VCS VERIFICATION REPORT

6.5 MW COGENERATION PROJECT IN AKBARPUR, PUNJAB

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Summary:

KBS Certification Services Pvt. Ltd. (here in after also referred as KBS) has performed the verification of the emission reductions reported for the project activity "6.5 MW cogeneration project in Akbarpur, Punjab" for the period 30-March-2009 to 19-June 2011 (both dates included), to review and determine the monitored reductions in GHG emissions that have occurred as a result of the project activity. The project is registered under VCS Ref Id: VCSR679 and the current monitoring period covers the period pre-CDM registration. The project activity was validated as VCS project by TÜV Rheinland (validation Report No.: 01 996 9105063620, dated 22 March 2011). It was also registered as a CDM project on 20 June 2011 under the UNFCCC reference number 4886 with a 10-year CDM fixed crediting period from 20 June 2011 to 19 June 2021. As emission reductions occur prior to the date of CDM registration of the project activity, the emission reductions prior to the project's CDM registration cannot be claimed as Certified Emission Reductions (CERs). These emission reductions are thus claimed as Verified Carbon Units (VCU) under the Verified Carbon Standard (VCS) version 3.3. This is in accordance to the eminent VCS Guidance for projects that are registered in two GHG programs.

The verification was performed on the basis of VCS Programme Guide version 3.4 & VCS Standard version 3.3 for the VCS projects, as well as criteria given to provide for consistent project operations, monitoring and reporting. The verification was conducted by means of document review, follow-up interviews and site inspection, and the resolution of outstanding issues.

In our opinion, the GHG emission reductions reported for the project in the monitoring report (version 03 dated 16 August 2013) are fairly stated. The GHG emission reductions were calculated correctly on the basis of approved small scale methodology AMS-I.C (version 18) and the monitoring plan contained in the registered VCS PD of 22 March 2011.

KBS Certification Services Pvt. Ltd. confirms that the monitoring system is in place and the claimed emission reductions or removals are free from material errors, omissions or misstatements, with a reasonable level of assurance. The report describes a total of 02 finding(s) which include:

- 01 Corrective Action Requests (CARs)
- 01 Clarification Requests (CLs) and
- 00 Forward Action Requests (FARs)

All finding(s) have been closed satisfactorily. Hence, KBS is able to certify that the emission reductions from the "6.5 MW cogeneration project in Akbarpur, Punjab" during the period amount to 61,416 tonnes CO_2 equivalent.

KBS does not assume any responsibility towards the issuance and utilization of the VCUs hereby verified and certified. Request for issuance of VCUs shall be made by the project proponent to an approved VCS Program Registry based on the requirements set out under the most recent version of

the VCS Program Guidelines clause on VCS Registration.

The verification of reported emission reductions is based on the information made available to KBS and the engagement conditions detailed in this report. KBS cannot be held liable by any party for decisions made or not made based on this report.

Abbreviations

BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CERs	Certified Emission Reductions
CL	Clarification Request
CO_2	Carbon dioxide
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EB	CDM Executive Board
EF	Emission Factor
EIA	Environmental Impact Assessment
ER	Emission Reduction
FAR	Forward Action Request
FCIPL	First Climate (India) Pvt. Ltd.
GACL	Gillanders Arbuthnot & Co. Ltd.
GHG	Greenhouse gas(es)
GPS	Global Positioning System
HCA	Host Country Approval
IPCC	Intergovernmental Panel on Climate Change
KBS	KBS Certification Services Pvt. Ltd
MP	Monitoring Plan
NEWNE	North East West North-East
O&M	Operation & Maintenance
OM	Operating Margin
PA	Project Activity
PD	Project Description
PP	Project proponent
SEIAA	State level Environment Impact Assessment Authority
UNFCCC	United Nations Framework Convention on Climate Change
VCSA	Verified Carbon Standard Association
VVS	Validation and Verification Standard

Table of Contents *Page*

1 INTRODUCTION 6
1.1 Objective 6
1.2 Scope and Criteria 6
1.3 Level of assurance 7
1.4 Summary Description of the Project 7
2 VALIDATION PROCESS, FINDINGS AND CONCLUSION 7
2.1 Validation Process 7
2.2 Validation Findings 8
2.2.1 Gap Validation 8
2.2.2 Methodology Deviations 8
2.2.3 Project Description Deviations 8
2.2.4 New Project Activity Instances 8
2.3 Validation Conclusion 8
3 VERIFICATION PROCESS 8
3.1 Method and Criteria 8
3.2 Document Review 9
3.3 Interviews 9
3.4 Site Inspections 10
3.5 Resolution of Any Material Discrepancy 11
4 VERIFICATION FINDINGS 11
4.1 Project Implementation Status 11
4.2 Accuracy of GHG Emission Reduction or Removal Calculations 18
4.3 Quality of Evidence to Determine GHG Emission Reductions or Removals 19
4.4 Management and Operational System 20
5 VERIFICATION CONCLUSION 20
6 REFERENCES 23
ANNEX 1: DETAILED FINDINGS 26
ANNEX 2: CERTIFICATE OF COMPETENCE 28

1 INTRODUCTION

Gillanders Arbuthnot & Co. Ltd. has commissioned KBS to carry out the verification and certification of emission reductions reported for the "6.5 MW cogeneration project in Akbarpur, Punjab" (the project) in the period 30 March 2009 to 19 June 2011 (both dates included). This report contains the findings from verification and includes a verification statement for the verified carbon units.

1.1 Objective

The objectives of this verification exercise are, by review of objective evidence, to establish that:

- The project activity has been implemented and operated as per the registered VCS PD and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- Monitoring report and other supporting documents are complete;
- The actual monitoring systems & procedures and monitoring report conforms with the requirements of the approved monitoring plan and the approved monitoring methodology;
- The data is recorded and stored as per the monitoring methodology and approved monitoring plan.
- The data reported are accurate, complete, consistent, transparent and free of material error or omission.

The objective of this verification was to verify and provide a verification statement of emission reductions reported for the "6.5 MW cogeneration project in Akbarpur, Punjab" for the period 30 March 2009 to 19 June 2011.

1.2 Scope and Criteria

The verification scope is defined as an independent and objective review of the VCS project description (VCS PD). The VCS PD is reviewed against the criteria stated in the VCS Version 3.3 and the relevant documents and policy announcements made by the VCSA. The "6.5 MW cogeneration project in Akbarpur, Punjab" is registered as a VCS project activity (Reference Number: VCSR679).

The scope of the verification is:

- To verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan.
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emissions reduction data is free from material misstatement.
- To verify that reported GHG emissions data is sufficiently supported by evidence.

The criteria of the verification are:

- VCS Program Guide version 3.4 /B02b/
- VCS Standard version 3.3 /B02a/ and other relevant requirements defined by VCSA.
- The approved small scale methodology AMS-I.C (version 18). /B01/

The verification shall ensure that reported emission reductions are complete and accurate in order to be verified.

Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. Our examination includes assessment, on a test basis, of evidence relevant to the amounts and disclosures in relation to the project's GHG emission reductions for the defined monitoring period.

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

1.3 Level of assurance

The verification report expresses a conclusion with a reasonable level of assurance about whether the reported GHG emissions reduction data is free from material misstatement. KBS applied a materiality threshold of 5% with respect to omission or misstatements concerning reported quantities as per VCS standard /B02a/.

1.4 Summary Description of the Project

Title of project activity:	6.5 MW cogeneration project in Akbarpur, Punjab
Project ID:	The project activity was validated under VCS by TÜV Rheinland (validation Report No.: 01 996 9105063620, 22 March 2011 /B13/) and it was also registered as a CDM project on 20 June 2011 under the UNFCCC reference number 4886 (http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1307501311.32/view) /B03/
Monitoring Period:	30 March 2009 to 19 June 2011 (both dates included)
Applied methodology:	AMS-I.C. ver. 18 - Thermal energy production with or without electricity /B01/
Location of the Project activity:	Village – Akbarpur; P.O. Box – 1, Ahmedgarh; District – Sangrur, Punjab – 148021. Latitude: 31° 30' 0" N; Longitude: 75° 22' 0" E
Project Participant:	Gillanders Arbuthnot & Co. Ltd.

2 VALIDATION PROCESS, FINDINGS AND CONCLUSION

The project activity has been validated under VCS (VCS Project Registry Id: VCSR679 /B15/). The validation of the project activity under VCS has been performed by TUV Rheinland Japan Ltd. vide validation report no. 01 996 9105063620 dated 22/03/2011 /B13/. The commissioning date of the project activity is 30/03/2009. Since, the validation of the project activity has already been carried out; KBS has performed only verification for the current monitoring period based on VCS validation report. The basis of taking end date of this monitoring period is the before the date of registration under CDM scheme.

2.1 Validation Process

This section is not applicable for the project activity.

2.2 Validation Findings

2.2.1 Gap Validation

The project activity has been validated under VCS (VCS Project Registry Id: VCSR679 /B15/). The validation of the project activity under VCS has been performed by TUV Rheinland Japan Ltd. vide validation report no. 01 996 9105063620 dated 22/03/2011 /B13/. The commissioning date of the project activity is 30/03/2009. Thus, the project activity has been registered within the validation deadline of two years and is eligible to claim credits under VCS.

2.2.2 Methodology Deviations

The verification process has assessed all factors and issues that constitute the basis for emission reductions from the project according to the applicable small-scale CDM methodology AMS-I.C (version 18) /B01/. There was no methodology deviation applied to this project.

2.2.3 Project Description Deviations

Not Applicable.

2.2.4 New Project Activity Instances

The project was not a grouped project; hence this clause is not applicable.

2.3 Validation Conclusion

Not applicable.

3 VERIFICATION PROCESS

3.1 Method and Criteria

KBS' approach to the verification is a two-stage process.

In the first stage, KBS completed a strategic review and risk assessment of the projects activities and processes in order to gain a full understanding of:

- Activities associated with all the sources contributing to the project emissions and emission reductions, including leakage if relevant;
- Protocols used to estimate or measure GHG emissions from these sources;
- Collection and handling of data;
- Controls on the collection and handling of data;
- Means of verifying reported data; and
- Compilation of the monitoring report.

At the end of this stage, KBS produced a Verification Checklist which, based on the risk assessment of the parameters and data collection and handling processes for each of those parameters, describes the verification approach and the sampling plan.

Using the Verification checklist, KBS verified the implementation of the monitoring plan and the data presented in the Monitoring Report for the period in question. This involved a site visit and a desk review of the monitoring report. This verification report describes the findings of this assessment.

3.2 Document Review

A desk review is undertaken, involving but not limited to,

- A review of the data and information presented to verify their completeness;
- A review of the monitoring plan and monitoring methodology, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures;
- An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

The list of documents reviewed is included in the section 'References'

3.3 Interviews

As per the audit plan the assessment team went on site and interviewed the concerned person as per following table:

Date	Name	Position	Short description of the subject discussed
11/07/2013	Mr. Rajesh Sehgal Mr. Sarbjat Singh Mr. Amardeep Singh	Senior Vice President, GACL Assistant General Manager, GACL Deputy Manager, GACL	Opening Meeting: Introduction, scope and objective of work, roles and responsibilities of audit team, resources required, and timetable of the onsite audit including venue for closing meeting and any concerns from PP.
11/07/2013	Mr. Amardeep Singh Mr. Dharmpal Singh Mr. Soumik Biswas	Deputy Manager, GACL Plant Incharge, GACL Manager, FCIPL	Implementation and operation of project activity (project boundary, technology, project equipment, monitoring and metering equipment) as per registered VCS PD/previous verification.
11/07/2013	Mr. Dharmpal Singh	Plant Incharge, GACL	Management and monitoring procedures followed at project site.
11/07/2013	Mr. Parvesh Mittal Mr. Vivek Dhiman Mr. Gautam Paul Mr. Jagdeep Singh	DCS Operator, GACL Turbine Operator, GACL Lab Attendant, GACL Boiler Operator, GACL	Physical inspection of the project activity: Site visit and interview of monitoring personnel
11/07/2013	Mr. Amardeep Singh Mr. Dharmpal Singh	Deputy Manager, GACL Plant Incharge, GACL	Management and operational system: Documentation, allocation of responsibilities, qualification and training, data recording &archiving, internal audit and management review and emergency procedures.
11/07/2013	Mr. Dharmpal Singh	Plant Incharge, GACL	Verification checklist: compliance of monitoring procedures followed at project site with registered VCS PD and monitoring methodology.
11/07/2013	Mr. Dharmpal Singh Mr. Soumik Biswas	Plant Incharge, GACL Manager, FCIPL	Review of monitored data and relevant document in accordance with registered monitoring plan and applied monitoring methodology.
11/07/2013	Mr. Soumik Biswas	Manager, FCIPL	Review of ER calculations in accordance with applied methodology

			and relevant tools.

3.4 Site Inspections

A site visit is undertaken by members of verification team, involving but not limited to,

- An assessment of the implementation and operation of the project activity as per the registered VCS PD;
- A review of information flows for generating, aggregating and reporting the monitoring parameters;
- Interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the approved monitoring plan;
- A cross-check between information provided in the monitoring report and data from other sources such as plant log books, inventories, purchase records or similar data sources;
- A check of the monitoring equipment, including calibration performance and observations of monitoring practices against the requirements of the VCS PD and the selected methodology;
- A review of calculations and assumptions made in determining the GHG data and emission reductions;
- An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

The site visit for this verification assessment was undertaken by assessment team – Kaushik Pal (Team Leader, Technical Expert and Local Expert) and details are mentioned below;

Location	Village – Akbarpur; P.O. Box – 1, Ahmedgarh; District – Sangrur, Punjab – 148021; India.	
Dates	11/07/2013	
Key points discussed	**Name of person interviewed**	**Designation, Organization**
Implementation and Operation of the project activity based on Revised Monitoring Plan and physical features of the project activity as per VCS PD	Mr. Amardeep Singh Mr. Dharmpal Singh	Deputy Manager, GACL Plant Incharge, GACL
Information flows for generating, aggregating and reporting the monitoring parameters	Mr. Dharmpal Singh	Plant Incharge, GACL
Competency of the operating personnel, monitoring personnel and calibrating agencies	Mr. Parvesh Mittal Mr. Vivek Dhiman Mr. Gautam Paul Mr. Jagdeep Singh	DCS Operator, GACL Turbine Operator, GACL Lab Attendant, GACL Boiler Operator, GACL
Data collection procedures	Mr. Amardeep Singh Mr. Dharmpal Singh	Deputy Manager, GACL Plant Incharge, GACL
Calibration performance and monitoring practices followed for monitoring equipments used in the project activity	Mr. Amardeep Singh Mr. Dharmpal Singh	Deputy Manager, GACL Plant Incharge, GACL
Quality Control and Quality Assurance procedures against the approved revised monitoring plan	Mr. Amardeep Singh Mr. Dharmpal Singh	Deputy Manager, GACL Plant Incharge, GACL
Calculation and assumptions made in determining the GHG data and emission reductions	Mr. Dharmpal Singh Mr. Soumik Biswas	Plant Incharge, GACL Manager, FCIPL
Compliance with VCS	Mr. Soumik Biswas	Manager, FCIPL

criterion and relevant guidance with respect to revised monitoring plan		
Level of accuracy (Materiality) of the monitoring activity	Mr. Soumik Biswas	Manager, FCIPL

3.5 Resolution of Any Material Discrepancy

During the course of verification the findings may be raised as under;

CAR is raised if one of the following occurs:

- Non-compliance with the monitoring plan or methodology are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;
- Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants;
- Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions;
- Issues identified in a FAR during validation to be verified during verification(s) have not been resolved by the project participants.

Clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable VCS requirements have been met.

FAR is raised during verification if the monitoring and reporting require attention and/or adjustment for the next verification period.

The verification report contains all CARs, CLs and FARs raised during this verification in transparent manner and provides clear information of the issues raised, response received and its resolutions, including the changes in the documents.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

As per the registered VCS PD /B14/ the project activity was commissioned on 30/03/2009 /P05/. Also as mentioned in the monitoring report /P02/ the plant is operating successfully from the date of commissioning till date; these were checked against the commissioning certificate /P05/ and the plant records /P09/.

The ex-ante estimation of emission reduction was 77,960 tCO_2 for the current monitoring period of 812 days considering 35,044 tCO_2 per annum. However, for the verification period from 30/03/2009 to 19/06/2011, the emission reduction at actual was found to be 61,416 tCO_2, which has shown a 21.22% decrease from the estimation done for the same period (30/03/2009 to 19/06/2011). During the tenure of current monitoring period, it was observed from the shut down periods that project activity generated lesser amount of electricity resulting in the lower quantum of emission reduction. The VCS PD considered 85% CUF, whereas during the current monitoring period the project activity achieved only 66% (on gross power generation) of plant load factor.

Shut Down details /P09/:

The major and only shutdown of the project activity was from the 19/04/2011 till after the end of current monitoring period for maintenance activities. This fact was cross checked and verified from the plant records.

The verification team has confirmed during the site visit that there are no changes that have happened in the project activity which may impact the applicability of the methodology. The verification team has also critically reviewed the implementation and operation of the project activity and found satisfactory.

Parameters determined ex-post:

4.1.1 Data/Parameter, Unit:

Gross electricity generated by the project activity in the year y ($EG_{gross,y}$), MWh

<table>
<tr><td></td><td>Discussion and verification assessment</td></tr>
<tr><td>Purpose of data</td><td>Calculation of baseline emissions</td></tr>
<tr><td>Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)</td><td>
<table>
<tr><td>Type</td><td colspan="3">Trivector Meter, E3M051, 3 Phase 4 Wire</td></tr>
<tr><td>Make</td><td colspan="3">Secure Meters Ltd.</td></tr>
<tr><td>Accuracy Class</td><td colspan="3">0.5S</td></tr>
<tr><td>Serial Number</td><td colspan="3">KAU06136</td></tr>
<tr><td>Calibration frequency</td><td colspan="3">Annual</td></tr>
<tr><td>Dates of last calibration</td><td>29-03-2009</td><td>01-03-2010</td><td>23-11-2010</td></tr>
<tr><td>Validity</td><td>28-03-2010</td><td>28-02-2011</td><td>22-11-2011</td></tr>
<tr><td>Calibrating Agency</td><td colspan="3">Adecon India</td></tr>
</table>
</td></tr>
<tr><td>Measuring/Reading/ Recording frequency</td><td>Measurement frequency: Continuous
Recording frequency: Hourly
Reporting frequency: Monthly</td></tr>
<tr><td>Data collection (from data generation, aggregation, to recording, calculation and reporting)</td><td>The gross electricity generated is measured by trivector energy meter. The data is recorded in plant log book on hourly basis. The collected data is aggregated and reported on monthly basis.</td></tr>
<tr><td>Verified value</td><td>84484.63</td></tr>
<tr><td>Cross checks</td><td>The verification team cross checked the reported data in the MR /P02/ and ER sheet /P04/ with the log book (plant records) /P09a/ records during site visit.</td></tr>
<tr><td>QA/QC procedures applied</td><td>Calibration of the energy meter is carried out at annually, as stated above. The data will be kept till two years after the end of the crediting period.
The reported values cross-checked with the plant records /P09a/ by the verification team were found consistent.</td></tr>
</table>

4.1.2 Data/Parameter, Unit:

Auxiliary electricity consumption by the project activity in the year y ($EG_{aux,y}$), MWh

	Discussion and verification assessment
Purpose of data	Calculation of baseline emissions

<table>
<tr><td>Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)</td><td>
<table>
<tr><td>Type</td><td>Energy meter, EM 6400</td></tr>
<tr><td>Make</td><td>Conzerv</td></tr>
<tr><td>Accuracy Class</td><td>0.5S</td></tr>
<tr><td>Serial Number</td><td>186772/3764-4109</td></tr>
<tr><td>Calibration frequency</td><td>Annual</td></tr>
</table>
<table>
<tr><th>Dates of last calibration</th><th>Validity</th><th>Calibrating Agency</th></tr>
<tr><td>05/10/2008</td><td>06/10/2009</td><td>Conzerv</td></tr>
<tr><td>28/07/2009</td><td>27/07/2010</td><td>Pressure & Process Boilers</td></tr>
<tr><td>01/03/2010</td><td>28/02/2011</td><td>Adecon India</td></tr>
<tr><td>24/11/2010</td><td>23/11/2011</td><td>United Automation & Services</td></tr>
</table>
</td></tr>
<tr><td>Measuring/Reading/ Recording frequency</td><td>Measurement frequency: Continuous
Recording frequency: Hourly
Reporting frequency: Monthly</td></tr>
<tr><td>Data collection (from data generation, aggregation, to recording, calculation and reporting)</td><td>The auxiliary electricity generated is measured by trivector energy meter. The data is recorded in plant log book on hourly basis. The collected data is aggregated and reported on monthly basis.</td></tr>
<tr><td>Verified value</td><td>11282.594</td></tr>
<tr><td>Cross checks</td><td>The verification team cross checked the reported data in the MR /P02/ and ER sheet /P04/ with the log book (plant records) /P09b/ records during site visit.</td></tr>
<tr><td>QA/QC procedures applied</td><td>Calibration of the energy meter is carried out at annually, as stated above. The data will be kept till two years after the end of the crediting period.

The reported values cross-checked with the plant records /P09b/ by the verification team were found consistent.</td></tr>
</table>

CL-01 was raised to obtain clarification on varying auxiliary consumption during the current monitoring period. The response by PP was deemed acceptable and the query was successfully closed.

4.1.3 Data/Parameter, Unit:

The amount of net electricity supplied by the project activity during the year y ($EG_{BL,y}$), MWh

	Discussion and verification assessment
Purpose of data	Calculation of baseline emissions
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	The parameter net electricity supplied by the project activity is a calculated parameter. As per the requirement of the monitoring plan, this parameter is calculated on monthly basis as the difference of Gross electricity generated and the auxiliary consumption of electricity, following the equation: $EG_{BL,y} = EG_{gross} – EG_{aux}$

Measuring/Reading/ Recording frequency	Recording frequency: Monthly Reporting frequency: Annually
Data collection (from data generation, aggregation, to recording, calculation and reporting)	This parameter is calculated as follows: $EG_{BL,y}$ (Net electricity supplied by project activity) = EG_{gross} (Gross electricity generated by project activity) – EG_{aux} (Auxiliary electricity consumption by project activity). These parameters are measured continuously by energy meters and recorded in the log book. Similarly, the *Net Electricity supplied by project activity* is calculated monthly considering the values of the measured parameters and aggregated annually.
Verified value	73202.036
Cross checks	The verification team cross checked the reported data in the MR /P02/ and ER sheet /P04/ with the log book (plant records) /P09c/ records during site visit.
QA/QC procedures applied	The net electricity supplied by the project activity is calculated as the difference of gross electricity generated and auxiliary consumption of electricity by the project activity. This data is recorded in the plant log book /P09c/. The data will be kept till two years after the end of the crediting period. The reported values cross-checked with the plant records /P09c/ by the verification team were found consistent.

4.1.4 Data/Parameter, Unit:

Quantity of rice-husk consumed in the project activity during the year y ($FC_{rice\ husk,y}$), Tonne

	Discussion and verification assessment
Purpose of data	Cross checking the calculation of baseline emissions
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Weigh Bridge: Type: Digital Accuracy: ±5 kgs Serial Number: 270424 Make: Wipro Calibration frequency: Annual **Dates of last calibration** / **Validity** / **Calibrating Agency**: 22/12/2008 – 21/12/2009 21/12/2009 – 20/12/2010 30/12/2010 – 29/12/2011 22/03/2011 – 21/03/2012 Department of Legal Metrology, Punjab
Measuring/Reading/ Recording frequency	Recording frequency: Monthly
Data collection (from data generation, aggregation, to recording, calculation	This parameter is calculated as follows: Quantity of rice husk consumed = Opening stock of rice husk – Closing stock of rice husk + Quantity of purchased rice husk

and reporting)	The quantity of rice husk purchased is measured using weigh bridge, the details of which have been given above.
Verified value	96931.056
Cross checks	The verification team cross checked the reported data in the MR /P02/ and ER sheet /P04/ with the rice husk procurement and consumption records /P10/ during site visit.
QA/QC procedures applied	Calibration of the weigh bridge is carried out at annually, as stated above. The data will be kept till two years after the end of the crediting period. A delay of 10 days has occurred in the calibration of weigh bridge during the year 2010. However, since this parameter is not used for calculation of emission reductions, the delay is not necessary to be taken into consideration. The reported values cross-checked with the plant records /P10/ by the verification team were found consistent.

4.1.5 Data/Parameter, Unit:

Quantity of sub-bituminous coal consumed in the project activity during the year y ($FC_{coal,y}$), Tonne

	Discussion and verification assessment
Purpose of data	Calculation of project emissions
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Weigh Bridge: Type: Digital Accuracy: ±5 kgs Serial Number: 270424 Make: Wipro Calibration frequency: Annual **Dates of last calibration** / **Validity** / **Calibrating Agency**: 22/12/2008 – 21/12/2009 21/12/2009 – 20/12/2010 30/12/2010 – 29/12/2011 22/03/2011 – 21/03/2012 Department of Legal Metrology, Punjab
Measuring/Reading/ Recording frequency	Recording frequency: Monthly
Data collection (from data generation, aggregation, to recording, calculation and reporting)	This parameter is calculated as follows: Quantity of coal consumed = Opening stock of coal – Closing stock of coal + Quantity of purchased coal The quantity of coal purchased is measured using weigh bridge, the details of which have been given above.
Verified value	0
Cross checks	Not applicable, since coal is not used during this monitoring period.
QA/QC procedures	Calibration of the weigh bridge is carried out at annually, as stated

applied	above. The data will be kept till two years after the end of the crediting period. A delay of 10 days has occurred in the calibration of weigh bridge during the year 2010. However, since coal was not consumed during the monitoring period, the delay is not necessary to be taken into consideration.

4.1.6 Data/Parameter, Unit:

Net calorific value of sub-bituminous coal consumed in the project activity during the year y ($NCV_{coal,y}$), TJ/tonne

	Discussion and verification assessment
Purpose of data	Calculation of project emissions
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Not applicable, since coal is not used during this monitoring period.
Measuring/Reading/ Recording frequency	Not applicable, since coal is not used during this monitoring period.
Data collection (from data generation, aggregation, to recording, calculation and reporting)	Not applicable, since coal is not used during this monitoring period.
Verified value	Not applicable, since coal is not used during this monitoring period.
Cross checks	Not applicable, since coal is not used during this monitoring period.
QA/QC procedures applied	Not applicable, since coal is not used during this monitoring period.

4.1.7 Data/Parameter, Unit:

Emission factor of sub-bituminous coal consumed in the project activity during the year y ($EF_{CO2,coal,y}$), tCO_2e/TJ

	Discussion and verification assessment
Purpose of data	Calculation of project emissions
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Not applicable since default values have been used.
Measuring/Reading/ Recording frequency	-
Data collection (from data generation, aggregation, to recording, calculation	The value of carbon emission factor for coal has been sourced from IPCC 2006 guidelines, Table 1.2, Chapter 1 of Volume 2 /B11/.

and reporting)	
Verified value	100
Cross checks	Not applicable, since coal is not used during this monitoring period.
QA/QC procedures applied	Not applicable, since coal is not used during this monitoring period.

4.1.8 Data/Parameter, Unit:

Net calorific value of rice-husk consumed in the project activity during the year y ($NCV_{rice\ husk,y}$), TJ/tonne

	Discussion and verification assessment
Purpose of data	Cross-checking the calculation of baseline emissions
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Not applicable as testing is conducted by independent NABL accredited external agency. Testing agency: Haryana Test House Dates of testing: 22/01/2010, 20/01/2011
Measuring/Reading/ Recording frequency	Monitoring frequency: Annual
Data collection (from data generation, aggregation, to recording, calculation and reporting)	NCV of rice husk is obtained through annual test results done by NABL accredited laboratory. These tests were conducted by Haryana Test House. Two test results have been recorded for the monitoring period under verification. The test reports for each consignment /P11/ have been checked and verified by the verification team
Verified value	**NCV Monitored (kCal/kg)** / **NCV Monitored (TJ/tonne)** 3068.57 / 0.0128475 3477.05 / 0.0145577
Cross checks	The test results were compared with the NCV of solid biomass (11.6 TJ/Gg) provided in 2006 IPCC guidelines /B11/ and found to be within range.
QA/QC procedures applied	The data will be kept till two years after the end of the crediting period.

CAR-01a was raised to rectify the NCV test report date which was incorrectly given in the MR and successfully closed.

4.1.9 Data/Parameter, Unit:

Moisture content of rice-husk in year y ($M_{rice\ husk,y}$), %

	Discussion and verification assessment
Purpose of data	Cross-checking the calculation of baseline emissions
Monitoring equipment (type, accuracy class, serial number,	Testing agency: In house lab test by electronic weighing scale

<table>
<tr><td>calibration frequency, date of last calibration, validity)</td><td></td></tr>
<tr><td>Measuring/Reading/ Recording frequency</td><td>Monitoring frequency: Weekly and consolidated on monthly basis</td></tr>
<tr><td>Data collection (from data generation, aggregation, to recording, calculation and reporting)</td><td>Moisture content of rice husk is monitored on weekly basis through annual test results done by In-house laboratory. These test results are aggregated on monthly basis. The average of these values for the monitoring period has been reported. The aggregated report for the test reports of each week /P12/ have been checked and verified by the verification team.</td></tr>
<tr><td>Verified value</td><td><table><tr><th>Period</th><th>Average Moisture %</th></tr><tr><td>30/03/2009 to 31/03/2010</td><td>11.78</td></tr><tr><td>01/04/2010 to 31/03/2011</td><td>12.09</td></tr><tr><td>1-Apr-2011 to 19-June-2011</td><td>9.79</td></tr></table></td></tr>
<tr><td>Cross checks</td><td>The verification team cross checked the reported data in the ER sheet /P04/ with the aggregated report of each week /P12/.</td></tr>
<tr><td>QA/QC procedures applied</td><td>The data will be kept till two years after the end of the crediting period.</td></tr>
</table>

CAR-01b was raised to include the average moisture content value from 1-April-2011 to 19-June-2011 which was not included earlier in the MR and successfully closed.

4.2 Accuracy of GHG Emission Reduction or Removal Calculations

As per the applied methodology AMS-I.C. Version 18 /B01/ and the registered VCS PD /B14/, the emission reductions for the project activity are calculated as per the formula given below:

$$\mathbf{ER_y = BE_y - PE_y - LE_y}$$

Where:

ER_y=Emission reductions in year y (t CO_2/y)
BE_y=Baseline Emissions in year y (t CO_2/y)
PE_y=Project emissions in year y (t CO_2/y)
LE_y=Leakage emissions in year y (t CO_2/y)

Project emissions:

The project activity has estimated project emissions from the consumption of coal. However, no fossil fuel was used during the current monitoring period. Also, the review of project implementation and operation at site by the verification team established there is no project emission associated with the project activity for the current monitoring period.

Leakage emissions:

The project activity has not estimated any leakages associated with the project activity. Also, the verification team has cross-checked some sample biomass transportation challans /P16/ and certificate giving the distances of places from where biomass is procured /P18/ to confirm the availability of rice husk within 200km radius of the project activity. Hence, no leakages are applicable for the current monitoring period.

Thus,

$ER_y = BE_y$

Since the project activity claims emission reductions from electricity generation only, the ER are calculated as per methodology AMS-I.D., version 16 /B12/.

Baseline emissions:

$BE_y = EG_{BL,y} \times EF_{CO2,grid,y}$

Where;

BE_y =Baseline Emissions in year y (t CO_2)
$EG_{BL,y}$=Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh)
$EF_{CO2,grid,y}$=CO_2 emission factor of the NEWNE grid in year y = 0.839 tCO_2/MWh; (fixed *ex-ante*)

The net electricity supplied to the grid is calculated as follows:

$EG_{BL,y}$ = Gross Electricity generation ($EG_{gross,y}$) – Auxiliary Electricity consumption ($EG_{aux,y}$)

Thus,

BE = (84484630 – 11282594) MWh × 0.839 tCO_2/MWh
= 61,416 tCO_2e (Rounded conservatively)

As described above,

PE = 0 tCO_2e
LE = 0 tCO_2e

Thus,
ER = 61,416 tCO_2e (Rounded conservatively)

There has neither been any event of failure of meters at the project site, nor have any of the meters exceeded the maximum permissible limit of error. The calculation of emission reductions is found to be correct. The data involved in emission reduction calculation has been thoroughly verified with plant records and found satisfactory. Refer to the section 4.1 of this report where all the assumptions, accuracy class of all the individual meters were described to compute the baseline emission and project emission from the project activity for the current monitoring period.

4.3 Quality of Evidence to Determine GHG Emission Reductions or Removals

The reported values, notation, units and sources in the monitoring report for all the monitoring parameters have been cross checked with the emission reduction sheet /P04/ and monitoring report /P02/. During the course of verification, the data is cross verified with the values mentioned in the emission reduction sheet and monitoring report. The procedure for data recording, transfer and compilation was also verified and found in compliance with the monitoring plan of the registered VCS PD /B14/.

Furthermore, the cross checks have been performed during site inspection on the continuous operation of the monitoring equipment and procedures.

4.4 Management and Operational System

The management system for the project activity is in place. The organization structure with the responsibilities, personnel competencies, monitoring procedure and monitoring management has been properly identified. By interviewing with the staff and checking during the site visit, KBS can confirm that the monitoring management system is implemented properly.

Monitoring and reporting of electricity generation, rice husk consumption, calorific value measurement and moisture in rice husk are part of normal operations of the project. The quality of meter readings are assured through calibration of energy meters /P13/ & weigh bridges /P14/.

5 VERIFICATION CONCLUSION

The scope of the verification:

We, KBS have been engaged by Gillanders Arbuthnot & Co. Ltd. To certify that the greenhouse gas (GHG) emission reductions reported for the 6.5 MW cogeneration project in Akbarpur, Punjab for the period from 30/03/2009 to 19/06/2011 in the verification report and the monitoring report version 03 dated 16/08/2013 are eligible for registration as Voluntary Carbon Units.

This engagement covers the verification of emission reductions from anthropogenic sources of greenhouse gases included within the project boundary of the 6.5 MW cogeneration project in Akbarpur, Punjab with the requirements of VCS Standard version 3.3.

Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. Our examination includes assessment, on a test basis, of evidence relevant to the amounts and disclosures in relation to the project's GHG emission reductions for the defined reporting period.

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

Conclusions of the verification:

a) KBS is an entity accredited by the United Nations Framework Convention for Climate Change (UNFCCC) to undertake certification and verification services in the sector in which the Project is undertaken. The accreditation is accepted by VCSA as indicated in Clause 5 of VCS Program Guide Version 3.3.
b) The monitoring report, together with other information examined, was prepared as per the VCS Monitoring Report Template, Version 3.2.
c) The information in the monitoring report together with other information examined by the assessment team, including all the information necessary to determine that the emission reductions achieved have been determined correctly.
d) Based on the examination of the monitoring report and other relevant information, the project meets all the requirements of the VCS Standard Version 3.3.
e) Based on our examination of the monitoring report and other relevant information, the claiming emission reductions during the monitoring period from 30/03/2009 to 19/06/2011 are verified as 61,416 tonnes CO_2 equivalent.

Liability statement with regards to the accuracy of the verification statement

The management of Gillanders Arbuthnot & Co. Ltd. is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions. KBS is responsible for verification and confirming emission estimates for the project, as described in the monitoring report.

Our certification approach draws on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. Our examination includes an assessment of evidence, through desk review, and where necessary, interviews, stakeholder discussions and site visits, relevant to certifying the rightfulness of the amounts and disclosures in relation to the Project's GHG emission reductions.

We planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that the amount of GHG emission reductions for the given period, prepared on the basis of the monitoring report, are fairly stated. This assessment included:

- Collection of evidence supporting the reported data;
- Checking whether the provisions of the Monitoring Plan in the registered PDD, were consistently and appropriately applied;
- Site visit and interview of relevant staff.

We have verified whether the information included in the monitoring report representing the emission reductions achieved has been determined correctly for the given period from the baseline figure.

Certification statements

Based on process and procedures conducted, in our opinion, the monitoring report version 03 dated 16/08/2013 on emission reductions for 6.5 MW cogeneration project in Akbarpur, Punjab during the reporting period from 30/03/2009 to 19/06/2011 is materially correct and is a fair representation of the GHG data and information and the emission reductions are fairly stated. All relevant facts have been found correct by our examination. The GHG emission reductions calculation is correct.

Therefore, KBS is able to certify that the project is in full compliance with the VCS Standard Version 3.3, and the quantity of the reported emission reductions during below reporting period are completely, comparably, accurately and correctly reported.

(0) Reporting period: From 30/03/2009 to 19/06/2011

Verified GHG emission reductions or removals in the above reporting period:

Period	Baseline Emissions (tCO_2e)	Project Emissions (tCO_2e)	Leakage Emissions (tCO_2e)	Emission Reductions (tCO_2e)
30/03/2009 – 31/12/2009	21,654	0	0	21,654
01/01/2010 – 31/12/2010	30,409	0	0	30,409
01/01/2011 – 19/06/2011	9,353	0	0	9,353
Total	**61,416**	**0**	**0**	**61,416**

The total emission reduction verified for the above mentioned period is 61,416 tCO_2e.
Location: Faridabad, Haryana, India
Date: 20/09/2013

Kaushal Goyal
Managing Director
KBS Certification Services Pvt. Ltd.

6 REFERENCES

Documents submitted by project participant:

Reference	Document
/P01/	Draft Monitoring report version 01 dated 22/06/2013.
/P02/	Final Monitoring report version 03 dated 16/08/2013
/P03/	Emission reduction calculation Excel sheet corresponding to /P01/.
/P04/	Emission reduction calculation Excel sheet corresponding to /P02/.
/P05/	Commissioning certificate – Protocol for completion of 1st Syn and 1st Load Trial of TG Test (No. CCC/NR/05-06/R0/012) dated 30/03/2009 by Triveni Engineering & Industries Ltd.
/P06/	Technical specifications of the project equipment
/P07/	Relevant clearances including: a. Consent to Operate (as per Water Act, 1974) by Punjab Pollution Control Board: i. No. SGR/WPC/2009/V-396 dated 27/01/2009 (validity: 26/01/2010) ii. No. 169 dated 14/01/2011 (validity: 26/01/2011) iii. No. 630 dated 17/02/2011 (validity: 26/01/2014)
	b. Consent to Operate (as per Air Act, 1981) by Punjab Pollution Control Board: i. No. SGR/APC/2008/V-368 dated 27/01/2009 (validity: 26/01/2010) ii. No. 171 dated 14/01/2011 (validity: 26/01/2011) iii. No. 631 dated 17/02/2011 (validity: 26/01/2014)
	c. No Objection Certificate (No. EE-P/2006/SGR/LM/40/17270) dated 22/12/2006 by Punjab Pollution Control Board
	d. Certificate of Use of Boiler by Punjab Boiler Inspection Department i. No. 5639 dated 04/01/2009 (validity: 03/01/2010) ii. No. 6461 dated 04/01/2010 (validity: 03/01/2011) iii. No. SPL/01/11/01 dated 05/01/2011 (validity: 04/01/2012)
	e. Environment Clearance (No. SEIAA/2008/24976) dated 27/06/2008 by State Level Environment Impact Assessment Authority, Punjab
/P08/	Biomass Assessment Study report dated 23/10/2008 by DSCL Energy Services Company Ltd.
/P09/	Plant log book records for the current monitoring period including: a. Gross electricity generation b. Auxiliary electricity consumption c. Net electricity generation
/P10/	Monthly rice husk procurement and consumption records for the current monitoring period
/P11/	Annual test reports for NCV of rice husk from NABL accredited laboratory for the current monitoring period: i. Test certificate (No. 12073-A) dated 22/01/2010 by Haryana Test House ii. Test certificate (No. 14473-A) dated 20/01/2011 by Haryana Test House
/P12/	On site laboratory test report for moisture content of rice husk for the current monitoring period
/P13/	a. Calibration certificates for gross electricity generation energy meter for the current monitoring period: i. Test certificate (No. SDE/PO/SML/06-07/045) dated 09/02/2007 by Secure Meters Limited ii. Test certificate (No. GACL/CPP/AI/TVM/09/022) dated 29/03/2009 by Adecon India iii. Test certificate (No. GACL/CPP/AI/TVM/10/13) dated 01/03/2010 by Adecon India

	iv. Test certificate (No. GACL/CPP/AI/TVM/11/01) dated 23/11/2010 by Adecon India
	b. Calibration certificates for auxiliary electricity consumption energy meter for the current monitoring period: i. Test certificate dated 05/10/2008 by Conserv ii. Test certificate dated 28/07/2009 by Pressure & Process Boilers iii. Test certificate (No. GACL/CPP/AI/TVM/10/14) dated 01/03/2010 by Adecon India iv. Test certificate dated 24/11/2010 by United Automation & Services
/P14/	Calibration certificates for fuel consumption weigh bridge by Department of Legal Metrology, Punjab: i. Test certificate No. 150891 dated 22/12/2008 ii. Test certificate No. 255359 dated 21/12/2009 iii. Test certificate No. 697087 dated 30/12/2010 iv. Test certificate No. 648732 dated 22/03/2011
/P15/	Training records for monitoring and data archiving
/P16/	Sample Rice husk transporter challans in the current monitoring period i. No. 678 dated 23/09/2009 by V. D. Traders ii. No. 78 dated 09/01/2010 by Tek Chand Mohan Lal iii. No. 161 dated 30/04/2010 by Tek Chand Mohan Lal iv. No. 49 dated 18/12/2010 by M/s. Maa Durga Enterprises v. No. 814 dated 01/03/2011 by V. K. Enterprises
/P17/	Internal audit records dated 05/04/2010 and 05/04/2011 during the current monitoring period
/P18/	Certificate stating the distances from places of biomass procurement by Dashmesh Truck Tempo Union
/P19/	Shutdown details during the current monitoring period from 30/03/2009 to 19/06/2011.

Background investigation records:

Sr. No.	Title of document/reference/website
/B01/	Approved Baseline & Monitoring Methodology: AMS-I.C, version 18
/B02/	a. VCS Standard Version 3.3 b. VCS Program Guide Version 3.4 c. VCS Registration and Issuance Process, Version 3.4
/B03/	UNFCCC Webpage of the registered CDM Project http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1307501311.32/view
/B04/	Kyoto Protocol (1997).
/B05/	Decision 3/CMP.1, Decision 4/CMP.1 and Decision 1/CMP.2, § 28.
/B06/	CEA CO_2 database version 5.0 http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm
/B07/	Websites referred: a. http://cdm.unfccc.int/index.html b. http://www.itouchmap.com/latlong.html c. v-c-s.org d. http://www.vcsprojectdatabase.org/
/B08/	Verification protocol of KBS
/B09/	Guideline on the application of materiality in verifications (EB: 69, Annex: 06, Version: 01.0)
/B10/	UNFCCC CDM Validation and Verification Standard (Version: 03)
/B11/	2006 IPCC Guidelines for National Greenhouse Gas Inventories
/B12/	Approved Baseline & Monitoring Methodology: AMS-I.D, version 16
/B13/	VCS Validation Report No. 01 996 9105063620 by TÜV Rheinland Japan Ltd. Dated 22/03/2011
/B14/	Registered VCS PD version 04, dated 22/03/2011

/B15/	VCS APX Registry project page – https://vcsregistry2.apx.com/mymodule/ProjectDoc/EditProjectDoc.asp?id1=679

Annex 1: Detailed Findings

Total findings raised	CAR: 01	CL: 01	FAR: 00

Table 1: Resolution of Corrective Action and Clarification Requests

CL/CAR No	Summary of findings	Summary of project owner response	Revised section(s)/Annexe(s) of the MR	Verification team conclusion
CAR-01	a. During site visit it was observed that the NCV of rice husk was monitored annually however in the submitted MR it was showing more than one year. PP is requested to put the correct date in the MR. b. Sec 3.2 of MR does not report April '11 to June'11 moisture content value. Cp Spread sheet and lab reports.	a. There was a typographical error in the submitted monitoring report. The date of the NCV analysis report has been corrected in the MR. b. The average moisture content values for the three months April'11 to 19 June'11 have now been reported in the revised MR.	Section 3.2	a. The corrected date of calibration report in the revised MR was cross-checked with the calibration report and found OK. Hence, CAR is closed. b. The revised MR includes moisture content values covering the entire monitoring period. Hence, CAR is closed.

CL-01	The auxiliary consumption value for the project activity varies from 16% to 11% for the current monitoring period. Hence PP was requested to clarify the variation.	The verifier is requested to note that the auxiliary consumption was higher in the initial months after commissioning and has stabilised to a level of 12-13% after 6-7 months of operation. In the initial phases after commissioning the auxiliary percentage is usually higher due to unstable operating conditions, load fluctuations and other teething issues associated with commissioning.	-	The justification provided is found acceptable considering the industry norms and based on professional judgement. Hence, CL is closed.

Annex 2: Certificate of Competence

Personnel Name:		**Kaushik Pal**	
Qualified to work as:			
Team Leader	☒	Technical Expert	☒
Validator/Verifier	☒	Financial Expert	☐
Technical Reviewer	☒	Local Expert (India)	☒
Area(s) of Technical Expertise			
Sectoral Scope		**Technical Area**	
Energy Industries (renewable/non-renewable) Energy Demand		TA 1.1: Thermal energy generation from fossil fuels and biomass including thermal electricity from solar TA 3.1 Energy Demand	
Approved by (Manager C & T)		Mayank Kumar Jain	
Approval date:		04/04/2013	

Personnel Name:		**Sayali Kumar**	
Qualified to work as:			
Team Leader	☐	Technical Expert	☒
Validator/Verifier	☒	Financial Expert	☐
Technical Reviewer	☐	Local Expert (India)	☒
Area(s) of Technical Expertise			
Sectoral Scope		**Technical Area**	
Energy industries (renewable/non-renewable sources)		TA 1.2: Energy generation from renewable energy sources	
Approved by (Manager C & T)		Mayank Kumar Jain	
Approval date:		25/06/2012	

Personnel Name:		**Asim Kumar Jana**	
Qualified to work as:			
Team Leader	☒	Technical Expert	☒
Validator/Verifier	☒	Financial Expert	☐
Technical Reviewer	☒	Local Expert (India)	☒
Area(s) of Technical Expertise			
Sectoral Scope		**Technical Area**	
Energy industries (renewable/non-renewable sources)		TA 1.1: Thermal energy generation from fossil fuels and biomass including thermal electricity from solar TA 1.2: Energy generation from renewable energy sources	

Energy Demand	TA 3.1: Energy Demand
Chemical Industry	TA 5.1: Chemical process industries
Solvents use	TA 12.1: Chemical process industries
Waste handling and disposal	TA 13.1: Waste handling and disposal
Approved by (Manager C & T)	Mayank Kumar Jain
Approval date:	13/04/2012