM-PDD section B.6.1 are following provided?	EB 41	Ann 12			OK
i. Explanation as to how the procedures, in the approved methodology to calculate project	EB 41	Ann 12	The B.6.1 Section of the PDD explains the emission reduction calculations with respect to Project	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
emissions, baseline emissions, leakage emissions and emission reductions are applied to the proposed project activity			emissions, Baseline emissions and leakage emissions as per the methodology		
ii. Equations used in calculating emission reductions	EB 41	Ann 12	The equations have been quoted as per the ACM 0012 Ver. 4.0 EB 60 for calculations pertaining to the estimation of emission reductions	OK	OK
iii. Explanation and justification for all relevant methodological choices, including different scenarios or cases, options and default values	EB 41	Ann 12	The scenarios for the baseline emissions have been justified as per the methodological conditions.	OK	OK
q. In CDM-PDD section B.6.2 are following provided?	EB 41	Ann 12			OK
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	The data parameterstablished in the B.6.2 of the PDD are not consistent with the methodology.	CAR 4	OK
ii. The actual value applied	EB 41	Ann 12	Please refer CAR 4	(CAR 4)	OK
iii. Explanation and justification for the choice of the source of data	EB 41	Ann 12	Please refer to CAR 4	(CAR 4)	OK
iv. Clear and transparent references or additional documentation in Annex 3	EB 41	Ann 12	Please refer to CAR 4	(CAR 4)	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	Please refer to CAR 4	(CAR 4)	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
r. In CDM-PDD section B.6.3 are following provided?	EB 41	Ann 12			OK
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	The ex-ante calculations have been mentioned in the B.6.3 section of the PDD as per the methodological chart. PP to justify the values used for f_{cap} calculations as per methodology ACM 0012 ver. 04 EB 60	CL 5	OK
ii. Documentation how each equation is applied, in a manner that enables the reader to reproduce the calculation	EB 41	Ann 12	The terminology used in the equations is not defined. Please refer CAR 4	(CAR 4)	OK
iii. Additional background information and or data in Annex 3, including relevant electronic files (i.e. spreadsheets)	EB 41	Ann 12	The project Participant has submitted spreadsheet for the emission reduction calculations	OK	OK
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 results of the ex ante estimation of emission reductions have been provided in prescribed tabular format.	OK	OK
t. In CDM-PDD section B.7.1 are following provided?	EB 41	Ann 12			OK
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	PP to justify "Quantity of electricity supplied to the recipient <i>j</i> by generator, which in the absence of the project activity would have been sourced from JSWSL coal based power plant." Measured by energy meters and recorded in the Plant Log Book During validation site visit it was observed that no energy meter was installed and the measurement process type	CAR 5	OK


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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
ii. For each parameter the following below information, using the table provided:	EB 41	Ann 12	Please refer CAR 5	(CAR 5)	OK
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	Please refer CAR 5	(CAR 5)	OK
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, 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.	EB 41	Ann 12	Please refer CAR 5	(CAR 5)	OK
u. In CDM-PDD section B.7.2 are following provided?	EB 41	Ann 12			OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
i. A detailed description of the monitoring plan	EB 41	Ann 12	The section B.7.2 describes the monitoring plan as per the methodology, which is in accordance with Annex 12 of EB 41.	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	Section B.7.2 explains the management structure of that has been planned for the project activity monitoring, as per Annex 12 of EB 41.	OK	OK
iii. The responsibilities for and institutional arrangements for data collection and archiving	EB 41	Ann 12	The section B.7.2 of the PDD defines the roles and responsibilities of the monitoring team for the project activity.	OK	OK
iv. Indication that the monitoring plan reflect good monitoring practice appropriate to the type of project activity	EB 41	Ann 12	PP has a ISO 14001 certified practice for the monitoring of the project activity.	OK	OK
v. Relevant further background information in Annex 4	EB 41	Ann 12	No further information about the monitoring in annex 4	OK	OK
v. In CDM-PDD section B.8 are following provided?	EB 41	Ann 12			OK
i. Date of completion of the application of the methodology to the project activity study in DD/MM/YYYY	EB 41	Ann 12	Yes the date of completing the PDD has been mentioned as 25/04/2011	OK	OK
ii. Contact information of the person(s)/entity(ies) responsible for the application of the baseline and monitoring methodology to the project activity	EB 41	Ann 12	Yes, the contact information of the person responsible for the application of the baseline and monitoring methodology to the project activity has been provided in annex 1 and referred in this section.	OK	OK
iii. Indication if the person/entity is also a project participant listed in Annex 1	EB 41	Ann 12	YES, It has been indicated that the person is also a project participant in Annex 1 of the PDD.	OK	OK
w. In CDM-PDD section C.1.1 are following provided?	EB 41	Ann 12			OK
i. The starting date of a CDM project activity, which is	EB 41	Ann	Starting date for the project activity 20/11/2007,	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
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)		12			
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	The date of the agreement with Shaanxi Blower Group (Co) Ltd.	OK	OK
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	Yes, the starting date of the project activity is prior to the date of publication of the CDM-PDD for global stakeholder consultation by a DOE. The project participant has provided the description in the web hosted PDD on how the benefits of the CDM were seriously considered prior to the starting date in section B.5 of the PDD.	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 C.1.2 section of the PDD mentions the expected lifetime for the project activity as 20 years and 0 months	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 PP has selected fixed crediting period for the project activity	OK	OK
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	EB 41	Ann	Not applicable	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
following format: (DD/MM/YYYY) provided?		12			
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			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	The dates are provided in the format: (DD/MM/YYYY)	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	The length of the crediting period has been mentioned 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	The impact assessment for the proposed project activity which reveals that this will contribute positively towards the environment and the negative impacts associated with its implementation will be insignificant. However PP to clarify "The proposed project activity will utilise the pressure energy potential of the top gas of the Blast Furnace-3 to generate electrical energy."	CL 6	OK
gg. In CDM-PDD section E.1 are the following provided?	EB 41	Ann 12			OK
i. The process by which comments by local 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.	EB 41	Ann 12	The local stakeholder consultation meeting was held at JMax, JSW Township, Vidyanagar, on 26th May, 2007. Invitation letters with brief description of the project were sent on 7 th May, 2007 to the stakeholders. The project participant has provided copy of evidences for stakeholders' invitations and comments received	OK	OK
ii. The project activity is described in a manner, which	EB 41	Ann	The presentation with respect to the CDM principles	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
allows the local stakeholders to understand the project activity, taking into account confidentiality provisions of the CDM modalities and procedures.		12	and the project activity was conducted, the same has been documented and submitted		
iii. The local stakeholder process has been completed before submitting the proposed project activity to the DOE for validation.	EB 41	Ann 12	Yes, the local stakeholder consultation has been conducted prior to the submission of the PDD to DOE for validation.	OK	OK
hh. In CDM-PDD section E.2 are following provided?	EB 41	Ann 12			OK
i. Identification of local stakeholders that have made comments	EB 41	Ann 12	The local stakeholders have been identified in the section E.2 of the PDD with their comments.	OK	OK
ii. A summary of this comments.	EB 41	Ann 12	The summary of the comments made by the local stakeholders and the responses by the PP have been summarized.	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 E.3 Section summarizes that there were no negative opinions were received from the stakeholders.	OK	OK
jj. In CDM-PDD Annex 1 are the following provided?	EB 41	Ann 12			OK
i. Contact information of project participants	EB 41	Ann 12	The contact information of the Project participant has been mentioned in the Annex 1 of the PDD	OK	OK
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	Yes, The contact information for the Organization with all the details as per the CDM PDD guidelines have been mentioned	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	EB 41	Ann 12	The Annex 2 mentions <i>"No public funding from the parties included in Annex I is available to the project activity"</i> .	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
and is not counted towards the financial obligations of those Parties provided?					
II. 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 PDD contains the background information used for baseline application. PP to justify the selection of Industries for the baseline analysis with respect to the capacities of the selected industries in comparison to project activity with respect to the Annex 1 of ACM0012 ver. 4.0 EB 60	CAR 6	OK
mm. In CDM-PDD Annex 4 is the background information used in the application of the monitoring methodology provided?	EB 41	Ann 12	Section B.7.1 has been referred	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 PDD describes the project activity in detail with respect to the technical details and the process involved in electricity generation from the waste pressure available at the exhaust of the Blast Furnace of a steel plant.	OK	OK
b. Is the description of the proposed CDM project activity as contained in the PDD:	VVM	59			OK
i. sufficiently covering all relevant elements?	VVM	59	Yes, the PDD covers all the relevant elements for the project activity	OK	OK
ii. accurate?	VVM	59	Yes, The information found to be precise	OK	OK
iii. providing the reader with a clear understanding of the nature of the proposed CDM project activity?	VVM	59	The information provided gives the reader a good understanding of the project	OK	OK
iv. Are there any changes/modifications compared to the webhosted PDD?	VVM	59	Changes will be made based on CAR and CL raised above	OK	OK
c. Is the proposed CDM project activity in existing facilities or or utilizing existing equipments?	VVM	60	No, The project is a Greenfield project activity	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
d. Is the CDM project activity one of the following types:	VVM	60			OK
i. Large scale?	VVM	60	No, Please refer CAR 1	(CAR 1)	OK
ii. Non-bundled small scale projects with emission reductions exceeding 15,000 tonnes per year?	VVM	60	Yes, estimated emissions are 49,432 tonnes per year	OK	OK
iii. Bundled small scale projects, each with emission reductions not exceeding 15,000 tonnes?	VVM	60	No, The project activity is not a Bundled small scale project.	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 validation site visit was conducted on the 19/10/2011 and 29/11/2012 to confirm the description mentioned in the PDD for the project activity.	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 exceeding 15,000 tonnes per year, was a physical site inspection conducted?	VVM	61	Not applicable	OK	OK
i. For all other proposed CDM project activities not referred to in paragraphs 59 – 61, was a physical site inspection conducted?	VVM	62	The validation site visit was conducted on the 19/10/2011 and 29/11/2012 to confirm the description mentioned in the PDD for the project activity.	OK	OK
j. If no, was it appropriately justified?	VVM	62	The validation site visit was conducted on the 19/10/2011 and 29/11/2012 to confirm the description mentioned in the PDD for the project activity.	OK	OK
k. Does the proposed CDM project activity involve the alteration of an existing installation or process?	VVM	63	The project activity is Greenfield project activity	OK	OK
l. If yes, does the project description clearly state the	VVM	63	The project activity is Greenfield project activity	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
differences resulting from the project activity compared to the pre-project situation?					
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	Yes, The PP has selected ACM0012 Version04 which is approved in EB 60. Title: "Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects"	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 applied with respect to Algorithms and/or formulae used to determine emission reductions?	VVM	67	Refer to (5.e) below	-	-
g. Has the selected methodology been correctly applied with respect to additionality?	VVM	67	Yes, The ACM 0012 Ver 4.0 refers to the latest approved version of "Tool for the demonstration and assessment of additionality"	OK	OK
i. Has the project participant used 'the latest approved version of "Tool for the demonstration of additionality"?'	ACM0012	V 4.0	No, The PP has not used the latest approved version of "Tool for the demonstration of additionality" Please refer CAR 7	(CAR 7)	OK



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h. Has the selected methodology been correctly applied with respect to monitoring methodology?	VVM	67	Yes, the selected methodology ACM0012, version 4.0 EB 60 has been correctly applied with respect to monitoring methodology	OK	OK
i. Are all data collected as part of monitoring plan archived electronically and kept at least for 2 years after the end of the last crediting period?	ACM0012	V 4.0	Section B.7.2 of the PDD mentions the data collection and storage of the same for 2years after the end of the last crediting period	OK	OK
ii. Is 100% of the data monitored? Please comment.	ACM0012	V 4.0	Yes, all the data parameters used in emission reduction calculation are 100% monitored	OK	OK
b. Applicability of the selected methodology to the project activity					
a. Is the selected baseline and monitoring methodology, previously approved by the CDM Executive Board, applicable to the project activity?	VVM	68	Yes, ACM 0012 version 4.0 has been approved in the 60 th Meeting of the EB	OK	OK
i. Is the project activity implemented in identified WECM stream/s, that will be utilized in the project activity, is, or would be flared or released to atmosphere in the absence of the project activity at the new facility?	ACM0012	V 4.0	Yes, The project activity is implemented in the Greenfield facility	OK	OK
ii. Is the project activity a An existing industrial facility, where the project activity is implemented, that captures and utilizes a portion ³ of the waste gas ⁴ stream(s) considered in the project activity, and meet the following criteria: <ul style="list-style-type: none"> The project activity is to increase the capture and utilization of waste gas for generation of electricity that is flared or vented in the absence of the project activity, and not only the replacement/modification/expansion^{5, 6} of existing generation equipment with or to a 	ACM0012	V 4.0	No, The project activity is implemented in the Greenfield facility	OK	OK



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<p>more efficient equipment;</p> <ul style="list-style-type: none"> • The portion of waste gas captured prior to implementation of the project activity is used for generation of captive electricity. The use of a portion of the waste gas in the baseline for the purpose of heat generation or other use prior to implementation of the project activity is also permitted under this methodology provided the generation of heat or other use in the crediting period remain same as that in the baseline; • If the project participant uses a part of the electricity generated in the project activity onsite and exports the remainder, both shall be monitored. In such situations it shall be demonstrated that the electricity generated for own consumption from waste gas is not reduced⁷ in the project activity; • Emission reductions generated in the project activity are attributable to the amount of waste gas captured and utilized in the project activity that was flared or vented in the absence of the project activity⁸ and to the increase in energy efficiency of the new power generating facility; • No auxiliary fossil fuel (except start-up fuel) is used in the waste gas boiler for the generation of captive electricity in the absence of the project 					



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iii.					OK
iv. Are following guidelines followed: <ul style="list-style-type: none"> • • <p>The consolidated methodology is applicable to project activities implemented in an existing or Greenfield facility converting waste energy carried in identified WECM stream(s) into useful energy. The WECM stream may be an energy source for:</p> <ul style="list-style-type: none"> • Generation of electricity; • Cogeneration; • Direct use as process heat source; • Generation of heat in element process; • Generation of mechanical energy; or • Supply of heat of reaction with or without process heating. 	ACM0 012	V 4.0	The project activity is electricity generation in the Greenfield facility	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
<p>v. Are the following applicability conditions justified</p> <p>i. For project activities which recover waste pressure, the methodology is applicable where waste pressure is used to generate electricity only and the electricity generated from waste pressure is measurable;</p> <p>ii. Regulations do not require the project facility to recover and/or utilize the waste energy prior to the implementation of the project activity;•</p> <p>iii. The methodology is applicable to both Greenfield and existing waste energy generation facilities.</p> <p>iv. If the production capacity of the project facility is expanded as a result of the project activity, the added production capacity must be treated as a Greenfield facility;2</p> <p>v. Waste energy that is released under abnormal operation (for example, emergencies, shut down) of the project facility shall not be included in the emission reduction calculations..</p>	ACM0 012	V 4.0	<p>i. Yes, the project activity uses waste pressure from the blast furnace</p> <p>ii. There exists no regulation in the host country to mandate the recovery of the waste energy</p> <p>iii. the project activity is greenfield facility</p> <p>iv. The expanded capacity has been treated as the greenfield facility</p> <p>v. The project activity has the technical arrangements for stopping the generation in case of emergencies the same has been explained in the PDD</p>	OK	OK
<p>i. Are following guidelines followed for Demonstration of use of waste energy in absence of CDM project activity:</p> <p>1) For existing project activities: It shall be demonstrated that the waste energy utilized in the project activity was flared or released into the atmosphere (or wasted in case of project activity recovering waste pressure) in the absence of the project activity at the existing facility by either one of the following ways:</p> <ul style="list-style-type: none"> • By direct measurements of the energy 	ACM0 012	V 4.0	The project activity is implemented in a Greenfield facility	OK	OK



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<p>content and amount of the waste energy produced for at least <i>three years</i> prior to the start of the project activity;</p> <ul style="list-style-type: none"> • Providing an energy balance of the relevant sections of the plant to prove that the waste energy was not a source of energy before the implementation of the project activity. For the energy balance applicable process parameters are required. The energy balance must demonstrate that the waste energy was not used and also provide conservative estimations of the energy content and amount of waste energy released; • Energy bills (electricity, fossil fuel) to demonstrate that all the energy required for the process (e.g. based on specific energy consumption specified by the manufacturer) has been procured commercially. Project participants are required to demonstrate through the financial documents (e.g. balance sheets, profit and loss statement) that no energy was generated by waste energy and sold to other facilities and/or the grid. The bills and financial statements should be audited by competent authorities; • Process plant manufacturer's original design specifications and layout diagrams 					



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<p>from the facility could be used as an estimate of the quantity and energy content of the waste energy produced for the rated plant capacity/per unit of product produced;</p> <ul style="list-style-type: none"> • On site checks conducted by the DOE prior to project implementation can confirm that no equipment for waste energy recovery and utilisation, on the WECM stream recovered under the project activity, had been installed prior to the implementation of the CDM project activity. 					
<p>ii. For the existing project activities, in cases where waste energy recovery activities were already implemented in other streams of WECM prior to the implementation of the CDM project activity, the following should be demonstrated:</p> <ul style="list-style-type: none"> • That there is no decrease in energy generated from the waste energy recovered previous to the implementation of the CDM project activity; or • In the case where there is a decrease in energy generation from previously recovered waste energy, it can be demonstrated that the decrease is due to a decrease in generation of waste energy on account of the 	ACM0 012	V 4.0V 4.0	Not applicable : the project activity is implemented in the Greenfield facility	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
<p>factors not related to the project activity;</p> <ul style="list-style-type: none"> The conditions shall be confirmed by the verifying DOE for each issuance period. 					
<p>iii. For Greenfield project activities the amount of waste gas captured and utilized prior the implementation of the project activity is known and quantified by either one of the following measures:</p> <ul style="list-style-type: none"> By direct measurements of the waste gas captured and utilised; or The energy efficiency of the electricity generation and the captive electricity¹⁴ generated for at least <i>three years</i> prior to the start of the project activity; or The energy balance of relevant sections of the plant to prove the portion of waste gas that is utilized for electricity generation before the implementation of the project activity. For the energy balance applicable process parameters are required. The energy balance must demonstrate the portion of waste gas used and also provide estimations of the energy content and amount of waste gas flared/vented; Manufacturer's specifications of electricity generation plant used prior to the project activity for its efficiency and rated electricity generation capacity. 	ACM0 012	V 4.0	The parameters pertaining to the waste gas capture has been validated from the manufacturer's specification.	OK	OK



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b. Has the DOE applied specific guidance provided by the CDM Executive Board in respect to the applicable approved methodology?	VVM	69			OK
c. Is the methodology correctly quoted?	VVM	70	Yes the methodology has been correctly quoted "Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects", Version 4.0 EB 60	OK	OK
d. Are the applicability conditions of the methodology met?	VVM	71	Yes, all the applicability conditions of the methodology are justified by the PP	OK	OK
e. Is the proeject activity expected to result in emissions other than those allowed by the methodology?	VVM	71	Not applicable	OK	OK
f. Is the choice of the methodology justified?	VVM	71	Please refer CAR 1		OK
g. Have the project participants shown that the project activity meets each of the applicability conditions or the approved methodology?	VVM	71	Refer to (5.b.d) above	-	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	Yes, The PP has justified all the applicable conditions as per the "Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects", Version 4.0	OK	OK
iv. Is the following guideline met "If the displaced electricity for recipient is supplied by a connected grid system, the CO ₂ emission factor of the electricity $EF_{elec,gr,j,y}$ shall be determined following the guidance provided in the "Tool to calculate the emission factor for an electricity system". If the total electricity	ACM0 012	V 4.0	Since the project activity displacing electricity in the internal grid. PP to justify the emission factor calculated in the B.6 section of the PDD.	CAR 12	OK



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generated by project activity is less than 60 GWh/year, then, project proponents can use approved small-scale methodology AMS I.D to estimate the grid emission factor."					
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	Not applicable		OK
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	Not applicable		OK
k. Can a determination regarding the applicability of the selected methodology to the proposed CDM project activity be made?	VVM	72	Please refer CAR 1	(CAR 1)	OK
l. If no, clarification of the methodology was requested, in accordance with the guidance provided by the CDM Executive Board?	VVM	72	Please refer CAR 1	(CAR 1)	OK
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 CDM Executive Board?	VVM	73	Not applicable	OK	OK
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	Not applicable	OK	OK
c. Project boundary					
a. Does the PDD correctly describe the project boundary, including the physical delineation of the	VVM	78	Please refer CAR 2	(CAR 2)	OK



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proposed CDM project activity included within the project boundary for the purpose of calculating project and baseline emissions for the proposed CDM project activity?					
i. Does the geographical extent project boundary include the following: <ul style="list-style-type: none"> The industrial facility where waste energy is generated, including the part of the industrial facility where the waste gas was utilized for generation of captive electricity prior to implementation of the project activity); The facility where process heat in the element process/ steam/ electricity/ mechanical energy is generated (generator of process heat/steam/electricity/mechanical energy). Equipment providing auxiliary heat to the waste energy recovery process shall be included within the project boundary; and The facility(ies) where the process heat in the element process/steam/electricity/ mechanical energy is used (the recipient plant(s)) and/or grid where electricity is exported, if applicable. 	ACM0012	V 4.0	Please refer CAR 2	(CAR 2)	OK
ii. Are summary of gases and sources included in the project activity as per table 1 of the methodology?	ACM0012	V 4.0	<i>Yes, the summary of sources included in the project activity as per the table 1 of ACM0012 Ver. 4 EB 60</i>		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	VVM	79	Please refer CAR 2	(CAR 2)	OK



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logistics etc.?					
c. Does the delineation in the PDD of the project boundary meet the requirements of the selected baseline?	VVM	79	Please refer CAR 2	(CAR 2)	OK
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	Please refer CAR 2	(CAR 2)	OK
e. Have all sources and GHGs required by the methodology been included within the project boundary?	VVM	79	Please refer CAR 2	(CAR 2)	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	<i>Yes, The selected methodology has summarized the sources or the gases to be included in the project boundary in table 1</i>	OK	OK
g. If yes, have the project participants justified that choice?	VVM	79	Yes, The PP has justified the choices for inclusion and exclusion of sources and gases in the project boundary	OK	OK
h. If yes, is the justification provided reasonable? (provide reference to the supporting documented evidence provided by the project participants)	VVM	79	<i>Justification is found suitable as per the methodology ACM 0012 Ver. 4 EB 60</i>	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 as <i>P8: On-site or off-site Greenfield fossil fuel based captive plant. As per the Methodology ACM0012 Ver. 4.0 EB 60</i>	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
b. Has any procedure contained in the methodology to identify the most reasonable baseline scenario, been correctly applied?	VVM	82	The Methodology ACM0012 Ver. 4.0 EB 60 elaborates the selection of baseline scenario, However PP to justify the selection of the baseline scenario in accordance with the Annex1 of the ACM 0012 Ver. 4.0 EB 60	CAR 13	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
<p>i. Does the PDD explain how Realistic and credible alternatives have been determined for:</p> <ul style="list-style-type: none"> Waste energy use in the absence of the project activity; Power generation in the absence of the project activity; Steam/heat generation in the absence of the project activity; and Mechanical energy generation in the absence of the project activity. 	ACM0012	V 4.0	<p>The possible baseline options identified from the above step are:</p> <ol style="list-style-type: none"> For the use of waste pressure, the realistic and credible alternatives identified are <ul style="list-style-type: none"> W2: Waste pressure energy is not utilized W4: Waste pressure is used for meeting energy demands at recipient facilities which represents project activity without undertaken as CDM activity For power generation, the realistic and credible alternatives identified are <ul style="list-style-type: none"> P1: Proposed project activity not undertaken as a CDM project activity P8: On-site or off-site Greenfield fossil fuel based captive plant <p>The PP has justified both the above scenarios pertaining to the baseline scenario in the Section B.4 of the PDD.</p> <p><i>Since the proposed project does not involve heat generation and/or mechanical energy generation from waste pressure, realistic and credible alternative for heat & mechanical energy generation are not taken into consideration for identification of baseline scenario.</i></p>	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
ii. Does the alternative identified for the project activity provide the same heat, power or mechanical energy output as in the project activity scenario and include the alternate use of the waste energy utilized in the project activity.	ACM0 012	V 4.0	Yes, the alternative identified for project activity provides the same heat and power output as in project activity scenario.	OK	OK
iii. Has the project participant provided evidence and supporting documents to exclude baseline options that <ul style="list-style-type: none"> Do not comply with legal and regulatory requirements; or Depend on fuels (used for generation of heat, power or mechanical energy), that are not available at the project site. 	ACM0 012	V 4.0	The Section B.4 of the PDD describes the selection of baseline options as per the methodological choices	OK	OK
iv. Does the PDD explain how most plausible baseline scenario is identified? (Step1). PI comment	ACM0 012	V 4.0	<p>The B.4 section of the webhosted PDD explains the most plausible scenario as The possible baseline options identified from the above step are: (Step 1 outcome)</p> <p>For the use of waste pressure, the realistic and credible alternatives identified are</p> <ul style="list-style-type: none"> W2: Waste pressure energy is not utilized W4: Waste pressure is used for meeting energy demands at recipient facilities which represents project activity without undertaken as CDM activity <p>For power generation, the realistic and credible alternatives identified are</p>	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			<ul style="list-style-type: none">• P1: Proposed project activity not undertaken as a CDM project activity• P8: On-site or off-site Greenfield fossil fuel based captive plant		



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
v. Have the most realistic and credible alternatives for waste energy (WECM) been properly determined? PI comment	ACM0 012	V 4.0	Yes the realistic and credible alternatives for waste energy has been determined as per the methodological choices in the B.4 section of the webhosted PDD. <ul style="list-style-type: none"> W2: Waste pressure energy is not utilized W4: Waste pressure is used for meeting energy demands at recipient facilities which represents project activity without undertaken as CDM activity 	OK	OK
vi. Have the most realistic and credible alternatives for power generation been properly determined? PI comment	ACM0 012	V 4.0	The power generation alternative for the project activity has been identified as <ul style="list-style-type: none"> P1: Proposed project activity not undertaken as a CDM project activity P8: On-site or off-site Greenfield fossil fuel based captive plant 	OK	OK
vii. Have the most realistic and credible alternatives for heat generation been properly determined? PI comment	ACM0 012	V 4.0	Not applicable	OK	OK
viii. Have the most realistic and credible alternatives for mechanical energy been properly determined? PI comment	ACM0 012	V 4.0	Not applicable		OK
ix. Does the PDD identify the fuel for the baseline choices of energy sources taking into account the national and/or sectoral policies as applicable? PI comment	ACM0 012	V 4.0	Please refer CAR 7	(CAR 7)	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
x. Does the PDD employ the Step 2 and/or Step 3 of the latest approved version of the Tool for the demonstration and assessment of additionality to eliminate non-feasible options? (Step3). PI comment	ACM0012	V 4.0	Please refer CAR 7	(CAR 7)	OK
xi. If there has more than one credible and plausible alternatives scenario been identified, does the PDD choose the lowest baseline emissions as the most likely baseline scenario? (Step4). PI comment	ACM0012	V 4.0	Please refer CAR 7 below	(CAR 7)	OK
c. Is the selection of baseline in accordance with the following <ul style="list-style-type: none"> Annex 1: Assessment of extent of use of WECM and determination of baseline practice factor for CDM project activity implemented in Greenfield facilities using a reference waste energy generating facility (or reference facility. for the purpose of this annex) and manufacturer's specifications. Annex 2: Assessment of extent of use of WECM in the existing facility Annex 3: Conservative baseline emissions if multiple waste gas stream(s) with potential for interchangeable application exist in the project facility 	ACM0012	V 4.0	Please refer CAR 7 and CAR 13	(CAR 7)	OK
d. 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	Yes, The Methodology ACM 0012 Ver 4 refers to the use of latest approved version of "Tool for the demonstration and assessment of additionality"	OK	OK
e. If yes, was the methodology consulted on the	VVM	82	Please refer CAR 7 below Yes		OK


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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
application of these tools? (In such cases, the guidance in the methodology shall supersede the tool.)					
f. Does the methodology require several alternative scenarios to be considered in the identification of the most reasonable baseline scenario?	VVM	83	Yes, Please refer CAR 7 below		OK
g. 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	Please refer CAR 7 below		OK
h. Has any reasonable alternative scenario been excluded?	VVM	83	Please refer CAR 7 below		OK
i. Is the baseline scenario identified reasonably supported by:	VVM	84			OK
i. Assumptions?	VVM	84	Please refer CAR 7 below		OK
ii. Calculations?	VVM	84	Please refer CAR 7 below		OK
iii. Rationales?	VVM	84	Please refer CAR 7 below		OK
j. Are the documents and sources referred to in the PDD correctly quoted and interpreted?	VVM	84	Please refer CAR 7 below		OK
k. 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	Nodal approvals (KPCB, Ministry Environment and Forestry India) and the Purchase orders, commissioning certificate	OK	OK
l. Have all applicable CDM requirements been taken into account in the identification of the baseline scenario for the proposed CDM project activity?	VVM	85	Please refer CL 1	(CL 1)	OK
m. Have all relevant policies and circumstances been identified and correctly considered in the PDD, in accordance with the guidance by the CDM Executive	VVM	85	It is stated that project participant has excluded alternatives, which do not comply with legal and regulatory requirements and depend on fuels that are	CL 9	OK



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Board?			not available at project site. However, in accordance with methodology, evidences and supporting documents are not submitted for such baseline options.		
n. 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	Yes, the PDD describes the offsite / Onsite fossil fuel based electricity generation Greenfield facility.	OK	OK
e. Algorithms and/or formulae used to determine emission reductions					
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	Yes, The section B.6 of the webhosted PDD calculates the emission reductions in the stepwise manner as prescribed by the ACM 0012 Version 4.0 EB 60	OK	OK
b. Have the equations and parameters in the PDD been correctly applied with respect those in the select approved methodology?	VVM	90	Yes, the equations and the parameters in the PDD are in accordance with the ACM 0012 Version 4 EB 60. However please refer CAR 12	OK	OK
i. Baseline Emissions Have the baseline emissions for the year y has been calculated through the formula (1) of the methodology?	ACM0 012	V 4.0	Yes equation (1) of the ACM0012 has been applied to calculate the baseline emission for the year y	OK	OK
ii. Has baseline emissions for the different scenarios calculated as per respective formulae of the methodology?	ACM0 012	V 4.0	Yes , please refer CAR 12	OK	OK
iii. As a measure of conservatiness, Is capping of baseline emissions done by using one of the 3 methods described in the methodology? Justify the	ACM0 012	V 4.0	Method 2 has been applied by the PP and the same has been justified in the B.6.1 section of the PDD	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
method used.					
iv. Project Emissions Have the project emissions been calculated through the formula (41) of the methodology?	ACM0 012	V 4.0	Yes the Project emissions are calculated as per the equation 41 of the ACM 0012 Ver. 4	OK	OK
v. Leakage No leakage is included	ACM0 012	V 4.0	No leakage is included	OK	OK
vi. Emission Reductions Have the emission reductions due to the project activity during the year y calculated through the formula (42) of the methodology?	ACM0 012	V 4.0	Yes the emission reduction are calculated as per the equation 42 of the ACM0012 ver. 4 EB 60	OK	OK
c. Does the methodology provide for selection between different options for equations or parameters?	VVM	90	Yes	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	The selection of equations and the options has been justified	OK	OK
e. If yes, have correct equations and parameters been used, in accordance with the methodology selected?	VVM	90	Refer to (5.e.b) above	-	OK
f. Will data and parameters be monitored throughout the crediting period of the proposed CDM project activity?	VVM	91	Yes data and parameters be monitored throughout the crediting period		OK
g. If no, and these data and parameters will remain fixed throughout the crediting period, are all data sources and assumptions:	VVM	91	There are some parameters, which are fixed ex-ante in accordance with methodology, are provided in Section B.6.2 of web hosted PDD	OK	OK
i. Appropriate and correct?	VVM	91			OK



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ii. Applicable to the proposed CDM project activity?	VVM	91	Yes, the data, which are fixed ex-ante, are applicable to project activity in line with applied baseline and monitoring methodology. Please refer CAR 12	OK	OK
iii. Resulting in a conservative estimate of the emission reductions?	VVM	91	Please refer CAR 12	(CAR 12)	OK
h. Will data and parameters be monitored on implementation and hence become available only after validation of the project activity?	VVM	91	Please refer CAR 5	(CAR 5)	OK
i. If yes, are the estimates provided in the PDD for these data and parameters reasonable?	VVM	91	Please refer CAR 5	(CAR 5)	OK
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 explains the additionality of the project activity is demonstrated by using "Tool for the demonstration and assessment of additionality" Version 05.2 PP to Justify how the same is in accordance with ACM 0012 Ver. 4 EB 60	CAR 7	OK
b. Were the following steps of the tool to assess additionality used:	EB 39	Ann 10			OK
i. Identification of alternatives to the project activity?	EB 39	Ann 10	Yes, PP has identified the alternatives to the project activity as per the baseline scenario prescribed by the methodology ACM 0012 Ver. 4.0 EB 60 and the same has been justified	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	Yes, PP has considered Investment analysis	OK	OK



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iii. Barriers analysis?	EB 39	Ann 10	No, PP has not conducted barrier analysis	OK	OK
iv. Common practice analysis?	EB 39	Ann 10	Please refer CAR 7 above	(CAR 7)	OK
c. In step 1 (i) have all the sub-steps as below been followed?	EB 39	Ann 10			OK
i. Sub-step 1a: Define alternatives to the project activity	EB 39	Ann 10	Please refer CAR 7 above	(CAR 7)	OK
ii. Sub-step 1b: Consistency with mandatory laws and regulations	EB 39	Ann 10	Please refer CAR 7 above	(CAR 7)	OK
d. Have the following alternatives been included while defining alternatives as per sub-step 1a?	EB 39	Ann 10			OK
i. (a) The proposed project activity undertaken without being registered as a CDM project activity;	EB 39	Ann 10	Yes, The project activity without CDM benefits has been considered as one of the alternatives	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	Yes, As per the methodological scenarios for the baseline identification the realistic and credible alternatives to the project activity have been considered	OK	OK
iii. (c) If applicable, continuation of the current situation (no project activity or other alternatives undertaken).	EB 39	Ann 10	NO, continuation of the current scenario is not considered as the project activity is the Greenfield project.	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	EB 39	Ann 10	Please refer CAR 7 above	(CAR 7)	OK



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introduced in the relevant country/region?					
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	Please refer CAR 7 above	(CAR 7)	OK
g. Is the alternative(s) in compliance with all mandatory applicable legal and regulatory requirements, even if these laws and regulations have objectives other than GHG reductions, e.g. to mitigate local air pollution.?	EB 39	Ann 10	Yes, The alternatives identified are in compliance with the legal and regulatory requirements	OK	OK
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	Not applicable	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	Please refer CAR 7 above	(CAR 7)	OK
j. Has PP selected Step 2 (Investment analysis) or Step 3 (Barrier analysis) or both Steps 2 and 3?	EB 39	Ann 10	Please refer CAR 7 above	(CAR 7)	OK
k. In step 2, have all the sub-steps as below been followed?	EB 39	Ann 10	Please refer CAR 7 above	(CAR 7)	OK
i. Sub-step 2a: Determine appropriate analysis	EB 39	Ann	Please refer CAR 7 above	(CAR 7)	OK



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method;		10			
ii. Sub-step 2b: Option I. Apply simple cost analysis;	EB 39	Ann 10	Please refer CAR 7 above	(CAR 7)	OK
iii. Sub-step 2b: Option II. Apply investment comparison analysis;	EB 39	Ann 10	Please refer CAR 7 above	(CAR 7)	OK
iv. Sub-step 2b: Option III. Apply benchmark analysis;	EB 39	Ann 10	Please refer CAR 7 above	(CAR 7)	OK
v. Sub-step 2c: Calculation and comparison of financial indicators (only applicable to Options II and III);	EB 39	Ann 10	Please refer CAR 7 above	(CAR 7)	OK
vi. Sub-step 2d: Sensitivity analysis (only applicable to Options II and III).	EB 39	Ann 10	Please refer CAR 7 above	(CAR 7)	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	Please refer CAR 7 above	(CAR 7)	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	Please refer CAR 7 above	(CAR 7)	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	Please refer CAR 7 above	(CAR 7)	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	Please refer CAR 7 above	(CAR 7)	OK
n. Has the below guideline followed for sub-step 2b	EB 39	Ann	Please refer CAR 7 above	(CAR 7)	OK



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Option II. Apply investment comparison analysis? Identify the financial indicator, such as IRR, NPV, cost benefit ratio, or unit cost of service most suitable for the project type and decision-making context. Please specify		10			
o. Has the below guideline followed for Sub-step 2b: Option III. Apply benchmark analysis?	EB 39	Ann 10	Please refer CAR 7 above	(CAR 7)	OK
i. Identify the financial/economic indicator, such as IRR, most suitable for the project type and decision context.	EB 39	Ann 10	Please refer CAR 7 above	(CAR 7)	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	Please refer CAR 7 above	(CAR 7)	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	EB 39	Ann 10	Please refer CAR 7 above	(CAR 7)	OK


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and guarantees 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	Please refer CAR 7 above	(CAR 7)	OK
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, ODA, etc, where applicable), and, as	EB 39	Ann 10	Please refer CAR 7 above	(CAR 7)	OK



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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	Please refer CAR 7 above	(CAR 7)	OK
iii. Justify and/or cite assumptions.	EB 39	Ann 10	Please refer CAR 7 above	(CAR 7)	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	Please refer CAR 7 above	(CAR 7)	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	Please refer CAR 7 above	(CAR 7)	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	Please refer CAR 7 above	(CAR 7)	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	Please refer CAR 7 above	(CAR 7)	OK
r. Has the outcome of Step 2 clearly mentioned with justification?	EB 39	Ann 10	Please refer CAR 7 above	(CAR 7)	OK



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s. In step 3: Barrier analysis have all the sub-steps as below been followed?	EB 39	Ann 10	Not applicable as PP has not applied the barrier analysis to demonstrate additionality	OK	OK
i. Sub-step 3a: Identify barriers that would prevent the implementation of the proposed CDM project activity;	EB 39	Ann 10	Not applicable as PP has not applied the barrier analysis 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	Not applicable as PP has not applied the barrier analysis 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	Not applicable as PP has not applied the barrier analysis to demonstrate additionality	OK	OK
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	Not applicable as PP has not applied the barrier analysis 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 country/region, which leads to an unacceptably high risk of equipment disrepair and malfunctioning or other underperformance; Lack of infrastructure	EB 39	Ann 10	Not applicable as PP has not applied the barrier analysis to demonstrate additionality	OK	OK



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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	Not applicable as PP has not applied the barrier analysis to demonstrate additionality	OK	OK
iv. (d) Other barriers, preferably specified in the underlying methodology as examples.	EB 39	Ann 10	Not applicable as PP has not applied the barrier analysis to demonstrate additionality	OK	OK
u. Has the outcome from Step 3a clearly mentioned in PDD?	EB 39	Ann 10	Not applicable as PP has not applied the barrier analysis 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	Not applicable as PP has not applied the barrier analysis to demonstrate additionality	OK	OK
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	EB 39	Ann 10	Not applicable as PP has not applied the barrier analysis to demonstrate additionality		OK



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alternative, and shall be eliminated from consideration.					
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	Not applicable as PP has not applied the barrier analysis to demonstrate additionality		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, educational institutions (e.g. universities, technical schools, training centres), industry associations and others. Please specify.	EB 39	Ann 10	Not applicable as PP has not applied the barrier analysis to demonstrate additionality	OK	OK
w. Has the outcome from Step 3 clearly mentioned in PDD?	EB 39	Ann 10	Not applicable as PP has not applied the barrier analysis to demonstrate additionality	OK	OK
x. In step 4: Common practise analysis have all the sub-steps as below followed?	EB 39	Ann 10	The PP has demonstrated the common practice analysis in the B.5 section of the PDD , However PP to justify how the same meets the requirements of Annex 21 of EB 65.	CAR 8	OK


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i. Sub-step 4a: Analyze other activities similar to the proposed project activity;	EB 39	Ann 10	Please refer CAR 8 above	(CAR 8)	OK
ii. Sub-step 4b: Discuss any similar Options that are occurring.	EB 39	Ann 10	Please refer CAR 8 above	(CAR 8)	OK
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	Please refer CAR 8 above	(CAR 8)	OK
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 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	EB 39	Ann 10	Please refer CAR 8 above	(CAR 8)	OK



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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	Please refer CAR 8 above	(CAR 8)	OK
bb. Has it been proved that the project is additional?	EB 39	Ann 10	Please refer CAR 7 above	(CAR 7)	OK



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<i>a. Prior consideration of the clean development mechanism</i>					
a. Is the project activity start date prior to the date of publication of the PDD for stakeholder comments?	VVM	98	Yes The start date of the project activity is 20/11/2007 which earlier to the date of publication of PDD for stakeholder comments		OK
b. If yes, were the CDM benefits considered necessary in the decision to undertake the project as a proposed CDM project activity?	VVM	98	Yes the Section B.5 of the PDD mentions the consideration of CDM benefits in the decision to undertake the project activity. However PP to Justify the following issues <ul style="list-style-type: none"> • CDM awareness • CDM benefits were decisive factor in the decision making • PP to clarify “the viability of project activity in comparison with capacity expansion of the blast furnace 4 “ 	CAR 9 CL 9	OK
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	Yes, the start date of project activity is mentioned as a date of first contract with the equipment supplier.	OK	OK
d. Does the project activity require construction, retrofit or other modifications?	VVM	99	Yes, the project activity is newly constructed	OK	OK
e. If yes, is it ensured that the date of commissioning cannot be considered as the project activity start date?	VVM	99	Yes, The date of commissioning is not considered as the start date of the project activity	OK	OK



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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 is a greenfield project with a start date before 02 August 2008	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 intention to seek CDM status? (Provide reference to such confirmation from host Party DNA and UNFCCC secretariat).	VVM	101	Not applicable	OK	OK
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			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	Please refer CAR 9 above	(CAR 9)	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?			Please refer CAR 9 above	(CAR 9)	OK
iii. reliable evidence from project participants that must indicate that continuing and real actions were	VVM	102	The chronology of events has been mentioned in the B.5 section of the webhosted PDD, The PP has	CAR 10	OK



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taken to secure CDM status for the project in parallel with its implementation, including, inter alia:			appointed CDM consultant in Mid 2007 , the next milestone signing of the ERPA has been achieved after a gap of 2years and further PP to justify the action		
a. contract with consultants for CDM/PDD/methodology services?	VVM	102	Please refer CAR 10 above	(CAR10)	OK
b. Emission Reduction Purchase Agreements or other documentation related to the sale of the potential CERs (including correspondence with multilateral financial institutions or carbon funds)?	VVM	102	Please refer CAR 10 above	(CAR10)	OK
c. evidence of agreements or negotiations with a DOE for validation services?	VVM	102	Please refer CAR 10 above	(CAR10)	OK
d. submission of a new methodology to the CDM Executive Board?	VVM	102	Please refer CAR 10 above	(CAR10)	OK
e. publication in newspaper?	VVM	102	Please refer CAR 10 above	(CAR10)	OK
f. interviews with DNA?	VVM	102	Please refer CAR 10 above	(CAR10)	OK
g. earlier correspondence on the project with the DNA or the UNFCCC secretariat?	VVM	102	Please refer CAR 10 above	(CAR10)	OK
h. Has the chronology of events including time lines been appropriately captured and explained/detailed in the PDD?	VVM	102	Please refer CAR 10 above	(CAR10)	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 ACM0012 Ver 4 EB 60 does not prescribe specific baseline scenario but gives a list of scenarios and possible alternatives applicable to the project activity	OK	OK



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b. If no, does the PDD identify credible alternatives to the project activity in order to determine the most realistic baseline scenario?	VVM	105	In the section B.4 of the webhosted PDD identifies the alternatives to the project activity in accordance with the methodology	OK	OK
c. Does the list of alternatives given in the PDD ensure that:	VVM	106			OK
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	Yes the list of alternatives includes project activity not undertaken as a CDM project	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	The list of plausible alternatives is prescribed by the methodology and the same has been justified by the PP	OK	OK
iii. the alternatives comply with all applicable and enforced legislation?	VVM	106	The Alternatives comply with the legislations of the host country	OK	OK
c. Investment analysis					
a. Has investment analysis been used to demonstrate the additionality of the proposed CDM project activity?	VVM	108	Yes, The PP has carried out investment analysis to demonstrate additionality	OK	OK
b. If yes, does the PDD provide evidence that the proposed CDM project activity would not be:	VVM	108			OK
i. the most economically or financially attractive alternative?	VVM	108	Yes The Section B.5 of the webhosted PDD confirms that the project activity is not financial attractive	OK	OK



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ii. economically or financially feasible, without the revenue from the sale of certified emission reductions (CERs)?	VVM	108	Yes, The section B.5 of the PDD mentions "The IRR for the project activity was found to be viable only with consideration of CDM revenues." After the investment analysis, However the CAR 7 has been raised for the investment analysis	(CAR 7)	OK
c. Was this shown by one of the following approaches?	VVM	109			OK
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	No, the proposed CDM project would produce financial benefits in the form savings in the captive consumption of the electricity. PP to justify the value considered in the Investment analysis "Base unit tariff rate on import of power (Rs/kWh) = 1.71 Rs/ KWh" and the escalation of 5% on the same	CAR 17	OK
ii. The proposed CDM project activity is less economically or financially attractive than at least one other credible and realistic alternative.	VVM	109	The investment analysis has been conducted by the PP where in the project IRR has been compared with the benchmark	OK	OK
iii. The financial returns of the proposed CDM project activity would be insufficient to justify the required investment.	VVM	109	Yes, The PP has compared the IRR with the benchmark	OK	OK
d. Is the period of assessment limited to the proposed crediting period of the CDM project activity?	EB 62	Ann5	No, The period of assessment is taken as 20 years (technical life of the project activity)	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	EB 62	Ann 5	1. PP to justify the calculations for the salvage value of the project activity in accordance with the CERC guidelines. 2. PP to justify the consideration of investment	CAR 11	OK



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project activity assets at the end of the assessment period?			analysis period of 20 years with respect to the technical life time of the project activity <ul style="list-style-type: none"> PP to clarify expected commissioning date 1 Aug 2011 mentioned in the Investment analysis 	CL 7	
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 62	Ann 5	Yes, IRR calculation includes maintenance expenses.	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 62	Ann 5	The project participant has taken the period of assessment equivalent to project lifetime, which is appropriate and correct.	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 62	Ann 5	Please refer CAR 11	(CAR 11)	OK
i. Has the fair value been calculated in accordance with local accounting regulations where available, or international best practice?	EB 62	Ann 5	Please refer CAR 11	(CAR 11)	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 62	Ann 5	Please refer CAR 11	(CAR 11)	OK
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 62	Ann 5	Yes, The depreciation calculated has been added back to the net profits to calculate the financial indicator	OK	OK



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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 62	Ann 5	Yes the corporate tax has been considered for the investment analysis	OK	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 62	Ann 5	PP to provide documentary evidences for All the input values used for investment analysis	CAR 14	OK
n. Is the timing of the investment decision consistent and appropriate with the input values?	EB 62	Ann 5	Yes the input values are consistant with the decision timing	OK	OK
o. Are all the listed input values been consistently applied in all calculations?	EB 62	Ann 5	The listed input values have been consistently mentioned in the investment analysis. However the Units mentioned in the assumption sheet for the currency are not consistant in the investment analysis sheet PP to clarify the same.	CL 11	OK
p. Does the investment analysis reflect the economic decision making context at point of the decision to recomence 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?	EB 62	Ann 5	The project activity is a greenfield project activity and there has been no recomencement of the projecgt activity. Hence not applicable	OK	OK
q. Have project participants supplied the spreadsheet versions of all investment analysis?	EB 62	Ann 5	Yes, the PP has submitted the workings / spreadsheets for investment analysis	OK	OK
r. Are all formulas used in this analysis readable and all relevant cells be viewable and unprotected?	EB 62	Ann 5	Yes, all the formulas used in the analysis are readable and all relevant cells be 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 62	Ann 5	Not applicable	OK	OK



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t. In case the PP wishes to black-out certain elements of the publicly available version, is it justifiable?	EB 62	Ann 5	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 62	Ann 5	Yes PP has considered the financing expenses	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 62	Ann 5	Not applicable as equity IRR is not calculated	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 62	Ann 5	The PDD adopts Project IRR which includes both debt and equity. Hence not applicable.	OK	OK
x. Was a pre-tax benchmark be applied?	EB 62	Ann 5	No, Post Tax benchmark is considered	OK	OK
y. In cases where a post-tax benchmark is applied, is actual interest payable taken into account in the calculation of income tax?	EB 62	Ann 5	Yes the actual interest payable has been considered in the IRR calculations	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 62	Ann 5	Prime Lending Rate by the RBI has been considered available at the time of decision making	OK	OK
aa. In cases where a benchmark approach is used is the applied benchmark appropriate to the type of IRR calculated?	EB 62	Ann 5	The benchmark applied is the WACC However PP to clarify the application of benchmark analysis in accordance with the ACM 0012 ver. 4.0 EB 60	CL 8	OK
bb. Has local commercial lending rates or weighted average costs of capital (WACC) selected as	EB 62	Ann 5	PP has selected the WACC	CAR 16	OK



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appropriate benchmarks for a project IRR?			PP to justify the following with reference to the EB 62 annex 5 <ul style="list-style-type: none"> • Selection of BSE 30 • Vintage data for the Beta calculations • Conservativeness of the benchmark • Selection of the companies for the Beta analysis 		
cc. Has required/expected returns on equity selected as appropriate benchmark for an equity IRR?	EB 62	Ann 5	Not applicable as project IRR has been calculated	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 62	Ann 5	Not applicable as PP has selected WACC for the benchmark analysis	OK	OK
ee. In the cases of projects which could be developed by an entity other than the project participant is the benchmark applied based on publicly available data sources which can be clearly validated?	EB 62	Ann 5	Not applicable Please refer CL 8	OK	OK
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 62	Ann 5	Not applicable as Internal Company benchmark is not selected	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 62	Ann 5	Not applicable as Internal Company benchmark is not selected	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 62	Ann 5	Not applicable as Internal Company benchmark is not selected	OK	OK


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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 62	Ann 5	Not applicable as Internal Company benchmark is not selected	OK	OK
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 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.)	EB 62	Ann 5	Please refer CAR 16	(CAR 16)	OK
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 62	Ann 5	Please refer CL 8	(CL 8)	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 62	Ann 5	<p>The sensitivity analysis has been carried out on</p> <ul style="list-style-type: none"> • Project cost • PLF of the project activity • And the net saving <p>Please refer CAR 17</p>	OK	OK



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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 62	Ann 5	The sensitivity analysis has been carried out on <ul style="list-style-type: none"> • Project cost • PLF of the project activity • And the net saving Please refer CAR 17	OK	OK
nn. Is the range of variations selected is reasonable in the project context?	EB 62	Ann 5	Yes the range of +/- 10% has been selected for the analysis which is in line with EB 62 annex 5	OK	OK
oo. Dos the variations in the sensitivity analysis at least cover a range of +10% and -10%, unless this is not deemed appropriate in the context of the specific project circumstances?	EB 62	Ann 5	Sensitivity analysis cover the range of +10% and -10%,	OK	OK
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 62	Ann 5	Please refer CAR 17	(CAR 17)	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			OK
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	PP has considered the plant load factor as per the DPR of the project activity PP to justify the selection of Plant load factor with reference to the EB 48 Annex 11	CAR 18	OK
ii. The plant load factor determined by a third	EB 48	Ann	Please refer CAR 18		OK



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party contracted by the project participants (e.g. an engineering company)?		11			
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	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 will be conducted after getting all supporting for the input parameter.	--	OK
ss. Were the parameters cross-checked against third-party or publicly available sources, such as invoices or price indices?	VVM	111	PP to provide annual report of the year in which investment was made, third party or publicly available sources and documents against actual cost incurred for the project in support of all the input parameters for investment analysis.	CL 12	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 DPR of the project activity has been reviewed Please refer CL 12	OK	OK
uu. Was the correctness of computations carried out and documented by the project participants assessed?	VVM	111	Yes the correctness of the computation has been assessed and the CAR's and CLs have been raised	OK	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	The sensitivity analysis explained in the B.5 section of the PDD does not mention the likelihood of occurrence of the conditions considered for the sensitivity analysis PP to clarify the same	CL 13	OK
ww. Is the type of benchmark applied suitable for the type of financial indicator presented?	VVM	112	Please refer CL 8	(CL8)	OK
xx. Do any risk premiums applied determining the benchmark reflect the risks associated with the project type or activity?	VVM	112	Please refer CL 8	(CL8)	OK
yy. To determine this, was it assessed whether it is	VVM	112			OK



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
reasonable to assume that no investment would be made at a rate of return lower than the benchmark by:					
i. assessing previous investment decisions by the project participants involved?	VVM	112	Please refer CL 8	(CL8)	OK
ii. determining whether the same benchmark has been applied?	VVM	112	Please refer CL 8	(CL8)	OK
iii. determining if there are verifiable circumstances that have led to a change in the benchmark?	VVM	112	Please refer CL 8	(CL8)	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	Not applicable PP has not considered values from FSR approved by national authorities	OK	OK
xx. If yes:	VVM	113			OK
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 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?	VVM	113	Not applicable PP has not considered values from FSR approved by national authorities	OK	OK
ii. Are the values used in the PDD and associated annexes fully consistent with the FSR?	VVM	113	Not applicable PP has not considered values from FSR approved by national authorities	OK	OK
iii. If not, was the appropriateness of the values validated?	VVM	113	Not applicable PP has not considered values from FSR approved by national authorities	OK	OK



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
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	Not applicable PP has not considered values from FSR approved by national authorities	OK	OK
d. Barrier analysis					
a. Has barrier analysis been used to demonstrate the additionality of the proposed CDM project activity?	VVM	115	Not applicable PP has not conducted barrier analysis	OK	OK
b. If yes, does the PDD demonstrate that the proposed CDM project activity faces barriers that:	VVM	115	Not applicable PP has not conducted barrier analysis	OK	OK
i. prevent the implementation of this type of proposed CDM project activity?	VVM	115	Not applicable PP has not conducted barrier analysis	OK	OK
ii. do not prevent the implementation of at least one of the alternatives?	VVM	115	Not applicable PP has not conducted barrier analysis	OK	OK
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	Not applicable PP has not conducted barrier analysis	OK	OK
d. Were the barriers determined as real by:	VVM	117			OK
i. assessing the available evidence and/or undertaking interviews with relevant individuals (including members of industry associations, government officials or local experts if	VVM	117	Not applicable PP has not conducted barrier analysis	OK	OK



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
necessary) to determine whether the barriers listed in the PDD exist?					
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	Not applicable PP has not conducted barrier analysis	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	Not applicable PP has not conducted barrier analysis	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 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?	VVM	117	Not applicable PP has not conducted barrier analysis	OK	OK
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 activity	OK	OK



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
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	The PP has demonstrated the common practice analysis in the B.5 section of the PDD , However PP to justify how the same meets the requirements of Annex 21 of EB 65 Please refer CAR 8	(CAR 8)	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	The PP has demonstrated the common practice analysis in the B.5 section of the PDD , However PP to justify how the same meets the requirements of Annex 21 of EB 65 Please refer CAR 8	(CAR 8)	OK
d. Was a region other than the entire host country chosen?	VVM	120	The PP has demonstrated the common practice analysis in the B.5 section of the PDD , However PP to justify how the same meets the requirements of Annex 21 of EB 65 Please refer CAR 8	(CAR 8)	OK
e. If yes, was the explanation why this region is more appropriate assessed?	VVM	120	The PP has demonstrated the common practice analysis in the B.5 section of the PDD , However PP to justify how the same meets the requirements of Annex 21 of EB 65 Please refer CAR 8	(CAR 8)	OK
f. Using official sources and local and industry expertise, was it determined to what extent similar and operational projects (e.g., using similar technology or practice), other than CDM project	VVM	120	The PP has demonstrated the common practice analysis in the B.5 section of the PDD , However PP to justify how the same meets the requirements of Annex 21 of EB 65	(CAR 8)	OK



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
activities, have been undertaken in the defined region?			Please refer CAR 8		
g. Are similar and operational projects, other than CDM project activities, already "widely observed and commonly carried out" in the defined region?	VVM	120	The PP has demonstrated the common practice analysis in the B.5 section of the PDD , However PP to justify how the same meets the requirements of Annex 21 of EB 65 Please refer CAR 8	(CAR 8)	OK
h. If yes, was it assessed whether there are essential distinctions between the proposed CDM project activity and the other similar activities?	VVM	120	The PP has demonstrated the common practice analysis in the B.5 section of the PDD , However PP to justify how the same meets the requirements of Annex 21 of EB 65 Please refer CAR 8	(CAR 8)	OK
7. Monitoring plan					
a. Does the PDD include a monitoring plan?	VVM	122	Yes The B.7.2 section of the PDD explains the monitoring plan pertaining to the project activity	OK	OK
b. Is this monitoring plan based on the approved monitoring methodology applied to the proposed CDM project activity?	VVM	122	The Monitoring plan is based on approved monitoring methodology ACM0012 version 4.0	OK	OK
c. Were the list of parameters required by the the selected methodology identified?	VVM	123	Yes, the list of parameter required by the selected methodology are identified	OK	OK



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
d. Does the monitoring plan contains all necessary parameters?	VVM	123	Q _{WCM,y} /Q _{WG,y} Quantity of WECM/Waste gas used for energy generation during year y Is not mentioned in the parameters to be monitored in the B.7.1section of the PDD , the same is not in accordance with the ACM 0012 Ver.4.0 EB 60 PP to justify	CAR 15	OK
e. Are the parameters clearly described?	VVM	123	Yes the parameters have been described Please refer CAR 15	(CAR 15)	OK
f. Does the means of monitoring described in the plan comply with the requirements of the methodology?	VVM	123	Yes the means of monitoring are in accordance with the requirements of the methodology Also Please refer CAR 5 and CAR 15		OK
g. Are following project emissions being monitored: (1) Quantity of fossil fuels used as supplementary fuel; (2) Net calorific value of fossil fuel; (3) CO ₂ emission factor of the fossil fuel; (4) Quantity of electricity consumed by the project operations; (5) CO ₂ emissions factor of electricity consumed by the project operations.	ACM0012	V 4.0	Not applicable as no project emission are envisaged in the project activity. No usage of supplementary fossil fuel used	OK	OK
h. Are following baseline emissions being monitored depending on the baseline scenario: (1) Quantity of electricity supplied to the recipient plant(s); (2) CO ₂ emission factor of electricity that would have been consumed by the recipient plant(s) in the absence of the project activity; (3) Quantity of heat supplied to the recipient plant(s);	ACM0012	V 4.0	Please refer CAR 5, CAR 12 and CAR 15	(CAR 5, CAR 12 CAR 15)	OK



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
(4) Properties of heat (e.g. pressure and temperature of the steam) supplied to the recipient plant(s); (5) Properties of heat return to element process (e.g. pressure and temperature of the condensate return) supplied by the recipient plant(s) to the project plant; (6) Efficiencies of element process or cogeneration plant or mechanical conversion equipment that would have been built in the absence of the project activity; (7) Mechanical energy delivered to the recipient plant (s).					
i. Are measuring equipment maintained/calibrated where ever applicable?	ACM0 012	V 4.0	Please refer CAR 5	(CAR 5)	OK
j. Are the monitoring arrangements described in the monitoring plan feasibl within the project design?	VVM	123	Please refer CAR 5	(CAR 5)	OK
k. 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	Yes the monitoring plan in the b.7 section of the PDD describes the periodic calibration of the equipments	OK	OK
l. 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			OK
i. data management procedures?	VVM	123	Yes	OK	OK
ii. quality assurance procedures?	VVM	123	Yes	OK	OK
iii. quality control procedures?	VVM	123	Yes	OK	OK



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
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	Please refer CL 1 above	(CL 1)	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	Please refer CL 1 above	(CL 1)	OK
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	Yes, PP invited the local stakeholder on 7 th May, 2007 in writing to comment on the proposed CDM project.	OK	OK
b. Have comments by local stakeholders that can reasonably be considered relevant for the proposed CDM project activity been invited?	VVM	129	Yes, The project participant has provided the evidences for stakeholder`s meeting.	OK	OK
c. Is the summary of the comments received as provided in the PDD complete?	VVM	129	Yes, the PP has mentioned summary of the comments received from the stakeholders and the responses from the PP in the section E.2 of the PDD	OK	OK
d. Have the project participants taken due account of any comments received and described this process in the PDD?	VVM	129	NA, as there is no negative comment received and hence it was not required to report how due account was taken.	OK	OK
10. Environmental impacts					OK
a. Have the project participants submitted documentation on the analysis of the environmental	VVM	131	PP has submitted an EIA analysis by a third party. The same has been explained in the D section of the	OK	OK



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
impacts of the project activity?			webhosted PDD		
b. Have the project participants undertaken an analysis of environmental impacts?	VVM	132	Yes, the PP has submitted an Environmental Impact Analysis study conducted by Zenith Energy (P) Ltd.		OK
c. Does the host Party require an environmental impact assessment?	VVM	132	Host Party does not require environmental impact assessment for this project activity	OK	OK
d. If yes, have the project participants undertaken an environmental impact assessment?	VVM	132	Though not necessary the PP has conducted the EIA and same has been documented	OK	OK

VALIDATION REPORT

**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
<p>CL 1 Title: “Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects” ACM 0012 Ver. 04.0.0 EB 60 PP to justify the selection of large scale methodology for a small scale project activity.</p>	3.k.i	<p>The project activity is implemented in a new facility which has come up under the capacity expansion programme of 7 MTPA to 10 MTPA. For waste energy recovery projects, there is a Small-Scale CDM methodology titled AMS III.Q. “Waste energy recovery (gas/heat/pressure) projects”. This methodology is applicable to the project activity that utilizes waste energy in an existing facility. Since the project activity is implemented in a new facility, this small-scale CDM methodology is not applicable. It is also clarified by EB that the Greenfield projects can not apply AMS III. Q and can apply ACM0012 through clarification: SSC 413 (http://cdm.unfccc.int/filestorage/D/Q/0/DQ04LKUM7BAXOF52WG6PCY9ZNI3ET8/Final%20response.pdf?t=MWd8bHhkaWhhfDCzyJ-Y0Z8ZDNZCEIXSDwAi)</p> <p>Considering all above facts, PP has used ACM0012; a large scale methodology which can be applied for project activity utilizing waste energy in an existing facility or Greenfield facility. Further, the justification to applicability conditions of this methodology is given in section B.2 of the PDD.</p>	<p>Due to unavailability of the applicable small scale methodology Project participant has opted for the Large Scale Methodology. This is evident from the SSC 413 hence the CL 1 is closed.</p>



VALIDATION REPORT

<p>CL 2 PP has stated that 2% of CDM revenues would be contributed towards the sustainable development as part of its commitment to Host Party DNA. however the mechanism opted for the same has to be provided by the PP.</p>	<p>3.d.iii</p>	<p>As a requirement by NCDMA, large scale CDM projects have to contribute 2% of the CDM benefits towards the sustainable development. The plan for utilizing the 2% of CDM benefits on realization of the sale of CERs is given in the Annex 5 of the PDD.</p>	<p>1. The project participant has submitted the undertaking for the commitment of 2% of revenue from the sale CER`s to be utilised towards the sustainable development, the same is submitted to the Host country DNA while applying for the Host country approval. The validation team accepts the submission of document hence CL 02 is closed.</p>
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VALIDATION REPORT

<p>CL3 The physical location with unique identification for the project activity and approaches to the site (railway station, airport) are presented in the PDD. Section A.4.1.4 is spread across more than one page and hence not in accordance with guidance to complete CDM PDD.</p>	3.f.ii	<p>As per CDM-PDD guidance Version 07.0, the physical location of the project should not exceed one page .PP has now updated the section A4.1.4 in one page.</p>	<p>The PP has corrected the A.4.1.4 as per CDM-PDD completing guidelines in PDD version 02 the validation team accepts the same. Hence the CL 3 is closed</p>
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VALIDATION REPORT

<p>CL 4 Yes, the B.2 section of the PDD has tabulated information about the applicable conditions of the ACM0012 ver. 04 EB 60 and the applicability justification with regards to the project activity. However in the first applicability condition the PDD mentions the expansion of steel plant by 3.2 MTPA but during the site visit it was noted that the expansion is only for 2.7 MTPA. PP to clarify the same</p>	<p>3.1.i</p>	<p>The capacity of the steel plant before the expansion was 7 MTPA and after the expansion; it is 10 MTPA. Thus, there is an increase of 3 MTPA in terms of capacity. Therefore, the steel plant has undergone an expansion of 3 MTPA. The same capacities are referred in the Consent to Operate dated 30/06/2011 (see Pg. 12 of CfO – Enclosure 1). The same is corrected in the PDD</p>	<p>The Consent for Operation issued by Karnataka State Pollution Control Board confirms the capacity expansion of 3 MTPA and the same has been corrected in the revised PDD version 02 the validation team accepts the correction. Hence the CL 04 has been closed.</p>
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VALIDATION REPORT

<p>CL 5 The ex-ante calculations have been mentioned in the B.6.3 section of the PDD as per the methodological chart. PP to justify the values used for f_{cap} calculations as per methodology ACM 0012 ver. 04 EB 60</p>	<p>3 r i</p>	<p>The fraction f_{cap} is determined as per the guidance given in ACM 0012 equation 38. The parameters required for the calculation are the quantity of waste pressure generated prior to the start of the project activity ($Q_{WCM,BL}$) and Quantity of the WECM used for energy generation ($Q_{WCM,y}$). The quantity of waste pressure generated is considered as 2.5 kg/cm^2 and the quantity of the WECM used is considered as $532,920 \text{ m}^3$. Both these values are obtained from the technical specifications of the BF-4 attached as Enclosure 2</p> <p>PP Response 2:</p> <p>As per methodology ACM0012 Version 4</p> <p>f_{cap} = "Factor that determines the energy that would have been produced in project year y using waste energy generated at a historical level, expressed as a fraction of the total energy produced using waste source in year y. The ratio is 1 if the waste energy generated in project year y is the same or less than that generated at a historical level. The value is estimated using the equations in section 3.2. <u>For Greenfield facilities, f_{cap} is 1</u>".</p> <p>TRT-4 CDM project activity is the greenfield project i.e. both the source of waste gas (BF-4) and the unit where the waste pressure is used (TRT) are new. Therefore for the TRT # 4 greenfield project, $f_{cap} = 1$.</p>	<p>PP to clarify the appropriateness of the f_{cap} calculations for the Greenfield project activity</p> <p>CL Open</p> <p>The project participant has used the default value $f_{cap} = 1$. as per the methodology, validation team reviewed the same and found applicable to the Greenfield project activity in accordance with ACM 0012 version 04 hence CL is closed</p>
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VALIDATION REPORT

<p>CL 6 The impact assessment for the proposed project activity which reveals that this will contribute positively towards the environment and the negative impacts associated with its implementation will be insignificant. However PP to clarify "The proposed project activity will utilise the pressure energy potential of the top gas of the Blast Furnace-3 to generate electrical energy."</p>	3.ff	<p>The project activity will utilize the waste pressure of the BF-4 gas to generate electricity. Thus, the project activity will not have any negative impacts on the environment. The sentence is corrected in section D.2.</p>	<p>The typographical error has been corrected in the revised PDD version 02 which is accepted by the validation team. Hence CL 06 has been closed.</p>
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VALIDATION REPORT

CL 7 PP to clarify expected commissioning date 1 Aug 2011 mentioned in the Investment analysis		Since the project is already commissioned, PP has changed the expected commissioning date with the actual commissioning date – 14/09/2011 and updated the same in the PDD. Enclosure 3	The exact commissioning date of the project activity is mentioned in the revised PDD the validation team accepts the same. Hence CL 07 was closed.
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VALIDATION REPORT

<p>CL 8 PP to clarify the application of benchmark analysis in accordance with the "Tool for the demonstration and assessment of additionality" (Version 06.0.0). para 24 annex 21 of EB 65</p>	<p>6.c.a a</p>	<p>PP has used "Tool for the demonstration and assessment of Additionality" Version 05.2 which has grace period for RfR up to 25/07/2012 (http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v6.0.0.pdf/history_view).</p> <p>The steps given for the benchmark calculation in this version and the version 06.0.0 are the same. Thus, even though PP is using the older version of the tool, it is still meeting the requirements of version 06.0.0 for benchmark calculation. Tus, PP requests to consider the use of version 05.2 of the tool.</p> <p>PP Response 2:</p> <p>PP has updated the PDD to Version 06.1.0 "Tool for the demonstration and assessment of additionality".</p> <p>The clause 19 of Guidance on the assessment on investment analysis (Version 5) says " If the proposed baseline scenario leaves the project participant no other choice than to make an investment to supply the same (or substitute) products or services, a benchmark analysis is not appropriate and an investment comparison analysis shall be used "</p> <p>In the absence of project activity PP could have sourced same power from CPP and no situation raises in the baseline for the PP to make new investment. Thus the comparative analysis is not appropriate and benchmark analysis is more appropriate in decision making scenario pertaining to the project activity. The selection of benchmark analysis is also in line with Para 5 of EB 51,Annex 59.</p> <p>Therefore PP has selected benchmark analysis to assess financial additionality.</p>	<p>PP to justify the selection of Benchmark Analysis. CL 08 open</p> <p>The project participant has justified the selection of benchmark analysis in accordance with the EB 51,Annex 59 and has updated the analysis with latest version 06.1.0 "Tool for the demonstration and assessment of additionality".</p> <p>Hence CL 08 is closed</p>
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VALIDATION REPORT

CL9 PP to clarify “the vaibility of project activity in comparision with capacity expansion of the blast furnace 4 “	6.a.b	Though the project activity is a part of the capacity expansion programme; its viability cannot be compared against the of the capacity expansion project. The feasibility of the TRT -4 project is being evaluated as a standalone project. The capacity expansion project will include not only this project but also the other components and their respective feasibility assessment Therefore, the viability of the project cannot be compared against the capacity expansion.	The project activity is evaluated based on the savings due to electricity generation hence the CL 9 is closed
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VALIDATION REPORT

<p>CL 10</p> <p>It is stated that project participant has excluded alternatives, which do not comply with legal and regulatory requirements and depend on fuels that are not available at project site. However, in accordance with methodology, evidences and supporting documents are not submitted for such baseline options, which are excluded.</p>	<p>6.d.b</p>	<p>The only alternative eliminated on the basis of not complying with the regulatory requirements is W1 i.e. venting of the BF gas directly into the atmosphere. This is clear from the consent to operate for the facility which is already submitted to the validator. Other than this scenario, PP has not eliminated any scenario based on the legal and regulatory requirements.</p> <p>The sentence before identifying the alternatives <i>“Involve fuels (used for the generation of heat, power or mechanical energy), that are not produced or imported in the host country”</i> is quoted from the baseline methodology, but not used for eliminating any alternative in the further discussion.</p>	<p>PP has submitted the consent to operate facility from the state pollution authority and the revised PDD reflects that there is no elimination of baseline options on the basis of regulatory requirements which is inline with the methodology. Hence the validation team accepts the clarification and CL 10 is closed.</p>
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VALIDATION REPORT

CL 11 <i>The listed input values have been consistently mentioned in the investment analysis. However the Units mentioned in the assumption sheet for the currency are not consistent in the investment analysis sheet PP to clarify the same.</i>	6.c.o	The unit for the currency in the assumption sheet is Rs. Crores. While using these assumptions in the investment analysis, the unit is changed from Rs. Crores to INR. Million. These two units are now clearly mentioned in the assumption and investment analysis worksheet.	In the revised IRR sheet the Units for the currency are now constantly mentioned the validation team accepts the correction and hence the CL 11 is closed
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VALIDATION REPORT

<p>CL 12</p> <ul style="list-style-type: none"> • PP to provide annual report of the year in which investment was made. • Since the project activity is commissioned PP to justify the “as build cost of the project activity” in the investment analysis • PP to provide documentary evidences for the actual costs incurred for the implementation of the project activity. 	6.c.ss	<ul style="list-style-type: none"> • The annual report for year 2006-07 is attached as Enclosure 4 • The total project cost considered in the investment analysis comprises of land, buildings and civil works, plant and machinery, miscellaneous fixed assets, contingency, IDC, preliminary and pre-operative and margin money as per the project report dated Feb 2007.. Further, the project cost can be cross checked against the actual cost incurred by PP which is evident through the purchase orders. The purchase order for the main equipment and the contract attached as Enclosure 5 • The purchase orders placed by PP for the implementation of the project are already attached as Enclosure 6 	<p>The PP has now submitted copies of the original documents pertaining to the investment analysis. Hence the CL 12 closed.</p> <p>Further CAR / CL will be raised after the assessment of the financial analysis by the sector expert.</p> <p>164</p>
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VALIDATION REPORT

CL 13 <i>The sensitivity analysis expalined in the B.5 section of the PDD. However the PDD does not mention the likelyhood of occurence of the conditions considered for the sensivity analysis PP to clarify the same</i>	6.c.vv	The likelihood of the scenario in which the benchmark will be crossed is discussed in the Section B.5 of the PDD.	The revised PDD version 02 has the explanation of the sensitivity analysis and the likelihood of the occurrence of the conditions has been described. The validation team accepts the description hence the CL 13 is closed.
CAR 1 Host country approval not submitted	1.a	<p>PP has applied for the Host Country Approval and has attended the meeting with NCDMA on 15/11/2011. The invitation from NCDMA for the meeting is attached as Enclosure 7. The approval will be submitted to DOE as it will be received form NCDMA.</p> <p>PP Response 2: Host Country Approval has been submitted to DOE and attached as Enclosure 12</p>	<p>CAR 01 is open Project participant has submitted the host country approval dt 14th March 2012 Ref No. 4/22/2011- CCC Validation team after reviewing the same and cross checking with the information available on the NCDMA website accepts the submission and hence CAR 01 is closed</p>



VALIDATION REPORT

<p>CAR 2 The flow diagram for the project activity does not depict the actual scenario which is not in line with the methodology ACM 0012 Ver. 4 EB 60</p>	<p>3. m. ii</p>	<p>The project boundary is revised in line with ACM0012 Version 04.0.0.</p>	<p>The revised PDD version 02 is corrected as per ACM0012 Version 04.0.0 the validation team accepts the same and hence the CAR 02 has been closed</p>
<p>CAR 3 The section B.5 of the PDD explains the chronology of the events to justify the continuous actions to secure the CDM status for the project activity, However the date mentioned for "Copy of extracts of Minutes of Meeting of Board of Directors held on 30.04.2007" does not match with the document provided, PP to justify the same</p>	<p>3.0.iv</p>	<p>The investment in the project activity was approved on a meeting held on 03/04/2007. Thus, the date of the investment decision is corrected in line with this date in section B.5.</p>	<p>The investment decision date has been corrected as per the Meeting date. The date mentioned in the revised PDD version 02 is as per the "Copy of extracts of Minutes of Meeting of Board of Directors held on 30.04.2007. The validation team accepts the same and hence the CAR 03 has been closed</p>



VALIDATION REPORT

CAR 4 The data parameters tabulated in the B.6.2 of the PDD are not consistent with the methodology.	3.q.i	Parameters like $Q_{BL, product}$ and $q_{wcm, product}$ are included in the section B.6.2. Thus, PP has now covered all the parameters relevant to the project activity.	The Project Participant has corrected the B.6.2 section of the webhosted PDD in the revised PDD version 02 this is in line with the ACM0012 Version 04.0.0, hence accepted by the validation team hence CAR 04 has been closed.
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VALIDATION REPORT

<p>CAR 5</p> <p>7 PP to justify</p> <p>8 <i>“Quantity of electricity supplied to the recipient j by generator, which in the absence of the project activity would have been sourced from JSWSL coal based power plant.” Measured by energy meters and recorded in the Plant Log Book</i> During validation site visit it was observed that no energy meter was installed and the measurement process type.</p>	3.t.i	<p>At the validation site visit, the installation of the energy meters was about to happen. PP will ensure that electricity meter will be installed for measuring the quantity of electricity produced and supplied by the project activity.</p> <p>PP Response 2: Documentary evidence for electricity meter is being submitted to the DOE (Enclosure 13- Photos of the TRT 4 Electricity Meters Installed).</p>	<p>Project Participant to provide documentary evidence for the same CAR 05 is open</p> <p>The project participant has provided the photographs of the actual meters installed for measuring electricity supplied by the project activity. validation team accepts the documentary evidences and hence CAR 5 is closed</p>
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VALIDATION REPORT

<p>CAR 6 Yes The Annex 3 of the PDD contains the background information used for baseline application. PP to justify the selection of Industries for the baseline analysis with respect to the capacities of the selected industries in comparison to project activity with respect to the Annex 1 of ACM0012 ver. 4.0 EB 60</p>	<p>3.ii</p>	<p>As per the Annex 1 of the ACM0012, the capacity of the facilities which are similar to the project facility should be within range of $\pm 10\%$ of the project facility. The project facility is the blast furnace 4. The capacity of the blast furnace as given by SIEMENS VAI is 2.7 MTPA. Thus, the blast furnaces of the capacity ranging between 2.43 to 2.97 MTPA are selected for the analysis.</p>	<p>The revised PDD version 02 contains the explanation for baseline analysis as per the Annex 01 of ACM0012 version 4.0.0 EB 60. The analysis was cross checked the validation team with the information available on the UNFCCC website and concluded that all projects compared are in the range of $\pm 10\%$ of the project capacity. Hence CAR 6 was closed.</p>
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VALIDATION REPORT

<p>CAR 7 Yes, the section B.5 of the PDD explains the additionality of the project activity is demonstrated by using "Tool for the demonstration and assessment of additionality" Version 05.2</p> <p>PP to Justify how the same is in accordance with "Tool for the demonstration and assessment of additionality" (Version 06.0.0) annex 21 of EB 65</p>	6.a	<p>The difference between the two versions of "Tool for the demonstration and assessment of additionality" is the some editorial revisions and inclusion of requirements first of its kind and guidelines on common practice in the Version 06.0.0.</p> <p>As per guidance 43 in Version 06.0.0, the measures listed in the Para 6 of the tool need to demonstrate the common practice analysis with the help of the new guidance and the measures that are different from those listed in Para 6 need to carry out this analysis through sub step 4 a and 4b. The project activity is a waste energy recovery and power generation. This measure is not covered under the activities listed under Para 6. Therefore, as per Version 06.0.0, PP needs to demonstrate the common practice analysis through step 4 a and 4 b.</p> <p>Now while applying the Version 05.2 of the tool, PP has carried out the common practice analysis using step 4 a and 4 b which are as same as mentioned in the new Version 06.0.0. Thus, even though PP has applied the older version of the tool, the demonstration and assessment of Additionality is going to be same even it applies the version 06.0.0.</p> <p>Moreover, as mentioned in the above response "Tool for the demonstration and assessment of additionality" Version 05.2 has still a grace period up to 25/07/2012 for Request for Registration. Therefore, PP requests to allow the use of Version 05.2.</p> <p>As per Para 43 of Annex 21 of EB 65, the measures that are different from those listed in Para 6 need to demonstrate the common practice analysis through steps 4 a and 4 b. The project activity is a waste pressure recovery and power generation and is not covered under the activities that are listed in the Para 6. Therefore, PP needs to demonstrate common practice analysis as per Step 4 a and 4 b of Annex 21 of EB 65.</p> <p>PP Response 2 However now PP has demonstrated the common practice analysis as per "Guidelines on Common Practice" Version 2 of EB 69, Annex 8.</p>	<p>The PP has provided the justification for selection of tool and the validity of the tool . The change in version of the tool does not have any impact on the project activity</p> <p>Project participant has revised the common practice analysis as per the EB 69 annex8 hence validation team accepts the correction and the CAR 7 is closed.</p>
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VALIDATION REPORT

<p>CAR 8 The PP has demonstrated the common practice analysis in the B.5 section of the PDD , However PP to justify how the same meets the requirements of Annex 21 of EB 65</p>	<p>6.x</p>	<p>Now the step 4 a and 4 b of the Annex 21 of EB 65 are same as mentioned in the version 05.2 of the tool. Hence, there is no difference in the common practice analysis even if PP uses Annex 21 of EB 65.</p> <p>As mentioned in the CAR 7, since the version 05.2 has a grace period up to 25/07/2012, PP is continuing with the use of the same version.</p> <p>PP Response 2 However now PP has demonstrated the common practice analysis as per “Guidelines on Common Practice” Version 2 of EB 69,Annex 8.</p>	<p>The PP has provided the justification for selection of tool and the validity of the tool . The change in version of the tool does not have any impact on the project activity . Project participant has revised the common practice analysis as per the EB 69 annex8 hence validation team accepts the correction and the CAR 8 is closed.</p>
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VALIDATION REPORT

<p>CAR 9 Yes the Section B.5 of the PDD mentions the consideration of CDM benefits in the decision to undertake the project activity. However PP to Justify the following issues</p> <ul style="list-style-type: none"> • CDM awareness • CDM benefits were decisive factor in the decision making <p>In accordance with annex 13 of EB 62</p>	6.a.b	<p>In accordance with Annex 13 of EB 62, an explanation on the CDM awareness and CDM benefits were decisive factor in the decision making is provided in section B.5 of the revised PDD.</p>	<p>The revised PDD version 02 has been corrected as per annex 13 of the EB 62. The explanation pertaining to the CDM awareness and the decisiveness of the CDM benefits was evident from the documents submitted by the project participant, validation team after cross checking the actual documents and the personal interviews with the PP, is able to confirm the same. Hence the CAR 9 was closed.</p>
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VALIDATION REPORT

<p>CAR 10 The chronology of events has been mentioned in the B.5 section of the webhosted PDD, The PP has appointed CDM consultant in Mid 2007 , the next milestone signing of the ERPA has been achieved after a gap of 2years and further PP to justify the action in line with Annex 13 EB 63</p>	<p>6.a.h</p>	<p>The agreement between CDM consultant and PP is dated 03/03/2008. This is corrected in the B.5. The agreement is attached as Enclosure 8. Thus, the gap between the CDM consultant appointment and signing of ERPA is less than 1 and half years and hence is meeting the requirement of Para 8 (a) of Annex 13 of EB 63.</p>	<p>The agreement date has been corrected and based on the document submitted it is evident that the PP has signed the contractual agreement with the CDM consultant on 03/03/2008 for this project activity validation team accepts the correction after cross checking the documents in accordance with the Annex 13 of EB 63. Hence CAR 10 is closed.</p>
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VALIDATION REPORT

<p>9 CAR 11 10 1.PP to justify the calculations for the salvage value of the project activity in accordance with the CERC guidelines. 2. PP to justify the consideration of investment analysis period of 20 years with respect to the technical life time of the project activity</p>	6.c.e	<p>1. PP has considered 10% of the project cost as the salvage value. This is as per the Para 15 of CERC guidelines (http://cercind.gov.in/2009/February09/SOR-regulations-on-T&C-of-tariff-05022009.pdf).</p> <p>2. The technical life time of the project activity i.e. the technical life time of the top gas pressure recovery turbine is 20 years which can be seen from the technical offer from the supplier. The offer is attached as the Enclosure 9. Since the life time of the project activity is 20 years, as per Para 3 of Annex 5 of EB 62, the assessment period is considered as 20 years.</p> <p>PP Response 2:</p> <p>The salvage value of Top gas pressure Recovery Turbine at the end of its technical life time (i.e. 20 years) is Rs 44 million which is 10% of the TRT plant & machinery asset i.e. Rs 435 million. Hence the calculation of plants & machinery salvage value is as per CERC guidelines.</p> <p>However the salvage value calculation provided in the IRR sheet is combined salvage value of civil building and TRT plant & machinery and hence different from 10% of total project cost.</p>	<p>1. The calculations provided in the IRR sheet for the salvage value are not as per the CERC guidelines. This point of CAR 11 is open</p> <p>The revised IRR sheet considers the salvage value in accordance with CERC guidelines and same has been certified by the financial expert, hence validation team accepts the correction and this point of CAR 11 is closed</p> <p>2. The document for the technical lifetime of the project activity has been provided and the period considered investment analysis is in line with the Annex 5 of EB 62 the validation team accepts the same and hence this point of CAR 11 is closed</p>
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VALIDATION REPORT

<p>CAR 12 Since the project activity displacing electricity in the internal grid. PP to justify the emission factor calculated in the B.6 section of the PDD.</p>	<p>6.b.h</p>	<p>As per equation 3 of ACM0012 Version 04.0.0, definition of "$EF_{elec,i,j,y}$" says the emission factor for electricity source is for an "identified source" that would be displaced due to the project activity during the year. In section B.4 of the PDD, PP has identified the baseline source of the electricity as "the coal based captive power plant of JSW Steel Ltd" which was approved as part of the capacity expansion project in the board meeting held on 30/04/2007. Thus, as per the equation 3 of the methodology, CO₂ emission factor for "Captive coal based power plant of JSW Steel Ltd" is used which is the emission factor of coal.</p> <p>PP Response 2: PP has computed the emission factor of internal grid mix, and same has been updated in PDD, ER, IRR sheet.(Enclosure 14).</p>	<p>During the site visit it was observed that the coal based power plant is not directly connected to the Blast Furnace 4 but through a internal grid. PP to justify how the electricity generated is displacing the electricity generated by the coal based power plant.</p> <p>CAR 12 is open The project participant has revised the emission reduction calculations and has computed the emission factor of the internal grid in accordance with ACM 0012 version 04 using "Tool to calculate emission factor for an electricity system, Version 02.2.1". hence validation team accepts the correction and CAR 12 is closed</p>
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VALIDATION REPORT

<p>CAR 13</p> <p>The Methodology ACM0012 Ver. 4.0 EB 60 elaborates the selection of baseline scenario,</p> <p><i>However PP to justify the selection of the baseline scenario in accordance with the Annex1 of the ACM 0012 Ver. 4.0 EB 60</i></p>	6.d.b	<p>The requirement of Annex 1 of the methodology is demonstrated in the Annex 3 of the PDD.</p>	<p>The revised PDD version 02 has elaborated the extent of use of waste energy from the waste energy generation facilities in the absence of the CDM project in accordance with the procedures provided in Annex 1 (for Greenfield project facilities). The explanation has been cross checked with the publically available data and the information available on the UNFCC website hence validation team accepts the analysis and CAR 13 is closed.</p>
<p>CAR 14</p> <p><i>PP to provide documentary evidences for All the input values used for investment analysis</i></p>	6.c.m	<p>The input values used in the investment analysis are sourced from the project report prepared by a third party consultant and which was available before the decision time. The project report is already submitted to DOE.</p> <p>Values like the depreciation and tax rates are sourced from the publicly available data available at investment decision. The web links for the same are included in the financials.</p>	<p>The PP has now provided the supporting documents for the input values considered in the investment analysis available at the time of decision making. Hence the CAR 14 is closed</p>



VALIDATION REPORT

<p>CAR 15 QWCM,y/QWG,y Quantity of WECM/Waste gas used for energy generation during year y Is not mentioned in the parameters to be monitored in the B.7.1 section of the PDD, the same is not in accordance with the ACM 0012 Ver.4.0 EB 60 PP to justify</p>	7.d	<p>$Q_{WCM,y}$ i.e. quantity of the waste gas used for energy generation is included as a monitoring parameter in B.7.1.</p>	<p>The B.7.1 section of the webhosted PDD has been revised as per the ACM 0012 Version 4.0.0 EB 60 in revised PDD version 02 hence the validation team accepts the inclusion of "$Q_{WCM,y}$" as a parameter to be monitored. Hence the CAR 15 was closed</p>
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VALIDATION REPORT

<p>CAR 16 PP has selected the WACC</p> <p>PP to justify the following with reference to the EB 62 annex 5</p> <ul style="list-style-type: none"> • Selection of BSE 30 • Vintage data for the Beta calculations • Conservativeness of the benchmark • Selection of the companies for the Beta analysis 	<p>6.c.b b</p>	<p>PP as applied Annex 5 of EB 62 for carrying out investment analysis.</p> <ul style="list-style-type: none"> • PP has now chosen BSE 100. The reason for selection of BSE 100: The base year of BSE 100 is taken as 1983-84 and thus it has the sufficient historical data available. The index comprises of 100 component stocks representing large, well established and financially sound companies across key sectors. Moreover, it is designed based on the “free-float market capitalization-weighted” methodology which is a widely followed index construction methodology on which the majority of the global equity indices are based. This can be confirmed from http://www.bseindia.com/about/abindices/bse100.asp. There are other indices like BSE 30, BSE 500 available in the market. BSE 30 and BSE 500 has inception year of 1979 and 1999 and consists of 30 and 500 stocks respectively. As long term return of the market is being measured, it is important to select a longer time period that covers all phases of economy and various types of investors, while also including a broad set of stocks so as to be representative of the economy. BSE 100 reflects longer available time period from the date of investment decision (23 years) and contains sufficient stocks (100) including power sector stocks (3 companies) and is therefore considered more appropriate than BSE 30 (Which offers longer vintage but less number of power companies (only 2) listed in power sector) or BSE 500 (which contains more number of power companies but sufficient vintage of 6 years). • Vintage data for beta: The vintage selected for beta calculation is of 5 years. Reuters uses a data vintage of 5 year trailing stock prices for the calculation of the beta value in their website. (http://reuters-en.custhelp.com/app/answers/detail/a_id/1075/~what-method-does-reuters-use-to-calculate-the-beta-displayed-on-your-website%3F). Therefore, PP has chosen the data vintage of 5 years. • Selection of companies for beta calculation: As per Para 9 of Annex 59 of EB 51, for the projects in which the electricity was being produced for captive consumption the benchmark of the core business is considered to be appropriate, as the project was considered to be an investment in the core business. In the project activity, the power generated from pressure recover is used for the captive consumption, thus the project is considered as the investment in the core business which is steel manufacturing. Thus, PP has tailored the benchmark “WACC” by applying risk profile of the companies which are involved in the steel business and using the D/E specific to the project. Therefore, the companies which are chosen for the beta computation are the companies which are into steel manufacturing business and listed on BSE. 	<p>PP to justify why the internal Benchmark for the analysis is not selected as the project cannot be developed by any other entity. PP to justify the selection of CAPM based on the market trends instead of internal benchmark with reference to the paragraph 13 of the annex 5 of the EB 62</p>
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VALIDATION REPORT

CAR 16 (contd)		PP Response 2 From the board meeting note 1072, it's clear that the return on capital employed (ROCE) for the capacity expansion project is 30%. Considering the ROCE value i.e. 30% (Enclosure 15), the WACC value computed using CAPM (i.e. 12.69%) is conservative and hence selection of CAPM based on market trend is selected instead of internal benchmark.	The project participant has provided the justification for the selection of benchmark in accordance with the EB 51 annex 59 hence validation team accepts the correction and hence CAR 16 is closed
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VALIDATION REPORT

<p>CAR 17 The proposed CDM project would produce financial benefits in the form savings in the captive consumption of the electricity. PP to justify the value considered in the Investment analysis "Base unit tariff rate on import of power (Rs/kWh) = 1.71 Rs/ kWh" and the escalation of 5% on the same</p>	6.c.c.i	<p>The unit tariff rate for import of power is sourced from the financial model appraised by SBI Cap. This is the cost of energy generation from the identified baseline alternative – the coal based power plant that would have delivered equivalent electricity in the absence of project activity. A letter from SBI cap and the financial model appraised by it is attached as Enclosure 10</p> <p>PP Response2 : Now the IRR is computed using the appropriate unit tariff rate (i.e. Rs 1.53/kWh) of financial model appraised by SBI Cap whose value is lesser than the previous considered tariff rate (i.e. Rs 1.71/kWh). This has resulted in the reduction of IRR.</p>	<p>PP has now submitted the third party analysis for the consideration of tariff rate for the investment analysis. However PP to justify the reduction in IRR as per the revised investment analysis submitted (IRR sheet version 02) CAR 17 is open The revised investment analysis is in accordance with EB 69 Annex 21 and has been certified by the financial expert hence validation team accepts the reduction in IRR and CAR 17 is closed</p>
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VALIDATION REPORT

CAR 18 PP to justify the Plant Load Factor based on the historical data available	6.c.q q.i	<p>The project activity is commissioned in month of September 2011. Thus, there is insufficient data available to calculate PLF. PP is already operating a project similar to the project activity. This similar project is installed at BF-3 and is using the pressure of the BF-3 gas to generated power through turbine. The data on PLF for this similar project is attached as Enclosure 11</p>	<p>The project participant has submitted the actual generation reports of the TRT -3 with the same capacity and the PLF is found to be lesser than assumed PLF for the current project activity TRT -4. The assumed value of the PLF is conservative and is based on the actual generation hence the validation team accepts the assumption. Hence CAR 18 is closed.</p>



VALIDATION REPORT

COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

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

BUREAU VERITAS CERTIFICATION published the project documents on the UNFCCC CDM website (<http://cdm.unfccc.int>) on 19/07/2011 and invited comments within 17/08/2011 by Parties, stakeholders and non-governmental organizations. Comments were received for the CDM project "Installation of Top-Pressure Recovery Turbine at Blast Furnace-4". The comments received for the said CDM project are compiled below in tabular format.

Sr. No.	Details of the commenter	Date of Comment	Comment [unedited]	Response by project participant	Explanation on how account is taken by DOE
1	Karthikeyan	Between 19 Jul 11 to 17 Aug 11	The WACC is given as 14.98%. The interest rate is 11.5% and tax rate of 33.99%. This will give a return of more than 33% on equity. This is very high compared to default return given by EB. Moreover, the calculation of return on equity has not been disclosed. The PDD states, "The listed companies whose beta value available at the time of investment decision (year 2007) is given in the table below", but surprising no	The WACC after revision is 12.67% and the ROE is 24.21%. As per guidance 15 of Annex 5 of EB 62, PP can use either option a or b to calculate ROE. Therefore, PP has used option B where in PP has applied CAPM method to compute ROE. CAPM is a well-established and widely used method. Hence, the calculation of ROE is in conformity with Annex 5 of EB 62.	The WACC and ROE has been revised by the project participant in accordance with the EB 62 annex 5 and also in accordance with "Tool for demonstration and assessment of the Additionality" Version 06.1.0. the financial analysis has been certified by the financial expert. Hence validation team accepts WACC and ROE.



VALIDATION REPORT

Sr. No.	Details of the commenter	Date of Comment	Comment [unedited]	Response by project participant	Explanation on how account is taken by DOE
			information has been given below!! PDD is not transparent and DOE should not have web hosted this project	<p>The companies which are used for the beta calculation are included in the PDD with their respective beta values.</p> <p>However on conservative basis, WACC (10.21%) is computed by using default ROE (15.93%) which is also included in the financial sheet.</p>	
			Waste heat recovery project is eligible for 100% depreciation. Since it is a power project it is eligible for tax holiday. Financial indicator calculation should consider this in calculation.	Please note this is a waste pressure recovery project and not heat recovery project. Therefore, it is not eligible for 100% depreciation. Since it's an energy generation project, benefit of 80 I A is taken into consideration.	The project activity is not a waste heat recovery project. The financial analysis has been verified by the financial expert. Validation team has cross checked the companies act of India to confirm the availability of tax holiday hence validation team accepts the financial model presented by the project participant



VALIDATION REPORT

Sr. No.	Details of the commenter	Date of Comment	Comment [unedited]	Response by project participant	Explanation on how account is taken by DOE
			O&M cost is given as 48.9 mn. for a project cost of 58.3 mn. Even if the cost of 58.3 mn. is taken as per MW cost – though it is not stated in the PDD- the O&M cost will be more than 6% of the project cost. This is very high and DOE should not accept this. There are so many waste heat recovery projects which have assumed O&M cost of less than 5%.	The O&M cost is only Rs. 48.9 million which is obtained from project report dated Feb 2007 prepared by third party; while the project cost is Rs. 583.2 million. Thus, there is a substantial difference between both these costs. PP is already operating a similar kind of project at the same location. The actual O&M expense incurred by PP for this project is Rs. 46 million. Thus, the O&M cost considered by PP is justifiable.	The project cost and O&M costs are verified from the DPR and cross checked with the actual purchase order hence the validation team accepts the project cost and O&M Cost
			The project does not seem to be additional	PP has demonstrated the Additionality in line with the “Tool for demonstration and assessment of the Additionality” Version 06.1.0. All the 4 steps of the tools are passed by the project successfully	The project participant has justified the additionality as per the “Tool for demonstration and assessment of the Additionality” Version 06.1.0. and the financial analysis has been verified by the financial



VALIDATION REPORT

Sr. No.	Details of the commenter	Date of Comment	Comment [unedited]	Response by project participant	Explanation on how account is taken by DOE
				and hence, the project can be considered as an additional.	expert which justifies the additionality of the project.

ⁱ“Combined tool to identify the baseline scenario and demonstrate additionality”, version 2.2