VALIDATION REPORT

Waste Gas based Power Generation Project at Ankit Metal & Power Limited in India

REPORT NO. 2008-0618

REVISION NO. 02

VALIDATION REPORT

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CERTIFICATION AS

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Date of first issue: 02-06-2008	Project No.: 46081013
Approved by: Michael Lehmann	Organisational unit: Climate Change Services
Client: Ankit Metal & Power Limited	Client ref.: Mr. J. P. Tapuriah

Project Name: Waste Gas based Power Generation Project at Ankit Metal & Power Limited
Country: India
Methodology: ACM0012
Version: 02
GHG reducing Measure/Technology: Waste heat based power generation
ER estimate: 26 808 tones of CO_2 e per annum
Size
☒ Large Scale
☐ Small Scale
Validation Phases:
☒ Desk Review
☒ Follow up interviews
☒ Resolution of outstanding issues
Validation Status
☐ Corrective Actions Requested
☐ Clarifications Requested
☒ Full Approval and submission for registration
☐ Rejected

In summary, it is DNV's opinion that the "Waste Gas based Power Generation Project at Ankit Metal & Power Limited" in India, as described in the PDD version 4 dated 22 January 2009, meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0012, version 2. DNV thus requests the registration of the project as a CDM project activity.

Report No.:	Date of this revision:	Rev. No.
2008-0618	03-03-2009	02

Report title:
Waste Gas based Power Generation Project at Ankit Metal & Power Limited in India

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Key words:
Climate Change
Kyoto Protocol
Validation
Clean Development

Service Area
Validation
Market Sector
Energy Industry

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Abbreviations

AFBC	Atmospheric Fluidized Bed Combustion
AMPL	Ankit Metal and Power Limited
BM	Build margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CL	Clarification request
CM	Combined margin
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
CPP	Captive Power Plant
DNA	Designated National Authority
DNV	Det Norske Veritas
DRI	Direct Reduced Iron
EREG	Eastern Regional Electricity Grid
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of Approval
MoEF	Ministry of Environment and Forests
MP	Monitoring Plan
NGO	Non-governmental Organisation
ODA	Official Development Assistance
OM	Operating margin
PDD	Project Design Document
PPA	Power purchase agreement
SPCB	State Pollution Control Board
TPD	Ton Per Day
UNFCCC	United Nations Framework Convention on Climate Change
WBPCB	West Bengal Pollution Control Board
WBSEB	Waste Bengal State Electricity Board
WBSEDCL	Waste Bengal State Electricity Distribution Company Limited
WHRB	Waste Heat Recovery Boiler

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VALIDATION REPORT

1 EXECUTIVE SUMMARY – VALIDATION OPINION

Det Norske Veritas Certification AS (DNV) has performed a validation of the 'Waste Gas based Power Generation Project at Ankit Metal & Power Limited' in India. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host Party criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfilment of stated criteria.

The host Party is India. No Annex I Party project participant has yet been identified. India fulfils the participation criteria and has approved the project and authorized the project participant. The DNA of India confirmed that the project assists in achieving sustainable development.

The project correctly applies ACM 0012 - "Waste heat based power generation", version 2.

The proposed project activity will utilise DRI kiln gas in WHRB for the generation of electricity thereby replacing power generation from coal based captive power plant. The project results in reductions of CO_2 emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project 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.

The total emission reductions from the project are estimated to be on the average 26 808 tCO_2e per year over the selected 10 year fixed crediting period. The emission reduction forecast has been checked, and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

Adequate training and monitoring procedures have been implemented.

In summary, it is DNV's opinion that the 'Waste Gas based Power Generation Project at Ankit Metal & Power Limited' in India, as described in the PDD of 22 January 2009, meets all relevant UNFCCC requirement for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM.0012, version 2. DNV thus requests the registration of the project as a CDM project activity.

2 INTRODUCTION

Ankit Metal & Power Limited has commissioned Det Norske Veritas Certification AS (DNV) to perform a validation of the "Waste Gas based Power Generation Project at Ankit Metal & Power Limited" in India. This report summarises the findings of the validation of the project, performed 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 modalities and procedures and the subsequent decisions by the CDM Executive Board.

2.1 Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the 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).

2.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, the simplified modalities and procedures for small-scale CDM project activities and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology ACM0012, version 2. The validation team has employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

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

3 METHODOLOGY

The validation consisted of the following three phases:

I a desk review of the project design documents

II follow-up interviews with project stakeholders

III the resolution of outstanding issues and the issuance of the final validation report and opinion.

The following sections outline each step in more detail.

3.1 Desk Review of the Project Design Documentation

The following table outlines the documentation reviewed during the validation:

/1/ Ankit Metal & Power Limited: *PDD, version 1, dated 15 March 2008; PDD, version 2, dated 18 August 2008; PDD, version 3, dated 27 October 2008; PDD, version 4, dated 22 January 2009*

/2/ Ankit Metal & Power Limited: *Details of production of sponge iron*

/3/ Ankit Metal & Power Limited: *Details of operating days char and coal fine generation (month wise) of the DRI kiln*

/4/ Ankit Metal & Power Limited: *Offer for annubar flow meter for gas flow measurement from Emerson process management*

/5/ Ankit Metal & Power Limited: *AMPL_Emission Reduction.xls.zip*

/6/ Ankit Metal & Power Limited: *AMPL_Baseline Power Generation Cost.xls*

/7/ Ankit Metal & Power Limited: *AMPL_Project Power Generation Cost.xls*

/8/ Ankit Metal & Power Limited: *AMPL-Electricity Consumption.xls*

/9/ Ankit Metal & Power Limited: *Baseline Sensitivity.xls*

/10/ Ankit Metal & Power Limited: *Project Sensitivity.xls*

/11/ Ankit Metal & Power Limited: *Overall efficiency of 12 MW AFBC based power plant by "Consultants and Engineers".*

/12/ Ankit Metal & Power Limited: *Overall efficiency of 12 MW AFBC based power plant by "Shaktipunj Engineers Private Limited"*

/13/ Ankit Metal & Power Limited: *Contract agreement with Ernst & Young Pvt. Ltd. Dated 21 June 2006*

/14/ Ankit Metal & Power Limited: *Capitalisation of CPP – WHRB & AFBC as on 30 June 2008 prepared by chartered accounts.*

/15/ Ankit Metal & Power Limited: *Letter from engineer in chief dated 29 July 2005 with reference no. PHE/2076/S/1(1)*

/16/ Ankit Metal & Power Limited: *Letter to chief engineer (western zone) dated 23 April 2004 with reference no. ASWPL/077/04-05*

/17/ Ankit Metal & Power Limited: *Letter to The chief environmental officer dated 1 December 2005 with reference no. AMPL/CPP/0508/05-06*

/18/ Ankit Metal & Power Limited: *Letter to hon'ble minister in charge dated 15 December 2005 with reference no. AMPL/0527/05-06*

/19/ Ankit Metal & Power Limited: *Letter to minister in charge dated 5 January 2006 with*

reference no. AMPL/0563/05-06

/20/ Ankit Metal & Power Limited: *Letter to engineer in chief dated 30 January 2006 with reference no. AMPL/0619/05-06*

/21/ Ankit Metal & Power Limited: *Letter from engineer in chief dated 10 February 2006 wth reference no. PHE/356/S*

/22/ Ankit Metal & Power Limited: *Contract agreement with M/s Triveni Engineering & Industries Limited for steam turbo generator dated 4 May 2005*

/23/ Ankit Metal & Power Limited: *Contract agreement with M/s Cethar Vessels (P) Limited for WHRB and AFBC dated 8 August 2005*

/24/ Ankit Metal & Power Limited: *Technical specification of steam turbo generator, WHRB and AFBC*

/25/ Ankit Metal & Power Limited: *Quality management system manual*

/26/ Ankit Metal & Power Limited: *Preventive maintenance schedule annual plan for the year of 2007-2008 of 12 MW CPP*

/27/ Ankit Metal & Power Limited: *Day wise W.B.S.E.B. power consumption report from 1 August 2006*

/28/ Ankit Metal & Power Limited: *Agreement with W.B.S.E.B for the supply of electrical energy at high voltage dated 7 August 2004*

/29/ Ankit Metal & Power Limited: *Slake holder consulting documents*

/30/ Ankit Metal & Power Limited: *Term loan & OCC limits sanctioned from Andhra Bank dated 27 July 2005 with reference no. 731/1/AMP/319*

/31/ Ankit Metal & Power Limited: *Loan sanction from Syndicate bank dated 11 August 2005 with reference no. BRB/580/9505/AVD/2005*

/32/ Ankit Metal & Power Limited: *Commercial advances sanction of credit facilities from State bank of India dated 9 June 2005*

/33/ Ankit Metal & Power Limited: *Electricity bills from W.B.S.E.D.C.L*

/34/ Ankit Metal & Power Limited: *Letter to The S.E. & Circle Manager for frequent low voltage of AMPL's 33 KV feeder dated 10 January 2007*

/35/ Ankit Metal & Power Limited: *Rates of depreciation under companies act*

/36/ Ankit Metal & Power Limited: *Proximate analysis of char*

/37/ Ankit Metal & Power Limited: *Certificate from State bank of India for prior consideration of CDM benefit*

/38/ Ankit Metal & Power Limited: *Offer from Mangalam carbon assets for consulting of the CDM projects dated 25 May 2006*

/39/ Ankit Metal & Power Limited: *Offer from Agrinergy for consulting of the CDM projects dated 19 July 2005*

/40/ Ankit Metal & Power Limited: *Extracts of MOM of the board of directors dated 15 January 2004 for serious consideration of CDM benefit.*

/41/ Ankit Metal & Power Limited: *Statement of cost break up for baseline and project activity by "Shaktipunj Engineers Private Limited"*

/42/ CDM Executive Board: *Validation and Verification Manual*. Version 01

/43/ CDM Executive Board*: ACM0012, "Consolidated baseline methodology for GHG emission reductions for waste gas or waste heat or waste pressure based energy*

system" version 2

/44/ SPCB: *Consent to establish of 12 MW CPP dated 10 May 2005*

/45/ SPCB: *Consent to operate of one number rotary kiln of 350 TPD, three number induction furnace of capacity 8 MT each, one 12 MW captive power plant and one rolling mill of capacity 5000 MT/month valid for the period 1 July 2007 to 30 June 2008.*

/46/ DNA of India: *Letter of approval dated 3 March 2008*

/47/ SPCB: *Consent to establish of 350 TPD DRI kiln dated 29 January 2004*

/48/ Ankit Metal & Power Limited: *Letter from Consultants and Engineers with Ref. No. C&A/ASWPL/03-04 dated 8 January 2004*

/49/ Ankit Metal & Power Limited: *Certificate from chartered accountants R Kothari & Company*

/50/ Ankit Metal & Power Limited: *Letter to M/s Consultants and engineers dated 5 January 2004*

3.2 Follow-up Interviews with Project Stakeholders

On 23 April 2008, DNV performed on-site visit and interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. The interviews were carried out by Soumik Biswas, Sasim Chattopadhyay and Indrajit Rana of DNV, India. Representatives of Ankit Metal & Power Limited and E &Y Ltd. were interviewed. The main topics of the interviews are summarized below.

Name	**Interview Topics**
Ankit Metal & Power Limited *Mr. J.P.Tapuriah, Technical Director* *Mr. Sanjay Singh, Director (Resident Works)* *Mr. R.B.Suman, Sr. GM Power Plant* *Mr. Malay Kotal, AGM (Mech) Power Plant* *Mr. S.K.Banerjee, AGM (Inst) Power plant* *Mr. S. Pathi, AGM (Elec) Power Plant* *Mr.P.S.Kumar, Sr. GM (Sponge Iron Plant)* ***Ernst & Young*** *Mr. Saunak Saha* *Mr. Arghya Pal*	➢ Proof of CDM consideration ➢ Applicability of the methodology ➢ Determination of baseline ➢ Assessment of project additionality and discussed barriers ➢ Emission reduction calculations and data used ➢ Review of project design and technology used ➢ Review of monitoring and verification procedure of the organisation and management structure of the organization for the project activity. ➢ Environmental consents and permits ➢ Review of the stakeholder consultation process.

3.3 Resolution of Outstanding Issues

The objective of this phase of the validation was to resolve any outstanding issues which needed be clarified prior to DNV's positive conclusion on the project design. In order to ensure transparency a validation protocol was customised for the project. The protocol shows in a transparent manner the criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, 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 validation protocol consists of three tables. The different columns in these tables are described in the figure below. The completed validation protocol for the "Waste Gas based Power Generation Project at Ankit Metal & Power Limited" is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of CDM criteria or where a risk to the fulfilment of project objectives is identified. Corrective action requests (CAR) are issued, where:

i) mistakes have been made with a direct influence on project results;
ii) CDM and/or methodology specific requirements have not been met; or
iii) there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

A request for clarification (CL) may be used where additional information is needed to fully clarify an issue.

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Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities		
Requirement	***Reference***	***Conclusion***
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is either acceptable based on evidence provided (**OK**), a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements or a request for **Clarification (CL)** where further clarifications are needed.*

Validation Protocol Table 2: Requirement checklist				
Checklist Question	***Reference***	***Means of verification (MoV)***	***Comment***	***Draft and/or Final Conclusion***
The various requirements in Table 2 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the large-scale PDD template, version 03 - in effect as of: 28 July 2006. Each section is then further sub-divided.	*Gives reference to documents where the answer to the checklist question or item is found.*	*Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.*	*This is either acceptable based on evidence provided (**OK**), or a c**orrective action request (CAR)** due to non-compliance with the checklist question (See below). A request for clarification (CL) is used when the validation team has identified a need for further clarification.*

Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Draft report clarifications and corrective action requests	***Ref. to checklist question in table 2***	***Summary of project owner response***	***Validation conclusion***
If the conclusions from the draft Validation are either a CAR or a CL, these should be listed in this section.	*Reference to the checklist question number in Table 2 where the CAR or CL is explained.*	*The responses given by the project participants during the communications with the validation team should be summarised in this section.*	*This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".*

Figure 1 Validation protocol tables

3.4 Internal Quality Control

The validation report underwent a technical review before requesting registration of the project activity. The technical review was performed by a technical reviewer qualified in accordance with DNV' s qualification scheme for CDM validation and verification.

3.5 Validation Team

The validation team consisted of the following personnel:

				Type of involvement					
Role/Qualification	***Last Name***	***First Name***	***Country***	Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	Expert input
CDM validator / technical team leader	Biswas	Soumik	India	√	√		√		√
CDM validator	Rana	Indrajit	India	√	√	√			
GHG auditor	Chattopadhyay	Sasim	India		√				
Technical reviewer	Chandrashekara	Kumaraswamy	India					√	

The qualification of each individual validation team member is detailed in Appendix B to this report.

4 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.
The validation findings relate to the project design as documented and described in the project design documentation dated 22 January 2009.

4.1 Participation Requirements

The project participant is the private entity Ankit Metal & Power Limited of India. No Annex-I Party project participant is yet identified. The host Party India meets all the requirements for participating in a CDM project. The Ministry of Environment and Forests, the DNA of India, has approved the project with a letter of approval dated 3 March 2008, which also confirms that the project assists in achieving sustainable development in India.

The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA.

4.2 Project Design

The project is located in the plant premises of Ankit metal and power limited in Bankura district of West Bengal in India. The project entails utilization of the heat content of the DRI kiln gas for generation of power in a waste heat recovery based power plant. The power generated by the project activity will partially meet the electrical energy requirement of the integrated steel plant of Ankit Metal & Power Limited. The project activity involves the installation of a 38 tph, 67 kg/cm^2, 485^{o}C 'Cethar Vessels Ltd' waste heat recovery boiler and a 12 MW single extraction-cum-air cooled type 'Triveni Engineering & Industries Ltd' steam turbo generator. The total steam requirement in the TG has been made available by WHRB and an AFBC through a common steam feeder. The steam generated in the WHRB is equivalent to 8 MW electricity generation and for AFBC it is equivalent to 4 MW. Under normal operational condition, an estimated 90,000 m^3/hr of DRI kiln gas will be available from the DRI kiln. As per the conventional sponge iron manufacturing process, the gas emanating from DRI kiln is introduced into an After Burning Chamber (ABC) to ensure complete combustion. In the project scenario, the DRI kiln gas, after complete combustion in the ABC, will be introduced into the Waste Heat Recovery Boiler (WHRB) where the heat content of the DRI kiln gas will be extracted and utilized for generation of steam. After 12% auxiliary consumption (73 498 MW hr/annum) electricity will be supplied to the integrated steel plant of AMPL. The remaining electricity requirements of the integrated plant amounting to around 98 030 MWhr/annum will be sourced from eastern regional electricity grid. The technical details of the WHRB, AFBC and TG have been verified from the technical data sheets of the equipment.

In absence of the project activity, the equivalent amount of electricity would have been sourced from coal based captive power plant. The waste heat recovery boiler has been designed by M/s Cether Vessels Ltd., a reputed organisation in the field of boiler manufacturing. The steam turbo generator has been designed by M/s Triveni Engineering & Industries Ltd. Other technical devices and instruments are of a reputed make. Thus, the project design reflects good engineering practice.

The starting date of the project activity has been selected as 4 May 2005 which is the date of contract /51/ for the steam turbo generator with M/s Triveni Engineering & Industries Limited and reflects the earliest date on which real action for the project was initiated. The project is presently operational since January 2008. The lifetime of the project is 20 years which is deemed reasonable. The project has selected a fixed crediting period of 10 years starting from 1 July 2009, or from the date of registration, whichever is later. The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA

The project description is to the consideration of DNV complete and accurate.

4.3 Baseline Determination

The approved consolidated methodology ACM0012, "Consolidated baseline methodology for GHG emission reductions for waste gas or waste heat or waste pressure based energy system" version 2 has been applied for the project activity. The methodology is applicable to the project since:

- it involves generation of electricity from waste heat
- electricity generated is used within the plant premises, since total power requirement in the plant is higher than the electricity generation capacity of the project activity.
- the generated electricity is measurable and may be exported to the grid since grid is connected with the plant internal bus bar
- energy is generated by the owner of the industrial facility
- regulations do not constrain the plant from using fossil fuels since AFBC based power plant is also with in the project activity.
- The project is a new facility since earlier to this facility there was no facility of power generation in the plant premises.
- Waste gas that is released under abnormal operation (emergencies, shut down) of the plant shall not be accounted for since the project proponent will not consider waste gas that will be released under abnormal operation (emergencies, shut down) of the plant for estimation of emission reductions.
- The waste heat utilized in the project activity was released into the atmosphere in the absence of the project activity. This has been validated from the electricity bills of the plant which establishes that there was no electricity generation in the plant and the entire electricity requirement was sourced from the grid (For a DRI kiln there is no separate heat requirement and electricity is the only required energy). DNV has also validated from the annual report of AMPL that in absence of the project activity no energy was generated by waste gas and sold to other facilities and/or the grid. The bills and financial statements have been audited by chartered accountants R. Kothari and company /52/.

The project is a combination of DRI kiln gas (waste heat) based and coal fine and char based electricity generation facility with a total installed capacity of 12 MW where WHRB contributes 8 MW and the rest will be supplied by the coal and char fired AFBC. The baseline scenario has been identified as the most plausible baseline scenario among all realistic and credible alternative(s) in line with the methodology ACM0012 version 2.

Three alternative scenarios to the project activity have been considered as plausible baseline scenarios in the absence of the project. These are i) Generation of power in a coal based 12 MW captive power plant and wastage of the heat content of the gas to the atmosphere

(combination of scenarios W2 and P4). ii) Import of power from the grid and wastage of the heat content of the gas to the atmosphere (combination of scenarios W2 and P6) and iii) Project activity without CDM benefit. Among these, alternative 1 has been determined as the baseline scenario which implies that equivalent amount of electricity would have been sourced from coal based captive power plant in the baseline. This alternative is the most likely baseline scenario since the unit cost of power for this scenario is the lowest of all the three options. DNV has validated these alternatives from the board note of AMPL /53/ dated 15 January 2004. It has been evidenced from the board note and relevant background work document /54/ /55/ power generation from the project activity would be a better proposition with the proposed carbon revenue from the project activity than coal based CPP. The unit cost calculation has been checked during the validation and has been discussed in further details in section 3.10.

Natural gas based power generation has not been considered as a baseline due to non-availability of natural gas in the region. Wind or hydro based power generation has also been excluded due to the same reason. Since the project does not involve co-generation, baseline scenario for heat generation has not been evaluated. This is deemed justified. DNV thus considers the list of realistic and credible alternatives to be complete.

4.4 Additionality

CDM consideration and continued action to secure CDM status

The project start date has been identified as 4 May 2005 on which a contract agreement /56/ for steam turbo generator with M/s Triveni Engineering & Industries Limited was signed by the project proponent. It has been evidenced from the meeting of the board of directors of AMPL /57/ dated 15 January 2004 that CDM benefit had been considered prior to the start of the implementation of the project. More over, State Bank of India has also provided a certificate /58/ which is a third party document, that demonstrates that prior to the sanctioning of the term loan for the project activity, the bank was informed that the project was being taken up as a climate change initiative under CDM. The project proponent has appointed M/s E & Y as consultants for the CDM project on 21 June 2006. Prior to the appointment of E & Y, the project proponent had negotiated with two other CDM consultants. Those were Agrinergy and Mangalam Carbon Assets. The offers /59/ /60/ from those two consultants were received on 19 July 2005 and 25 May 2006, respectively. Since the existing methodology at that time, ACM0004, did not permit the scenario of AFBC as well as WHRB operating simultaneously and a new methodology was already submitted as NM0179 to account for the same, the PDD was not published with ACM0004 and the PDD was published only after the approval of ACM0012. Based on the above evidences, DNV was able to confirm that in compliance with EB41 annex 46, CDM benefits were seriously considered in the decision to proceed with the project activity and real and continuing action were undertaken to ensure CDM benefits during the implementation of the project activity.

The project's additionality is demonstrated using "Tool for the demonstration and assessment of additionality", version 5

Step 1, Identification of alternatives to the project activity consistent with mandatory laws and regulations: Three alternatives to the project activity have been considered as the baseline scenario. These are i) Generation of power in a coal based 12 MW captive power

plant. ii) Import of power from the grid and iii) Project activity with out CDM benefit; combination of the 8 MW WHRB and 4 MW AFBC. All the alternatives are in compliance with the laws and regulations of India. Among these, alternatives, the project proponent has calculated the unit cost of power generation for all the scenarios and has considered the least cost option as the baseline. The unit cost comparison establishes that alternative 1 is the least cost option among the three alternatives and has hence been selected as the most likely baseline scenario.

Step 2, Investment analysis: The CDM project activity and the alternatives identified in Step 1 generate financial or economic benefits other than CDM related income, so the investment comparison analysis (Option II) or the benchmark analysis (Option III) is applicable to the project activity. .Among these two options Ankit Metal & Power Limited has adopted the investment comparison analysis. The unit cost of electricity generation has been used as the financial indicator for the investment comparison analysis.

The assumptions used in the investment comparison analysis are deemed appropriate and the justification is shown in the following table.

Inputs	Assumption	Justification
Project cost (inclusive of WHR boiler, AFBC and 12 MW steam turbine)	INR 520 million	The project cost is calculated based upon the DPR which has been prepared by Shaktipunj Engineers Private Limited, a power plant consultant. Due to delays in the project implementation, the actual project cost has been increased to INR 647.8 million. Thus, project cost of INR 520 million is deemed appropriate.
Baseline cost (Inclusive of AFBC and 12 MW steam turbine)	INR 420 million	The project cost is calculated based upon the DPR which has been prepared by Shaktipunj Engineers Private Limited, a power plant consultant
Cost of coal	INR 800/MT	Project proponent has proposed to use F-grade coal, coal fines, and char in the power plant AFBC boiler. This has also been crosschecked from the technical specification of AFBC. Hence the price of coal INR 800/MT is deemed appropriate.
Availability of WHRB	270 days	It has been validated from the operation records of the plant from October 2005 to October 2007 that the average days of operation of the sponge iron kiln per year is about 260 days.
Composition of fuel mix	Coal:Char::40:60	Cethar Vessels (P) Limited certifies that maximum char can be used in

		the AFBC boiler is 75%. Hence 60% of char in the fuel mix is conservative.
Design station heat rate of AFBC boiler	2457Kcal/KWh	Source from technical data sheet of the AFBC boiler
GCV of char and coal	2000 Kcal/kg and 2400 Kcal/kg respectively	GCV of char has been determined by laboratory tested value. GCV of F grade coal varies from 2400Kcal/kg to 3360kCal/kg as per the data provided by Ministry of Coal, Government of India (http://www.coal.nic.in/point4.html). Considering lower GCV is a conservative approach as it increases the cost of power in the baseline.
Grid electricity price	INR 3.50/KWh	Based on the electricity bill and tariff order of WBSEB

The unit costs of all the three alternatives are listed below:

- Alternative 1; generation of power in a coal based captive power plant: INR 2.48/KWh
- Alternative 2; import of power from the grid: INR 3.50/KWh
- Alternative 3; project activity with out CDM benefit – combination of 8 MW WHRB and 4 MW AFBC: INR 2.70/KWh

To meet the uniformity of the unit cost analysis total output from all the three alternatives has been fixed to 165528000 kWh/annum which is the total power requirement of Ankit Metal and power limited considering 330 days of operation. Thus in alternative 1 and alternative 3 extra grid power has been considered to meet the power requirement.

From the investment comparison analysis of the financial indicator (unit cost of power) for the project activity and the project alternatives, it has been found that the "Generation of power in a coal based captive power plant" has the best financial indicator (*i.e.* it has the lowest unit cost of electricity generation) amongst all plausible alternatives including the project activity without CDM revenue. As per the "Tool for the demonstration and assessment of additionality", version 5; *"If one of the other alternatives has the best indicator, then the CDM project activity can not be considered as the most financially attractive"*. It may therefore be concluded that the project activity can not be considered as the most financially attractive proposition.

To make investment comparison analysis robust and realistic, a sensitivity analysis has been done by varying the values of input parameters which has more than or equal to 20% contribution in either total project costs or total project revenues. Project proponent has done the baseline sensitivity analysis by variation of coal price, grid power cost and power generation from waste gas. Moreoever, the project cost that at the time of the investment decision was derived from calculations based upon the DPR prepared by Shaktipunj Engineers Private Limited, a power plant consultant, increased to INR 647.8 million in actual costs. Hence, a decrease in project cost has not been considered in the sensitivity analysis. It has been assessed and verified that even if the coal price or the grid power cost increases by

100%, the cost of power generation from project activity is still higher than the unit cost of power generation from the selected baseline scenario of 12 MW coal based CPP.

The power generation cost in the baseline scenario can cross the power generation cost in the project scenario, only if the waste gas based power generation increases by around 23% *i.e.* if the availability of DRI kiln goes up to 332 days per annum. This is highly unrealistic as the average campaign life of a 350 tpd DRI kiln is much shorter due to frequent choking problem which leads to an annual operation of about 270 days per annum. The operational records of the DRI kiln for the financial year 2006-2007, 2007-2008, and 2008-2009 up to October 2008 (2years 6 months) have been provided to the validator. The annual average operational days for the DRI kiln were around 124 days, 145 days, and 265 days per annum, respectively. During the initial start-up period there were technical problems resulting in less operating days. The plant finally achieved stable operation end of 2007. Thus annual operation of about 270 days per annum is deemed appropriate and realistic.

The host Party India being a power deficit country, it is highly unrealistic that the grid power cost will reduce. The same is also evident from the Order of the West Bengal Electricity Regulatory Commission which gives an increasing trend in power tariff.

Step 3, Barrier analysis: The project proponent has elaborated on operational barrier due to inconsistent power generation from waste heat. Since in the project scenario the major power requirement of the plant will be met from the WHRB, any fluctuation in the gas generation from the DRI kiln can affect the operation of the entire plant. Operation of WHRB totally depends on the DRI kiln throughput. As the throughput is decreased DRI gas volume also decreases which affects the load of WHRB. Excluding first six months production due to teething issues after commissioning the DRI kiln load factor varies from 11% to 94% and average load factor of the DRI kiln is 42%. Non-availability of waste gas may occur due to DRI kiln shut downs, functional disturbances in the DRI kiln or due to any kind of load fluctuations in the upstream of the project. Thus DNV has validated the uncertainty of the load of WHRB. These problems do not affect the baseline scenario of coal based CPP, where plant load factor is almost fixed and dependency on the grid supply can be pre-determined. In case of sudden non-availability of power from the WHRB, the project proponent would have to fall back on the grid supply which is imported through a 33 kV feeder. But the supply voltage keeps on fluctuating frequently since the supply voltage at the nearest grid sub-station is on an average of 27 kV It has also been validated from communication /34/ between the project proponent and the state electricity board that the grid supply in the region is of fluctuating in nature, power cut for 8 to 10 times in a day and also suffers frequently from low voltage. Hence, sudden load on the grid supply which may occur due to non-availability of power from the WHRB will disturb entire plant's normal operation. Hence it is DNV's opinion that combined uncertainty of the load of WHRB and grid power creates real prohibitive barrier for implementation WHRB based electricity generation.

Step 4, Common practice analysis: For assessing the common practice analysis, the sponge iron plants in the state of West Bengal has been considered. India being a large country, the government policies, subsidies, benefits, power and raw material costs, industrial and environmental policies are controlled and decided by the state authorities. Hence, the sponge iron plants in West Bengal operate under the same set of economical, environmental and political conditions which is different on state-to-state basis. Hence, considering the sponge iron plants in West Bengal for the common practice analysis is deemed justified. As per the

report on "Sponge Iron Industry", published by Central Pollution Control Board, Ministry of Environment & Forests, Government of India, there are 32 sponge iron plants in West Bengal till 2007. Among the 32 sponge iron plant in West Bengal only 13 plants have own WHRB for power generation, and all of them have considered CDM benefit for implementation of the same. Hence it can be concluded that WHRB based power generation is not a common practice in sponge iron plants in West Bengal and WHRB in sponge iron plant in West Bengal is feasible only with CDM benefit.

From the discussion above it can be concluded that the project is not a business-as-usual scenario and thus additional.

4.5 Monitoring

The monitoring methodology selected complies with requirements of ACM0012, version 2. The monitoring plan will give opportunity for real measurements of achieved emission reductions.

4.5.1 Parameters determined ex-ante

The efficiency of captive power plant and amount of waste gas the industrial facility generates per unit of product (*i.e.* DRI) generated by the process (*i.e.* sponge iron manufacturing) that generates waste gas has been fixed on *ex-ante* basis. Highest of the efficiency values provided by two manufacturers for power plants with specifications similar to that that would have been required to supply the recipient with electricity that it receives from the project activity has been fixed as efficiency of CPP. 'Consultants and Engineers' and 'Shaktipunj Engineers Pvt. Limited' have provided the overall efficiency of 32% and 35% of 12 MW AFBC based power plant. Both the organizations are power plant consultants. From these two efficiency values 35% is the more conservative figure and thus 35% efficiency has been considered in the emission reduction calculation. Waste gas generated by the industrial facility per unit of product has been fixed at 6171 m^3/ton on the basis of 90 000 m^3/hr DRI gas generation from the 350 tpd DRI Kiln as per the certificate provided by the power plant consultants, Shaktipunj Engineers Private Limited. DNV has cross checked the value of DRI gas generation for other similar capacity DRI kiln from the document "Sponge Iron Industry" prepared by central pollution control board and found conservative. Capping of baseline emissions has been fixed to 346 715 794 m^3/year from the last 30 months sponge iron production figure. The DRI kiln has been commissioned 3 years ago. However first 6 months production has been excluded due to the teething issues just after commissioning of the DRI kiln which is deemed appropriate.

4.5.2 Parameters monitored ex-post

The following parameters will be monitored on ex–post basis.

- Quantity of waste gas used for energy generation during year y
- Energy content of the steam generated in waste heat recovery boiler with the heat content of the waste gas of the DRI kiln and fed to turbine via common steam header
- Energy content of steam generated in AFBC and fed to turbine via common steam header
- Quantity of electricity supplied to the recipient *j* by generator which in the absence of the project activity would have been sourced from the i^{th} source (*i.e.* the coal based captive power plant) during the year y

- CO_2 emission for the electricity source *i* (*i.e.* the coal based captive power plant), displaced due to the project activity during the year y
- CO_2 emission factor per unit of energy of the fossil fuel (coal) used in the baseline generation source i
- Quantity of fossil fuel type *i* combusted to supplement waste gas in the project activity during the year y
- Net calorific value of the fossil fuel type *i* combusted as supplementary fuel
- CO_2 emission factor per unit of energy of the fuel type i

4.5.3 Management system and quality assurance

The existing data management, review and audit systems of AMPL are conforming to ISO 9001:2000 standards. Thus it can be expected that the management for the project activity will provide adequate reliability in data monitoring, archiving and performance reviews.

4.6 Estimate of GHG Emissions

The emission reductions have been calculated in a conservative manner. The baseline emissions are calculated from the net power generation from the project activity, CO_2 emission factor for the electricity source *i* (*i.e.* the coal based captive power plant) displaced due to the project activity during the year y (in tonnes CO_2/MWh), fraction of total electricity generated by the project activity using waste gas, and energy that would have been produced in project year y using waste gas generated in base year. The calculations are as per the approved methodology.

There are no leakage effects due to this project activity.

No additional waste gas cleaning over what is being done in the baseline scenario will be required due to the project activity. Therefore there will not be any additional energy consumption due to cleaning of waste gas in the project scenario. For the project activity under consideration, there is no provision for auxiliary fossil fuel firing in the waste heat recovery boiler to supplement the heat content of the waste gas. Therefore no project emission is considered while computing the *ex-ante* emission reductions resulting from the project activity. However the same will be monitored during the proposed crediting period and in case of any consumption of auxiliary fuel for supplementing the heat content of the waste gas, emission from the same will be determined and will be accounted for during the computation of emission reductions, annually on an *ex-post* basis.

The project will reduce emissions which are real and measurable. The project is expected to result in emission reductions of approximately 26 808 tCO_2 yearly, provided the underlying assumptions do not change. The baseline emission estimate can be replicated using the data and parameter values provided in the PDD. The data sources mentioned have been verified by DNV. In summary, the GHG calculations are complete and transparent, and their accuracy has been verified. No other project emission or leakage sources contributing more than 1% and not mentioned by the methodology have been found.

4.7 Environmental Impacts

The project does not require an environmental impact analysis as per the EIA notification of the MoEF. The environmental impacts of the project have been discussed in detail in the

PDD. The project is not likely to create any adverse environmental effects. The project complies with environmental regulations in India. Necessary licenses and environmental clearances have been obtained. The West Bengal pollution control board has granted consent to operate to the project.

4.8 Comments by Local Stakeholders

The stakeholders identified for the project include Village Panchayat, Employees of AMPL, Consultants, Equipment Suppliers, Non-Governmental Organizations (NGOs), West Bengal State Electricity Board, West Bengal Pollution Control Board, Ministry of Environment and Forests, Government of India. The stakeholders were contacted on a one to one basis and comments were invited on the project. A summary of the comments received have been provided. The project did not receive any adverse comments during the stakeholder consultation and hence no mitigating actions were required.

4.9 Comments by Parties, Stakeholders and NGOs

The PDD of 15 March 2008 was made publicly available on DNV's climate change website (http://www.dnv.com/certification/climatechange) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 20 March 2008 to 18 April 2008.

Two comments were received and are given (in unedited form) in the below text box.

Comment by: Rajaram velayudhan, individual

☐ Accredited NGO ☐ Party ☒ Stakeholder

Inserted on: 18 April 2008

Subject: Concerns on the additionality

Comment: It needs to be further explained by the PP how they have considered that the investment barrier presented in the PDD is sufficient to prevent the implementation of the project activity but would not be sufficient to prevent the implementation of a coal and char fired captive power plant,

further details may be required form the PP regarding the technological barrier and to explain what will be the impact of the simultaneous installation of the AFBC boiler on the mitigation of this barrier.

The DOE should confirm at the time of validation is to request to provide further evidence to support the conclusion that the fossil fuel AFBC boiler would have been installed without the development of the waste heat recovery boiler.

Comment by: Suzane Decosta, Low Carbon

☐ Accredited NGO ☐ Party ☒ Stakeholder

Inserted on: 18 April 2008

Subject: 12 MW WHR

Comment: the group does not hold a very sound crediantials in the country, moreover the project has been designed in a way to show it unviable without cdm consideration. Moreover the additionality does not hold good as it has been deliberately proved by the PP to justify the same. The project does not seem to have a lifeline

How DNV has considered the comment received in its validation:

Response against first comment: The project proponent did not use investment barrier but rather has substantiated the additionality of the project through investment comparison analysis and technological barriers. The detailed calculation along with the supporting documents for the assumption for the each of the parameter has been provided to the validator. For investment comparison analysis, project proponent has used the unit cost analysis. To meet the uniformity of the unit cost analysis, total out put from all the three alternatives has been fixed at 165 528 000 KWh/annum which is the total power requirement of Ankit Metal and Power Limited. Thus in alternative 1 and alternative 3, extra grid power has been considered to meet the power requirement. The ascending order of unit cost of power generation are baseline activity (power generation from coal based AFBC with grid import), project activity (power generation from WHRB and coal based AFBC with grid import) and only grid import. As per the "Tool for the demonstration and assessment of additionality (Version 05)", *"If one of the other alternatives has the best indicator, then the CDM project activity can not be considered as the most financially attractive"*. It may therefore be concluded that the project activity can not be considered as the most financially attractive proposition.

The details regarding the technological barriers *i.e.* fluctuations of waste gas supply from the DRI kiln which in turn affects the performance of the WHRB boilers have been substantiated to the validator. The same can be validated from publicly available documents which substantiate the low campaign life and accresion problem of DRI kilns resulting in fluctuation of waste gas supply from DRI kilns. These problems do not affect the baseline scenario of coal based CPP, where plant load factor is almost fixed .and dependency on the grid supply can be pre-determined. In case of sudden non-availability of power from the WHRB, the project proponent would have to fall back on the grid supply which is imported through a 33 KV feeder. But the supply voltage keeps on fluctuating frequently since the supply voltage at the nearest grid sub-station is on an average of 27 KV Hence, sudden load on the grid supply which may occur due to non-availability of power from the WHRB will disturb entire plant's normal operation

(Source: http://www.steelworld.com/outlook0107.pdf : *Accresion problem in DRI kiln resulting low campaign life of the kiln.*

http://cdm.unfccc.int/Projects/DB/BVQI1204523116.65/ReviewInitialComments/3DYCAS2EZCTCYG7OQXQAGEY8UMPR7L): *Third party document about the technical and operational barrier of the DRI kiln.*

http://books.google.co.in/books?id=PBvJ6Jf8nxQC&pg=PA22&lpg=PA22&dq=DRI+Kiln+gas+based+power+plant&source=web&ots=m78g4OwfzD&sig=-56kCDWNVfar64ybqoM2gq1vlYI&hl=en&sa=X&oi=book_result&resnum=10&ct=result**):** *waste heat recovery from the DRI kiln which has capacity of less than 200 000tpa may not be economically viable.*

Moreover the supporting documents regarding the disruptions of power supply from the grid have also been provided to the validator. Thus, it is DNV's opinion that dependency on the grid power is also hardly possible. In the project activity, the majority of the electricity has

been sourced from WHRB and grid which are not a dependable source. Hence the project is not a business as usual scenario and therefore additional.

Response against second comment: Ankit Metal & Power Limited (AMPL) is established by Shri.S.K.Patni & others with an objective to set up an integrated steel plant in Eastern India. The same group has also set up Rohit Ferro Tech Limited which has achieved excellence in the field of Ferro Chrome manufacturing. Impex Metal & Ferro Alloys Private Limited, another Group Company and a renowned trading unit for over 16 years, is involved with the manufacturing of varied Ferro Alloys. The project developer has got an extensive background in the field of iron and steel manufacturing which is backed up by a dedicated team of highly qualified professionals having experience in technical, administrative, finance and marketing fields. The company is also listed in the Bombay Stock Exchange. (BSE Id :532870) and National Stock Exchange (NSE Id :ANKITMET, ISIN Id :INE106I01010)

(Source: http://www.moneycontrol.com/stocks/cptmarket/compsearchnew.php?fname=price&companyname=Ankit%20Metal)

All justifications regarding the additionality of the project activity along with all relevant supporting documents have been provided to the validator. It is DNV's opinion that the project is not a business as usual scenario and hence additional.

APPENDIX A

CDM VALIDATION PROTOCOL

Table 1 Mandatory Requirement for Clean Development Mechanism (CDM) Project Activities

Requirement	Reference	Conclusion
About Parties		
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3.	Kyoto Protocol Art.12.2	OK
2. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK
3. The project shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	OK
4. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	OK
5. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK
6. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	OK
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	OK
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	NA
9. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	CDM Modalities and Procedures §31b	NA
About additionality		

Requirement	Reference	Conclusion
10. Reduction in GHG emissions shall be additional to any that would occur in the absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	OK ~~CL 3~~ ~~CL 5~~ ~~CL 6~~ ~~CL 7~~ ~~CL 8~~ ~~CL 9~~ ~~CL 10~~ ~~CL 11~~ ~~CL 12~~ ~~CAR 1~~
About forecast emission reductions and environmental impacts		
11. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	OK
For large-scale projects only		
12. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	NA
About stakeholder involvement		
13. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	OK ~~CL 19~~
14. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project	CDM Modalities and Procedures §40	OK

Requirement	Reference	Conclusion
design document and comments have been made publicly available.		
Other		
15. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
16. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	CDM Modalities and Procedures §45c,d	OK
17. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	OK
18. The project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM Modalities and Procedures Appendix B, EB Decision	OK
19. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	OK

Table 2 Requirements Checklist

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A. General Description of Project Activity *The project design is assessed.*					
A.1. Project Boundaries *Project Boundaries are the limits and borders defining the GHG emission reduction project.*					
A.1.1. Are the project's spatial boundaries (geographical) clearly defined?	/1/	DR	Yes the project activity has been implemented within the plant premises of M/S Ankit Metal & Power Limited located at Jorehira in Bankura district of West Bengal in India.		OK
A.1.2. Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/2/	DR/I	Yes. The project system boundary encompasses the DRI kilns, waste heat recovery boiler (WHRB), the AFBC boiler, the common steam header and steam turbine generator.		OK
A.2. Participation Requirements *Referring to Part A, Annex 1 and 2 of the PDD as well as the CDM glossary with respect to the terms Party, Letter of Approval, Authorization and Project Participant.*					
A.2.1. Which Parties and project participants are participating in the project?	/3/	DR/I	The private entity Ankit Metal & Power Limited of India is the participant for the project		OK
A.2.2. Have all involved Parties provided a valid and complete letter of approval and have all private/public project participants been authorized	/4/	DR/I	The Ministry of Environment & Forest (MoEF), Government of India, the DNA of India has approved the project. The project		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
by an involved Party?			proponent has submitted the letter of approval to the validator.		
A.2.3. Do all participating Parties fulfil the participation requirements as follows: - Ratification of the Kyoto Protocol - Voluntary participation - Designated a National Authority	/5/	DR	The Ministry of Environment and Forests (MoEF) is the DNA of India. India ratified the Kyoto Protocol on 26 August 2002. The host party India has confirmed their voluntary participation.		OK
A.2.4. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance.	/6/	DR/I	The project does not have any public funding from any Annex I Party		OK
A.3. Technology to be employed *Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.*					
A.3.1. Does the project design engineering reflect current good practices?	/7/	DR/I	Yes the project design engineering reflects the current good practices. The WHRB and the turbine generator both are of reputed make.		OK
A.3.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/8/	DR/I	The project proponent is requested to mention the make of WHRB and turbine generator in the PDD.	~~CL 1~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A.3.3. Does the project make provisions for meeting training and maintenance needs?	/9/ /10/	DR/I	The project proponent is requested to submit the training manual of the project and the maintenance schedule of the WHRB and turbine generator.	~~CL 2~~	OK
A.4. Contribution to Sustainable Development *The project's contribution to sustainable development is assessed.*					
A.4.1. Has the host country confirmed that the project assists it in achieving sustainable development?	/11/	DR/I	The Letter of Approval from the DNA of India confirming the project's contribution to sustainable development has been submitted to the validator		OK
A.4.2. Will the project create other environmental or social benefits than GHG emission reductions?	/12/	DR/I	The project activity will reduce the thermal load of the local environment to a great extent by recovering and effectively utilizing the heat content of the DRI kiln gas. The project also helps to improve the economic status of the local community in the rural area of Bankura district of West Bengal in India by generating some local employments during the construction of the project.		OK
B. Project Baseline *The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.*					
B.1. Baseline Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.1.1. Does the project apply an approved methodology and the correct version thereof?	/13/	DR	Approved consolidated methodology ACM0012, version 2 has been applied for the project, which was pertinent at the time of web hosting.		OK
B.1.2. Are the applicability criteria in the baseline methodology all fulfilled?	/14/	DR	The methodology is applicable to the project activity since: ▪ The project involves generation of electricity from waste heat ▪ The electricity generated will be used within the industrial facility ▪ Energy is generated by the owner of the industrial facility producing the waste heat ▪ The credits are claimed by the generator of energy ▪ The project is a new initiative ▪ The waste heat utilized in the project was flared in the absence of the project activity. To establish that the waste heat was not utilized in the absence of the project, the project proponent has submitted electricity bills from the period before the installation of the project. However, the electricity bills produced show that the electricity consumption from the grid in the project plant is much lower than what has been projected in the PDD. Thus it cannot be	~~CL 3~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			concluded whether the entire energy requirement of the plant was met from the grid. The project proponent is requested to justify the energy demand projected in the PDD as well as provide explanation or additional documentary evidence that the entire power requirement for the plant was met from the grid in the absence of the project.		
B.2. Baseline Scenario Determination *The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.*					
B.2.1. What is the baseline scenario?	/15/	DR/I	The baseline scenario is a 12 MW coal based captive power plant.		OK
B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/16/		Other than the selected baseline the project proponent has also considered the following alternatives: ▪ Sourcing power from grid ▪ Project activity without CDM benefits Natural gas based power generation has not been considered as a baseline due to non-availability of natural gas in the region. Wind or hydro based power generation has also been excluded due to the same reason. The coal based CPP is the most likely baseline scenario due to the fact that unit cost		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			of power from grid is higher than coal based CPP. Since the project does not involve co-generation, baseline scenario for heat generation has not been evaluated. This is deemed justified.		
B.2.3. Has the baseline scenario been determined according to the methodology?	/17/	DR	Yes, determination of baseline scenario selection corresponds to the methodology ACM0012, version 2		OK
B.2.4. Has the baseline scenario been determined using conservative assumptions where possible?	/18/	DR/I	The baseline scenario has been determined on the basis of the electricity generation from the proposed WHR based power plant. The electricity is meant to displace equivalent amount of electricity that would have been generated from fossil fuel based CPP.		OK
B.2.5. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/19/	DR/I	The project proponent is requested to clarify the trends in the sponge iron manufacturing sector in India regarding DRI kiln gas recovery and utilization.	~~CL 4~~	OK
B.2.6. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/20/	DR/I	The project proponent is requested to substantiate the baseline scenario with DRI kiln gas recovery project in India	~~CL 4~~	OK
B.2.7. Have the major risks to the baseline been identified?	/21/	DR/I	There are no risks to the identified baseline.		OK
B.3. Additionality Determination *The assessment of additionality will be validated with*					

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
focus on whether the project itself is not a likely baseline scenario.					
B.3.1. Is the project additionality assessed according to the methodology?	/22/ /23/ /24/ /25/ /26/ /27/ /28/ /29/	DR/I	The project's additionality is demonstrated using "Tool for the demonstration and assessment of additionality", version 04. The project proponent is requested to demonstrate the additionality of the project as per the "Tool for the demonstration and assessment of additionality", version 05 which is the latest version launched in **EB 39** **Step 1:** Three alternatives to the project activity have been considered as the baseline scenario. These are i) Generation of power in a coal based 12 MW captive power plant. ii) Import of power from the grid and iii) Project activity; combination of the 8 MW WHRB and 4 MW AFBC. All the alternatives are in compliance with the laws and regulations of India. Among these alternatives, the coal based CPP has been selected as the most likely baseline scenario since it is the least cost option among the three alternatives. **Step 2:** Among the two options *i.e.* 'Option-II: Investment comparison analysis' and 'Option-III: Benchmark analysis', Ankit Metal & Power Limited has been adopted the investment comparison analysis. The unit cost of electricity generation has been used as	~~CAR 1~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			the financial indicator for the investment comparison analysis. The project proponent has provided excel sheets for the financial calculations. However the following needs to be clarified or justified: ▪ Actual power requirement of the plant ▪ The actual char and fine generation report of AMPL ▪ The project proponent has used the price of coal INR 800/MT which is the price of F-grade coal. However, during the site visit the validation team was informed that the D-grade coal would be used in the project. The project proponent is requested to rectify the calculations based on the price of D-grade coal ▪ The calorific value of the coal has been under-stated by the project proponent. The project proponent is requested to change the calorific value with the appropriate grade specification and re-calculate the project financials. ▪ The actual cost for the project scenario as well as the baseline scenario. The project proponent is also requested to provide the purchase order for the AFBC and the WHRB.	~~CL 3~~ ~~CL 5~~ ~~**CL 6**~~ ~~CL 7~~ ~~CL 8~~	

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			▪ For the different expenses mentioned under the O&M costs, the expenses in the project scenario are almost double of that in the selected baseline scenario. However this is very improbable since it is not likely that the management or administrative or maintenance staff required will differ in the baseline and project scenario. Hence these costs should be the same for the project as well as the baseline. The project proponent is requested to rectify the same in the calculations.	~~CL 9~~	
			▪ The project proponent has calculated an interest contribution to the unit cost of power generation. However the interest has been charged on the entire project cost. Since the project will have a 70:30 debt:equity ratio, the interest should be calculated only on the debt part. The project proponent is requested to rectify the same	~~CL 10~~	
			In the investment analysis the project proponent has been assumed 270 working days per annum for WHRB where as working days of AFBC has been chosen as 330 days. It has been validated from the operation records of the plant from October 2005 to October 2008 that the average days of		

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			operation of the sponge iron kiln per year was less 265 days. The project proponent is requested to do the sensitivity analysis in such a way that the unit cost of power generation in project activity will be less than the unit cost of power generation of the most attractive alternative (baseline activity) and substantiate why this variation is not possible. . **Step 3:** The project proponent has also elaborated on operational barrier due to inconsistent power generation from waste heat. Since in the project scenario the maximum power requirement of the plant will be met from the WHR any fluctuation in the gas generation from the DRI kiln can affect the operation of the entire plant. This problem does not affect the baseline scenario of coal based CPP. In case of non-availability of power from the WHR the project proponent would have to fall back on the grid supply. It has been validated from communication between the project proponent and the state electricity board that the grid supply in the region is of fluctuating nature and also suffers frequently from low voltage.	~~CL 11~~ ~~CL 12~~	

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			Step 4: The project proponent has argued that among the 33 sponge iron plant in West Bengal almost all plant with equivalent capacity of AMPL consume power from the grid. Some plants have installed WHRB with CDM benefit. The project proponent is requested to substantiate this with proper document**.**		
B.3.2. Are all assumptions stated in a transparent and conservative manner?	/30/ /31/ /32/ /33/ /34/ /35/ /36/ /37/	DR/I	Please refer to B.3.1	~~CL 5~~ ~~CL 6~~ ~~CL 7~~ ~~CL 8~~ ~~CL 9~~ ~~CL 10~~ ~~CL 11~~ ~~CL 12~~ ~~CL 3~~ ~~CAR 1~~	OK
B.3.3. Is sufficient evidence provided to support the relevance of the arguments made?	/38/ /39/ /40/ /41/ /42/ /43/ /44/ /45/	DR/I	Please refer to B.3.1	~~CL 5~~ ~~CL 6~~ ~~CL 7~~ ~~CL 8~~ ~~CL 9~~ ~~CL 10~~ ~~CL 11~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
				~~CL 12~~ ~~CL 3~~ ~~CAR 1~~	
B.3.4. If the starting date of the project activity is before the date of validation, has sufficient evidence been provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity?	/46/ /47/ /48/ /49/ /50/ /51/ /52/ /53/ /54/ /55/ /56/	DR/I	The project proponent has selected 15 January 2004 as the start date of the project which is the date of the meeting of the board of directors for approving the project. It has been observed from the minutes of the meeting that benefits from CDM were considered during the project approval. It has also been observed that the project proponent initiated the process of contracting a CDM consultant. This has been validated from communication of Agrinergy dated 19 July 2005 and also from communication from Mangalam Carbon Assets dated 25 May 2006. The project proponent has also submitted a communication from the State Bank of India in which the bank has stated that the project proponent had informed the bank that the project will be undertaken as a climate change initiative under CDM. However, considering the fact that even the first consultant was approached in July 2005 which is one and a half years after the approval of the project by the board, the project proponent is requested to further substantiate the delay in presenting the	~~CL 13~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			project as a CDM activity. The project proponent is also requested to explain the discrepancy that although the board of directors approved the installation of a 8 MW WHR based power plant the first proposal which had been communicated with Agrinergy, was for a 16 MW WHR based power plant.	~~CL 14~~	
B.4. Calculation of GHG Emission Reductions – Project emissions *It is assessed whether the project emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
B.4.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/57/	DR/I	Yes, the calculations are documented as per the approved consolidated methodology ACM0012 version 2. Since no fossil fuel is likely to be used to supplement the waste gas and the project activity does not entail the use of any gas cleaning plant, there are no emissions from the project activity		OK
B.5. Calculation of GHG Emission Reductions – Baseline emissions *It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
B.5.1. Are the calculations documented according to the	/58/	DR/I	The baseline emissions have been calculated		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
approved methodology and in a complete and transparent manner?			as per the approved consolidated methodology ACM0012 version 2. As per the baseline scenario, power, equivalent to the net power generated in the project activity, would have been generated in a coal based captive power plant. Hence the baseline emission has been calculated as the product of the electricity generated from WHRB and the emission factor of the baseline coal based CPP.		
B.5.2. Have conservative assumptions been used when calculating the baseline emissions?	/59/ /60/ /61/	DR/I	In calculating the baseline emissions the project proponent has calculated the fraction of total electricity generated by the project activity using waste gas from the proportion of steam generated from the WHRB and the AFBC. However the project proponent is requested to clarify the following: ▪ The project proponent is requested to substantiate the captive power plant efficiency with proper document. Since three years waste gas data is not available with the project proponent, the project proponent is requested to provide the manufacturer's data for the amount of waste gas generated per unit of product. Also the project proponent is requested to provide documentation for the 3 years average	~~CL 15~~ ~~CL 16~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			production prior to project implementation.		
B.5.3. Are uncertainties in the baseline emission estimates properly addressed?	/62/	DR/I	There are no uncertainties in the base line emission		OK
B.6. Calculation of GHG Emission Reductions – Leakage *It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
B.6.1. Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/63/	DR	There are no leakage emissions from the project as per the methodology ACM0012 version 2		OK
B.7. Emission Reductions *The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.*					
B.7.1. Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.	/64/	DR/I	The project will result in emission reductions over the baseline. However the actual amount will be confirmed in the final validation report		OK
B.8. Monitoring Methodology *It is assessed whether the project applies an appropriate monitoring methodology.*					
B.8.1. Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/65/	DR/I	The monitoring methodology selected complies with requirements of ACM0012 version 2.		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.8.2. Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/66/	DR/I	The monitored data will be retained and preserved for up to 2 years after the crediting period. Records will be maintained in electronic and/or paper media.		OK
B.9. Monitoring of Project Emissions *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					
B.9.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/67/	DR/I	Yes, the monitoring plan provides for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period. If any fossil fuel is used to supplement the waste heat in the project scenario, the quantity consumed and the calorific value of the same will be monitored.		OK
B.9.2. Are the choices of project GHG indicators reasonable and conservative?	/68/	DR/I	Yes, CO_2 is the only reasonable and conservative GHG indicator.		OK
B.9.3. Is the measurement method clearly stated for each GHG value to be monitored and deemed appropriate?	/69/	DR/I	Yes		OK
B.9.4. Is the measurement equipment described and deemed appropriate?	/70/	DR/I	Yes		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.9.5. Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/71/	DR/I	Yes		OK
B.9.6. Is the measurement *interval* identified and deemed appropriate?	/72/	DR/I	Yes		OK
B.9.7. Is the *registration, monitoring, measurement* and *reporting* procedure defined?	/73/	DR/I	Yes		OK
B.9.8. Are procedures identified for *maintenance* of monitoring equipment and installations? Are the calibration intervals being observed?	/74/	DR/I	Yes		OK
B.9.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/75/	DR/I	Yes		OK
B.10. Monitoring of Baseline Emissions *It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.*					
B.10.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/76/	DR/I	Yes, the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period.		OK
B.10.2. Are the choices of baseline GHG indicators reasonable and conservative?	/77/	DR/I	CO_2 is the only baseline GHG indicator and		OK

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			the same has been accounted for.		
B.10.3. Is the measurement method clearly stated for each baseline indicator to be monitored and also deemed appropriate?	/78/	DR/I	Yes		OK
B.10.4. Is the measurement *equipment* described and deemed appropriate?	/79/ /80/	DR/I	The project proponent is requested to clarify the type of measuring instrument that will be used for measuring the waste gas flow in the project scenario.	~~CL 17~~	OK
B.10.5. Is the measurement *accuracy* addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/81/	DR/I	Yes		OK
B.10.6. Is the measurement *interval* for baseline data identified and deemed appropriate?	/82/	DR/I	Yes		OK
B.10.7. Is the registration, *monitoring*, *measurement* and *reporting* procedure defined?	/83/	DR/I	Yes		OK
B.10.8. Are procedures identified for *maintenance* of monitoring equipment and installations? Are the calibration intervals being observed?	/84/	DR/I	Yes		OK
B.10.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/85/	DR/I	Yes		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.11. Monitoring of Leakage *It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.*	/86/				
B.11.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/87/	DR/I	There are no leakage emission in the project as per the methodology ACM0012 version 2		OK
B.12. Monitoring of Sustainable Development Indicators/ Environmental Impacts *It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over time.*	/88/				
B.12.1. Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/89/	DR/I	The DNA of India does not mandate the monitoring of sustainable development indicators		OK
B.13. Project Management Planning *It is checked that project implementation is properly prepared for and that critical arrangements are addressed.*	/90/				
B.13.1. Is the authority and responsibility of overall project management clearly described?	/91/	DR/I	Yes the authority and responsibility of overall project management has been described clearly.		OK
B.13.2. Are procedures identified for training of monitoring personnel?	/92/	DR/I	Yes, procedures for training of monitoring personnel have been identified.		OK
B.13.3. Are procedures identified for emergency preparedness for cases where emergencies can	/93/	DR/I	There are no emergencies which might lead to unintended emissions.		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
cause unintended emissions?					
B.13.4. Are procedures identified for review of reported results/data?	/94/	DR/I	Yes procedures for review and internal audits have been identified.		OK
B.13.5. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/95/	DR/I	Please refer to B.13.1		OK
C. Duration of the Project/ Crediting Period *It is assessed whether the temporary boundaries of the project are clearly defined.*					
C.1.1. Are the project's starting date and operational lifetime clearly defined and evidenced?	/96/		The project proponent has selected 15 January 2004 as the start date of the project which is the date of the meeting of the board of directors for approving the project. The lifetime of the project has been selected as 20 years which is deemed reasonable.		OK
C.1.2. Is the start of the crediting period clearly defined and reasonable?	/97/	DR	The project proponent has been selected a non renewable crediting period of 10 years starting from 1 July 2009 or the date of registration of the project activity with UNFCCC, whichever is later		OK
D. Environmental Impacts *Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.*					
D.1.1. Has an analysis of the environmental impacts of	/98/	DR/I	Yes, the environmental impacts of the project		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
the project activity been sufficiently described?			activity have been described adequately.		
D.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/99/	DR/I	The EIA for the project has been approved and the "Consent to Establish' for the project has been granted.		OK
D.1.3. Will the project create any adverse environmental effects?	/100/	DR/I	There are no negative environmental impacts due to the project activity.		OK
D.1.4. Are transboundary environmental impacts considered in the analysis?	/101/	DR/I	Yes.		OK
D.1.5. Have identified environmental impacts been addressed in the project design?	/102/	DR/I	Yes.		OK
D.1.6. Does the project comply with environmental legislation in the host country?	/103/ /104/ /105/	DR/I	The project is requested to provide the following documents: ▪ Consent to establish ▪ Consent to operate	~~CL 18~~	OK
E. Stakeholder Comments *The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.*					
E.1.1. Have relevant stakeholders been consulted?	/106/	DR/I	The following stake holders have been consulted as relevant stake holders		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			▪ Village Panchayat ▪ Employees of AMPL ▪ Consultants. ▪ Equipment Suppliers ▪ Non-Governmental Organizations (NGOs) ▪ West Bengal State Electricity Board. ▪ West Bengal Pollution Control Board. ▪ Ministry of Environment and Forests, Government of India.		
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	/107 / /108 /	DR/I	The project proponent has consulted the local stakeholders through one-to-one correspondences. The project proponent is requested to submit the copy of these letters for invitation of the stakeholders' comments.	~~CL 19~~	OK
E.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/109 /	DR/I	Stakeholder consultation is not mandated by the Indian DNA.		OK
E.1.4. Is a summary of the stakeholder comments received provided?	/110 /	DR/I	Yes, a summary of the comments received during the stakeholder consultation process has bee provided in the PDD.		OK
E.1.5. Has due account been taken of any stakeholder comments received?	/111 /	DR/I	No negative feed back came from any of the local stake holder		OK

Table 2b: Additional requirements checklist for VVM version 1

A.1. Letter of approval					
A.1.1 Is the LoA received directly from the DNA or through the project participant.	/112 /	DR	Copy of the letter of approval has been received from project participant. However, approval of HCA for the project activity under consideration has been evidenced from the official web site of MoEF, the DNA of India (ref.: http://cdmindia.nic.in/cdmindia/projectList.jsp?search=search).		OK
A.2. Project design					
A.2.1 Does the PDD describe the CDM project activity with all relevant elements in a transparent and accurate way?	/113 /	DR	Yes		OK
A.2.2 Has the CDM project activity at the start of the validation been constructed or does the CDM project activity use existing facilities or equipment?	/114 /	DR/I	The project activity has been constructed before the start of the validation.		OK
A.2.3 Is the project a large scale project, a small scale project with average annual emission reductions above 15 000 tonnes or a bundled small scale project? Has on-site visit been carried out?	/115 /	DR/I	The project is a large scale project. On site visit has been carried out on 23 April 2008.		OK
A.2.4 Does the project activity involved alteration of existing installations? If so, have the differences between pre-project and post-project activity been clearly described in the PDD?	/116 /	DR/I	The project does not involve any alteration of existing installations.		OK
A.3. Project emissions not addressed by the methodology					
A.3.1 Does the methodology describe all project emission source for the project activity that contributes all 1% of the emission reductions? Sources that the methodology considers not to take into account are not relevant (e.g. cement and iron consumption for building hydropower plants).	/117 /	DR	There will be no project emission and this complies with the requirements of the applied methodology ACM0012.		OK
A.4. Documentation of baseline emissions					

A.4.1 Documentation of the baseline determination: a. All assumptions and data used by the project participants are listed in the PDD and related document to be submitted for registration. The data are properly referenced. b. All documentation is relevant as well as correctly quoted and interpreted. c. Assumptions and data can be deemed reasonable d. Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD. e. The methodology has been correctly applied to identify what would occurred in the absence of the proposed CDM project activity	/118 /	DR/I	Baseline determination has been done properly with reasonable data. All assumptions and data used by the project participants are listed in the PDD and all the data are properly referenced. All documentation is relevant as well as correctly quoted and interpreted. Project has got clearance from state pollution control board and host country approval from MoEF. The methodology has been correctly applied to identify what would occur in the absence of the proposed CDM project activity.		OK
A.5. Documentation of the calculations					
A.5.1 Algorithms and/or formulae used to determine emission reductions • All assumptions and data used by the project participants are listed in the PDD and related document submitted for registration. The data are properly referenced • All documentation is correctly quoted and interpreted. • All values used can be deemed reasonable in the context of the project activity • The methodology has been correctly applied to calculate the emission reductions and this can be replicated by the data provided in the PDD and supporting files to be submitted for registration.	/119 /	DR/I	Formulae used to determine emission reduction has been sourced correctly from the methodology ACM0012 version 2. All assumptions and reasonable data used by the project participants are listed in the PDD and all the data are properly referenced		OK
A.6. Implementation of the monitoring plan					
A.6.1 How were the plans for implementation of the monitoring	/120	DR/I	The AMPL management has established		OK

plan, data management, QA/QC procedures assessed? To what extent can the emission reductions achieved by the project by monitored ex-post and verified later by a DOE?	/		QA/QC procedures for data monitoring and data management. The emission reduction by the project activity can be achieved at full extent by monitored *ex-post* and verified later by a DOE.		
A.7. CDM consideration prior to starting date					
A.7.1 The prior consideration of CDM for the project activity complies with EB41 annex 46	/121 /	DR/I	Yes, please refer *CDM consideration and continued action to secure CDM status* under additionality discussion		OK

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
CAR 1 The project's additionality is demonstrated using "Tool for the demonstration and assessment of additionality", version 04. The project proponent is requested to demonstrate the additionality of the project as per the "Tool for the demonstration and assessment of additionality", version 05 which is the latest version launched in EB 39	B.3.1	The same has been revised in the PDD/Version 02. Please refer to Section B.5 of the PDD/ Version 02.	**OK.** Project Proponent has revised the additionality tool with the current version "Tool for the demonstration and assessment of additionality", version 05. Project proponent has used Option II. Apply investment comparison analysis on the basis of the unit cost of electricity production which is deemed appropriate. CAR is closed.
CL 1 The project proponent is requested to mention the make of WHRB and turbine generator in the PDD	A.3.2	The make of WHRB and the turbine generator have been mentioned in the PDD/Version 02. Please refer to Section A.4.3 of PDD/ Version 02 for details.	**OK.** Project proponent has mentioned the make of WHRB and turbine generator in the PDD. The maker of WHRB and turbine generator are Cethar vessels (P) limited and Triveni engineering & industries limited respectively who have excellent reputation in the specified field. CL is closed.
CL 2 The project proponent is requested to submit the training manual of the project and the maintenance schedule of the WHRB and turbine generator	A.3.3	M/s. Ankit Metal & Power Limited is certified with ISO 9001:2000. The training manual is developed in accordance with the guidance of ISO 9001: 2000. 'Section 6.2.2: Competence, Awareness and Training'	**OK.** M/s. Ankit Metal & Power Limited is certified with ISO 9001:2000. DNV has validated from the document "Section 6.2.2: competence, awareness and training" that adequate training program has been arranged by the Ankit

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		of the Quality Management System Manual of M/s. Ankit Metal & Power Limited has been provided to the Validator for details. Regular maintenance of the WHRB and the turbine generator will be carried out as specified by the individual suppliers. The supplier's maintenance schedules have been provided to the Validator for details.	metal & power limited. From the suppliers maintenance schedule DNV has also validated that preventive maintenance schedule of WHRB has been taken care properly. CL is closed.
CL 3 To establish that the waste heat was not utilized in the absence of the project, the project proponent has submitted electricity bills from the period before the installation of the project. However, the electricity bills produced show that the electricity consumption from the grid in the project plant is much lower than what has been projected in the PDD. Thus it cannot be concluded whether the entire energy requirement of the plant was met from the grid. The project proponent is requested to justify the energy demand projected in the PDD as well as provide explanation or additional documentary evidence that the entire power requirement for the plant was met from the grid in the absence of the project	B.1.3	The Validator has been provided with electricity bills of M/s. Ankit Metal & Power Limited for the period August 2006 to October 2007. However it is to be noted that the different facilities of the integrated steel plant have been commissioned in a phase wise manner. During the abovementioned period, the following units have been commissioned: ▪ Sponge Iron facility ▪ Steel Melting Shop comprising of three Induction Furnaces The Rolling Mill and the Ferro Manganese Plant have not been commissioned during that period neither the project activity power plant was commissioned at that point of time.	**OK.** The waste gas utilized in the project activity was flared or released into the atmosphere in the absence of the project activity at existing facility. During the period August 2006 to October 2007 only Sponge Iron facility and Steel Melting Shop comprising of three Induction Furnaces has been operated. The total electricity requirement of the plant was 6 to 7.5 MW which has been supplied from the grid. DNV has crosschecked the electricity requirement with the electricity bill of the above said period. CL is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		Therefore the power requirement of the plant was around 6.5-7.0MW and the entire power was imported from the grid. The same can be verified with the electricity bills for the above period. This will also substantiate that the DRI kiln gas was not utilized in absence of the project activity and the same was wasted.	
CL 4 The project proponent is requested to clarify the trends in the sponge iron manufacturing sector in India regarding DRI kiln gas recovery and utilization	B.2.5	The Joint Plant Committee of Government of India has conducted a survey on the Indian Sponge Iron Industry in 2005 (closure of suvey is 31st August 2005) and published the report as"Survey of Indian Sponge Iron Industry". The survey report presents the status of Indian Sponge Iron Industry at the time of project implementation. As per this report, out of the 147 coal based sponge iron units in the India, only 16 units have captive power generation facility. This substantiates that power generation with DRI kiln gas is not a common practice in the Indian Sponge Iron Industry at the time of implementation of the project activity. Furthermore most of	**OK.** In India, precisely in West Bengal WHRB is not a common practice in sponge iron manufacturing sector. From the survey of Indian sponge iron industry dated 31 August 2005 DNV has validated that out of the 147 coal based sponge iron units in the India, only 16 units have captive power generation facility with maximum concentration in Chhattisgarh. In recent scenario as per the article "Sponge Iron Industry" prepared by CPCB Ministry of environment and forest in March 2007, among the 32 sponge iron industry in West Bengal only 13 have WHRB for power generation from which 12 have been considered the project with CDM benefit.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		the sponge iron units whoever have commissioned captive power plant has considered CDM revenue.	CL is closed.
CL 5 The actual char and fine generation report of AMPL	B.3.1	The actual char and coal fine generation report of M/s. Ankit Metal & Power Limited have been submitted to the Validator.	**OK**. DNV has received the actual char and coal fine generation report. The report has been prepared for the period of October 2005 to March 2008. Char and coal fine generation as per the report are 36 066 MT/annum and 29 154 MT/Annum. The char and coal fine has been required for the project activity are 21 625 MT/annum and 14 415 MT/annum respectively which are less than the char and coal fine generation quantity. Thus DNV has validated that char and coal fine required in the project are sufficient. CL is closed.
CL 6 The project proponent has used the price of coal INR 800/MT which is the price of F-grade coal. However, during the site visit the validation team was informed that the D-grade coal would be used in the project. The project proponent is requested to rectify the calculations based on the price of D-grade coal	B.3.1	The project proponent proposes to use F-grade coal in the power plant AFBC boiler. D-grade coal is a higher grade coal which is used for reduction purposes. Therefore D-grade coal is used only in the DRI kiln of M/s. Ankit Metal & Power Limited and not in the AFBC boiler. This justifies the power cost computation based on the price of	**OK.** Project proponent has proposed to use F-grade coal, coal fines, and char in the power plant AFBC boiler. It has also been crosschecked from the technical specification of AFBC. Hence the price of coal INR 800/MT is deemed appropriate. CL is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		F-grade coal.	
CL 7 The calorific value of the coal has been under-stated by the project proponent. The project proponent is requested to change the calorific value with the appropriate grade specification and re-calculate the project financials	B.3.1	The project proponent will utilize 'F' grade coal in the power plant. The calorific value of 'F' grade coal varies between 2400-3360kCal/kg as per the data provided by Ministry of Coal, Government of India (http://www.coal.nic.in/point4.html). In accordance with this guideline, the project proponent has worked out the coal based power generation cost with a calorific value of coal as 2400kCal/kg. This will lead to higher coal consumption and hence a higher power generation cost with coal. Therefore consideration of the lowest calorific value of 'F' grade coal in the baseline scenario is conservative. Consequently the difference between the power generation cost in the baseline scenario and in the project scenario, as predicted in the PDD/ Version 01, is the least. However following the suggestion of the Validator, the project proponent has re-calculated the power generation cost in the baseline and project scenario with the highest calorific value of 'F' grade	**OK.** The calorific value of F grade coal which has been used in the project has considered as 2400 kCal/kg. The project proponent has worked out the coal based power generation cost with a calorific value of coal as 2400kCal/kg. This will lead to higher coal consumption and hence a higher power generation cost with coal. Therefore consideration of the lowest calorific value of 'F' grade coal in the baseline scenario is conservative. Consequently the difference between the power generation cost in the baseline scenario and in the project scenario is the least. CL is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		coal. The results of the same has been provided below: Base Case: Rs. 2.45/ kWh Project Case: Rs. 2.69/kWh The different in power generation cost between the baseline scenario and the project scenario, as given above, still substantiates that project activity is not economically more attractive option than the baseline scenario.	
CL 8 The actual cost for the project scenario as well as the baseline scenario. The project proponent is also requested to provide the purchase order for the AFBC and the WHRB	B.3.1	The purchase orders for the AFBC boiler and the WHRB have been provided to the Validator.	**NOT OK.** The purchase orders for the AFBC boiler and the WHRB have been provided to the Validator. The actual cost for the project scenario as well as the baseline scenario has been taken from project cost breakup prepared by power plant consultants, Shaktipunj engineers private limited. However project proponent is requested to substantiate the cost breakup was valid during the implementation of the project by keeping in mind the delay of the project implementation after approval of the project. CL is open
CL 8 (continued) The purchase orders for the AFBC boiler and	B.3.1	The total cost incurred on account of implementation of the project activity	**OK.** Due to delay in implementation of the project the project cost has been

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
the WHRB have been provided to the Validator. The actual cost for the project scenario as well as the baseline scenario has been taken from project cost breakup prepared by power plant consultants, Shaktipunj engineers private limited. However project proponent is requested to substantiate the cost breakup was valid during the implementation of the project by keeping in mind the delay of the project implementation after approval of the project.		till 30th June, 2008 is found to be INR 64.78 Crores against the assumption of INR 52 Crores as done initially by M/s. Shaktipunj Engineers Private Limited during the inception of the project activity. The "Statement of Capitalization of Captive Power Plant of M/s. Ankit Metal & Power Limited", duly reviewed and certified by a Chartered Accountant has been provided to the Validator.	increased from 52 crores to 64.78 crores. Thus project cost has been increased from DPR stage to the real implementation stage. However the unit cost of power generation from the project activity has been calculatedb based on the project cost in the DPR stage which is deemed appropriate. CL is closed.
CL 9 For the different expenses mentioned under the O&M costs, the expenses in the project scenario are almost double of that in the selected baseline scenario. However this is very improbable since it is not likely that the management or administrative or maintenance staff required will differ in the baseline and project scenario. Hence these costs should be the same for the project as well as the baseline. The project proponent is requested to rectify the same in the calculations	B.3.1	The project proponent has considered ▪ O&M Cost which includes salaries and wages of the operational staff and maintenance cost of all the equipments and ▪ Administrative Expenses for determination of unit power generation cost both in the baseline scenario and in the project scenario. This is to be clarified here that the project proponent has considered an equal amount of salaries and wages for the operational staff (INR 21.6 million per annum) and administrative expenses (INR 31.6 million per annum) both in the baseline scenario and in the project scenario. The detailed breakup for the	**OK.** Project proponent has provided the spread sheet of the unit cost calculation. From this spread sheet DNV has validated salary / wages and administrative expenses of the baseline scenario as well as project scenario. In both the cases the cost has been taken INR 21.6 million and INR 31.6 million for salary / wages and administrative expenses. The maintenance cost of WHRB has been considered to be higher than that of AFBC boiler since the waste gas entering the WHRB has a higher temperature and particulate load and corrosive in nature. This leads to high-temperature corrosion on the gas side as well as on the water-side.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		same has been provided to the Validator. This is conservative as the manpower requirement in the project scenario will be higher than that in the baseline scenario because of higher number of operation equipments (two boilers in project scenario *viz-a-viz* one boiler in the baseline scenario). The maintenance cost of WHRB is considered to be higher than that of AFBC boiler. This is justified since the waste gas entering the WHRB has a higher temperature and particulate load and corrosive in nature. This leads to high-temperature corrosion on the gas side as well as on the water-side. Furthermore WHRB tube may fail frequently because of creep rupture, fatigue, poor quality control, improper operation or poor design. Moreover WHRBs are fire tube boilers; thermal stresses generated from thermal expansion of the tube elements will result in frequent damages of the boiler tubes. This justifies the consideration of a higher maintenance cost of WHRB. The project proponent has also provided the actual maintenance cost incurred for	CL is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		the WHRB for the month of January 2008 to the Validator. This substantiates that actual maintenance cost is even higher that that envisaged.	
CL 10 The project proponent has calculated an interest contribution to the unit cost of power generation. However the interest has been charged on the entire project cost. Since the project will have a 70:30 debt:equity ratio, the interest should be calculated only on the debt part. The project proponent is requested to rectify the same	B.3.1	At the time of project conceptualization and approval, the Management of M/s. Ankit Metal & Power Limited has conceived that the power plant project will be developed only through securing loan from the bank. The equity portion will be deployed in establishing the main stream facilities. This justifies the consideration of interest on the entire project cost. However, the project proponent has re-calculated the power generation cost in the baseline and project scenario with the consideration of only 70% of the project cost to be accrued from bank as debts. The results of the same are as below: Base Case: Rs. 2.40/kWh Project Case: Rs. 2.60/kWh The different in power generation cost between the baseline scenario and the project scenario, as given above, still substantiates that project activity is not economically more attractive option	**OK.** Considering the interest on the total project cost, unit cost of electricity in baseline scenario and project scenario has been taken INR 2.48/kWh and INR 2.70/kWh. Again considering 70:30 debts, equity ratio, unit cost of electricity in baseline scenario and project scenario has been taken INR 2.40/kWh and INR 2.60/kWh. Hence DNV has validated that in both the cases project activity is not economically more attractive option than the baseline scenario. CL is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		than the baseline scenario.	
CL 11 The project proponent is requested to do the sensitivity analysis in such a way that the project cost will cross the cost of the most attractive alternative and substantiate why this variation is not possible	B.3.1	In accordance with the suggestion of the Validator, the project proponent has re-computed the sensitivity analysis. It is found that the power generation cost in the project scenario can only cross the power generation cost in the baseline scenario only if the waste gas based power generation increases by around 23% *i.e.* if the availability of DRI kiln goes upto 332 days per annum. This is highly unrealistic as the average campaign life of a 350tpd DRI kiln is much shorter due to frequent accresion problem which will lead to an annual operation of about 270 days per annum. The operational records of the DRI kiln for the period October 2005 to October 2007 (2years) have been provided to the Validator. This will also substantiate that annual average operational days for the DRI kiln is around 260 days per annum. The power generation cost in the project scenario may also reduce with a corresponding reduction in power tariff *i.e.* grid power cost. However, the host	**OK.** Project proponent has done the baseline sensitivity analysis by variation of coal price and grid power cost and power generation from waste gas .In any combination unit cost of power generation from project activity will not cross the unit cost of power generation from the most attractive alternative which is 12 MW coal based CPP with rest quantity of electricity from the grid. The power generation cost in the baseline scenario can only cross the power generation cost in the project scenario only if the waste gas based power generation increases by around 23% *i.e.* if the availability of DRI kiln goes up to 332 days per annum. This is highly unrealistic as the average campaign life of a 350tpd DRI kiln is much shorter due to frequent choking problem which will lead to an annual operation of about 270 days per annum. The operational records of the DRI kiln for the period October 2005 to October 2007 (2years) have been provided to the Validator. This will also substantiate

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		country-India, being a power deficit country, it is highly unrealistic that the grid power cost will reduce. The same is also evident from the Order of the West Bengal Electricity Regulatory Commission which gives an increasing trend in power tariff.	that annual average operational days for the DRI kiln is around 260 days per annum. The host country-India, being a power deficit country, it is highly unrealistic that the grid power cost will reduce. The same is also evident from the Order of the West Bengal Electricity Regulatory Commission which gives an increasing trend in power tariff. CL is closed.
CL 12 The project proponent has argued that among the 33 sponge iron plant in West Bengal almost all plant with equivalent capacity of AMPL consume power from the grid. Some plants have installed WHRB with CDM benefit. The project proponent is requested to substantiate this with proper document.	B.3.1	As per the report on "Sponge Iron Industry", published by Central Pollution Control Board, Ministry of Environment & Forests, Government of India, there are 32 sponge iron plants in West Bengal in 2007. The project proponent has submitted a list of these sponge iron units with their current practice of power generation with CDM benefit to the Validator. Please refer to Annexure-I for details.	**OK.** Among the 32 sponge iron plant in West Bengal almost all plant with equivalent capacity of AMPL consume power from grid. Only 13 plants have own WHRB for power generation among them 12 plant has considered CDM benefit to implement the project. Hence from the common practice analysis DNV has validated that WHRB in sponge iron plant in West Bengal is additional. CL is closed.
CL 13 The project proponent has selected 15 January 2004 as the start date of the project which is	B.3.4	The project activity was approved by the Board of Directors of M/s. Ankit Metal & Power Limited on 15th January	**NOT OK.** Project Proponent has faced the barrier due to the water availability which causes main delay of the project

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
the date of the meeting of the board of directors for approving the project. It has been observed from the minutes of the meeting that benefits from CDM were considered during the project approval. It has also been observed that the project proponent initiated the process of contracting a CDM consultant. This has been validated from communication of Agrinergy dated 19 July 2005 and also from communication from Mangalam Carbon Assets dated 25 May 2006. The project proponent has also submitted a communication from the State Bank of India in which the bank has stated that the project proponent had informed the bank that the project will be undertaken as a climate change initiative under CDM. However, considering the fact that even the first consultant was approached in July 2005 which is one and a half years after the approval of the project by the board, the project proponent is requested to further substantiate the delay in presenting the project as a CDM activity		2004. Subsequent to the approval, the Management has proceeded with the implementation of the project activity as a climate change initiative. However the Management has faced a lot of hurdles in sourcing water which is an essential component of an integrated steel plant operation and DRI kiln operation. With the tremendous uncertainty of securing a reliable water source, the integrated steel plant operation could not be initiated and the whole process got delayed. In this regard, the Validator has been provided with all the communications with the □ Chief Engineer (Western Zone), Public Health Engineering Department, Government of West Bengal □ Engineer-in-Chief, Public Health Engineering Department, Government of West Bengal □ Minister-in-charge, Commerce & Industry, Government of West Bengal All these communications and the corresponding replies from the recipients will substantiate the delay in securing a reliable water source for	activity. Project proponent has submitted the documents regarding this delay. The events have been listed below. • 15 January 2004 approval for the project. • 23 April 2004 letter submitted to chief engineer (WZ), PHE to get water supply. • 4 May 2005 turbine purchase order placed. • 19 July 2005 communication from Agrinergy (CDM consultant) • 8 August 2005 boiler purchase order placed. • 15 December 2005 letter submitted to honorable minister in charge to get water supply. • 30 January 2006 letter submitted to engineer in chief of PHED to gat water supply • 10 February 2006 clearance from PHE department. • 25 May 2006 Communication from Mangalam Carbon Assets However project proponent is requested

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		commencing the operation of the integrated steel plant. The project proponent has finally received a sanction for water souring from the Engineer-in-Chief, Public Health Engineering Department, Government of West Bengal on 10th February 2006, almost two years after the project activity approval from the Management of M/s. Ankit Metal & Power Limited. With this overall uncertainty of water availability, the entire project activity implementation was also jeopardized. This can be further substantiated that the project proponent has placed the order for the Steam-Turbo Generator set (first Purchase Order for the project activity) on 4th May 2005, almost after one and a half year of project activity approval. The project proponent has approached a CDM Consultant in July 2005, immediately after the placement of the first Purchase Order. This will justify the delay in presenting the project activity as a CDM project activity. Furthermore, in accordance with the guidance of the Executive Board of	to provide the date when current consultant has been appointed with supporting documents also provide the chronological events of the project in the PDD CL is open

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		UNFCCC (EB-41 Meeting report/ Paragrah-67), the project proponent has revised the start date of the project activity as 4th May 2005 as per the first Contract Agreement between the project proponent and the manufacturer of the Steam-Turbo Generator set. Please refer to Section C.1.1 of the PDD/ Version 02 for details.	
CL 13 (continued) However project proponent is requested to provide the date when current consultant has been appointed with supporting documents also provide the chronological events in the PDD	B.3.4	The current CDM Consultant was appointed on 21st June 2006. The copy of the "Award for CDM Consultancy Services" to the current CDM Consultant has been provided to the Validator. The chronology of the events has been incorporated in Section B.5 of the PDD/Version 02.	**OK.** The chronology of the events has been incorporated in section B.5 of the PDD version 2.From the evidences DNV has validated that the delay in validation of the project is quite reasonable and is deemed appropriate. CL is closed.
CL 14 The project proponent is also requested to explain the discrepancy that although the board of directors approved the installation of a 8 MW WHR based power plant the first proposal which had been communicated with Agrinergy, was for a 16 MW WHR based power plant	B.3.4	The Board of M/s. Ankit Metal & Power Limited has approved 8MW WHR based power plant. The same will be backed up by around 4MW of power generation with steam from an AFBC boiler as well as with grid power. Therefore the captive power plant has been designed for a gross power generation capacity of around 12MW. This can also be substantiated with the	**OK.** DNV has validated that the project has consisted of 8MW WHR based power plant around 4MW of power generation with steam from an AFBC. In board approval note, contract agreements with boiler and turbine supplier, environmental clearance, and consent to establish 12 MW CPP have been considered. Thus mention of 16MW WHR based

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		Contract Agreements between M/s. Ankit Metal & Power Limited and the Boiler Supplier (*i.e.* M/s. Cethar Vessels (P) Limited) and manufacturer of the Steam-Turbo Generator set (*i.e.* M/s. Triveni Engineering & Industries Limited). These Contract Agreements have been provided to the Validator. Furthermore, in accordance with the decision of the Board, the project proponent has applied for Environmental Clearance for 12MW captive power plant to the Chief Environmental Officer, Environmental Department, Government of West Bengal (please refer to the letter from M/s. Ankit Metal & Power Limited to the Chief Environmental Officer dated 1st December 2005, Ref. No.:AMPL/CPP/0508/05-06). The Consent to Establish (NOC) from West Bengal Pollution Control Board has also been accorded to the project proponent for setting up a 12MW captive power plant (please refer to NOC dated 10th May 2205, Memo No.: 194-2N-439/2004). All these third party evidences are in accordance with the	power plant in the proposal of Agrinergy, CDM consultants is a typographical error on the part of that CDM consultant CL is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		Board's decision of setting up a 12MW captive power plant comprising of WHRB (of around 8MW) and AFBC boiler (of around 4MW). Therefore mention of 16MW WHR based power plant in the proposal of one of the CDM consultants is a typographical error on the part of that CDM consultant.	
CL 15 The project proponent is requested to substantiate the captive power plant efficiency with proper document	B.5.2	In accordance with the guidance of the methodology ACM0012/ Version 02, the project proponent has determined the efficiency of coal based captive power generation (*i.e.* baseline scenario) as the highest of the efficiency values provided by two manufacturers for power plants with specifications similar to that that would have been required to supply the project proponent with electricity that it receives from the project activity. Both the manufacturer's certificates on coal based captive power plant efficiency have been provided to the Validator.	**Not OK**. DNV has not received any manufactures certificate on coal based power plant to validate power plant efficiency. CL is open.
CL 15 (continued) DNV has not received any manufactures certificate on coal based power plant to validate power plant efficiency.	B.5.2	The certificates from two Power Plant Consultants on efficiency of coal based power plant have been submitted to the Validator. The same are as follows:	**OK.** The project proponent has submitted the efficiency of coal based power plant from two power plant consultants in accordance with the

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		1. Certificate from M/s. Shaktipunj Engineers Private Limited dated 12/12/2003 and 2. Certificate from M/s. Consultant & Engineers dated 13/12/2007. The coal based power plant efficiency (*i.e.* baseline scenario) has been taken to be the higher of the two values provided by two Power Plant Consultants in accordance with the Approved Consolidated Methodology-ACM 0012/Version 02.	approved consolidated methodology-ACM 0012/Version 02. Among these two highest efficiency 35% has been considered. CL is closed.
CL 16 Since three years waste gas data is not available with the project proponent, the project proponent is requested to provide the manufacturer's data for the amount of waste gas generated per unit of product. Also the project proponent is requested to provide documentation for the 3 years average production prior to project implementation	B.5.2	The manufacturer's data for the DRI kiln substantiating the amount of waste gas generated per unit of sponge iron produced has been provided to the Validator. The DRI kiln was commissioned on October 2005. The monthly sponge iron production data from October 2005 onwards have been provided to the Validator.	**NOT OK**. Project proponent has provided the amount of waste gas generated per unit of sponge iron production. The value has been fixed at 90000 m^3/hr for 350 TPD sponge iron production from the kiln whose diameter and length are 4.2 meter and 78 meter respectively. The last 30 months average sponge iron production is 51699 MT/annum Project proponent is requested to cap the base line on the basis of sponge iron production 51 699MT/annum instead of design value 94 500MT/annum CL is open

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
CL 16 (continued) Project proponent has provided the amount of waste gas generated per unit of sponge iron production. The value has been fixed at 90000 m3/hr for 350 TPD sponge iron production from the kiln whose diameter and length are 4.2 meter and 78 meter respectively. The last 30 months average sponge iron production is 56 181 MT/annum Project proponent is requested to cap the base line on the basis of sponge iron production 56 181 MT/annum instead of design value 94 500MT/annum	B.5.2	In accordance with the recommendation from the Validator, the baseline emission is capped on the basis of average sponge iron production of 56181 MT/annum (*i.e.* average annual production over the last 30 months). Please refer to Section B.6.2 of the PDD/ Version 02 for details.	**OK.** The DRI kiln has been started 36 months ago, but due to initial teething problems after the commissioning of the DRI kiln first six months production is omitted for capping of the baseline.. Rest 30 months average annual production is 56181 MT/annum. The baseline has been capped on that production of DRI kiln. CL is closed.
CL 17 The project proponent is requested to clarify the type of measuring instrument that will be used for measuring the waste gas flow in the project scenario.	B.10.4	The project proponent is in the process of installation of a flow meter for measurement of waste gas emanating from the DRI kiln. The specification of the same has been provided to the validator.	**OK.** The project proponent has installed annubar flow meter for gas flow measurement of Emerson process management (India) private limited who is the global leder in field instrumentation products as a result of its unmatched superior performance, flexibility and state of the art design. CL is closed.
CL 18 The project is requested to provide the following documents: □ Consent to establish	D.1.6	The Consent to Establish and the Consent to Operate for the project activity under consideration have been provided to the Validator.	**OK.** Project proponent has provided valid consent to establish dated 10 May 2005 and consent to operate dated 28 February 2007 and 27 February 2008. The consent to operate is valid up to 30

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
□ Consent to operate			May 2008. CL is closed.
CL 19 The project proponent has consulted the local stakeholders through one-to-one correspondences. The project proponent is requested to submit the copy of these letters for invitation of the stakeholders' comments	E.1.2	The project proponent has appraised all the identified stakeholders about the project activity through a Notice. The copy of the same has been provided to the Validator. All the stakeholders have appreciated the initiative of the project proponent. The stakeholder consultation letters have also been provided to the Validator.	**OK.** The entire stake holder consulting document has been provided to the validator. CL is closed.

APPENDIX B

CERTIFICATES OF COMPETENCE

CERTIFICATE OF COMPETENCE

Kumaraswamy Chandrashekara

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:		yes				
Technical Area		***CDM Validator***	***CDM Verifier***	***Sector Expert***	***Methodology Expert***	***Technical Reviewer***
Landfill gas		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Renewables	*Hydro power*	Jan 2009	Jan 2009		Jan 2009	Jan 2009
	Wind power	Jan 2009	Jan 2009			
	Other renewable	Jan 2009	Jan 2009			
Biomass		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Grid connection of isolated system		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Cement		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Waste-heat / waste-gas recovery		Jan 2009	Jan 2009	Jan 2009	Jan 2009	Jan 2009
Efficiency of thermal power plants		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Coal mine methane		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Fuel switch		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Manure management		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Waste / wastewater treatment		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Energy efficiency		Jan 2009	Jan 2009	Jan 2009	Jan 2009	Jan 2009
N_2O		Jan 2009	Jan 2009		Jan 2009	Jan 2009
HFCs		Jan 2009	Jan 2009	Jan 2009	Jan 2009	Jan 2009
Flare reduction		Jan 2009	Jan 2009		Jan 2009	Jan 2009
PFCs		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Charcoal		Jan 2009	Jan 2009	Jan 2009	Jan 2009	Jan 2009
CO_2 *recovery*		Jan 2009	Jan 2009	Jan 2009	Jan 2009	Jan 2009
Transport		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Non-renewable biomass		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Biofuel		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Pipeline leakage reduction		Jan 2009	Jan 2009		Jan 2009	Jan 2009
SF_6		Jan 2009	Jan 2009		Jan 2009	Jan 2009

Høvik, 9 January 2009

Michael Lehmann

Michael Lehmann
Technical Director, Climate Change Services

CERTIFICATE OF COMPETENCE

Soumik Biswas

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:		Yes				
Technical Area		***CDM Validator***	***CDM Verifier***	***Sector Expert***	***Methodology Expert***	***Technical Reviewer***
Landfill gas		Jan 2009				
Renewables	*Hydro power*	Jan 2009				
	Wind power	Jan 2009	Jan 2009			
	Other renewable					
Biomass		Jan 2009	Jan 2009			
Grid connection of isolated system						
Cement		Jan 2009	Jan 2009			
Waste-heat / waste-gas recovery		Jan 2009	Jan 2009			
Efficiency of thermal power plants						
Coal mine methane						
Fuel switch				Jan 2009		
Manure management						
Waste / wastewater treatment						
Energy efficiency		Jan 2009	Jan 2009			
N_2O						
HFCs						
Flare reduction						
PFCs						
Charcoal						
CO_2 recovery						
Transport						
Non-renewable biomass						
Biofuel						
Pipeline leakage reduction						
SF_6						

Høvik, 9 January 2009

Michael Lehmann
Technical Director, Climate Change Services

CERTIFICATE OF COMPETENCE

Indrajit Rana

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:	Yes				
Technical Area	***CDM Validator***	***CDM Verifier***	***Sector Expert***	***Methodology Expert***	***Technical Reviewer***
Landfill gas					
Renewables — *Hydro power*					
Renewables — *Wind power*					
Renewables — *Other renewable*					
Biomass					
Grid connection of isolated system					
Cement					
Waste-heat / waste-gas recovery	Jan 2009	Jan 2009			
Efficiency of thermal power plants					
Coal mine methane					
Fuel switch					
Manure management					
Waste / wastewater treatment					
Energy efficiency		Jan 2009	Jan 2009		
N_2O					
HFCs					
Flare reduction					
PFCs					
Charcoal					
CO_2 recovery					
Transport					
Non-renewable biomass					
Biofuel					
Pipeline leakage reduction					
SF_6					

Høvik, 9 January 2009

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CERTIFICATE OF COMPETENCE

Sasim Chattopadhyay

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:	Yes				
Technical Area	***CDM Validator***	***CDM Verifier***	***Sector Expert***	***Methodology Expert***	***Technical Reviewer***
Landfill gas					
Renewables — *Hydro power*					
Renewables — *Wind power*					
Renewables — *Other renewable*					
Biomass					
Grid connection of isolated system					
Cement					
Waste-heat / waste-gas recovery					
Efficiency of thermal power plants					
Coal mine methane					
Fuel switch					
Manure management					
Waste / wastewater treatment					
Energy efficiency	Jan 2009	Jan 2009	Jan 2009		
N_2O					
HFCs					
Flare reduction					
PFCs					
Charcoal					
CO_2 recovery					
Transport					
Non-renewable biomass					
Biofuel					
Pipeline leakage reduction					
SF_6					

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