
VALIDATION REPORT

STERLITE INDUSTRIES INDIA LIMITED

VALIDATION OF THE POWER GENERATION FROM THE PROPOSED 11.2 MW WASTE HEAT RECOVERY BOILER AT ISA SMELT FURNACE OF THE COPPER SMELTER, STERLITE INDUSTRIES INDIA LIMITED, TUTICORIN

REPORT NO. 4004

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VALIDATION REPORT

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Summary:

M/s Sterlite Industries India Limited (SIIL) has established a "Power Generation from the proposed 11.2 MW waste heat recovery boiler at ISA smelt furnace of the Copper Smelter, Sterlite Industries India Limited, Tuticorin", at SIIL factory premises situated at State Industries Promotion Corporation of Tamil Nadu (SIPCOT) Industrial Complex, Tuticorin, Tamil Nadu, India. The project activity involves recovery of waste gas heat energy from copper smelter to generate the steam by a Waste Heat Recovery Boiler (WHRB). Also further energy is added through FO fired super heater to increase the steam pressure up to 66 bar. The steam at 45 TPH flow rate and 66 bar pressure leads to 11.2 MW TG set for electricity generation. Generated electricity is consumed in house. As per Draft CDM PDD (August 2005) the electricity generated is partly substituting the power generation from combination of LSHS based CPP of SIIL, power supply from coal based CPP of MALCO and electricity supply from state grid. The selected baseline is economically most attractive option as per guidance of selection of baseline of ACM 0004/Version 02. The selected baseline is also having the lowest emission factor of the credible and realistic alternatives to the project emission and hence, it is conservative.

This is a project activity in sectoral scope 1 with application of ACM0004/Version 02 approved by CDM EB. The scope of validation of project activity includes:

- Review and submission of new methodology
- Review of the Draft CDM PDD for preparation to publish the PDD (s) exclusive of confidential data
- Publication of the Draft CDM PDD without confidential data
- Collection and publication of all comments of the global stakeholders
- Significance evaluation of the environmental impacts associated with the project activity, the global stakeholder comments received and followed with a site visit, if required
- Validation of the proposed project activity
- Submission of the Validation Report to the CDM EB

This report summarizes the results of the Document Review, background investigation, follow-up interviews with local stakeholders and the staff of SIIL at the project activity site during the visit to the SIIL factory premises situated at SIPCOT Industrial Complex, Tuticorin, India. This has been during and after the process of the stakeholder consultation wherein the Draft CDM PDD (August 2005) of the proposed project activity was available on the UNFCCC CDM web site.

This process enabled the team to conduct a risk-based review of material issues with impact on future claims of the emission reduction from the project activity. The concerns thereof, in the form of draft validation findings have been registered in the Validation Protocol.

The process of validation was performed on the basis of the UNFCCC established criteria, which refer to the Kyoto Protocol criteria and the modalities and procedures of CDM project activities. The relevant host country criteria CDM interim approval criteria as available on the Ministry and Environment and Forests (MoEF), Government of India web site shall also be considered while arriving at the Validation Opinion.

Several concerns as elicited in the Validation Protocol have been raised in the form of 3 (three) CARs and 13 (Thirteen) CLs and resulting in corrections required to the Draft CDM PDD (August 2005) and its annexes as well as evidences on meeting with the host country 'sustainability development indicators' of the CDM –interim approval criteria (http://envfor.nic.in/divisions/ccd/cdm_iac.html). The report summarizes TUV Rheinland Group's opinion of the project activity as described in the Revised Draft CDM PDD (September 2006) has met with all the requirements of CDM and correctly applied the methodology suggested (ACM0004/Vesion 02). The relevant host country criteria have been evaluated by TUV Rheinland and are also noted in the Authorization Letter (F. No. 4/24/2005 - CCC-, dated December 26, 2005) granted to the project activity by the DNA for the project activity meeting with the sustainability criteria.

VALIDATION REPORT

Report No.: 4004	Subject Group: Environment and Energy Technology	
Report title: Power Generation from the proposed 11.2 MW waste heat recovery boiler at ISA smelt furnace of the Copper Smelter, Sterlite Industries India Limited, Tuticorin		
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VALIDATION REPORT

Abbreviations

Abbreviation	Full Form
°C	Degree Centigrade
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CER	Certified Emission Reduction
CERC	Central Electricity Regulatory Commission
CL	Clarification Request
CO ₂	Carbon Dioxide
CPP	Captive Power Plant
DNA	Designated National Authority
DR	Document Review
EB	Executive Board
EF	Emission Factor
EIA	Environment Impact Assessment
FO	Fuel Oil
GHG	Greenhouse Gas (es)
Govt.	Government
I	Interview
IETA	International Emissions Trading Association
INR	Indian Rupees
IPCC	Intergovernmental Panel on Climate Change
kW	Kilo Watt
kWh	Kilo Watt Hour
Lol	Letter of Intent
LSHS	Low Sulphur High Stock
MALCO	Madras Aluminium Company
MNES	Ministry of Non Conventional Energy Sources, Government of India
MoEF	Ministry of Environment and Forest, Government of India
MoV	Means of Verification
MP	Monitoring Plan
MVP	Monitoring and Verification Plan
MW _e	Mega Watt Electrical
MW _{th}	Mega Watt Thermal
NGO	Non Government Organisation
NOC	No Objection Certificate
ODA	Official Development Assistance
PDD	Project Design Document
PLF	Plant Load Factor
SIIL	Sterlite Industries India Limited
SV	Site Visit
TNEB	Tamil Nadu Electricity Board
TNPCB	Tamil Nadu Pollution Control Board
tCO ₂	Tonnes Carbon dioxide
TG	Turbo Generator
TPH	Tonne Per Hour
WHRB	Waste Heat Recovery Boiler

Conversion Factors and Definitions

VALIDATION REPORT

-1 lakh = 100,000

-1 tonne = 1000 kg

VALIDATION REPORT

<i>Table of Contents</i>	<i>Page</i>
1 INTRODUCTION.....	15
Objective	15
Scope	16
GHG Project Description	16
2 METHODOLOGY.....	16
Review of Documents	17
Follow-up Interviews	19
Resolution of Clarification and Corrective Action Requests	19
3 VALIDATION FINDINGS.....	20
Corrective Action Request	22
CAR 01: SIIL has submitted host country approval letter, which serves as confirmation that the project activity meets the sustainable development criteria of India and there is no involvement of Official Development Assistance.	22
Clarifications	22
Participation Requirements, Contribution to Sustainable Development and Official Development Assistance	25
Project Design	25
Baseline	26
Additionality of the Project Activity	27
Monitoring Plan	30
Calculation of GHG Emissions	31
Environmental Impacts	32
Comments by Local Stakeholders	32
4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS.....	33
5 VALIDATION OPINION.....	34
6 REFERENCES.....	36
CDM VALIDATION PROTOCOL.....	39
Introduction	39
TABLE 1 MANDATORY REQUIREMENTS FOR CLEAN DEVELOPMENT MECHANISM (CDM) PROJECT ACTIVITIES.....	1

VALIDATION REPORT

1. THE PROJECT SHALL ASSIST PARTIES INCLUDED IN ANNEX I IN ACHIEVING COMPLIANCE WITH PART OF THEIR EMISSION REDUCTION COMMITMENT UNDER ART. 3..... 1
2. THE PROJECT SHALL ASSIST NON-ANNEX I PARTIES IN ACHIEVING SUSTAINABLE DEVELOPMENT AND SHALL HAVE OBTAINED CONFIRMATION BY THE HOST COUNTRY THEREOF..... 1
3. THE PROJECT SHALL ASSIST NON-ANNEX I PARTIES IN CONTRIBUTING TO THE ULTIMATE OBJECTIVE OF THE UNFCCC..... 2
4. THE PROJECT SHALL HAVE THE WRITTEN APPROVAL OF VOLUNTARY PARTICIPATION FROM THE DESIGNATED NATIONAL AUTHORITIES OF EACH PARTY INVOLVED..... 2
5. THE EMISSION REDUCTIONS SHALL BE REAL, MEASURABLE AND GIVE LONG-TERM BENEFITS RELATED TO THE MITIGATION OF CLIMATE CHANGE..... 3
6. REDUCTION IN GHG EMISSIONS SHALL BE ADDITIONAL TO ANY THAT WOULD OCCUR IN 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..... 3
7. POTENTIAL PUBLIC FUNDING FOR THE PROJECT FROM PARTIES IN ANNEX I SHALL NOT BE A DIVERSION OF OFFICIAL DEVELOPMENT ASSISTANCE..... 3
8. PARTIES PARTICIPATING IN THE CDM SHALL DESIGNATE A NATIONAL AUTHORITY FOR THE CDM..... 4
9. THE HOST COUNTRY SHALL BE A PARTY TO THE KYOTO PROTOCOL.... 4
10. COMMENTS BY LOCAL STAKEHOLDERS SHALL BE INVITED, A SUMMARY OF THESE PROVIDED AND HOW DUE ACCOUNT WAS TAKEN OF ANY COMMENTS RECEIVED..... 4
11. 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..... 5

VALIDATION REPORT

12. BASELINE AND MONITORING METHODOLOGY SHALL BE PREVIOUSLY APPROVED BY THE CDM METHODOLOGY PANEL.....	5
13. 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.....	6
14. PARTIES, STAKEHOLDERS AND UNFCCC ACCREDITED NGOS SHALL HAVE BEEN INVITED TO COMMENT ON THE VALIDATION REQUIREMENTS FOR MINIMUM 30 DAYS, AND THE PROJECT DESIGN DOCUMENT AND COMMENTS HAVE BEEN MADE PUBLICLY AVAILABLE.....	6
15. 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.....	6
16. THE BASELINE METHODOLOGY SHALL EXCLUDE TO EARN CERS FOR DECREASES IN ACTIVITY LEVELS OUTSIDE THE PROJECT ACTIVITY OR DUE TO FORCE MAJEURE.....	6
17. THE PROJECT DESIGN DOCUMENT SHALL BE IN CONFORMANCE WITH THE UNFCCC CDM-PDD FORMAT.....	6
18. THE PDD INDICATES ALL THE PARTIES INVOLVED IN PROJECT DEVELOPMENT INCLUDING SOURCE OF BASELINE STUDIES.....	7
TABLE 2 REQUIREMENTS CHECKLIST.....	8
A. GENERAL DESCRIPTION OF PROJECT ACTIVITY.....	8
A.1. PROJECT BOUNDARIES.....	8
A.1.1. ARE THE PROJECT'S SPATIAL (GEOGRAPHICAL) BOUNDARIES CLEARLY DEFINED?.....	8
A.1.2. ARE THE PROJECT'S SYSTEM (COMPONENTS AND FACILITIES USED TO MITIGATE GHGS) BOUNDARIES CLEARLY DEFINED?.....	8
A.2. TECHNOLOGY TO BE EMPLOYED.....	8
A.2.1. DOES THE PROJECT DESIGN ENGINEERING REFLECT CURRENT GOOD PRACTICES?.....	9
A.2.2. DOES THE PROJECT USE STATE OF THE ART TECHNOLOGY OR WOULD THE TECHNOLOGY RESULT IN A SIGNIFICANTLY BETTER	

VALIDATION REPORT

PERFORMANCE THAN ANY COMMONLY USED TECHNOLOGIES IN THE HOST COUNTRY?.....	9
A.2.3. IS THE PROJECT TECHNOLOGY LIKELY TO BE SUBSTITUTED BY OTHER OR MORE EFFICIENT TECHNOLOGIES WITHIN THE PROJECT PERIOD?.....	9
A.2.4. DOES THE PROJECT REQUIRE EXTENSIVE INITIAL TRAINING AND MAINTENANCE EFFORTS IN ORDER TO WORK AS PRESUMED DURING THE PROJECT PERIOD?.....	9
A.2.5. DOES THE PROJECT MAKE PROVISIONS FOR MEETING TRAINING AND MAINTENANCE NEEDS?.....	10
A.3. CONTRIBUTION TO SUSTAINABLE DEVELOPMENT.....	10
A.3.1. IS THE PROJECT IN LINE WITH RELEVANT LEGISLATION AND PLANS IN THE HOST COUNTRY?.....	11
A.3.2. IS THE PROJECT IN LINE WITH HOST-COUNTRY SPECIFIC CDM REQUIREMENTS?.....	13
A.3.3. IS THE PROJECT IN LINE WITH SUSTAINABLE DEVELOPMENT POLICIES OF THE HOST COUNTRY?.....	13
A.3.4. WILL THE PROJECT CREATE OTHER ENVIRONMENTAL OR SOCIAL BENEFITS THAN GHG EMISSION REDUCTIONS?.....	13
B. PROJECT BASELINE.....	14
B.1. BASELINE METHODOLOGY.....	14
B.1.1. IS THE BASELINE METHODOLOGY PREVIOUSLY APPROVED BY THE CDM METHODOLOGY PANEL?.....	14
B.1.2. IS THE BASELINE METHODOLOGY THE ONE DEEMED MOST APPLICABLE FOR THIS PROJECT AND IS THE APPROPRIATENESS JUSTIFIED?.....	14
THE BELOW QUESTIONS ONLY APPLY WHEN THE VALIDATOR IS REVIEWING THE BASELINE METHODOLOGY PRIOR TO SUBMISSION TO THE CDM EB (TWO STEPS APPROACH):.....	15
B.1.3. IS THE DISCUSSION AND SELECTION OF THE BASELINE METHODOLOGY TRANSPARENT?.....	15
B.1.4. IS THE PROPOSED BASELINE METHODOLOGY IN LINE WITH ONE OF THE APPROACHES OUTLINED IN PARAGRAPH 48 OF THE MARRAKECH ACCORDS?.....	15

VALIDATION REPORT

B.1.5. DOES THE BASELINE METHODOLOGY SPECIFY DATA SOURCES AND ASSUMPTIONS?.....	15
B.1.6. DOES THE BASELINE METHODOLOGY SUFFICIENTLY DESCRIBE THE UNDERLYING RATIONALE FOR ALGORITHM/FORMULAE (E.G. MARGINAL VS. AVERAGE, ETC.).....	15
B.1.7. DOES THE BASELINE METHODOLOGY SPECIFY TYPES OF VARIABLES USED (E.G. FUELS USED, FUEL CONSUMPTION RATES, ETC)?.....	15
B.1.8. DOES THE BASELINE METHODOLOGY SPECIFY THE SPATIAL LEVEL OF DATA (LOCAL, REGIONAL, NATIONAL)?.....	15
B.1.9. DOES THE BASELINE METHODOLOGY SPECIFY AN APPROACH TO DEFINE THE ADDITIONALITY OF THE PROJECT?.....	15
B.2. BASELINE DETERMINATION.....	15
B.2.1. IS THE APPLICATION OF THE METHODOLOGY AND THE DISCUSSION AND DETERMINATION OF THE CHOSEN BASELINE TRANSPARENT?	15
B.2.2. HAS THE BASELINE BEEN DETERMINED USING CONSERVATIVE ASSUMPTIONS WHERE POSSIBLE?.....	16
B.2.3. HAS THE BASELINE BEEN ESTABLISHED ON A PROJECT-SPECIFIC BASIS?.....	17
B.2.4. DOES THE BASELINE SCENARIO SUFFICIENTLY TAKE INTO ACCOUNT RELEVANT NATIONAL AND/OR SECTORAL POLICIES, MACRO-ECONOMIC TRENDS AND POLITICAL ASPIRATIONS?.....	17
B.2.5. IS THE BASELINE DETERMINATION COMPATIBLE WITH THE AVAILABLE DATA?.....	17
B.2.6. DOES THE SELECTED BASELINE REPRESENT THE MOST LIKELY SCENARIO AMONG OTHER POSSIBLE AND/OR DISCUSSED SCENARIOS?.....	18
B.2.7. IS IT DEMONSTRATED/JUSTIFIED THAT THE PROJECT ACTIVITY ITSELF IS NOT A LIKELY BASELINE SCENARIO (E.G. THROUGH (A) A FLOW-CHART OR SERIES OF QUESTIONS THAT LEAD TO A NARROWING OF POTENTIAL BASELINE OPTIONS, (B) A QUALITATIVE OR QUANTITATIVE ASSESSMENT OF DIFFERENT POTENTIAL OPTIONS AND AN INDICATION OF WHY THE NON-PROJECT OPTION IS MORE LIKELY, (C) A QUALITATIVE OR QUANTITATIVE ASSESSMENT OF ONE OR MORE BARRIERS FACING	

VALIDATION REPORT

THE PROPOSED PROJECT ACTIVITY OR (D) AN INDICATION THAT THE PROJECT TYPE IS NOT COMMON PRACTICE IN THE PROPOSED AREA OF IMPLEMENTATION, AND NOT REQUIRED BY A PARTY'S LEGISLATION/REGULATIONS)?.....	19
B.2.8. HAVE THE MAJOR RISKS TO THE BASELINE BEEN IDENTIFIED?.....	21
B.2.9. IS ALL LITERATURE AND SOURCES CLEARLY REFERENCED?.....	21
C. DURATION OF THE PROJECT/ CREDITING PERIOD.....	21
C.1.1. ARE THE PROJECT'S STARTING DATE AND OPERATIONAL LIFETIME CLEARLY DEFINED AND REASONABLE?.....	21
C.1.2. IS THE ASSUMED CREDITING TIME CLEARLY DEFINED AND REASONABLE (RENEWABLE CREDITING PERIOD OF MAX. TWO X 7 YEARS OR FIXED CREDITING PERIOD OF MAX. 10 YEARS)?.....	22
D. MONITORING PLAN.....	22
D.1. MONITORING METHODOLOGY.....	22
D.1.1. IS THE MONITORING METHODOLOGY PREVIOUSLY APPROVED BY THE CDM METHODOLOGY PANEL?.....	22
D.1.2. IS THE MONITORING METHODOLOGY APPLICABLE FOR THIS PROJECT AND IS THE APPROPRIATENESS JUSTIFIED?.....	22
D.1.3. DOES THE MONITORING METHODOLOGY REFLECT GOOD MONITORING AND REPORTING PRACTICES?.....	23
D.1.4. IS THE DISCUSSION AND SELECTION OF THE MONITORING METHODOLOGY TRANSPARENT?.....	23
THE BELOW QUESTIONS ONLY APPLY WHEN THE VALIDATOR IS REVIEWING THE MONITORING METHODOLOGY PRIOR TO SUBMISSION TO THE CDM EB (TWO STEPS APPROACH):.....	23
D.1.5. DOES THE MONITORING METHODOLOGY 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?.....	23
D.1.6. IS THE SELECTED MONITORING METHODOLOGY SUPPORTED BY THE MONITORED AND RECORDED DATA?.....	23

VALIDATION REPORT

D.1.7.	ARE THE MONITORING PROVISIONS IN THE MONITORING METHODOLOGY CONSISTENT WITH THE PROJECT BOUNDARIES IN THE BASELINE STUDY?.....	23
D.1.8.	HAVE ANY NEEDS FOR MONITORING OUTSIDE THE PROJECT BOUNDARIES BEEN EVALUATED AND IF SO, INCLUDED AS APPLICABLE?.....	23
D.1.9.	DOES THE MONITORING METHODOLOGY ALLOW FOR CONSERVATIVE, TRANSPARENT, ACCURATE AND COMPLETE CALCULATION OF THE EX POST GHG EMISSIONS?.....	23
D.1.10.	ARE FORMULAS USED FOR CALCULATIONS STATED AND CALCULATIONS INCORPORATED OR REFERENCED?.....	24
D.1.11.	DO THE METHODOLOGIES FOR CALCULATING EMISSION REDUCTIONS COMPLY WITH EXISTING GOOD PRACTICE?.....	24
D.1.12.	IS THE MONITORING METHODOLOGY CLEAR AND USER FRIENDLY?.....	24
D.1.13.	DOES THE METHODOLOGY MITIGATE POSSIBLE MONITORING ERRORS OR UNCERTAINTIES ADDRESSED?.....	24
D.2.	MONITORING OF PROJECT EMISSIONS.....	24
D.2.1.	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?.....	25
D.2.2.	ARE THE CHOICES OF PROJECT GHG INDICATORS REASONABLE?..	25
D.2.3.	WILL IT BE POSSIBLE TO MONITOR / MEASURE THE SPECIFIED PROJECT GHG INDICATORS?.....	25
D.2.4.	WILL THE INDICATORS GIVE OPPORTUNITY FOR REAL MEASUREMENTS OF ACHIEVED EMISSION REDUCTIONS?.....	25
D.2.5.	WILL THE INDICATORS ENABLE COMPARISON OF PROJECT DATA AND PERFORMANCE OVER TIME?	25
D.3.	MONITORING OF LEAKAGE.....	26
D.3.1.	DOES THE MONITORING PLAN PROVIDE FOR THE COLLECTION AND ARCHIVING OF ALL RELEVANT DATA NECESSARY FOR DETERMINING LEAKAGE?.....	26

VALIDATION REPORT

D.3.2.	HAVE RELEVANT INDICATORS FOR GHG LEAKAGE BEEN INCLUDED?.....	26
D.3.3.	DOES THE MONITORING PLAN PROVIDE FOR THE COLLECTION AND ARCHIVING OF ALL RELEVANT DATA NECESSARY FOR DETERMINING LEAKAGE?.....	26
D.3.4.	WILL IT BE POSSIBLE TO MONITOR THE SPECIFIED GHG LEAKAGE INDICATORS?.....	26
D.4.	MONITORING OF BASELINE EMISSIONS.....	26
D.4.1.	DOES THE MONITORING PLAN PROVIDE FOR THE COLLECTION AND ARCHIVING OF ALL RELEVANT DATA NECESSARY FOR DETERMINING BASELINE EMISSIONS DURING THE CREDITING PERIOD?.....	26
D.4.2.	IS THE CHOICE OF BASELINE INDICATORS, IN PARTICULAR FOR BASELINE EMISSIONS, REASONABLE?.....	27
D.4.3.	WILL IT BE POSSIBLE TO MONITOR THE SPECIFIED BASELINE INDICATORS?.....	28
D.5.	MONITORING OF SUSTAINABLE DEVELOPMENT INDICATORS/ ENVIRONMENTAL IMPACTS.....	28
D.5.1.	DOES THE MONITORING PLAN PROVIDE THE COLLECTION AND ARCHIVING OF RELEVANT DATA CONCERNING ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS?.....	28
D.5.2.	IS THE CHOICE OF INDICATORS FOR SUSTAINABILITY DEVELOPMENT (SOCIAL, ENVIRONMENTAL, ECONOMIC) REASONABLE?.....	28
D.5.3.	WILL IT BE POSSIBLE TO MONITOR THE SPECIFIED SUSTAINABLE DEVELOPMENT INDICATORS?.....	29
D.5.4.	ARE THE SUSTAINABLE DEVELOPMENT INDICATORS IN LINE WITH STATED NATIONAL PRIORITIES IN THE HOST COUNTRY?.....	29
D.6.	PROJECT MANAGEMENT PLANNING.....	29
D.6.1.	IS THE AUTHORITY AND RESPONSIBILITY OF PROJECT MANAGEMENT CLEARLY DESCRIBED?.....	29
D.6.2.	IS THE AUTHORITY AND RESPONSIBILITY FOR REGISTRATION, MONITORING, MEASUREMENT AND REPORTING CLEARLY DESCRIBED?.....	29

VALIDATION REPORT

D.6.3.	ARE PROCEDURES IDENTIFIED FOR TRAINING OF MONITORING PERSONNEL?.....	29
D.6.4.	ARE PROCEDURES IDENTIFIED FOR EMERGENCY PREPAREDNESS FOR CASES WHERE EMERGENCIES CAN CAUSE UNINTENDED EMISSIONS?.....	29
D.6.5.	ARE PROCEDURES IDENTIFIED FOR CALIBRATION OF MONITORING EQUIPMENT?.....	30
D.6.6.	ARE PROCEDURES IDENTIFIED FOR MAINTENANCE OF MONITORING EQUIPMENT AND INSTALLATIONS?.....	30
D.6.7.	ARE PROCEDURES IDENTIFIED FOR MONITORING, MEASUREMENTS AND REPORTING?.....	30
D.6.8.	ARE PROCEDURES IDENTIFIED FOR DAY-TO-DAY RECORDS HANDLING (INCLUDING WHAT RECORDS TO KEEP, STORAGE AREA OF RECORDS AND HOW TO PROCESS PERFORMANCE DOCUMENTATION).....	30
D.6.9.	ARE PROCEDURES IDENTIFIED FOR DEALING WITH POSSIBLE MONITORING DATA ADJUSTMENTS AND UNCERTAINTIES?.....	30
D.6.10.	ARE PROCEDURES IDENTIFIED FOR REVIEW OF REPORTED RESULTS/DATA?.....	30
D.6.11.	ARE PROCEDURES IDENTIFIED FOR INTERNAL AUDITS OF GHG PROJECT COMPLIANCE WITH OPERATIONAL REQUIREMENTS WHERE APPLICABLE?.....	30
D.6.12.	ARE PROCEDURES IDENTIFIED FOR PROJECT PERFORMANCE REVIEWS BEFORE DATA IS SUBMITTED FOR VERIFICATION, INTERNALLY OR EXTERNALLY?.....	30
D.6.13.	ARE PROCEDURES IDENTIFIED FOR CORRECTIVE ACTIONS IN ORDER TO PROVIDE FOR MORE ACCURATE FUTURE MONITORING AND REPORTING?.....	31
E.	CALCULATION OF GHG EMISSIONS BY SOURCE.....	31
E.1.	PREDICTED PROJECT GHG EMISSIONS.....	31
E.1.1.	ARE ALL ASPECTS RELATED TO DIRECT AND INDIRECT GHG EMISSIONS CAPTURED IN THE PROJECT DESIGN?.....	31
E.1.2.	ARE THE GHG CALCULATIONS DOCUMENTED IN A COMPLETE AND TRANSPARENT MANNER?.....	31

VALIDATION REPORT

E.1.3.	HAVE CONSERVATIVE ASSUMPTIONS BEEN USED TO CALCULATE PROJECT GHG EMISSIONS?.....	31
E.1.4.	ARE UNCERTAINTIES IN THE GHG EMISSIONS ESTIMATES PROPERLY ADDRESSED IN THE DOCUMENTATION?.....	32
E.1.5.	HAVE ALL RELEVANT GREENHOUSE GASES AND SOURCE CATEGORIES LISTED IN KYOTO PROTOCOL ANNEX A BEEN EVALUATED?.....	32
E.2.	LEAKAGE.....	32
E.2.1.	ARE POTENTIAL LEAKAGE EFFECTS BEYOND THE CHOSEN PROJECT BOUNDARIES PROPERLY IDENTIFIED?.....	33
E.2.2.	HAVE THESE LEAKAGE EFFECTS BEEN PROPERLY ACCOUNTED FOR IN CALCULATIONS?.....	33
E.2.3.	DOES THE METHODOLOGY FOR CALCULATING LEAKAGE COMPLY WITH EXISTING GOOD PRACTICE?.....	33
E.2.4.	ARE THE CALCULATIONS DOCUMENTED IN A COMPLETE AND TRANSPARENT MANNER?	33
E.2.5.	HAVE CONSERVATIVE ASSUMPTIONS BEEN USED WHEN CALCULATING LEAKAGE?.....	33
E.2.6.	ARE UNCERTAINTIES IN THE LEAKAGE ESTIMATES PROPERLY ADDRESSED?.....	33
E.3.	BASELINE EMISSIONS.....	33
E.3.1.	HAVE THE MOST RELEVANT AND LIKELY OPERATIONAL CHARACTERISTICS AND BASELINE INDICATORS BEEN CHOSEN AS REFERENCE FOR BASELINE EMISSIONS?	33
E.3.2.	ARE THE BASELINE BOUNDARIES CLEARLY DEFINED AND DO THEY SUFFICIENTLY COVER SOURCES AND SINKS FOR BASELINE EMISSIONS?.....	34
E.3.3.	ARE THE GHG CALCULATIONS DOCUMENTED IN A COMPLETE AND TRANSPARENT MANNER?	34
E.3.4.	HAVE CONSERVATIVE ASSUMPTIONS BEEN USED WHEN CALCULATING BASELINE EMISSIONS?.....	35
E.3.5.	ARE UNCERTAINTIES IN THE GHG EMISSION ESTIMATES PROPERLY ADDRESSED IN THE DOCUMENTATION?.....	36

VALIDATION REPORT

E.3.6. HAVE THE PROJECT BASELINE(S) AND THE PROJECT EMISSIONS BEEN DETERMINED USING THE SAME APPROPRIATE METHODOLOGY AND CONSERVATIVE ASSUMPTIONS?.....	36
E.4. EMISSION REDUCTIONS.....	37
E.4.1. WILL THE PROJECT RESULT IN FEWER GHG EMISSIONS THAN THE BASELINE SCENARIO?.....	37
F. ENVIRONMENTAL IMPACTS.....	38
F.1.1. HAS AN ANALYSIS OF THE ENVIRONMENTAL IMPACTS OF THE PROJECT ACTIVITY BEEN SUFFICIENTLY DESCRIBED?.....	38
F.1.2. ARE THERE ANY HOST PARTY REQUIREMENTS FOR AN ENVIRONMENTAL IMPACT ASSESSMENT (EIA), AND IF YES, IS AN EIA APPROVED?.....	38
F.1.3. WILL THE PROJECT CREATE ANY ADVERSE ENVIRONMENTAL EFFECTS?.....	39
F.1.4. ARE TRANSBOUNDARY ENVIRONMENTAL IMPACTS CONSIDERED IN THE ANALYSIS?.....	39
F.1.5. HAVE IDENTIFIED ENVIRONMENTAL IMPACTS BEEN ADDRESSED IN THE PROJECT DESIGN?.....	39
F.1.6. DOES THE PROJECT COMPLY WITH ENVIRONMENTAL LEGISLATION IN THE HOST COUNTRY.....	39
G. STAKEHOLDER COMMENTS.....	40
G.1.1. HAVE RELEVANT STAKEHOLDERS BEEN CONSULTED?.....	41
G.1.2. HAVE APPROPRIATE MEDIA BEEN USED TO INVITE COMMENTS BY LOCAL STAKEHOLDERS?.....	41
G.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?.....	41
G.1.4. IS A SUMMARY OF THE STAKEHOLDER COMMENTS RECEIVED PROVIDED?.....	42
G.1.5. HAS DUE ACCOUNT BEEN TAKEN OF ANY STAKEHOLDER COMMENTS RECEIVED?.....	42

VALIDATION REPORT

TABLE 3 RESOLUTION OF CORRECTIVE ACTION AND CLARIFICATION
REQUESTS..... 44

SIIL has submitted host country approval letter, which serves as confirmation that the project activity meets the sustainable development criteria of India and there is no involvement of Official Development Assistance. 44

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Appendix A: Validation Protocol

VALIDATION REPORT

1 INTRODUCTION

Sterlite Industries India Limited (SIIL), has commissioned TUV Industrie Service GmbH TUV Rheinland Group (TUV Rheinland) to validate their "Power Generation from the proposed 11.2 MW waste heat recovery boiler at ISA smelt furnace of the copper smelter, Sterlite Industries India Limited, Tuticorin" as a CDM project activity. The project activity is expected to avoid 224,730 tCO_{2e} during crediting period of first 10 (Ten) years due to partial replacement of power generation from combination of electricity supply from LSHS based CPP of SIIL, power supply from coal based CPP of MALCO and electricity supply from state grid as per Revised Draft CDM PDD (September 2006). The baseline for the project activity is selected as the emission by LSHS based engine generation unit with waste heat recovery unit which is the most economical source and is in line with the guideline of the ACM 0004/Version 02.

The objective of the Validation Report is to give Validation Opinion on this proposed CDM project activity. The scope of the work is to review the Draft CDM PDD (August 2005), its annexes, other relevant documents, publish Draft CDM PDD (August 2005) and get opinion of global stakeholders arrive at a Validation Opinion and submit the Validation Report to CDM EB.

The services of the entire validation is performed by the Asia-Group of TÜV Rheinland Group under the leadership of TÜV Rheinland India and with technical support of experts coming from our Asia Group and other support, as and where, required.

Team Member	Role	Office
Darshak Mehta	Team Leader - GHG Auditor	India
Manojkumar Borekar	GHG Auditor	India
Dr. Manfred Brinkmann	Internal Reviewer	Japan

Objective

This report is representing the findings of the validation exercise along with the methodology applied for validation, compliance of the project activity with the requirements of the UNFCCC criteria including:

- Kyoto Protocol,
- Marrakesh Accords
- Guidelines issued by UNFCCC for validation of the project activity.

The Client has commissioned TUV Rheinland to validate their CDM project activity. The validation serves as design verification and is a requirement of all Client project activity. The purpose of a validation is to have an independent third party assess the project activity design. In particular, the project activity's baseline, the MP, and the project activity's compliance with relevant UNFCCC and host country criteria are validated in order to confirm that the project activity design as documented is sound and reasonable and meets the stated requirements and identified criteria. Validation is a requirement for all CDM project activities and is seen as necessary to provide assurance to stakeholders of the quality of the project activity and its intended generation of Certified Emission Reductions (CERs).

UNFCCC criteria refer to the Kyoto Protocol criteria and the CDM rules and modalities as agreed in the Bonn Agreement and the Marrakech Accords.

TUV Rheinland has thus checked amongst other:

- Format of the documents as required by UNFCCC
- Additionality of the project activity

VALIDATION REPORT

- Criteria for sustainable development by the host country (India),
- Baseline of the project activity
- GHG emission accounting practice.

TUV Rheinland when arriving at its opinion applied the above-mentioned criteria. The project activity has followed the methodology as explained in quotation numbered TUV/Pne/QVS4004/1702/MS dated January 28, 2004.

Scope

The scope of the validation is as follows:

- Review of the Draft CDM PDD for preparation to publish the PDD exclusive of confidential data
- Publication of Draft CDM PDD without confidential data
- Collection and publication of all comments of global stakeholders
- Significance evaluation of global stakeholder comments received and site visit
- Validation of the proposed project activity
- Submission of the Validation Report to the CDM EB

The Validation Report referred to the Validation and Verification Manual in preparation and has been prepared as per CDM report template version 3, December 03 published by IETA. TUV Rheinland employed risk-based approach to validation, focusing on the identification of significant risks for project activity implementation and reduction in GHGs, was used as a basis for assessing the project activity baseline scenario and the claimed emission reductions from the project activity.

Additionality of the project activity was demonstrated in the Revised Draft CDM PDD (September 2006) on basis of the project activity having to overcome technological barrier and managerial barriers.

TUV Rheinland has confirmed the data submitted by SIIL and checked the underlying calculations.

Further, the validation is not meant to provide any consulting to the project activity proponent. However, stated requests for CLs and/or CARs may provide input for improvement of the project activity design.

GHG Project Description

M/s SIIL has established a waste heat recovery based CPP. The project activity involves, receiving exhaust gases from copper smelter in a WHRB, generate steam and superheat it through external FO fired super heater to produce 45 TPH steam at 66 kg/cm² pressure, The steam is then passed through a turbine which can generate maximum gross electricity of 11.2 MW.

The electricity generated from the project activity is meeting partial electricity requirements of SIIL plant at Tuticorin which would have been met otherwise through a combination of electricity supply from LSHS based CPP of SIIL, power supply from coal based CPP of MALCO and electricity supply from state grid as per Draft CDM PDD (September 2006). The baseline of PA is economically most attractive option of LSHS based engine generator set having steam generation from exhaust of engine.

2 METHODOLOGY

The validation process consists of the following phases:

VALIDATION REPORT

- I. Review of Documents
 - A. Review of the SIIL's documentation
 - B. Desk review of identified supporting documents
- II. Follow-up interviews with project activity stakeholders
- III. Issue of the Draft Validation Report
- IV. Resolution of outstanding issues and the issuance of the Validation Report and Opinion

Review of Documents

Documents are most important evidences in validation process. Document Review was done as per the following criteria –

- Review of Documents of project proponents onsite and offsite as categorised as Category 1 Documents in the reference section
- Desk review of identified supporting documents categorised as Category 2 Documents in the reference section

As mentioned, all the documents reviewed are listed according to above categories in section 6. Other official documents and referenced web sites reviewed, to result in the conclusion of TÜV Rheinland's Validation Opinion, are also referred to in the same section.

In order to ensure transparency in the process, the Validation Protocol is customised for the project activity. The protocol shows in a transparent manner, criteria, 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 TÜV Rheinland documented how a particular requirement has been validated and the results of validation

The Validation Protocol consists of three tables. Different columns in these tables are described in table 1, 2 and 3 of figure 1 – Validation Protocol tables.

The study generated number of questions regarding the participation requirements, project design, baseline, monitoring plan calculation of GHG emission reduction and comments by local stakeholders. Explanations to these questions are sought from the project activity proponents and based on the submitted details having addressed these concerns a Validation Opinion is being formed. These queries are available within the text of this report as well as enclosed in completed and up-dated Validation Protocol annexed (Appendix A) to the report.

Findings established during the validation could either be seen as a non-fulfilment of validation criteria or where the risk to the fulfilment of project activity objectives is identified. CAR are issued, where:

- a. Mistakes have been made with a direct influence on project activity results
- b. CDM or host party requirements have not been met
- c. There is a risk that the project activity would not be accepted as a CDM project activity or that the emission reductions will not be certified

The validation team, has also used the additional labels in the form of request for Clarification where additional information is needed through the reporting of draft implications after having performed the Document Review (DR) and/or telephonic or personal Interview (I) and/or as when during the Site Visit (SV). This is along with the identification as Open (OP) for CLs that could not be completely closed during the formulation of the Validation Opinion and as a trail prior to or during the verification process.

<i>Validation Protocol Table 1: Mandatory Requirements</i>			
<i>Requirement</i>	<i>Reference</i>	<i>Conclusion</i>	<i>Cross reference</i>

VALIDATION REPORT

<i>The requirements the project activity must meet.</i>	<i>Gives reference to the legislation or agreement where the requirement is found.</i>	<i>This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the Validation Report.</i>	<i>Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.</i>
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Validation Protocol Table 2: Requirement checklist

Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
<i>The various requirements in Table 1 are linked to checklist questions the project activity should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.</i>	<i>Gives reference to documents where the answer to the checklist question or item is found.</i>	<i>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.</i>	<i>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.</i>	<i>This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). Clarification (CL) is used when the validation team has identified a need for further clarification. Open (OP) is used in the final validation report when, and in case, a justifiable exception is made in terms of pending clarifications residual to those identified in the draft validation stage and those that do not affect the Validation Opinion.</i>

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
<i>If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.</i>	<i>Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.</i>	<i>The responses given by the Client or other project participants during the communications with the validation team should be summarised in this section.</i>	<i>This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".</i>

Figure 1 Validation Protocol tables

VALIDATION REPORT

Follow-up Interviews

In order to reach a Validation Opinion follow up of interviews were conducted with the representatives of project activity proponent and regulatory officials. Prior to the interview the salient points to be discussed with each identified person was planned. Details of topics discussed are given in the following table 1.

Table 1: Summary of Follow-up Interviews on Site

Sr. No.	Interviewee	Topics Discussed
Date: December 22, 2005		
1	Chief Executive Officer, SIIL, Tuticorin	Conceptualisation of the project activity, project activity cost, planning of the project activity, Contribution of CDM to the project activity.
2	Manager – Utilities and CPP, SIIL, Tuticorin	Baseline scenario, operation of project activity
3	Member, Meelavittan, Local Village Panchayat, Tamil Nadu	Information on project activity, social, economic and environmental impact of the project activity, Consideration of CDM in the project activity.
4	Director, ABLE Foundation (NGO)	Information on project activity, social, economic and environmental impact of the project activity
5	Director, Chavaliala Roche Society	Information on project activity, social, economic and environmental impact of the project activity
6	Superintending Engineer, TNEB, Tuticorin	Billing of electricity, procedures and rules of third party sell of electricity, transmission and distribution losses
Date: December 23, 2005		
7	Manager- Health Safety and Environment, SIIL, Tuticorin	Process of environmental clearance, comments from the public hearing, due account of the comments in project design, Consideration of CDM in the project activity

TUV Rheinland considered the views obtained in these interviews while arriving at Validation Opinion.

Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve the requests for CARs and CLs and any other outstanding issues, which needed to be clarified for TUV Rheinland's validation of the project activity as a valid CDM project.

To maintain transparency in the process a Draft Validation Report is prepared and submitted to SIIL by TUV Rheinland. SIIL was asked to give clarification on the issues raised in the Draft Validation Report and also thereby an option to revising the Draft CDM PDD (August 2005), in the case project proponent found it necessary to resolve the issues raised by TUV Rheinland. SIIL responded to the CLs and CARs issued by TUV Rheinland with necessary revisions to the Draft CDM PDD of August 2005 to result in the Revised Draft CDM PPD (September 2006) that was resubmitted to TUV Rheinland Group.

These responses are accounted for while preparing the Validation Report and formulating the Validation Opinion.

VALIDATION REPORT

3 VALIDATION FINDINGS

In the following paragraphs observations of TUV Rheinland with respect to the review of documents as well as observations and interviews during the site visit are noted. The project activity was observed for compliance with requirements of Kyoto Protocol, Decision 21/8, host country's criteria for sustainable development and guidelines provided by UNFCCC. A detailed account of the finding is documented in Validation Protocol as Appendix A.

Where TUV Rheinland has identified issues that needed further inputs or those that represent a risk to the fulfilment of the project activity objectives, a CL or CAR respectively, have been raised upon identification of these issues. The CL and CAR are stated, where applicable, in the following sections and are further documented in the Validation Protocol.

The validation of the project activity resulted in 3 (three) CARs and 13 (Thirteen) CLs.

During the preparation of Draft Validation Report three main issues that were identified as CARs, it was found necessary for the project activity proponents to initiate immediate Corrective Actions (CA) and therefore also their closure before proceeding to the validation stage.

The project proponent has responded to the CARs and CLs. The Draft CDM PDD (August 2005) has been modified and resubmitted as revised Draft CDM PDD (September 2006) in line with the CARs and CLs raised by TUV Rheinland. These responses and revised Draft CDM PDD (September 2006) are considered while arriving at the Validation Opinion.

Corrective Action Requests (CAR)

CAR 01: Host country approval from DNA of India needs to be submitted to TUV Rheinland for assessment and confirmation that the proposed CDM project activity contributes to the sustainable development criteria of India.

CAR 02: LSHS based CPP is one of the sources of electricity supply for selected baseline in Draft CDM PDD (August 2005). If it is still featuring as part of the baseline after evaluation as indicated in CL 03, then the following needs to be considered while estimating the baseline.

1. LSHS based CPP is generating steam as well as electricity. Thus, energy and hence, the emission due to LSHS needs to be attributed to both the components of energy in appropriate proportions. The overall EF in baseline should also be corrected accordingly.
2. Baseline data given in Annex 3 of the Draft CDM PDD (August 2005) (table of Generation data for CPP 2: 22.5 MW LSHS based power plant) are not confirming with the data submitted to TUV Rheinland during the site visit. Appropriate correction is required in the Draft CDM PDD (August 2005) and subsequent baseline calculations if, this data forms part of the baseline after selection of baseline as per CL 03.

CAR 03: Draft CDM PDD (August 2005) has calculated the EF by considering import of electricity from grid on basis of state grid of Tamil Nadu. As per latest guideline for applicability of ACM0002/Version 05, SIIL needs to establish the baseline on basis of import of electricity from Southern India grid.

Clarification

CL 01: Section C of Draft CDM PDD (August 2005) has indicated that the starting date of project activity is April 2003, when construction of the project activity begun and the first crediting period started on July 26, 2005. SIIL needs to submit appropriate evidences to support starting date of project activity and beginning of first crediting period for the project activity.

CL 02: As per ACM0004/Version 02, alternatives to the baseline of the project activity should include project activity not undertaken as a CDM project activity. This alternative is not explored

VALIDATION REPORT

while evaluating alternatives to the baseline of project activity. SIIL should include this as an alternative to the project activity.

CL 03: As per ACM0004/Version 02, the baseline should be selected on basis of economically most attractive alternative from the alternatives that do not face any prohibitive barriers. SIIL needs to evaluate all the selected alternatives for their economical attractiveness and justify selection of a particular alternative as baseline to the project activity as per ACM0004/Version 02.

CL 04: SIIL needs to clarify the following with respect to additionality

1. The format of 'Tools for Demonstration and Assessment of Additionality' should be in line with the latest version approved by CDM EB.
2. SIIL needs to submit evidence that CDM revenues due to the project activity were considered in application to the banks and financial institutes prior to financial closure of the project activity

CL 05: While evaluating alternatives to the project activity in step 1 of the additionality tools, Alternative 4 – 'Continuation of current situation' is indicated to be same as the Alternative 1 – 'Import of 11.2 MW electricity from TNEB grid'. However, the current situation at the time of project activity conceptualisation involves use of electricity from the LSHS based reciprocating engine based CPP. SIIL needs to re-evaluate Alternative 4 as described in Draft CDM PDD (August 2005).

CL 06: As part of Sub - step 3a of the 'Tools for Demonstration and Assessment of Additionality' it is stated that "- - - -this would preclude any investment in a new captive power plant based on fossil fuel (LSHS)". SIIL needs to explain how is investment in a new captive power plant based on fossil fuel (LSHS) relevant while comparing the alternative to project activity. The text needs further clarification in this respect.

CL 07: As part of Sub-step 3a of the additionality tools, it is noted that the statutory requirements for WHRB has reduced the plant availability from 98 per cent to 93.5 per cent. This statement needs to be substantiated with evidences by SIIL.

CL 08: As part of common practice analysis in step 4 of the 'Tools for Demonstration and Assessment of Additionality', other copper smelters in India are analysed. SIIL needs to submit evidence on practices followed by these smelters with respect to waste heat recovery based power generation.

CL 09: Monitoring plan of the Draft CDM PDD (August 2005) needs to revise the monitoring plan and incorporate all the parameters, which are necessary for the revised baseline conditions, which have been arrived after economic analysis.

CL 10: SIIL needs to submit evidence of comments by Village Panchayat. The process of consultation of the stakeholders should be described within the text of Draft CDM PDD.

CL 11: SIIL needs to incorporate technical specifications of the monitoring instruments, in order to address uncertainties in measurement of GHG emissions.

CL 12: The following procedures are required from SIIL:

- i. Training of monitoring personnel related to GHG emission reduction project activity
- ii. Emergency preparedness for cases where emergencies can cause unintended GHG emissions
- iii. Calibration of monitoring equipment related to GHG emission reduction project activity
- iv. Maintenance of monitoring equipment and installations related to GHG emission
- v. Monitoring, measurements and reporting of GHG emission

VALIDATION REPORT

- vi. Day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)
- vii. Dealing with possible monitoring data adjustments and uncertainties related to measurement of GHG emission
- viii. Review of reported results/data related to GHG emission
- ix. Internal audits of GHG project activity compliance with operational requirements where applicable
- x. Project activity performance reviews before data is submitted for verification, internally or externally
- xi. Corrective actions in order to provide for accurate future monitoring and reporting GHG emission reduction

CL 13: Draft CDM PDD (August 2005) is unclear with respect to persons / organisations involved in development of baseline and monitoring. SIIL should identify the responsible person for above-mentioned activity along with their contact details.

Final Conclusion

Corrective Action Request

CAR 01: *SIIL has submitted host country approval letter¹, which serves as confirmation that the project activity meets the sustainable development criteria of India and there is no involvement of Official Development Assistance.*

CAR 01 is thus closed.

CAR 02: *SIIL has evaluated options for baseline as per guidance of ACM0004/Version 02 and arrived at the conclusion that the LSHS based power plant with provision of steam generation from exhaust of engine set is economically most attractive option to the project activity as part of resolution of CL 03 in Revised Draft CDM PDD (September 2006).*

1. *SIIL has modified the calculations of baseline along with the monitoring plan to reflect appropriate value of emission due to production of electricity by LSHS based engine generator set having facility to generate steam from exhaust of engine. The changes can be seen in section B.6 of the Revised Draft CDM PDD (September 2006)*
2. *The baseline data considered for CPP 2 are now in line with the data made available to TUV Rheinland.*

CAR 02 is thus closed.

CAR 03: *Revised Draft CDM PDD (September 2006) has revaluated the baseline of the project activity by considering most economical option of electricity generation i.e. LSHS based engine generator set having facility to generate steam from exhaust of engine. Since import of electricity from state grid of Tamil Nadu / Southern region grid of India is not considered in the baseline, there is no need to calculate the EF on basis of Southern India grid.*

CAR 03 is thus closed.

Clarifications

CL 01: *Project proponent has submitted evidence (Thermal Systems (Hyderabad) Pvt.Ltd., April 10, 2004, Invoice against the customer 'Sterlite Industries (India) Limited' order number*

¹ MoEF, December 26, 2005, F- No 4/24/2005-CCC, Host Country approval to '11.2 MW Power Generation by Waste Heat Recovery Boiler at ISA Smelt Furnace of Copper smelter at Tuticorin, Tamil Nadu by Sterlite Industries India Limited – regarding CDM

VALIDATION REPORT

3LTPA/PS/WHRS/Contract-001, RR/LR No 36287, On the basis of this evidence it is concluded conclude that the project activity started in April 2003.

SIIL has submitted document (SIIL, July 26, 2005, Take over certificate for 11.2 MW STG set) suggesting that 11.2 MW STG from Demag Delaval Industrial Turbomachinery was taken over by SIIL on July 26, 2005. This has confirms that the crediting period for the project activity started on July 26, 2006.

CL 01 is thus closed

CL 02: Revised Draft CDM PDD (September 2006) section B has incorporated “project activity not undertaken as a CDM project activity” as an option while evaluating alternatives to the baseline of project activity, which is as per ACM0004/Version 02.

CL 02 is thus closed

CL 03: Revised Draft CDM PDD (September 2006) has made an economic evaluation of all the credible and plausible alternatives to the proposed project activity to decide the baseline scenario as per requirement of ACM0004/Version 02. The analysis has suggested that the option of electricity generation through LSHS fired engine generator set having facility to generate steam from exhaust of engine is the most economical option for the project activity. TUV Rheinland has also confirmed that this option is having lowest emission of CO₂ per kWh generated. Thus, this is most conservative approach for selection of the baseline.

CL 03 is thus closed.

CL 04: Following clarifications are submitted by SIIL with respect to additionality of the project activity.

- 1. Revised Draft CDM PDD (September 2006) has applied the latest version of ‘Tools for Demonstration and Assessment of Additionality’ as approved by CDM EB.*
- 2. SIIL has submitted evidence (SIIL, February 15, 2003, Order number 113019908, placed on Ernst & Young for CDM advisory services) suggesting that CDM revenues were considered during the conceptualization of project activity.*

CL 04 is thus closed

CL 05: Revised Draft CDM PDD (September 2006) has re-evaluated Alternative 4 – ‘Continuation of Current situation’ and there is no duplication of same alternatives in Revised Draft CDM PDD (September 2006).

CL 05 is thus closed

CL 06: Project proponent has made appropriate changes to clarify alternative “Option (b.1): Import of electricity from TNEB/SRG”, in Revised Draft CDM PDD (September 2006).

CL 06 is thus closed

CL 07: There is no evidence suggesting that the plant availability would have reduced from 98 per cent to 93.5 per cent due to statutory requirements for the WHRB. However, SIIL has submitted the evidence (The Winter Company April 22, 1998, Sterlite Copper Smelter Expansion, Project No. 175-01) to demonstrate that the expert opinion on waste heat recovery boiler for the copper smelter was negative. One of the main reasons sighted for this was that the boiler maintenance would reduce availability of the copper smelter.

CL 07 is thus closed

CL 08: SIIL has referred to the following evidences to indicate the practices followed by other smelters from the project activity:

VALIDATION REPORT

1. Website "<http://www.xstratatech.com/en/>"
2. ICRA, May 2005, Copper, The Indian Copper Industry
3. <http://www.hindustancopper.com/home.asp>

ISASMELT smelting process installations are available in Australia, Belgium, China, Germany, India, Malaysia and United States of America. Moreover from ISASMELT history, it is found that ISASMELT smelting process installation is only available with SIIL in India.

As per "Report by ICRA Information, Grading & Research Service, COPPER The Indian Copper Industry, May 2005", The Industry currently has just 3 major players (Sterlite, Hindalco and Hindustan Copper Ltd.). In addition to all, as per "© Brook Hunt & Associate Ltd 2005", Hindalco Industries Limited (Operator: Birla Copper) has commissioned Outokumpu flash furnace with steam from flash furnace waste heat recovery and coal fired boiler. The Birla copper smelter at Dahej was having capacity of 250,000 Tonnes per annum at the time of project conceptualisation. Hindustan Copper Ltd. has also commissioned Outokumpu flash furnace without waste heat recovery system. Hindustan Copper is of 47000 Tonnes per annum capacity, which was too small, compare to the project activity.

CL 08 is thus closed.

CL 09: SIIL has done economic analysis of all the plausible and credible alternatives to the project activity and concluded that the baseline of the project activity is LSHS based engine generator set with provision of waste heat from exhaust of the engine. Section B.6 of the Revised Draft CDM PDD (September 2006) has incorporated all the necessary parameters for measurement of baseline emission.

Thus CL 09 is closed.

CL 10: SIIL has submit evidence of comments by Village Panchayat vide following documents:

1. Counsellor-18 Ward (Aiadm), South Veera Pandiyapuram (PO), Ottapidaram Taluk, Tuticorin, April 24, 2005
2. Chillanatham Panchayat Ottapidaram Panchayat Division Tuticorin District, President, April 24, 2005

Revised Draft CDM PDD (September 2006) section E.1, has described the process of consultation of the stakeholders.

CL 10 is thus closed.

CL 11: Revised Draft CDM PDD (September 2006), Annexure 4 has demonstrated specifications of the monitoring instruments. These parameters will help in determining uncertainties in the monitoring parameters.

CL 11 is thus closed

CL 12: SIIL has submitted documents (SIIL, Tuticorin, Tamil Nadu, CDM Project Manual, 11.2 MW WHRB at ISA Smelt furnace) relating to the procedures as mentioned in CL 12.

CL 12 is thus closed.

CL 13: Revised Draft CDM PDD (September 2006) has incorporated name and entity responsible for determination of baseline and monitoring methodology in section B.8 along with contact details.

CL 13 is thus closed.

VALIDATION REPORT

Participation Requirements, Contribution to Sustainable Development and Official Development Assistance

The project activity is involving India as the only party. No Annex I party is involved in the project activity at this stage. DNA of India has granted the project activity host party approval, through letter, F. No. 4/24/2005 - CCC-, dated December 26, 2005.

India has ratified the Kyoto Protocol (KP). Ministry of Environment and Forest (MoEF), Government of India is the DNA for India. As per the website (http://www.envfor.nic.in/cdm/cdm_india.htm) of MoEF, DNA assesses the project activities. While granting host country approval, DNA of India notes that:

1. The project activity meets the national sustainable development priority and complies with the legal framework so as to ensure that the project activity is compatible with the local priorities and stakeholders have been duly consulted
2. The project activity proposals do not involve diversion of Official Development Assistance (ODA) in accordance with the modalities and procedures.

Thus, having been granted the host country approval it is concluded that the project activity meets the above-mentioned criteria.

An additional evidence of no involvement of ODA in the project activity is provided by a self-certifying letter (SIIL, December 23, 2005, Letter by Chief Financial Officer of SIIL stating sources of finance for 3 lakh tonne per annum expansion of SIIL at smelter) by SIIL, which states that the project activity was carried out through internal accrual of SIIL.

Project Design

Description of the project activity

SIIL Tuticorin is a copper smelting facility that was expanded from 1.8 lakh tonne copper per annum to 3 lakh tonne copper per annum. As part of capacity expansion, a WHRB was installed to generate steam. This steam is further super heated through a FO fired super heater and generates 45 TPH steam at 66 bar pressure. The steam is then passed through 11.2 MW condensing steam turbine to generate electricity.

Prior to installation of the project activity, the electricity requirement of the complex was met through combination of electricity supply from LSHS based CPP of SIIL, power supply from coal based CPP of MALCO and electricity supply from state grid. It may be noted here that the LSHS based engine generating unit is also producing steam from exhaust of the engine. Thus, the energy of LSHS is utilised for electricity generation as well as steam generation.

In absence of this project activity, the electricity generated by the project activity could have been generated by most economical means of electricity generation i.e., electricity generation through the LSHS based engine generator set where waste heat from engine exhaust was used for steam generation.

Starting date, Crediting Period and Life time of the project activity

The project activity has chosen fixed crediting period of 10 (Ten) years. This crediting period is less than the project activity lifetime of 20 (Twenty) years as stated in Revised Draft CDM PDD (September 2006).

Starting date of the project activity is April 2003 as indicated in section C.1.1 of the Draft CDM PDD (August 2005). SIIL has submitted supportive (Thermal Systems (Hyderabad) Pvt.Ltd., April 10, 2004, Invoice against the customer 'Sterlite Industries (India) Limited' order number

VALIDATION REPORT

3LTPA/PS/WHRS/Contract-001, RR/LR No 36287). On the basis of mentioned Invoice copy, TÜV Rheinland conclude that the project activity started in April 10, 2003.

First crediting period of the project activity starts from July 26, 2005. This is ascertained through takeover certificate document (SIIL, July 26, 2005, Take over certificate for 11.2 MW STG set) signed between SIIL and Demag Delaval Industrial Turbomachinery suggesting that starting date of crediting period for the project activity is July 26, 2005.

Baseline

The project activity is applying ACM0004/Version 02 'Consolidated baseline methodology for waste gas and/or heat for power generation' for the project activity. The baseline methodology is approved by the CDM EB in its meeting of March 3, 2006 (EB 23).

The project activity is an electricity generation project in an industrial facility and based on utilization of waste heat of the gases for generation of electricity and adheres to the Sectoral Scope 1 that it represents.

TÜV Rheinland has checked the applicability criterion for the methodology ACM0004/Version 02. The applicability conditions are met by the project activity.

As per ACM0004/Version 02, the baseline scenario should be selected from evaluation of alternatives. As stipulated by the methodology, Revised Draft CDM PDD (September 2006) has identified the following options to the project activity:

- Option a. The proposed project activity not undertaken as a CDM project activity;
- Option b Import of electricity from the grid
 - (b.1) Import of electricity from TNEB/MALCO
 - (b.2) Import of electricity from MALCO
- Option c New or existing on-site captive power generation, using other energy sources other than waste heat
- Option d A mix of options (b) and (c)
- Option e Other uses of the waste heat and waste gases

Option a, the proposed project activity not undertaken as CDM project activity is ruled out as a plausible option to the project activity due to various barriers faced by the project activity. This can also be confirmed through a fact that prior to expansion of the Copper smelter from 1.8 million tonne per annum to 3.0 million tonne per annum the facility operated without a waste heat recovery unit for about 8 to 9 years.

Further more it is also noted that no other use of waste heat is envisaged at this point other than steam generation. The steam generated through exhaust of LSHS fired engine generator set is sufficient to meet the process steam requirement of the complex and hence, this use is not practical. Thus, option of other uses of waste gas is not plausible and realistic.

An economic analysis of all the remaining plausible options is made by SIIL on basis of INR / kWh. This analysis indicates that the LSHS based power plant with facility to generate steam from exhaust of the engine is the most economical way of producing the electricity when the cost of steam generation is appropriately accounted for. SIIL has an internal management system giving monthly overview of all the energy sources. Data of April 2003 when the project activity was started are submitted to TÜV Rheinland for validation of above statement.

In addition to above, TÜV Rheinland has also checked the conservativeness of the emission factor for the selected baseline. This has resulted in finding that the LSHS based power plant with appropriate compensation for steam generation is not only the most economical option but

VALIDATION REPORT

is also having the least CO₂ emission. Thus, the selected baseline is most conservative amongst the plausible alternatives to the project activity.

Additionality of the Project Activity

The additionality of the project activity is determined with the help of 'Tools for Demonstration and Assessment of Additionality' approved by CDM EB. An analysis of the application of the 'Tools for Demonstration and Assessment of Additionality' is given in the following paragraphs.

Step 0 Preliminary Screening Based on Starting Date of Project Activity

Starting date of project activity is indicated as April 10, 2003 as has been indicated in section 3.1 of this report. This date is after January 01, 2000 and hence, the project activity is eligible for retroactive credits.

In order to prove consideration of CDM by the SIIL, it has provided evidence (SIIL, February 15, 2003, Order number 113019908, placed on Ernst & Young for CDM advisory services). The validation team has validated evidence.

Step 1 Identification of alternatives to the project activity consistent with current laws and regulations

SIIL has used the latest version of 'Tools for demonstration and assessment of additionality'. Application of these tools is described in the following paragraphs.

Sub-step 1a. Define alternatives to the project activity:

As per the 'Tools for Demonstration and Assessment of Additionality', alternatives to the project activity should be realistic and credible. The alternative should provide output or services comparable with the proposed CDM project activity.

Revised Draft CDM PDD (September 2006) has identified the following alternatives to the project activity:

- Option a. The proposed project activity not undertaken as a CDM project activity;
- Option b Import of electricity from the grid
 - (b.1) Import of electricity from TNEB/MALCO
 - (b.2) Import of electricity from MALCO
- Option c New or existing on-site captive power generation, using other energy sources other than waste heat
- Option d A mix of options (b) and (c)
- Option e Other uses of the waste heat and waste gases

An analysis of the alternatives considered by SIIL is as follows:

Option (a): The proposed project activity not undertaken as a CDM project activity

Barriers faced by the project activity are managerial / technical and hence not feasible. As a matter of fact, prior to the project activity when the plant was operating at 1.8 million tonne per annum capacity, the plant was operating without waste heat recovery device for more than 8 years.

Option (a) would not realistic and credible.

Option (b): Import of electricity (From TNEB / Southern grid or MALCO)

Import of electricity via TNEB grid with electricity supply from TNEB and MALCO is an alternative which is credible and realistic. In absence of the project activity the project proponent could have imported electricity from TNEB / Southern region grid as described in option b1 or could have imported the electricity from MALCO as described in option b2. Excecersing option

VALIDATION REPORT

of import of electricity from grid would have saved additional efforts involved in maintenance of waste heat recovery boiler and employment skilled staff for its operation.

Option (b) is realistic and credible.

Option (c): New or existing on-site captive power generation, using other energy sources other than waste heat

Onsite captive power generation using other energy sources such as wind or hydro are ruled out due to geographical conditions, which will not provide continuous electricity generation essential for SIIL complex. Electricity generation by other fossil fuel sources such as Natural gas and coal is ruled out due to non-availability of these sources in the region and need for establishing duplicate infrastructure of fuel storage and handling. The LSHS based power plants and related fuel handling facility were already established at the plant site when the project activity was conceptualised. This option would have also required additional manpower and expertise to handle the plant.

LSHS based power plant was already operating at SIIL plant at the time of project conceptualisation and it would not have required any additional effort on part of SIIL to accept this as an option to the project activity.

Option (d): A mix of options (b) and (c)

Import of electricity from MALCO and TNEB and on-site captive power generation by using LSHS was a practice followed by SIIL at the time of project activity conceptualisation. Hence this is a more realistic and credible option.

Option (e): Other uses of waste heat and waste gases

This alternative is use of waste heat for heat generation instead of power generation. The only other use of waste heat that can be envisaged is process steam generation. The steam generation from exhaust of LSHS based power plant is sufficient to meet requirement of the complex and hence, there is no additional use of steam. Thus, Option (e) is not realistic.

Sub – Step 1b Enforcement of applicable laws and regulations

All the selected alternatives are in compliance with the existing laws and regulations of India. These alternatives are giving same service as the project activity.

Step 2 Investment Analyses

This route was not considered by SIIL.

Step 3 Barrier Analyses

Sub-step 3a. Identify barriers that would prevent the implementation of type of the proposed project activity

SIIL has identified following barriers that would prevent SIIL from implementation of the project activity:

Investment barrier

SIIL has indicated that the project activity has additional investment to meet the electricity requirements of the plant. However, it is apparent that all the other alternatives to the plant except for the grid would have also required extensive investment. In the absence of additional information to support the argument of Revised Draft CDM PDD (September 2006), it is difficult to accept investment barrier as a barrier to the project activity.

Technological barrier

VALIDATION REPORT

The waste heat recovery system was introduced to SIIL when expansion of the smelter took place from 1.8 million tonne per annum to 3.0 million tonne per annum. Prior to this expansion, the copper smelter was operating without any waste heat recovery. SIIL had explored the possibility of having a waste heat recovery unit. The primary technical opinion of the experts was against setting up a waste heat recovery unit due to problems envisaged for an additional boiler, maintenance cost of waste heat recovery boiler, and most importantly, reduction in availability of the smelter. Reduction in ISA smelter availability is the most important barrier since, it affects the primary business of Copper smelting of SIIL. The initial technical opinion was clearly against setting up a WHRB.

Managerial Barriers

In addition to technical barrier it was observed that by validation team during the site visit that the operation of LSHS fired boiler is an outsourced activity and no additional manpower from SIIL is involved for electricity generation. This gives SIIL the freedom to concentrate on its core business. Expertise in running a boiler that is essential for operation of the current activity is also not required when the project activity is compared with the LSHS based power plant. There was also no requirement to send the staff abroad for training in operation of a WHRB associated with Copper smelter. SIIL has submitted proof in form of passports of employees Mr. Rathna Gopalan Janarthan (Passport number B 3705854, Chinese Visa number A1087906 issued on May 25, 2004) and Mr. Sandeep Sadashivrao Korhadkar (Passport number B 3317919 and Chinese Visa number A1087907 issued on May 25, 2004) to confirm that SIIL had sent the persons for training abroad.

Additionality test for regulatory / legal requirements

Draft CDM PDD (August 2005) has indicated that there is no mandatory legal binding on SIIL to implement the project activity.

However, no legal bindings are not a barrier to a project activity.

Sub-step 3 b Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except in the proposed project activity)

Import of electricity from the grid as well as operation of LSHS based engine generating sets are business as usual case for SIIL and it would not have faced the managerial and technical barriers faced by the project activity.

The argument that import of electricity from grid does not face the technological barrier or managerial barrier faced by the project activity is acceptable.

Step 4 Common Practice Analysis

In order to justify the application of 'Tools for Demonstration and Assessment of Additionality' latest format approved by CDM EB should be used by SIIL.

Sub-step 4.a Analyse other activities similar to the project activity

India had three copper smelters at the time of conceptualisation of the project activity in India.

- a. Hindustan Copper and
- b. Sterlite Industries India Limited
- c. Birla Copper Hindalco

The smelter of Hindustan Copper is of 47000 Tonnes per annum capacity, which was too small, compared to the project activity and had no waste heat recovery facility ever since it was in operation. On the other hand Birla copper smelter at Dahej was having capacity of 250,000 Tonnes per annum at the time of project conceptualisation. It had a waste heat recovery facility.

VALIDATION REPORT

However, the copper smelter of Birla Copper employed different technology of flash vessel technology.

From the above it is concluded that the project

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

Discussions in sub-step 4.a suggest that the project activity cannot be compared with prevailing practices in India at the time of conceptualisation of .

Step 5 Impact of CDM Registration

As discussed in earlier steps of the 'Tools for demonstration and assessment of additionality', SIIL has overcome technological barrier and managerial barriers while implementing the project activity. Availability of CDM funds to the project activity will encourage other potential projects with waste heat recovery and energy efficiency improvement to implement the technology and reduce GHG emission.

Application of 'Tools for demonstration and analysis of additionality' suggests that the project activity is additional.

Monitoring Plan

The project activity is applying ACM0004/Version 02 'Consolidated monitoring methodology for waste gas and/or heat for power generation' for the project activity. The monitoring methodology is approved by CDM EB in 23rd meeting on 3 March 2006.

Applicability criteria of the monitoring methodology to the project activity are noted by TUV Rheinland and the project activity is meeting the applicability criteria.

The project activity has made provision for monitoring and archiving the data for baseline, project emission and data of electricity generation from the project activity.

Revised Draft CDM PDD (September 2006) has made provisions for monitoring the GHG emission reduction due to the project activity. All the data necessary for the estimation or measuring the GHG emissions within the project boundary in the project scenario as well as baseline scenario have been included in the monitoring plan of Revised Draft CDM PDD (September 2006).

The baseline data consists of:

- Amount of fossil fuel (LSHS), consumed by captive power plant (24 MW) at SIIL
- Amount of fossil fuel (LSHS), consumed by captive power plant (22.5 MW) at SIIL
- CO₂ emission coefficient of LSHS at captive power plant (24 MW) at SIIL
- CO₂ emission coefficient of LSHS at captive power plant (22.5 MW) at SIIL
- Electricity generation of captive power plant (24 MW) at SIIL
- Electricity generation of captive power plant (22.5 MW) at SIIL
- Energy efficiency of captive power plant (24 MW) at SIIL
- Energy efficiency of captive power plant (22.5 MW) at SIIL
- Steam generation by LSHS based captive power plant (24 MW) at SIIL
- Steam generation by LSHS based captive power plant (22.5 MW) at SIIL
- Steam temperature of LSHS based captive power plant (24 MW) at SIIL
- Steam temperature of LSHS based captive power plant (22.5 MW) at SIIL
- Steam pressure of LSHS based captive power plant (24 MW) at SIIL
- Steam pressure of LSHS based captive power plant (22.5 MW) at SIIL

VALIDATION REPORT

Project Activity Parameters Monitored:

- Quantity of auxiliary fuel used by the project activity
- Carbon emission factor of auxiliary fuel used by the project activity
- Net calorific value of the auxiliary fuel used by the project activity
- Total electricity generated by the project activity
- Auxiliary electricity consumption by project activity
- Net electricity supplied to the facility

As a ground-truthing activity following areas were visited by TUV Rheinland validation team:

- Copper smelter
- WHRB constituting the CDM project activity and the steam cycle
- TG area and the understanding of the power cycle
- LSHS based CPP

Revised Draft CDM PDD (September 2006), Annex 4, table: "Monitoring parameters and related equipment details" describes different monitoring data with procedure for monitoring the instrument, traceability of instrument calibration, tag number/ instrument serial number, service and technical definition of instrument, make of instrument, location of instrument, calibration method, least count, range of instrument, accuracy class, linkage with system management.

Recording frequencies of parameters are mentioned in Section D, of Revised Draft CDM PDD (September 2006). All energy related parameters like electricity generation by TG, auxiliary electricity consumption are monitored by digital energy meters and also recorded in relevant logbook. Quantity and calorific values of fuel used (Furnace Oil) are monitored by online DCS system by mass flow rate meter. Logbooks consisting all critical parameters of ISA SMELTER furnace are prepared and maintained for recording the process data. Details of data archiving are described in Section D of Revised Draft CDM PDD (September 2006). Monitored data are collected as per the recording frequency for generating reports. As per Revised Draft CDM PDD (September 2006), history of monitored data can be verified in logbooks and stored for two years after the end of crediting period. The validation team has discussed and verified review procedures and frequency of data with SIIL official during site visit. Respective area in charge of SIIL site review progress of documented procedures, records of monitoring plan and quality system records on a daily basis. Revised Draft CDM PDD (September 2006) Annex 4, has indicated calibration method of different key monitoring parameters. Calibration procedures are adopted to maintain accuracy of instruments of the plant. Calibration of Monitoring Equipment for CDM is systematically link with the system management.

During discussion with project proponent, it is concluded that, periodic calibration schedule will be carried out over the year for all electrical and electronic instruments and recorded in calibration reports. As per Revised Draft CDM PDD (September 2006) Annex 4, mentioned uncertainty related to monitoring the parameters. Deliberation of uncertainty related to the different monitoring parameters mentioned in, Annex 4 of Revised Draft CDM PDD (September 2006), takes due care of conservative approach in calculation of GHG emission calculation.

Calculation of GHG Emissions

The physical boundary of the project activity includes, waste heat or gas source (ISA furnace), captive power generating equipment (waste heat recovery boiler, steam drum, DM water plant, steam turbine generator) and equipment used to provide auxiliary heat to the waste heat recovery process (super heater) and the CPP based on LSHS

Project activity boundary for determination of baseline emission includes CPP of SIIL.

Consideration of all GHG emissions due to project activity is as follows -

VALIDATION REPORT

-CO₂ emission due to waste gas from copper smelter. This emission was happening even before the project activity and hence, there is no additional CO₂ emission due to combustion of this gas alone.

-ACM0004/Version 02 has recommended exclusion of CH₄ (Methane) from emission reduction.

-CFCs (Chlorofluorocarbons) or PFCs (Per fluorocarbons) are not used in the project activity and hence, they are neglected

-SF₆ (Sulphur Hexafluoride) is not used directly in the project activity.

-N₂O (Nitrous Oxide) emission is neglected since, other combustion technologies would also have led to N₂O emission and so, and net change can be considered as zero.

Calculation of GHG emission is based on EF most economic option of electricity generation where electricity is generated with the help of LSHS based engine generator set having facility to generate steam from exhaust of engine. The resulting emission reduction is reduced further by the project emission generated due to use of FO in the super heater.

Environmental Impacts

According to Ministry of Environment and Forests Environment, Government of India, Environmental Impact Assessment Notification S.O.60 (E), dated January 27, 1994 a new project having investment of more than INR 1000 million or an expansion modernisation project having investment of more than INR 500 million is required to carry out an Environment Impact Assessment (EIA) ([http://www.envfor.nic.in/legis/eia/so-60\(e\).doc](http://www.envfor.nic.in/legis/eia/so-60(e).doc)). The project activity is part of a larger expansion project costing about INR 3000 millionⁱ and hence, Environment Impact Assessment Notification S.O 60 (E) dated January 27, 1994 is applicable to the project activity. MoEF has granted permissionⁱⁱ to the project activity based on application of SIIL.

Revised Draft CDM PDD (September 2006) section D and enclosure 1 has given a report on environmental impact. The report has given impacts of the project activity during construction stage as well as operational phase on air quality, noise, land and soil, water, ecology and socio economic environment. The report has also given an Environment Management Plan for construction phase and operational phase.

Comments by Local Stakeholders

Draft CDM PDD (August 2005) has identified following as stakeholders to the project activity:

1. Elected body of representatives administering local area (Village Panchayat)
2. Tamil Nadu Pollution Control Board (TNPCB)
3. Ministry of Environment and Forest, Government of India (MoEF)
4. Non Government Organisations
5. Consultants
6. Equipment suppliers

The stakeholder's consultation process is understood through various documents submitted by SIIL including NOC by Environment – Forests (EC3) Department, Government of Tamil Naduⁱⁱⁱ, copy of public notice published by TNPCB, consent by TNPCB^{iv} and clearance^v given by MoEF. TUV Rheinland confirms by validation of above evidences that SIIL has invited comments from local stakeholders as per provisions of environmental laws of India.

SIIL has also submitted proof of payment of taxes to Meelavittan village panchayat^{vi}. Evidence on clearance / permission from the local village panchayat are made available to TUV Rheinland along with consultation and response of the NGOs on project activity. SIIL has

VALIDATION REPORT

described the process of identification of the stakeholders within the text of Revised Draft CDM PDD (September 2006).

As part of the validation process TUV Rheinland consulted the following:

1. Member, Meelavittan, Local Village Panchayat, Tamil Nadu
2. Director, ABLE Foundation (NGO)
3. Director, Chavalia Roche Society
4. District Environment Engineer, Tuticorin District, TNPCB
5. Superintending Engineer, TNEB, Tuticorin

The issues discussed with these stakeholders are noted in section 2.2 of this report. The stakeholders have given no negative comment regarding the project activity.

4COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

TUV Rheinland has published the Draft CDM PDD (August 2005) on UNFCCC website from September 06, 2005 to October 05, 2005. During the publication of the Draft CDM PDD (August 2005), no comment was received on the project activity.

VALIDATION REPORT

5 VALIDATION OPINION

TUV Rheinland has performed a validation of the “Power Generation from the proposed 11.2 MW waste heat recovery boiler at ISA smelt furnace of the Copper Smelter, Sterlite Industries India Limited, Tuticorin” (hereafter called “the project”). The validation was performed on the basis of the UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and subsequent decisions by the CDM EB for CDM project activity. Validation process also considered basis of the UNFCCC criteria relevant to those criteria relevant to the host country, India, as well as criteria to provide for consistent project operations, monitoring and reporting.

The validation consisted of the following three phases: i) a desk review of the project design documents (October 2005 to September 2006), ii) follow-up interviews with project stakeholders (December 22, December 23, 2005) and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion (October 2005 to September 2006). The validation raised request for clarification and for whose resolution upon TUV Rheinland’s request, additional information was submitted to TUV Rheinland and the CDM-PDD was revised and resubmitted for validation.

The project participant is Sterlite Industries India Limited (SIIL), and has received a confirmation from the Designated National Authority (DNA) of India that the project activity assists in achieving sustainable development. There is no involvement of Official Development Assistance in the project activity. No participating Annex I Party has yet been identified.

The project activity engages in the recovery of waste gas heat energy from ISA copper smelter furnace to generate the steam by a Waste Heat Recovery Boiler (WHRB). Supplementary heat energy is added through FO fired super heater to increase the steam pressure up to 66 bar. The steam at 45 TPH flow rate and 66 bar pressure leads to 11.2 MW TG set for electricity generation. Generated electricity is consumed in house. As per Revised Draft CDM PDD (September 2006) the electricity generated is partly substituting the power generation from combination of LSHS based CPP of SIIL, power supply from coal based CPP of MALCO and electricity supply from state grid. The selected baseline is economically most attractive option as per guidance of selection of baseline of ACM 0004/Version 02. The selected baseline is also having the lowest emission factor of the credible and realistic alternatives to the project emission and hence, it is conservative.

The project activity applies the “approved consolidated baseline methodology for waste gas and/or heat for power generation” (ACM0004/Version 02). The baseline methodology has been correctly applied and the assumptions made for the selection of the baseline scenario are sound. It is sufficiently demonstrated that the project activity is not a likely baseline scenario and that the emissions reductions attributable to the project activity are additional to any that would occur in the absence of the project activity.

The project activity is expected to reduce the volume of CO_{2e} emissions compared to the emissions that would occur in the baseline scenario and very likely to result in a total emission reductions of 22,473 tCO_{2e} per year during fixed 10 (ten) years crediting period.

The monitoring plan and supporting documents sufficiently specify the monitoring requirements of the main project indicators and the likeliness to achieve the estimated amount of emission reduction.

The project activity is not anticipated to have an environmental impact within and outside the project boundary and the necessary norms to meet the environmental obligations in context to the project activity have been declared to relevant Indian regulators.

VALIDATION REPORT

In summary, it is TUV Rheinland's opinion that the project, as described in the revised project design document of September 2006, meets all relevant UNFCCC requirements for the CDM and correctly applies the approved consolidated baseline and monitoring methodology ACM0004/Version 02. Hence, TUV Rheinland requests the registration of the "Power Generation from the proposed 11.2 MW waste heat recovery boiler at ISA smelt furnace of the Copper Smelter, Sterlite Industries India Limited, Tuticorin " at SIIL as a CDM project activity.

VALIDATION REPORT

6*REFERENCES

Category 1 Documents:

Documents provided by SIIL include the Draft CDM PDD (August 2005), confirmation by the Designated National Authority of India on the project's contribution to sustainable development and its voluntary participation.

1. 1 MoEF, Host Country Approval, F. No. 4/24/2005 - CCC-, dated December 26, 2005
2. SIIL, August 2005, Draft CDM PDD, SIIL, Power generation from proposed 11.2 MW waste heat recovery boiler at the ISA smelt furnace of the copper smelter, Sterlite Industries India Limited, SIIL, Tuticorin, Version 02 dated 19 August 2005
3. SIIL, September 2006, Revised Draft CDM PDD, SIIL, Power generation from proposed 11.2 MW waste heat recovery boiler at the ISA smelt furnace of the copper smelter, Sterlite Industries India Limited, SIIL, Tuticorin

Category 2 Documents:

- 1 Chief electrical inspector, Tamil Nadu, November 8, 2004, Approval for 11.2 MW TG set operation
- 2 Government of Tamil Nadu, August 25, 1998, Policy on captive power generation, Letter no. 6551/A1/98-3
- 3 Government of Tamil Nadu, Environment-Forests (ECS) Department, July 01, 2004, NOC for expansion project of SIIL to produce copper cathode, phosphoric acid, copper cathode etc, letter number 10203/EC3/2004-2
- 4 MALCO, February 02, 2006, E-mail submitting power plant data
- 5 MALCO, January 20, 2006, Electricity bills from January 2004 to December 2005
- 6 MALCO, January 24, 2006, Data submitting power plant data of MALCO
- 7 MoEF, September 22, 2004, Environmental clearance for expansion of copper smelter plant by SIIL at village Meetavittam in District Tuticorin, Tamil Nadu
- 8 Ramakrishna and Co., November 21, 2005, Statement giving cost of Waste heat recovery boiler and turbine
- 9 Shiva Analytical Laboratory, April 04, 2003, Test certificate for LSHS, CA NO. 1060304148
- 1 Shiva Analytical Laboratory, August 08, 2003, Test certificate for LSHS, CA NO. 1060308592
- 0
- 1 SIIL, August 19, 2002, Agreement between SIIL and Thermal Systems for supply of Waste heat recovery system
- 1
- 1 SIIL, August 28, 2005, Payment advice for President, Meelavittan Panchayat, Document number 126569
- 2
- 1 SIIL, August 30, 2005, Incoming material inspection plan, Revision No. 14
- 3
- 1 SIIL, December 2003 to November 05, Monthly production report

While efforts have been made to provide accurate information, there could be printing error, which may have crept in. In the event of any discrepancy, background documents listed with this validation report shall be the authentic reference point.

VALIDATION REPORT

- 1 SIIL, December 23, 2005, Letter indicating sources of finance for 3 LTPA expansion for smelter
5 including WHRB, turbine, new refinery and CCR
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- 1 SIIL, December 23, 2005, MALCO Power Plant boiler efficiency calculations
6
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- 1 SIIL, December 7, 2002, Incoming material inspection plan, Revision No. 10
7
.
- 1 SIIL, December 27, 2002, CO₂ emission trading (Greenhouse gas emission) Internal note on of
8 SIIL
.
- 1 SIIL, February 15, 2003, Order submitted to Ernst and Young for advisory service on Kyoto
9 Protocol, Order number 113019908
.
- 2 SIIL, February 15, 2005, Change control form, Revision No. 2
0
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- 2 SIIL, January 20, 2005, Work order on operation and maintenance of 11.2 MW power plant at
1 SIIL, Tuticorin
.
- 2 SIIL, January 31, 2006, E-mail submitting data on steam generation in SIIL from September 02
2 to November 03
.
- 2 SIIL, May 01, 2005, List of critical instruments of area, Feed / New ISA, WHRB, New RHF's
3
.
- 2 SIIL, November 27, 2002, Contract between SIIL and ALSTOM Limited for supply of equipment
4 for turbine
.
- 2 SIIL, November 28, 2002, Agreement for erection and commissioning between SIIL and GEA
5 cooling tower Technologies (India) Private Limited
.
- 2 SIIL, September 2002 to November 2005, Electricity bills for SIIL, Tuticorin
6
.
- 2 TNEB, July 12, 2005, Approval for parallel operation of 11.2 MW TG set with TNEB grid
7
.
- 2 TNEB, Jun2 04, 1999, Approval of wheeling of power to SIIL from MALCO, Letter No.
8 SE/EMC/EE1 AE2/D.817 / 99-1
.
- 2 TNPCB, April 19, 2005, Consent order for air (Prevention and control of Pollution) Act 1981,
9 Consent order number 11451
.
- 3 TNPCB, December 05, 2002, Information on public hearing for expansion project, Letter number
0 DEE/TTN/F-11-0002
.
- 3 Form B, Govt of Tamil Nadu, Indian Boiler Act, 1923 (General Act V of 1923),
1 November 26, 2005, Certificate of proficiency as Boiler Operation Engineer's Rules,
1965, Certificate no 1580
.
- 3 Form B, Govt of Tamil Nadu, Indian Boiler Act, 1923 (General Act V of 1923),
2 November 15, 1990, Certificate of Boiler attendant certificate of competency
.

VALIDATION REPORT

Ας Παρτ οφ τηε παλιδατιον προχεσσ, τηε φολλοωινγ ωεβ σιτεσ ωερε αλσο ρεφερρεδ το:

- Website of UNFCCC, <http://unfccc.int/>
- Website of International Emission trading Association (IETA) <http://www.ieta.org/>
- Website of Ministry of Power, Government of India <http://www.powermin.nic.in/>
- Website of MoEF, Government of India <http://envfor.nic.in/>
- Website of CEA of India <http://www.cea.nic.in/>
- Website of CERC of India <http://www.cercind.org/>
- Website of Nuclear Power Corporation of India www.npcil.org

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CDM VALIDATION PROTOCOL

Introduction

This document contains a specific Validation Protocol for CDM project activity, which must be seen in conjunction with the *Validation and Verification Guidelines* and the *Validation Report Template*.

This validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM project activity is expected to meet; and
- It ensures a transparent validation process by inducing TUV Industrie Service GmbH TUV Rheinland Group (TUV Rheinland) to document how a particular requirement has been validated and which conclusions have been reached;

This protocol contains three tables with specific requirements for validation of “Power generation from proposed 11.2 MW waste heat recovery boiler at the ISA Smelt furnace of the Copper Smelter, Sterlite Industries India Limited (SIIL), Tuticorin”. Project activity. Table 1 shows the requirements that the GHG emission reduction project activity will be validated against. Table 2 consists of a checklist with validation questions related to one or more of the requirements in Table 1. Where a finding is issued, a corrective action request or clarification request are stated. The resolution and final conclusions of these requests are described in Table 3 of this protocol. On receipt of the clarification / corrective action, the final conclusion is reached. This may be closed when the explanation is satisfactory or open in case when the explanation is not satisfactory but it does not affect the opinion of the TUV Rheinland.

Before this validation protocol is applied to validate SIIL project activity, TUV Rheinland has reviewed and adjusted/amended the protocol to make it applicable to SIIL project activity characteristics and circumstances. The application of the TUV Rheinland’s professional judgement and technical expertise has ensure that checklist amendments cover all necessary specific project activity requirements that have impact on project activity performance and acceptance of the project activity. Given the above, the checklist part of the protocol is neither exhaustive nor prescriptive.

It may be noted that unless it is specified otherwise, this document PDD, means Draft CDM PDD (August 05)

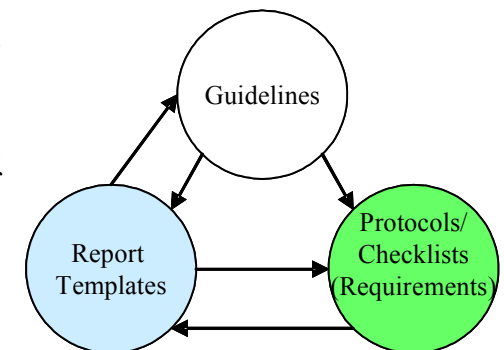


Table 1 Mandatory Requirements for Clean Development Mechanism (CDM) Project Activities

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
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	Table 2, Section E.4.1 A waste heat recovery based project electricity generation project activity will produce electricity that does not consume fossil fuel and hence, there will be avoidance of generation of CO ₂ .
2. 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, Marrakesh Accords, CDM Modalities §40a	CAR-01 OK	Table 2, Section A.3 MoEF, December 26, 2005, F- No 4/24/2005-CCC, Host Country approval to '11.2 MW Power Generation by Waste Heat Recovery Boiler at ISA Smelt Furnace of Copper smelter at Tuticorin, Tamil Nadu by Sterlite Industries India

The entries in the protocol are adjusted and amended as appropriate to prepare for the validation of “Power generation from proposed 11.2 MW waste heat recovery boiler at the ISA Smelt furnace of the Copper Smelter, Sterlite Industries India Limited (SIIL), Tuticorin”

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
			Limited – regarding CDM, Host party approval by the DNA of India confirms that the project activity is meeting the sustainable development criteria of host country.
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art.12.2.	OK	Table 2, Section E.4.1,
4. The project shall have the written approval of voluntary participation from the designated national authorities of each party involved	Kyoto Protocol Art. 12.5a, Marrakesh Accords, CDM Modalities §40a	GAR-01 OK OK	MoEF, December 26, 2005, F- No 4/24/2005-CCC, Host Country approval to '11.2 MW Power Generation by Waste Heat Recovery Boiler at ISA Smelt Furnace of Copper smelter at Tuticorin, Tamil Nadu by Sterlite Industries India Limited – regarding CDM, India is the only party involved in the project activity and

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
			host country approval has been granted by DNA of India
5. 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	Table 2, Section E.4 Emission reduction are real, measurable and give long term benefits related o mitigation of climate change
6. Reduction in GHG emissions shall be additional to any that would occur in 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, Marrakesh Accords, CDM Modalities §43	OK	Table 2, Section B.2, The project activity is additional to any that would occur in absence of the project activity
7. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance	Marrakech Accords	OK	Self-declaration by SIIL (SIIL, December 23, 2005, Certification by Chief financial Officer of SIIL on funding for expansion project) confirms that the project activity is carried out through internal funds. In addition to this, host

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REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
			country approval granted by DNA of India (MoEF, December 26, 2005, F- No 4/24/2005-CCC, Host Country approval to '11.2 MW Power Generation by Waste Heat Recovery Boiler at ISA Smelt Furnace of Copper smelter at Tuticorin, Tamil Nadu by Sterlite Industries India Limited – regarding CDM) is another confirmation that no ODA is involved in the project activity.
8. Parties participating in the CDM shall designate a national authority for the CDM	Marrakech Accords, CDM Modalities §29	OK	http://cdm.unfccc.int
9. The host country shall be a Party to the Kyoto Protocol	Marrakech Accords, CDM Modalities §30	OK	http://cdm.unfccc.int , India ratified Kyoto Protocol
10. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received	Marrakech Accords, CDM	OK	Table 2, Section G. (1. MoEF,

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
	Modalities §37b		September 22, 2004, Expansion of Copper Smelter plant by Sterlite Industries India Limited at Village Meelavittam, District Tuticorin in Tamilnadu) Local stakeholders comments are invited as per EIA notification by Government of India and MoEF clearance has been obtained.
11. 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.	Marrakech Accords, CDM Modalities §37c	OK	Table 2, Section F. No negative environmental impact is anticipated due to the project activity. Environment impact Analysis is carried out as per the requirements of government of India.
12. Baseline and monitoring methodology shall be previously approved by the CDM Methodology Panel	Marrakech Accords, CDM Modalities §37e	OK	Table 2, Section B.1.1 and D.1.1. http://cdm.unfccc.int ACM0004/Version 02 is used

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REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
13. 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	Marrakech Accords, CDM Modalities §37f	GL-09 OK	Table 2, Section D, Additional monitoring is required for ascertaining emission reduction
14. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available	Marrakech Accords, CDM Modalities, §40	OK	Draft CDM PDD (August 2005) was published for public comment on UNFCCC web site from September 06, 2005 to October 05, 2005
15. 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	Marrakech Accords, CDM Modalities, §45c,d	OK	Table 2, Section B.2.4 The
16. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure	Marrakech Accords, CDM Modalities, §47	OK	The baseline methodology is approved by CDM EB and excludes to earn CERs for decreases in activity levels outside the project activity or due to force majeure.
17. The project design document shall be in conformance with the UNFCCC CDM-PDD format	Marrakech Accords, CDM	OK	The format of PDD is as per the available

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REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
	Modalities, Appendix B, EB Decisions		PDD format on website of UNFCCC.
18. The PDD indicates all the parties involved in project development including source of baseline studies	M & P para 37 f and Annex A, section 2	GL-13 OK	The project development including baseline studies is made by SIIL as per details given in section B.8 of Revised Draft CDM PDD (September 2006)

Table 2 Requirements Checklist

CHECKLIST QUESTION	Ref.#	MoV*	COMMENTS	Draft Concl	Final Concl
A. General Description of Project Activity <i>The project design is assessed.</i>					
A.1.Project Boundaries <i>Project Boundaries are the limits and borders defining the GHG emission reduction project.</i>					
A.1.1.Are the project’s spatial (geographical) boundaries clearly defined?	PDD B.4	DR	Geographical boundaries of the project activity are clearly defined. As per Draft CDM PDD (August, 2005), geographical boundary of the project activity comprises the waste heat or gas sources, captive power generating equipment, equipment used to provide auxiliary heat to the waste heat recovery process and the CPP based on LSHS.		OK
A.1.2.Are the project’s system (components and facilities used to mitigate GHGs) boundaries clearly defined?	PDD B.4	DR	As per ACM0004/Version 02, the baseline should be selected on basis of economically most attractive alternative from the alternatives that do not face any prohibitive barriers. SIIL needs to evaluate all the selected alternatives for their economical attractiveness and justify selection of a particular alternative as baseline to the project activity as per ACM0004/Version 02.	GL-03	OK
A.2.Technology to be employed					

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- # PDD has reference of Draft CDM PDD (August 2005) in this column

CHECKLIST QUESTION	Ref.#	MoV*	COMMENTS	Draft Concl	Final Concl
<i>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.</i>					
A.2.1.Does the project design engineering reflect current good practices?	PDD A.2 / Agree ment of August 18, 2003 between Thermal system and SIIL	DR	<p>The project activity has imported technology from ALSTOM a world-renowned firm for supply of CPP equipments.</p> <p>The project activity is also expected to follow Indian Boiler Act.</p> <p>Various provisions of the work order to Thermal systems, (the contractor for supply of waste heat recovery system) are ensure good design engineering.</p> <p>This makes TUV Rheinland to believe that project activity reflects good design engineering.</p>		OK
A.2.2.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?	PDD A 2	DR	The technology of waste heat recovery system from copper smelter was not available in India at the time of project activity conceptualisation and had to be imported.		OK
A.2.3.Is the project technology likely to be substituted by other or more efficient technologies within the project period?	PDD A.2	DR	The basic of the technology are not likely to change significantly.		OK
A.2.4.Does the project require extensive initial training	PDD	DR	SIIL has sent people to gain experience in		OK

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CHECKLIST QUESTION	Ref.#	MoV*	COMMENTS	Draft Concl	Final Concl
and maintenance efforts in order to work as presumed during the project period?	A.4.3 / PDD B.3		similar plants abroad to gain training on the operation of WHRB.		
A.2.5.Does the project make provisions for meeting training and maintenance needs?	PDD A.4.3 / Form B, Govt of Tamil Nadu, Indian Boiler Act, 1923 (General Act V of 1923), Certificate of proficiency as Boiler Operator Engineer	DR	<p>The project activity is following Indian Boiler act 1923 under which the WHRB operators are trained. SIIL has submitted copy of the qualification letters of the staff operating WHRB to TUV Rheinland for validation.</p> <p>SIIL has sent people to gain experience in similar plants abroad to gain training on the operation of WHRB.</p>		OK
A.3. Contribution to Sustainable Development <i>The project's contribution to sustainable development</i>					

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<i>is assessed.</i>					
A.3.1. Is the project in line with relevant legislation and plans in the host country?	PDD F.2 / TNPC B, April 19, 2005, consent 11134, Consent for expansion for copper smelter / TNPC B, April 19, 2005, consent 15481, Consent for expansion for copper smelter	DR	<p>The project activity is in line with applicable laws of the country.</p> <ul style="list-style-type: none"> • SIIL obtained • Consent to establish from TNPCB • Environmental clearance for the copper smelter expansion activity from MoEF, GoI and NOC from TNPCB. • Environmental clearance from MoEF • No objection certificate from Environment and Forest department, Government of Tamil Nadu • Approval for parallel operation of 11.2 MW TG set with TNEB grid 		OK

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The entries in the protocol are adjusted and amended as appropriate to prepare for the validation of “Power generation from proposed 11.2 MW waste heat recovery boiler at the ISA Smelt furnace of the Copper Smelter, Sterlite Industries India Limited (SIIL), Tuticorin”

CHECKLIST QUESTION	Ref.#	MoV*	COMMENTS	Draft Concl	Final Concl
	/ MoEF, Septe mber 22, No. J- 11011/ 62/200 3 – IA II (I) / Enviro nment and Forest (EC 3) Dept. July 1, 2004 10203/ EC3/2 004-2 NOC/ TNEB, July 12, 2005, Lr. No. CE/Co mm/E ET/A1/ F.Sterli				

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CHECKLIST QUESTION	Ref.#	MoV*	COMMENTS	Draft Concl	Final Concl
	te/CR. 3011/0 5				
A.3.2.Is the project in line with host-country specific CDM requirements?	PDD A.2 / A.4.3	DR	Host country approval from DNA of India needs to be submitted to TUV Rheinland for assessment and confirmation that the proposed CDM project activity contributes to the sustainable development criteria of India.	GAR-01	OK
A.3.3.Is the project in line with sustainable development policies of the host country?	PDD F	DR	Host country approval from DNA of India needs to be submitted to TUV Rheinland for assessment and confirmation that the proposed CDM project activity contributes to the sustainable development criteria of India.	GAR-01	OK
A.3.4.Will the project create other environmental or social benefits than GHG emission reductions?	PDD B.3	DR	Following additional advantages are gained from the project activity: <ul style="list-style-type: none"> • The project activity has imported technology of waste heat recovery from metallurgical WHRB that was not available. • The project activity has generated employment in the local community • The staffs of project activity were sent abroad to gain experience in the WHRB operation of similar 		OK

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CHECKLIST QUESTION	Ref.#	MoV*	COMMENTS	Draft Concl	Final Concl
			nature.		
B. Project Baseline <i>The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i>					
B.1.Baseline Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
B.1.1.Is the baseline methodology previously approved by the CDM Methodology Panel?	PDD B.1	DR	Yes the baseline methodology is approved by the CDM Methodology Panel under, Title: Consolidated baseline methodology for waste gas and/or heat for power generation. Reference: ACM0004/Version 02, Sectoral Scope:01, 3 March 2006.		OK
B.1.2.Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	PDD B.1.1	DR	Approved consolidated baseline methodology ACM0004/Version 02, Sectoral Scope:01, 3 March 2006, is applicable to the project activity. This methodology applies to project activities that generate electricity from waste heat or the combustion of waste gases in industrial facilities hence; the application of the methodology is justified.		OK

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CHECKLIST QUESTION	Ref.#	MoV*	COMMENTS	Draft Concl	Final Concl
The below questions only apply when the validator is reviewing the baseline methodology prior to submission to the CDM EB (Two Steps Approach):					
B.1.3.Is the discussion and selection of the baseline methodology transparent?					
B.1.4.Is the proposed baseline methodology in line with one of the approaches outlined in Paragraph 48 of the Marrakech Accords?					
B.1.5.Does the baseline methodology specify data sources and assumptions?					
B.1.6.Does the baseline methodology sufficiently describe the underlying rationale for algorithm/formulae (e.g. marginal vs. average, etc.)					
B.1.7.Does the baseline methodology specify types of variables used (e.g. fuels used, fuel consumption rates, etc)?					
B.1.8.Does the baseline methodology specify the spatial level of data (local, regional, national)?					
B.1.9. Does the baseline methodology specify an approach to define the additionality of the project?					
B.2.Baseline Determination <i>The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.</i>					
B.2.1.Is the application of the methodology and the discussion and determination of the chosen	PDD B.2	DR	As per ACM0004/Version 01, alternatives to the baseline of the project activity should	GL-02	OK

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CHECKLIST QUESTION	Ref.#	MoV*	COMMENTS	Draft Concl	Final Concl
baseline transparent?			<p>include project activity not undertaken as a CDM project activity. This alternative is not explored while evaluating alternatives to the baseline of project activity. SIIL should include this as an alternative to the project activity.</p> <p>As per ACM0004/Version 02, the baseline should be selected on basis of economically most attractive alternative from the alternatives that do not face any prohibitive barriers. SIIL needs to evaluate all the selected alternatives for their economical attractiveness and justify selection of a particular alternative as baseline to the project activity as per ACM0004/Version 02.</p>	GL-03	OK
B.2.2.Has the baseline been determined using conservative assumptions where possible?	PDD B.2	DR	<p>LSHS based CPP is one of the sources of electricity supply for selected baseline in Draft CDM PDD (August 2005). If it is still featuring as part of the baseline after evaluation as indicated in CL 03, then the following needs to be considered while estimating the baseline.</p> <ol style="list-style-type: none"> 1. LSHS based CPP is generating steam as well as electricity. Thus, energy and hence, the emission due to LSHS needs to be attributed to both the components of energy in appropriate proportions. The overall 	GAR-02	OK

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			<p>EF in baseline should also be corrected accordingly.</p> <p>2. Baseline data given in Annex 3 of the Draft CDM PDD (August 2005) (table of Generation data for CPP 2: 22.5 MW LSHS based power plant) are not confirming with the data submitted to TUV Rheinland during the site visit. Appropriate correction is required in the Draft CDM PDD (August 2005) and subsequent baseline calculations if, this data forms part of the baseline after selection of baseline as per CL 03.</p>		
B.2.3.Has the baseline been established on a project-specific basis?	PDD B.2	DR	Yes, baseline is project activity specific.		OK
B.2.4.Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	PDD B.5	DR	Draft CDM PDD has taken account of relevant sectoral national policies related to the project activity.		OK
B.2.5.Is the baseline determination compatible with the available data?	PDD Annex 3	DR	<p>TUV Rheinland has collected the data related to baseline calculations and found the same in order.</p> <p>LSHS based CPP is one of the sources of electricity supply for selected baseline in Draft CDM PDD (August 2005). If it is still featuring as part of the baseline after evaluation as indicated in CL 03, then the</p>	GAR-02	OK

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			<p>following needs to be considered while estimating the baseline.</p> <ol style="list-style-type: none"> 1. LSHS based CPP is generating steam as well as electricity. Thus, energy and hence, the emission due to LSHS needs to be attributed to both the components of energy in appropriate proportions. The overall EF in baseline should also be corrected accordingly. 2. Baseline data given in Annex 3 of the Draft CDM PDD (August 2005) (table of Generation data for CPP 2: 22.5 MW LSHS based power plant) are not confirming with the data submitted to TUV Rheinland during the site visit. Appropriate correction is required in the Draft CDM PDD (August 2005) and subsequent baseline calculations if, this data forms part of the baseline after selection of baseline as per CL 03. 		
B.2.6.Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	PDDb. 2 / PDD B.3, Step 1	DR	As per ACM0004/Version 01, the baseline should be selected on basis of economically most attractive alternative from the alternatives that do not face any prohibitive barriers. SIIL needs to evaluate all the selected alternatives for their economical attractiveness and justify selection of a	GL-03	OK

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			particular alternative as baseline to the project activity as per ACM0004/Version 02.		
B.2.7. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario (e.g. through (a) a flow-chart or series of questions that lead to a narrowing of potential baseline options, (b) a qualitative or quantitative assessment of different potential options and an indication of why the non-project option is more likely, (c) a qualitative or quantitative assessment of one or more barriers facing the proposed project activity or (d) an indication that the project type is not common practice in the proposed area of implementation, and not required by a Party's legislation/regulations)?	PDD B.3	DR	<p>Tools for demonstration and assessment of additionality' approved by EB in its 16th meeting are used to demonstrate that the project activity is not a baseline scenario. Following clarifications are sought with respect to the 'Tools to demonstrate and assessment of additionality' to the project activity:</p> <p>SIIL needs to clarify the following with respect to additionality</p> <ol style="list-style-type: none"> 1. The format of 'Tools for Demonstration and Assessment of Additionality' should be in line with the latest version approved by CDM EB. 2. SIIL needs to submit evidence that CDM revenues due to the project activity were considered in application to the banks and financial institutes prior to financial closure of the project activity <p>While evaluating alternatives to the project activity in step 1 of the 'Tools for demonstration and assessment of additionality', Alternative 4 – 'Continuation of current situation' is indicated to be same</p>	<p>CL-04</p> <p>CL-05</p>	<p>OK</p> <p>OK</p>

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			<p>as the Alternative 1 – ‘Import of 11.2 MW electricity from TNEB grid’. However, the current situation at the time of project activity conceptualisation involves use of electricity from the LSHS based reciprocating engine based CPP. SIIL needs to re-evaluate Alternative 4 as described in Draft CDM PDD (August 2005).</p> <p>As part of Sub - step 3a of the ‘Tools for Demonstration and Assessment of Additionality’ it is stated that “- - - -this would preclude any investment in a new captive power plant based on fossil fuel (LSHS)”. SIIL needs to explain how is investment in a new captive power plant based on fossil fuel (LSHS) relevant while comparing the alternative to project activity. The text needs further clarification in this respect.</p> <p>As part of Sub-step 3a of the ‘Tools for demonstration and assessment of additionality’, it is noted that the statutory requirements for WHRB has reduced the plant availability from 98 per cent to 93.5 per cent. This statement needs to be substantiated with evidences by SIIL.</p> <p>As part of common practice analysis in step 4 of the ‘Tools for Demonstration and Assessment of Additionality’, other copper</p>	<p>GL-06</p> <p>OK</p> <p>GL-07</p> <p>OK</p>	

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			smelters in India are analysed. SIIL needs to submit evidence on practices followed by these smelters with respect to waste heat recovery based power generation.	GL-08	OK
B.2.8.Have the major risks to the baseline been identified?	PDD	DR	No major risks have been identified to the baseline.		OK
B.2.9.Is all literature and sources clearly referenced?	PDD B.3 / PDD B.2 / PDD Annex 3	DR	As part of common practice analysis in step 4 of the ‘Tools for Demonstration and Assessment of Additionality’, other copper smelters in India are analysed. SIIL needs to submit evidence on practices followed by these smelters with respect to waste heat recovery based power generation.	GL-08	OK
C. Duration of the Project/ Crediting Period <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>					
C.1.1.Are the project’s starting date and operational lifetime clearly defined and reasonable?	PDD C.1.1 and C.1.2	DR	Section C of Draft CDM PDD (August 2005) has indicated that the starting date of project activity is April 2003, when construction of the project activity begun and the first crediting period started on July 26, 2005. SIIL needs to submit appropriate evidences to support starting date of project activity and beginning of first crediting period for the project activity. Operational lifetime of the project activity is	GL-01	OK

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			20 years and 0(zero) months.		
C.1.2.Is the assumed crediting time clearly defined and reasonable (renewable crediting period of max. two x 7 years or fixed crediting period of max. 10 years)?	PDD C.2.2.1 and C.2.2	DR	The fixed crediting period of the project is starting from July 2001 (Tentative) The length of the crediting period is fixed for 10 (Ten) years		OK
D. Monitoring Plan <i>The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed ((Blue text contains requirements to be assessed for optional review of monitoring methodology prior to submission and approval by CDM EB).</i>					
D.1.Monitoring Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
D.1.1.Is the monitoring methodology previously approved by the CDM Methodology Panel?	http://cdm.unfccc.int/PDD D.1	DR	The monitoring methodology ACM0004/Version02, Sectoral Scope:01, 3 March 2006 is previously approved by the EB.		OK
D.1.2.Is the monitoring methodology applicable for this project and is the appropriateness justified?	PDD D.2	DR	Yes, the project activity fits the applicability criteria of ACM0004/Version 02, Sectoral Scope:01, 3 March 2006. This methodology applies to project activities that generate electricity from waste heat or the combustion of waste gases in industrial facilities hence; the application of the		OK

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			methodology is justified.		
D.1.3.Does the monitoring methodology reflect good monitoring and reporting practices?	PDD D.2. / PDD D.2.1.1 , D.2.1.3	DR	Monitoring plan of the Draft CDM PDD (August 2005) needs to revise the monitoring plan and incorporate all the parameters, which are necessary for the revised baseline conditions, which have been arrived after economic analysis.	GL-09	OK
D.1.4.Is the discussion and selection of the monitoring methodology transparent?	PDD D.2	DR	Discussion and selection of monitoring methodology is transparent		OK
The below questions only apply when the validator is reviewing the monitoring methodology prior to submission to the CDM EB (Two Steps Approach):					
D.1.5.Does the monitoring methodology 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?					
D.1.6.Is the selected monitoring methodology supported by the monitored and recorded data?					
D.1.7.Are the monitoring provisions in the monitoring methodology consistent with the project boundaries in the baseline study?					
D.1.8.Have any needs for monitoring outside the project boundaries been evaluated and if so, included as applicable?					
D.1.9.Does the monitoring methodology allow for					

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conservative, transparent, accurate and complete calculation of the ex post GHG emissions?					
D.1.10.Are formulas used for calculations stated and calculations incorporated or referenced?					
D.1.11.Do the methodologies for calculating emission reductions comply with existing good practice?					
D.1.12.Is the monitoring methodology clear and user friendly?					
D.1.13.Does the methodology mitigate possible monitoring errors or uncertainties addressed?					
D.2.Monitoring of Project Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					

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CHECKLIST QUESTION	Ref.#	MoV*	COMMENTS	Draft Concl	Final Concl
D.2.1.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?	D.2.1.1 , D2.1.2, D2.1.3	DR	Monitoring plan of the Draft CDM PDD (August 2005) needs to revise the monitoring plan and incorporate all the parameters, which are necessary for the revised baseline conditions, which have been arrived after economic analysis.	GL-09	OK
D.2.2.Are the choices of project GHG indicators reasonable?	PDD	DR	Yes, the choice of project GHG indicator (CO ₂) is reasonable.		OK
D.2.3.Will it be possible to monitor / measure the specified project GHG indicators?	PDD	DR	Yes, it will be possible to monitor / measure GHG emission indicator.		OK
D.2.4.Will the indicators give opportunity for real measurements of achieved emission reductions?	PDD	DR	Yes, the indicators will give opportunity for real measurement of achieved emission reductions.		OK
D.2.5.Will the indicators enable comparison of project data and performance over time?	PDD	DR	Measurement FO consumption in super heater will enable comparison of project		OK

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CHECKLIST QUESTION	Ref.#	MoV*	COMMENTS	Draft Concl	Final Concl
			activity data.		
D.3.Monitoring of Leakage <i>It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</i>					
D.3.1.Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	PDD E.1	DR	Leakage is not expected to occur outside the project activity boundary. Hence, monitoring of leakage is not necessary. As per Draft CDM PDD (August, 2005), leakage due to the transport of FO would almost equal to the leakage due to the transport of LSHS in the absence of project activity.		OK
D.3.2.Have relevant indicators for GHG leakage been included?	PDDE. 1, E.2, E.3, E.4	DR	Monitoring is not necessary for leakage		OK
D.3.3.Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	PDDD. 2.3		Monitoring is not necessary for leakage		OK
D.3.4.Will it be possible to monitor the specified GHG leakage indicators?	PDDD. 2.3	DR	Monitoring is not necessary for leakage		OK
D.4.Monitoring of Baseline Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
D.4.1.Does the monitoring plan provide for the collection and archiving of all relevant data necessary for	PDD	DR	Draft CDM PDD (August 2005) has		

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CHECKLIST QUESTION	Ref.#	MoV*	COMMENTS	Draft Concl	Final Concl
determining baseline emissions during the crediting period?	D.1, D.2, D.2.1.1		calculated the EF by considering import of electricity from grid on basis of state grid of Tamil Nadu. As per latest guideline for applicability of ACM0002/Version 05, SIIL needs to establish the baseline on basis of import of electricity from Southern India grid.	GAR-03	OK
D.4.2.Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	PDD	DR	<p>LSHS based CPP is one of the sources of electricity supply for selected baseline in Draft CDM PDD (August 2005). If it is still featuring as part of the baseline after evaluation as indicated in CL 03, then the following needs to be considered while estimating the baseline.</p> <ol style="list-style-type: none"> 1. LSHS based CPP is generating steam as well as electricity. Thus, energy and hence, the emission due to LSHS needs to be attributed to both the components of energy in appropriate proportions. The overall EF in baseline should also be corrected accordingly. 2. Baseline data given in Annex 3 of the Draft CDM PDD (August 2005) (table of Generation data for CPP 2: 22.5 MW LSHS based power plant) are not confirming with the data submitted to TUV Rheinland during the site visit. Appropriate correction 	GAR-02	OK

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			<p>is required in the Draft CDM PDD (August 2005) and subsequent baseline calculations if, this data forms part of the baseline after selection of baseline as per CL 03.</p> <p>Draft CDM PDD (August 2005) has calculated the EF by considering import of electricity from grid on basis of state grid of Tamil Nadu. As per latest guideline for applicability of ACM0002/Version 05, SIIL needs to establish the baseline on basis of import of electricity from Southern India grid.</p>	GAR-03	OK
D.4.3.Will it be possible to monitor the specified baseline indicators?	PDD D.2.1.1	DR	It will be possible to monitor the baseline indicators in the project activity if D.4.1 and D.4.2 are known		OK
D.5.Monitoring of Sustainable Development Indicators/ Environmental Impacts <i>It is checked that choices of indicators are reasonable and complete to monitor sustainable performance over time.</i>					
D.5.1.Does the monitoring plan provide the collection and archiving of relevant data concerning environmental, social and economic impacts?	PDD F.1, Annex 4	DR	The monitoring plan provides no plan for collection and achieving of relevant data concerning to environmental, social and economic impacts.	GL-09	OK
D.5.2.Is the choice of indicators for sustainability	PDD D	DR	The monitoring plan has no provision for	GL-09	OK

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CHECKLIST QUESTION	Ref.#	MoV*	COMMENTS	Draft Concl	Final Concl
development (social, environmental, economic) reasonable?	and PDD F		collecting and archiving environmental, social, and economical impacts.		
D.5.3.Will it be possible to monitor the specified sustainable development indicators?	PDD D and PDD F	DR	The monitoring plan has no provision for collecting and archiving environmental, social, and economical impacts.	GL-09	OK
D.5.4.Are the sustainable development indicators in line with stated national priorities in the Host Country?	PDD D and PDD F / PDD A.2 / PDD	DR	The monitoring plan has no provision for collecting and archiving environmental, social, and economical impacts.	GL-09	OK
D.6.Project Management Planning <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>					
D.6.1.Is the authority and responsibility of project management clearly described?	PDD Annex 1	DR	Yes, the authority and responsibility of project activity management is clearly described		OK
D.6.2.Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	PDD Annex 1	DR	As per Draft CDM PDD (August, 2005) authority and responsibility for registration are clearly described but reporting procedure is not clearly described.	GL-12	OK
D.6.3.Are procedures identified for training of monitoring personnel?	SV / I	DR	Procedures for training of monitoring personnel need to be demonstrated by SIIL	GL-12	OK
D.6.4.Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	SV / I	DR	Procedures for emergency preparedness when unintended emissions can be caused need to be demonstrated by SIIL	GL-12	OK

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CHECKLIST QUESTION	Ref.#	MoV*	COMMENTS	Draft Concl	Final Concl
D.6.5.Are procedures identified for calibration of monitoring equipment?	SV / I	DR	Procedures for identified calibration of monitoring equipment need to be demonstrated by SIIL	GL-12	OK
D.6.6.Are procedures identified for maintenance of monitoring equipment and installations?	SV / I	DR	Procedures identified for maintenance of monitoring equipment and need to be demonstrated by SIIL	GL-12	OK
D.6.7.Are procedures identified for monitoring, measurements and reporting?	SV / I	DR	Procedures identified for reporting need to be demonstrated by SIIL	GL-12	OK
D.6.8.Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	SV / I	DR	Procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation) need to be demonstrated by SIIL	GL-12	OK
D.6.9.Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	SV / I	DR	Procedures identified for dealing with possible monitoring data adjustments and uncertainties need to be demonstrated by SIIL	GL-12	OK
D.6.10.Are procedures identified for review of reported results/data?	SV / I	DR	Procedures identified for review of reported results/data need to be demonstrated by SIIL	GL-12	OK
D.6.11.Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	SV / I	DR	Procedure for internal audits of GHG project activity compliance with operational requirements where applicable need to be demonstrated by SIIL	GL-12	OK
D.6.12.Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	SV / I	DR	Procedures for project activity performance reviews before data is submitted for verification, internally or externally need to be demonstrated by SIIL	GL-12	OK

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CHECKLIST QUESTION	Ref.#	MoV*	COMMENTS	Draft Concl	Final Concl
D.6.13.Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	SV / I	DR	Procedures for corrective actions in order to provide for more accurate future monitoring and reporting need to be demonstrated by SIIL.	CL-12	OK
E. Calculation of GHG Emissions by Source <i>It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.</i>					
E.1.Predicted Project GHG Emissions <i>The validation of predicted project GHG emissions focuses on transparency and completeness of calculations.</i>					
E.1.1.Are all aspects related to direct and indirect GHG emissions captured in the project design?	PDD E.1	DR	Yes all aspects related to direct and indirect GHG emissions captured in the project activity design.		OK
E.1.2.Are the GHG calculations documented in a complete and transparent manner?	PDD E.1	DR	Yes the GHG calculations documented in a complete and transparent manner.		OK
E.1.3.Have conservative assumptions been used to calculate project GHG emissions?	PDD E.1	DR	LSHS based CPP is one of the sources of electricity supply for selected baseline in Draft CDM PDD (August 2005). If it is still featuring as part of the baseline after evaluation as indicated in CL 03, then the following needs to be considered while estimating the baseline. 1. LSHS based CPP is generating steam as well as electricity. Thus,	GAR-02	OK

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			<p>energy and hence, the emission due to LSHS needs to be attributed to both the components of energy in appropriate proportions. The overall EF in baseline should also be corrected accordingly.</p> <p>2. Baseline data given in Annex 3 of the Draft CDM PDD (August 2005) (table of Generation data for CPP 2: 22.5 MW LSHS based power plant) are not confirming with the data submitted to TUV Rheinland during the site visit. Appropriate correction is required in the Draft CDM PDD (August 2005) and subsequent baseline calculations if, this data forms part of the baseline after selection of baseline as per CL 03.</p>		
E.1.4.Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	PDD E.1	DR	SIIL needs to incorporate technical specifications of the monitoring instruments, in order to address uncertainties in measurement of GHG emissions.	CL-11	OK
E.1.5.Have all relevant greenhouse gases and source categories listed in Kyoto Protocol Annex A been evaluated?	PDD E.1	DR	Yes all relevant GHGs and source categories listed in Kyoto Protocol Annex A have been evaluated.		OK
E.2.Leakage					

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<i>It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed.</i>					
E.2.1.Are potential leakage effects beyond the chosen project boundaries properly identified?	PDD E.2	DR	There are no potential leakage in the project activity		OK
E.2.2.Have these leakage effects been properly accounted for in calculations?	PDD E.2	DR	There are no potential leakage in the project activity		OK
E.2.3.Does the methodology for calculating leakage comply with existing good practice?	PDD E.2	DR	There are no potential leakage in the project activity		OK
E.2.4.Are the calculations documented in a complete and transparent manner?	PDD E.2	DR	There are no potential leakage in the project activity		OK
E.2.5.Have conservative assumptions been used when calculating leakage?	PDD E.2	DR	There are no potential leakage in the project activity		OK
E.2.6.Are uncertainties in the leakage estimates properly addressed?	PDD E.2	DR	There are no potential leakage in the project activity		OK
E.3.Baseline Emissions <i>The validation of predicted baseline GHG emissions focuses on transparency and completeness of calculations.</i>					
E.3.1.Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions?	PDD E.4	DR	Electricity generation from <ul style="list-style-type: none"> LSHS based CPP of SIIL MALCO's coal based CPP TNEB grid 		OK

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			are chosen as reference for baseline emissions. The project activity emission is determined by FO consumption in super heater. These are appropriate reference for baseline emissions provided CL 03 is closed satisfactorily.		
E.3.2.Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	PDD B.4	DR	Yes, the project activity boundaries are clearly defined and they cover sources and sinks for baseline emissions		OK
E.3.3.Are the GHG calculations documented in a complete and transparent manner?	PDD E.4	DR	LSHS based CPP is one of the sources of electricity supply for selected baseline in Draft CDM PDD (August 2005). If it is still featuring as part of the baseline after evaluation as indicated in CL 03, then the following needs to be considered while estimating the baseline. <ol style="list-style-type: none"> 1. LSHS based CPP is generating steam as well as electricity. Thus, energy and hence, the emission due to LSHS needs to be attributed to both the components of energy in appropriate proportions. The overall EF in baseline should also be corrected accordingly. 2. Baseline data given in Annex 3 of the Draft CDM PDD (August 2005) (table of Generation data for CPP 2: 22.5 MW LSHS based power plant) 	GAR-02	OK

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			are not confirming with the data submitted to TUV Rheinland during the site visit. Appropriate correction is required in the Draft CDM PDD (August 2005) and subsequent baseline calculations if, this data forms part of the baseline after selection of baseline as per CL 03.		
E.3.4. Have conservative assumptions been used when calculating baseline emissions?	PDD E.4	DR	<p>LSHS based CPP is one of the sources of electricity supply for selected baseline in Draft CDM PDD (August 2005). If it is still featuring as part of the baseline after evaluation as indicated in CL 03, then the following needs to be considered while estimating the baseline.</p> <ol style="list-style-type: none"> 1. LSHS based CPP is generating steam as well as electricity. Thus, energy and hence, the emission due to LSHS needs to be attributed to both the components of energy in appropriate proportions. The overall EF in baseline should also be corrected accordingly. 2. Baseline data given in Annex 3 of the Draft CDM PDD (August 2005) (table of Generation data for CPP 2: 22.5 MW LSHS based power plant) are not confirming with the data submitted to TUV Rheinland during 	GAR-02	OK

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			the site visit. Appropriate correction is required in the Draft CDM PDD (August 2005) and subsequent baseline calculations if, this data forms part of the baseline after selection of baseline as per CL 03.		
E.3.5.Are uncertainties in the GHG emission estimates properly addressed in the documentation?	PDD	DR	SIIL needs to incorporate technical specifications of the monitoring instruments, in order to address uncertainties in measurement of GHG emissions.	CL-11	OK
E.3.6.Have the project baseline(s) and the project emissions been determined using the same appropriate methodology and conservative assumptions?	PDD	DR	<p>LSHS based CPP is one of the sources of electricity supply for selected baseline in Draft CDM PDD (August 2005). If it is still featuring as part of the baseline after evaluation as indicated in CL 03, then the following needs to be considered while estimating the baseline.</p> <ol style="list-style-type: none"> 3. LSHS based CPP is generating steam as well as electricity. Thus, energy and hence, the emission due to LSHS needs to be attributed to both the components of energy in appropriate proportions. The overall EF in baseline should also be corrected accordingly. 4. Baseline data given in Annex 3 of the Draft CDM PDD (August 2005) 	CAR-02	OK

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CHECKLIST QUESTION	Ref.#	MoV*	COMMENTS	Draft Concl	Final Concl
			<p>(table of Generation data for CPP 2: 22.5 MW LSHS based power plant) are not confirming with the data submitted to TUV Rheinland during the site visit. Appropriate correction is required in the Draft CDM PDD (August 2005) and subsequent baseline calculations if, this data forms part of the baseline after selection of baseline as per CL 03.</p> <p>Draft CDM PDD (August 2005) has calculated the EF by considering import of electricity from grid on basis of state grid of Tamil Nadu. As per latest guideline for applicability of ACM0002/Version 05, SIIL needs to establish the baseline on basis of import of electricity from Southern India grid.</p>	GAR-03	OK
E.4.Emission Reductions Validation of baseline GHG emissions will focus on methodology transparency and completeness in emission estimations.					
E.4.1.Will the project result in fewer GHG emissions than the baseline scenario?	PDD E.4, PDD E.5 and PDDE.		Yes, the project activity will result in fewer emission than the baseline scenario		OK

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CHECKLIST QUESTION	Ref.#	MoV*	COMMENTS	Draft Concl	Final Concl
	6				
F. Environmental Impacts <i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i>					
F.1.1.Has an analysis of the environmental impacts of the project activity been sufficiently described?	PDD F.1, Enclosure 1	DR	As per Draft CDM PDD (August 2005), SIIL prepared EIA report includes <ul style="list-style-type: none"> • Air quality impact • Noise level increase • Land and soil impact • Water environment impact • Impact on ecology • Impact on socio-economic environment 		OK
F.1.2.Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	PDD F.2 / MoEF, September 22, 2004, J-11011/ 82/2003-IA II	DR	The project activity is part of a larger expansion project, which is having investment in excess of the investment stipulated by law of Government of India for conducting Environment Impact Assessment. MoEF has given clearance to the expansion of the copper smelter. The project activity was a part of this expansion project.		OK

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	(I)				
F.1.3.Will the project create any adverse environmental effects?	PDD	DR	No the project activity will not creates any adverse environmental effects.		OK
F.1.4.Are transboundary environmental impacts considered in the analysis?	PDD F.1	DR	Yes, trans boundary environmental impacts are considered in the analysis.		OK
F.1.5.Have identified environmental impacts been addressed in the project design?	PDD Enclos ure 1	DR	The project activity has addressed environmental impacts in the project activity design		OK
F.1.6.Does the project comply with environmental legislation in the host country	PDD F.2 / TNPC B, April 19, 2005, consen t 11134, Conse nt for expans ion for copper smelter / TNPC B, April 19, 2005, consen	DR	<p>The project activity is complying with environmental legislations in the host country. It has obtained the following from relevant authorities:</p> <ul style="list-style-type: none"> • Environmental clearance from MoEF • NOC from Environment and Forests (EC3) Department, Government of Tamil Nadu • Consent to establish from TNPCB <p>Thus, the project activity complies with environmental legislation of the host country</p>		OK

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The entries in the protocol are adjusted and amended as appropriate to prepare for the validation of “Power generation from proposed 11.2 MW waste heat recovery boiler at the ISA Smelt furnace of the Copper Smelter, Sterlite Industries India Limited (SIIL), Tuticorin”

CHECKLIST QUESTION	Ref.#	MoV*	COMMENTS	Draft Concl	Final Concl
	t 15481, Conse nt for expans ion for copper smelter / MoEF, Septe mber 22, No. J- 11011/ 62/200 3 – IA II (I) / Enviro nment and Forest (EC 3) Dept. July 1, 2004 10203/ EC3/2 004-2				
G. Stakeholder Comments					

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CHECKLIST QUESTION	Ref.#	MoV*	COMMENTS	Draft Concl	Final Concl
<i>The validator should ensure that a stakeholder comments have been invited and that due account has been taken of any comments received.</i>					
G.1.1.Have relevant stakeholders been consulted?	PDD G.1	DR	<p>Identified as stakeholders are</p> <ul style="list-style-type: none"> • Elected body of representatives administrating the local area (village Panchayat) • Tamil Nadu Pollution Control Board (TNPCB) • Ministry of Environment and Forests (MoEF), Government of India • Non Governmental Organization (NGO's) • Consultant • Equipment supplier <p>SIIL needs to submit evidence of comments by Village Panchayat. The process and criteria of identification of the stakeholders should be described within the text of Draft CDM PDD.</p>	GL-10	OK
G.1.2.Have appropriate media been used to invite comments by local stakeholders?	PDD G1	DR	<p>SIIL needs to submit evidence of comments by Village Panchayat. The process and criteria of identification of the stakeholders should be described within the text of Draft CDM PDD.</p>	GL-10	OK
G.1.3.If a stakeholder consultation process is required by regulations/laws in the host country, has the	PDD G	DR	Yes, local stakeholder consultation process		OK

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CHECKLIST QUESTION	Ref.#	MoV*	COMMENTS	Draft Concl	Final Concl
stakeholder consultation process been carried out in accordance with such regulations/laws?	1 / MoEF, September 22, 2004, J- 11011/ 82/200 3 – IA II (I) Environmental clearance to expansion of copper smelter		is required as per India’s law as mentioned in F.1.2 above. A clearance has been granted to the project activity by MoEF, Govt. of India as per EIA notification		
G.1.4.Is a summary of the stakeholder comments received provided?	PDD G.2	DR	SIIL needs to submit evidence of comments by Village Panchayat. The process and criteria of identification of the stakeholders should be described within the text of Draft CDM PDD.	CL-10	OK
G.1.5.Has due account been taken of any stakeholder comments received?	PDD G.3 / MoEF, September	DR	As part of EIA notification SIIL has carried out the public hearing process obtained clearance from MoEF. MoEF takes in to account all the comments received while granting environmental clearance to the		OK

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The entries in the protocol are adjusted and amended as appropriate to prepare for the validation of “Power generation from proposed 11.2 MW waste heat recovery boiler at the ISA Smelt furnace of the Copper Smelter, Sterlite Industries India Limited (SIIL), Tuticorin”

CHECKLIST QUESTION	Ref.#	MoV*	COMMENTS	Draft Concl	Final Concl
	22, 2004, J- 11011/ 82/200 3 – IA II (I) Enviro nment al clearan ce to expans ion of copper smelter		project activity. As part of the validation process DoE had interviews with various officials, village panchayat representatives and NGOs. No negative comments have been received during these interviews		

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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 01: Host country approval from DNA of India needs to be submitted to TUV Rheinland for assessment and confirmation that the proposed CDM project activity contributes to the sustainable development criteria of India.	Table 1, Requirement 2, 4 Table 2 A.3.2, A.3.3	SIIL has submitted host country approval letter “MoEF, December 26, 2005, F- No 4/24/2005-CCC, Host Country approval to ‘11.2 MW Power Generation by Waste Heat Recovery Boiler at ISA Smelt Furnace of Copper smelter at Tuticorin, Tamil Nadu by Sterlite Industries India Limited – regarding CDM”	<i>SIIL has submitted host country approval letter², which serves as confirmation that the project activity meets the sustainable development criteria of India and there is no involvement of Official Development Assistance.</i> <i>CAR 01 is thus closed.</i>
CAR 02: LSHS based CPP is one of the sources of electricity supply for selected baseline in Draft CDM PDD (August 2005). If it is still featuring as part of the baseline after evaluation as indicated in CL 03, then the following needs to be considered while estimating the baseline. 1. LSHS based CPP is generating steam as well as electricity. Thus, energy and hence, the emission due to LSHS needs to be attributed to both the components of energy in appropriate proportions. The overall EF in baseline should also be corrected	B.2.2 B.2.5 D.4.2, E.3.3, E.3.4 E.3.6	Section B.6 of the Revised Draft CDM PDD (September 2006), has incorporated the calculations of baseline along with the monitoring plan to consider appropriate value of emission due to production of electricity by LSHS based engine generator set having facility to generate steam from exhaust of engine. SIIL has corrected annex 3 in Revised Draft CDM PDD (September 2006).	<i>SIIL has evaluated options for baseline as per guidance of ACM0004/Version 02 and arrived at the conclusion that the LSHS based power plant with provision of steam generation from exhaust of engine set is economically most attractive option to the project activity as part of resolution of CL 03 in Revised Draft CDM PDD (September 2006).</i> <i>1. SIIL has modified the calculations of baseline along with the monitoring plan to reflect appropriate value of</i>

² MoEF, December 26, 2005, F- No 4/24/2005-CCC, Host Country approval to ‘11.2 MW Power Generation by Waste Heat Recovery Boiler at ISA Smelt Furnace of Copper smelter at Tuticorin, Tamil Nadu by Sterlite Industries India Limited – regarding CDM

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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
<p>accordingly.</p> <p>2. Baseline data given in Annex 3 of the Draft CDM PDD (August 2005) (table of Generation data for CPP 2: 22.5 MW LSHS based power plant) are not confirming with the data submitted to TUV Rheinland during the site visit. Appropriate correction is required in the Draft CDM PDD (August 2005) and subsequent baseline calculations if, this data forms part of the baseline after selection of baseline as per CL 03.</p>			<p><i>emission due to production of electricity by LSHS based engine generator set having facility to generate steam from exhaust of engine. The changes can be seen in section B.6 of the Revised Draft CDM PDD (September 2006)</i></p> <p>2. <i>The baseline data considered for CPP 2 are now in line with the data made available to TUV Rheinland.</i></p> <p><i>CAR 02 is thus closed.</i></p>
<p>CAR 03: Draft CDM PDD (August 2005) has calculated the EF by considering import of electricity from grid on basis of state grid of Tamil Nadu. As per latest guideline for applicability of ACM0002/Version 05, SIIL needs to establish the baseline on basis of import of electricity from Southern India grid.</p>	<p>D.4.1 D.4.2 E.1.3</p>	<p>SIIL has considered LSHS based engine generator set having facility to generate steam from exhaust of engine (baseline of the project activity by considering most economical option of electricity generation). Hence import of electricity from TNEB is not considered in the baseline.</p>	<p><i>Revised Draft CDM PDD (September 2006) has revaluated the baseline of the project activity by considering most economical option of electricity generation i.e. LSHS based engine generator set having facility to generate steam from exhaust of engine. Since import of electricity from state grid of Tamil Nadu / Southern region grid of India is not considered in the baseline, there is no need to calculate the EF on basis of Southern India grid.</i></p> <p><i>CAR 03 is thus closed.</i></p>

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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 01: Section C of Draft CDM PDD (August 2005) has indicated that the starting date of project activity is April 2003, when construction of the project activity begun and the first crediting period started on July 26, 2005. SIIL needs to submit appropriate evidences to support starting date of project activity and beginning of first crediting period for the project activity.	C.1.1	SIIL has submitted appropriate evidences to support starting date of project activity and beginning of first crediting period for the project activity.	<p><i>Project proponent has submitted evidence (Thermal Systems (Hyderabad) Pvt. Ltd., April 10, 2004, Invoice against the customer ‘Sterlite Industries (India) Limited’ order number 3LTPA/PS/WHRS/Contract-001, RR/LR No 36287, On the basis of this evidence it is concluded conclude that the project activity started in April 2003.</i></p> <p><i>SIIL has submitted document (SIIL, July 26, 2005, Take over certificate for 11.2 MW STG set) suggesting that 11.2 MW STG from Demag Delaval Industrial Turbomachinery was taken over by SIIL on July 26, 2005. This has confirms that the crediting period for the project activity started on July 26, 2006.</i></p> <p><i>CL 01 is thus closed</i></p>
CL 02: As per ACM0004/Version 02, alternatives to the baseline of the project activity should include project activity not undertaken as a CDM project activity. This alternative is not explored while evaluating alternatives to the baseline of project activity. SIIL should include this as an alternative to the project activity.	B.2.1	SIIL has considered “project activity not undertaken as a CDM project activity” while evaluating evaluation of alternatives to the baseline of project activity and same is amended in Revised Draft CDM PDD (September 2006).	<p><i>Revised Draft CDM PDD (September 2006) section B has incorporated “project activity not undertaken as a CDM project activity” as an option while evaluating alternatives to the baseline of project activity, which is as per ACM0004/Version 02.</i></p> <p><i>CL 02 is thus closed</i></p>

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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 03: As per ACM0004/Version 02, the baseline should be selected on basis of economically most attractive alternative from the alternatives that do not face any prohibitive barriers. SIIL needs to evaluate all the selected alternatives for their economical attractiveness and justify selection of a particular alternative as baseline to the project activity as per ACM0004/Version 02.	B.2.1 B.2.6	<p>Project proponent has considered economic evaluation of below credible and plausible alternatives to the proposed CDM project activity to decide the baseline scenario</p> <ol style="list-style-type: none"> 1) Import of Electricity from State grid 2) Import from MALCO 3) Power generation from Captive Power Plant of M/s. Sterlite Industries (India) Ltd 4) Combination of 1,2 and 3 <p>After the evaluation most economical option for the project activity and lowest emission of CO₂ per kWh generated is selected as a baseline (LSHS based CPP).</p>	<p><i>Revised Draft CDM PDD (September 2006) has made an economic evaluation of all the credible and plausible alternatives to the proposed project activity to decide the baseline scenario as per requirement of ACM0004/Version 02. The analysis has suggested that the option of electricity generation through LSHS fired engine generator set having facility to generate steam from exhaust of engine is the most economical option for the project activity. TUV Rheinland has also confirmed that this option is having lowest emission of CO₂ per kWh generated. Thus, this is most conservative approach for selection of the baseline.</i></p> <p><i>CL 03 is thus closed.</i></p>
<p>CL 04: SIIL needs to clarify the following with respect to additionality</p> <ol style="list-style-type: none"> 1. The format of ‘Tools for demonstration and assessment of additionality’ should be in line with the latest version approved by CDM EB. 2. SIIL needs to submit evidence that CDM revenues due to the project 	B.2.7	<p>SIIL has adopted the latest version of ‘Tools for Demonstration and Assessment of Additionality’ while revising the Draft CDM PDD.</p> <p>Project proponent has demonstrated, that CDM revenues were considered vide letter “SIIL, February 15, 2003, Order number 113019908, placed on</p>	<p><i>Following clarifications are submitted by SIIL with respect to additionality of the project activity.</i></p> <ol style="list-style-type: none"> 1. <i>Revised Draft CDM PDD (September 2006) has applied the latest version of ‘Tools for Demonstration and Assessment of Additionality’ as approved by</i>

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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
activity were considered in application to the banks and financial institutes prior to financial closure of the project activity		Ernst & Young for CDM advisory services	<p><i>CDM EB.</i></p> <p><i>2. SIIL has submitted evidence (SIIL, February 15, 2003, Order number 113019908, placed on Ernst & Young for CDM advisory services)</i></p> <p><i>CL 04 is thus closed</i></p>
CL 05: While evaluating alternatives to the project activity in step 1 of the ‘Tools for demonstration and assessment of additionality’, Alternative 4 – ‘Continuation of current situation’ is indicated to be same as the Alternative 1 – ‘Import of 11.2 MW electricity from TNEB grid’. However, the current situation at the time of project activity conceptualisation involves use of electricity from the LSHS based reciprocating engine based CPP. SIIL needs to re-evaluate Alternative 4 as described in Draft CDM PDD (August 2005).	B.2.7	SIIL has re-evaluated the options for project activity in Revised Draft CDM PDD (September 2006)	<p><i>Revised Draft CDM PDD (September 2006) has re-evaluated Alternative 4 – ‘Continuation of Current situation’ and there is no duplication of same alternatives in Revised Draft CDM PDD (September 2006).</i></p> <p><i>CL 05 is thus closed</i></p>
CL 06: As part of Sub - step 3a of the ‘Tools for Demonstration and Assessment of Additionality’ it is stated that “- - - -this would preclude any investment in a new captive power plant based on fossil fuel (LSHS)”. SIIL needs to explain how is	B.2.7	Project proponent has amended the Draft CDM PDD accordingly.	<p><i>Project proponent has made appropriate changes to clarify alternative “Option (b.1): Import of electricity from TNEB/SRG”, in Revised Draft CDM PDD (September 2006).</i></p> <p><i>CL 06 is thus closed</i></p>

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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
investment in a new captive power plant based on fossil fuel (LSHS) relevant while comparing the alternative to project activity. The text needs further clarification in this respect.			
CL 07: As part of Sub-step 3a of the additionality tools, it is noted that the statutory requirements for WHRB has reduced the plant availability from 98 per cent to 93.5 per cent. This statement needs to be substantiated with evidences by SIIL. .	B.2.7	<p>The plant availability data is based upon personal experience of the plant personnel. It remains a fact that the plant availability would reduce due to a waste heat recovery boiler.</p> <p>In order to prove the adverse affect on plant availability, SIIL has submitted the letter vide “ The Winter Company April 22, 1998, Sterlite Copper Smelter Expansion, Project No. 175-01”.</p>	<p><i>There is no evidence suggesting that the plant availability would have reduced from 98 per cent to 93.5 per cent due to statutory requirements for the WHRB. However SIIL has submitted the evidence (The Winter Company April 22, 1998, Sterlite Copper Smelter Expansion, Project No. 175-01) to demonstrate that the expert opinion on waste heat recovery boiler for the copper smelter was negative. One of the main reasons sighted for this was that the boiler maintenance would reduce availability of the copper smelter.</i></p> <p><i>CL 07 is thus closed</i></p>
CL 08: As part of common practice analysis in step 4 of the ‘Tools for Demonstration and Assessment of Additionality’, other copper smelters in India are analysed. SIIL needs to submit	B.2.7, B.2.9	<p>In India there are just 3 major players (Sterlite, Hindalco and Hindustan Copper Ltd.) in the copper processing.</p> <p>SIIL has submitted the appropriate evidence to demonstrate that</p>	<p><i>SIIL has referred to the following evidences to indicate the practices followed by other smelters from the project activity:</i></p> <p>1. Website “</p>

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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
evidence on practices followed by these smelters with respect to waste heat recovery based power generation.		ISASMELT smelting process with waste heat recovery is unique in India.	<p>http://www.xstratatech.com/en/</p> <ol style="list-style-type: none"> 2. ICRA, May 2005, Copper, The Indian Copper Industry 3. http://www.hindustancopper.com/home.asp <p>ISASMELT smelting process installations are available in Australia, Belgium, China, Germany, India, Malaysia and United States of America. Moreover from ISASMELT history, it is found that ISASMELT smelting process installation is only available with SIIL in India.</p> <p>As per “Report by ICRA Information, Grading & Research Service, COPPER The Indian Copper Industry, May 2005”, The Industry currently has just 3 major players (Sterlite, Hindalco and Hindustan Copper Ltd.). In addition to all, as per “© Brook Hunt & Associate Ltd 2005”, Hindalco Industries Limited (Operator: Birla Copper) has commissioned Outokumpu flash furnace with steam from flash furnace waste heat recovery and coal fired boiler. The Birla copper smelter at Dahej was having capacity of 250,000 Tonnes per annum at the time of project conceptualisation. Hindustan</p>

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			<p><i>Copper Ltd. has also commissioned Outokumpu flash furnace without waste heat recovery system. Hindustan Copper is of 47000 Tonnes per annum capacity, which was too small, compare to the project activity.</i></p> <p><i>CL 08 is thus closed.</i></p>
CL 09: Monitoring plan of the Draft CDM PDD (August 2005) needs to revise the monitoring plan and incorporate all the parameters, which are necessary for the revised baseline conditions, which have been arrived after economic analysis.	Table 1, Requirement 13, Table 2 D.1.3, D.2.1 D.5.1, D.5.2, D.5.3 D.5.4	SIIL has revised the Monitoring plan as per ACM 0004/Version 02 by considering appropriate baseline.	<p><i>SIIL has done economic analysis of all the alternatives to the project activity and indicated that the baseline of the project activity is LSHS based engine generator set with provision of waste heat from exhaust of the engine. Section B.6 of the Revised Draft CDM PDD (September 2006) has incorporated all the necessary parameters for measurement of baseline emission.</i></p> <p><i>Thus CL 09 is closed.</i></p>
CL 10: SIIL needs to submit evidence of comments by Village Panchayat. The process of consultation of the stakeholders should be described within the text of Draft CDM PDD.	G.1.1 G.1.2 G.1.4	SIIL has submitted evidence of comments by Village Panchayat. Revised Draft CDM PDD has amended the process of identification of the stakeholders.	<p><i>SIIL has submit evidence of comments by Village Panchayat vide following documents:</i></p> <ol style="list-style-type: none"> <i>1. Counsellor-18 Ward (Aiadm), South Veera Pandiyapuram (PO), Ottapidaram Taluk,</i>

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			<p><i>Tuticorin, April 24, 2005</i></p> <p><i>2. Chillanatham Panchayat Ottapidaram Panchayat Division Tuticorin District, President, April 24, 2005</i></p> <p><i>Revised Draft CDM PDD (September 2006) section E.1, has described the process of consultation of the stakeholders.</i></p> <p><i>CL 10 is thus closed.</i></p>
CL 11: SIIL needs to incorporate technical specifications of the monitoring instruments, in order to address uncertainties in measurement of GHG emissions.	E.1.4 E.3.5	Revised Draft CDM PDD (September 2006), has describes technical specifications of the monitoring instruments.	<p><i>Revised Draft CDM PDD (September 2006), Annexure 4 has demonstrated specifications of the monitoring instruments. These parameters will help in determining uncertainties in the monitoring parameters.</i></p> <p><i>CL 11 is thus closed</i></p>
<p>CL 12: The following procedures are required from SIIL:</p> <p>i. Training of monitoring personnel related to GHG emission reduction project activity</p> <p>ii. Emergency preparedness for cases where emergencies can cause unintended GHG emissions</p>	D.6.2 D.6.3 D.6.4 D.6.5 D.6.6 D.6.7	SIIL has submitted the “SIIL, Tuticorin, TamilNadu, CDM Project Manual, 11.2 MW WHRB at ISA Smelt furnace” under which training of monitoring personnel, emergency preparedness, calibration of monitoring equipment, maintenance of monitoring equipments, monitoring and reporting procedure, records handling, monitoring data	<p><i>SIIL has submitted documents (SIIL, Tuticorin, Tamil Nadu, CDM Project Manual, 11.2 MW WHRB at ISA Smelt furnace) relating to the procedures as mentioned in CL 12.</i></p> <p><i>CL 12 is thus closed.</i></p>

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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
<ul style="list-style-type: none"> iii. Calibration of monitoring equipment related to GHG emission reduction project activity iv. Maintenance of monitoring equipment and installations related to GHG emission v. Monitoring, measurements and reporting of GHG emission vi. Day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation) vii. Dealing with possible monitoring data adjustments and uncertainties related to measurement of GHG emission viii. Review of reported results/data related to GHG emission ix. Internal audits of GHG project activity compliance with operational requirements where applicable x. Project activity performance reviews before data is submitted for verification, internally or externally xi. Corrective actions in order to provide for accurate future monitoring and reporting GHG emission reduction 	<ul style="list-style-type: none"> D.6.8 D.6.9 D.6.10 D.6.11 D.6.12 D.6.13 	<p>adjustments and uncertainties related to measurement of GHG emission, performance review procedure, internal audit, corrective action procedure are provided.</p>	
CL 13: Draft CDM PDD (August 2005) is unclear with respect to persons / organisations involved in development of	Table 1, Requirement 18	Revised Draft CDM PDD (September 2006) has incorporated the necessary changes regarding the name and entity responsible for determination of	<i>Revised Draft CDM PDD (September 2006) has incorporated name and entity responsible for determination of</i>

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baseline and monitoring. SIIL should identify the responsible person for above-mentioned activity along with their contact details.		baseline and monitoring methodology.	<i>baseline and monitoring methodology in section B.8 along with contact details.</i> <i>CL 13 is thus closed.</i>

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ⁱ Ramakrishna & Co., November 11, 2005, Certificate on cost of Waste heat recovery boiler and turbine

ⁱⁱ MoEF, September 22, 2004, NOC for expansion of copper smelter plant by SIIL

ⁱⁱⁱ Environment – Forest (EC3) Department, Government of Tamil Nadu, July 1, 2004, 10203/EC3/2004-2, NOC

^{iv} TNPCB, April 19, 2005, Consent order number 11451 (Expansion), Consent for expansion granted to SIIL

^v MoEF, September 22, 2004, J-11011/82/2003-IA II (I), Clearance for expansion of copper smelter under EIA notification dated January 27, 2004

^{vi} SIIL, August 20, 2005, Document number 126569, Payment advice to president of Meelavittan