TÜV Rheinland Group

Mr. Hans Jürgen Stehr
Chair, CDM Executive Board
UNFCCC

Response to the requests for review for the CDM project activity "Koppal Green Power Limited Biomass Power Project " (Ref. no. 1383),

2008-01-29

Dear Mr. Stehr,

The DOE TÜV Rheinland Japan Ltd. was informed on 15 January 2008 that the CDM project "Koppal Green Power Limited Biomass Power Project" (Ref. no. 1383), which was validated by our organization, is under request for review because three requests for review have been received from members of the board.
Issues 1 and 2 are common to all requests for review, whereas issues 3-6 are raised only in one of those requests.

We would like to provide our response to the issues on the following pages.

In summary, we understand the issues raised in the requests for review and regret if the previously submitted documentation was not sufficiently clear. However, we hope that this explanation will find acceptance among the members of the Executive Board.

Sincerely,

Dr. Manfred Brinkmann
CDM Program Manager
TÜV Rheinland Japan Ltd.

Issue 1:

Further clarification is required on how the prevailing practice barrier has been verified and validated.

TÜV Rheinland Response

While considering prevailing practice barrier to the proposed project activity the following information was considered by the validation team:

1. Karnataka Renewable Energy Development Ltd (KREDL) is the Government of Karnataka's nodal agency for the promotion of non-conventional energy sources in Karnataka. The agency has published data on its website (http://kredl.kar.nic.in/Index.asp) for sanctioned capacity of projects and commissioned capacity of projects. This data is generally considered as a comprehensive and authentic source of information.

   The basis for accepting prevailing practice barrier has been the lack of experience in biomass-based power plants at the time of project conceptualization in the state of Karnataka as compared to sanctioned capacities. The validation team has checked publicly available official sources

   a. Web-site of Ministry of New and Renewable Energy Sources, Government of India ((http://www.mnes.nic.in/),

   b. Web-site of KREDL (http://kredl.kar.nic.in/Index.asp),

   c. Website of UNFCCC for CDM (http://cdm.unfccc.int/index.html)

   to validate the arguments presented by the project proponent. During this analysis, it was found that there was just one operational power plant of 4.5 MW (Malavalli Power Plant Private Limited). (http://www.kredl.kar.nic.in/Docs/Biomass%20-%20commissioned%20as%20on%20date.doc) It was also noted that the KREDL had sanctioned capacity of 437.7 MW. (http://www.kredl.kar.nic.in/List%20of%20Biomass%20Projects%20Alloted.xls) before conceptualization of project activity (Koppal Green Power Limited, Purchase Order of Boiler, March 12, 2003). Thus, even though capacity of 437.7 MW was sanctioned actual implemented projects were just about 1 per cent of the capacity sanctioned.
2. The validation team also checked implementation of sanctioned projects subsequent to the project activity. It was confirmed that out of 65 sanctioned projects, only 11 plants have been implemented in the state of Karnataka until January 2007.
3. Further to above, the location of biomass-based power plants in India has been checked by the validation team in various other states at the time of conceptualization of the project. Comparison on state level is deemed reasonable to determine the common practice because the circumstances with respect to renewable energy promotional schemes, logistics of fuel transportation, perception of doing business,

availability of skilled / unskilled manpower, fuel availability, environmental legislations are different for each state. In such circumstances, having a precedence of an operating plant is important for a company to know that the system of regulations and system of plant operation works.

The data on installed biomass based power projects at the time of project conceptualization is as follows:

Installed capacity of Biomass / Co-generation Power in India during 2002 2003

Sr. No	State	Installed Capacity in MW	Percentage of Total Installed Capacity of Grid Connected Biomass Based Power Plants in India
1	Andhra Pradesh	108.7	66.19
2	Chhattisgrh	11	6.69
3	Gujarat	0.5	0.30
4	Haryana	4	2.43
5	Karnataka	10*	6.09
6	Maharashtra	3.5	2.13
7	Punjab	10	6.09
8	Tamilnadu	16.5	10.04
	Total	164.2	100

* This figure is slightly different from the figure presented on KREDL site (4.5 MW). Since, state level agency has also given break up for only biomass-based power plant. The additional power is coming from cogeneration power plant of M/s South India Paper Mills (http://www.kredl.kar.nic.in/Docs/Cogeneration%20projects%20allotted%20in%20karnataka.doc). This power plant was not considered by the validation team since it is not built exclusively for grid electricity generation, but is set up as an integral part of steam requirement for paper manufacturing facility. Even if the figure of 10 MW is considered, it does not change the line of arguments substantially.

4. While validating the project, the validation team took into account that India is a country with 28 states and 7 union territories out of which biomass based power projects existed only in 8 states (http://www.mnes.nic.in/annualreport/2002_2003_English/ch5_pg11.htm), and within these 8 states the largest share of 66% of installed capacity was in the state of Andhra Pradesh only. Thus, the average penetration at national level in India was relatively low.

5. Fuel availability is a basic requirement to set up a power plant. In case of a conventional fuel based power plants, the fuel availability and transportation linkage is well established. Generally quality of fuel available is also consistent throughout the year. When one intends to use biomass as fuel, the first information that is required for a project proponent is to know the availability of fuel in a particular area, its availability in a

season, mode of transportation and price. Such information is available through biomass assessment studies. However, at the time of conceptualization of the project activity, biomass assessment study was done in only 299 *talukas*[1] (http://www.mnes.nic.in/annualreport/2002_2003_English/ch5_pg10.htm) out of 3342 *talukas* of India (http://www.eco-web.com/editorial/06554-01.html). Thus, absence of such vital data on fuel availability, itself is an indication that biomass based power plants were not a common practice in India at the time of project conceptualization.

Considerations of all the above information, the validation team reached the conclusion that setting up a biomass based power project required special efforts at the time of project conceptualization

Issues 2 and 3:

2. ***Considering the time gap between start of the project activity and the submission for validation, further clarification is required on how the DOE has validated that the CDM was seriously considered before implementation.***
3. ***In addition, the Validation report states that "The proof of CDM consideration is presented in the form of minutes of meeting of Board of Directors of KGPL. The meeting was held on July 05, 2000. This was confirmed through appropriate documentary evidence. (Certified copy of minutes of meeting by R. Ramakrishna Gupta, R & A Associates, Company Secretary, CP No. 6696). The evidence suggests that CDM was seriously considered prior to start of the project activity on March 12, 2003". The DOE shall further clarify whether the evidence confirms or merely suggests that the CDM was considered prior to start date of project activity.***

TÜV Rheinland Response

Issues 2 and 3 are both related to the project history and are therefore addressed as a combined response in the following paragraphs.

The chronology of evaluation of CDM system and the proposed project activity is as follows:

Sr. No	Date	Description
1	December 11, 1997	Signing of Kyoto Protocol
2	July 05, 2000	CDM consideration by project participant through the board of directors (RA Associates, Minutes of the meeting of Board of Directors of the company held on 5th July 2000, Koppal / TUV Ref. / Valid / 4, November 23, 2006) (Ref: Annex 1)
3	November 01, 2002	AMS- I.D./Version 01 is published
4	March 12, 2003	Project starting date (Boiler purchase agreement)

[1] Taluka is a sub division of district in India

Sr. No	Date	Description
5	March 28, 2003	CDM Modalities and procedure published by report of COP on its eight session held at New Delhi from 23rd Oct to 1st Nov. 2002. Report No. FCCC/CP/2002/7/Add-3 dated 28th March 2003.
6	November 04, 2003	Request of IREDA for inclusion of KGPL project as CDM project under TERI-NSS study (IREDA, National Strategy Study for Implementation of CDM in India, IREDA/PTS/Cogen-biomass/CDM, November 04, 2003) (Ref.: Annex 2)
7	December 14, 2003	First PDD published on UNFCCC website in AMS I.D./Version 02 for Hidroelectrica Candelaria from Guatemala host country.
8	January 27, 2004	First PDD published on UNFCCC website in AMS I.D./Version 02 for Wind Electricity generation in Tamilnadu from India host country
9	May 23, 2005	First Registered CDM project from India (Ref No. 0058 Biomass in Rajasthan – Electricity generation from mustard crop residues)
10	December 05, 2005	First draft engagement letter of Ernst & Young consultant for climate change advisory services to project participant and their final engagement letter on January 06, 2006 (Ref.: Annex 3)
11	December 30, 2005	Appointment of TUV Rheinland by project participant (Ref.: Annex 4)
12	October 04, 2006 to November 02,2006	PDD of project participant (KGPL) published on UNFCCC site for public comments

From above chronology of events it is deemed evident that the Clean Development Mechanism was already being discussed in the public domain when the project proponent considered CDM. In this era of formulation of the policies and modalities, the project proponent had been approached by IREDA to make a Project Design Document. It may be noted that there was a learning phase on part of all the consultant as well as project developers. In-spite of approval by the project proponent to IREDA for making PDD on the project, the PDD was not prepared until late 2005. This was the time when as an alternative solution, the project proponent selected another consultant. Thus, there has been demonstration that the project proponent had started working on CDM process even before the first PDD was published on the UNFCCC site worldwide or when the first project was registered. All the necessary evidences can be seen in the Annex 2, Annex 3 and Annex 4 attached herewith.

Issue 4:

4. Furthermore, the PDD states that "All the finances and economics of the plant were planned based on the returns calculated as per the expected tariffs from KPTCL.". Further clarification is required on how this evidence was assessed by the DOE when validating additionality.

TÜV Rheinland Response

The basis of financial calculation is power purchase agreement between Koppal Green Power Limited and Karnataka Power Transmission Corporation Limited. (KPTCL, Power Purchase Agreement with Koppal Green Power Limited, March 30, 2001). These conditions are available in Annex 5 of this response. This document was seen by the validation team to validate the sentence, *"All the finances and economics of the plant were planned based on the returns calculated as per the expected tariffs from KPTCL*."

Above sentence was part of the argument on policy related barriers faced by the proposed project activity. It is argued that subsequent to start of construction of the proposed project activity, there was a change in tariff, which affected the project adversely. It was argued that the CDM funds would help in bridging this gap of revenues. Changes in Policy and changes in tariff rate are indeed considered to be hurdles. However, by the time these hurdles came, the decision to implement the project was already taken by the project proponent. Hence, this argument was not considered as a prohibitive barrier to the proposed project activity.

While validating the additionality, validation team found that the prevailing practice barrier was a prohibitive barrier in the state of Karnataka. The evidences regarding prevailing practice barrier are assessed as explained in the response to Issue 1 (see above). It may also be noted that in the ultimate analysis the validation team has accepted prevailing practice as the only prohibitive barrier to the proposed project activity.

Issue 5:

AMS-I.D. Version 10 is applied by the project participant. However, further clarification and elaboration is required on the calculation of the baseline emission factor in chapter 4. While using the CM approach as per procedures in ACM0002 (version 6), the choice of simple OM within the four options is not substantiated (PDD, p.12) nor explicitly scrutinized by the DOE (validation report, B.1.1. and B.1.2., p.30 commented only). Further clarification is also required.

TÜV Rheinland Response

AMS I.D./Version 10 refers to ACM0002 to calculate baseline emission factors. When the request for registration was submitted, version 06 of ACM0002 was applicable. Salient features of this include "*selection any of one of the four procedure to calculate operating margin can be chosen but restriction to use the simple OM and Average OM must be considered".*

The most preferred option to calculate operating margin is dispatch data analysis. However, the data required for dispatch data analysis is not available in India (Please refer to footnote 2 on page 5 of CO2 Baseline database for

the Indian Power Sector, Users Guide, Version 2.0 published by CEA of India http://www.cea.nic.in/planning/c%20and%20e/user_guide_ver2.pdf). The same explanation is provided in the Revised Draft CDM PDD (January 2008) Page 12 - 13 of section B.4.

The next best option is to use the simple operating margin method. Here, the necessary condition is
'low cost must run resources constitute less than 50% of grid generation based on average of the five most recent years'.
Above condition was confirmed through All India Electricity Statistics, General Review sheet, table 3.4 of central Electricity Authority data for the year 2000-01 to 2004-05 and annual report for the year 2005-2006 of Southern Regional Load Dispatch Center, Annual Grid Report (http://www.srldc.org/var/ftp/reports/yearlyrep/2005-06-year.pdf page 43)

Further justification for selection of simple operating margin is provided in annex 6.

The data for this calculation is available from the "CO_2 Baseline Database for the Indian Power Sector, User Guide, Version 2.0" by Central Electricity Authority, Government of India (Please refer to http://www.cea.nic.in/planning/c%20and%20e/Database_publishing_ver2.zip)
The users example (page no 17 to 19 of Users Guide) has given the calculation procedure for combined margin approach. The CM (Combined Margin) approach calculations are attached in Annex 7.
Above explanation may also be found in the revised Draft CDM PDD (January 2008), section B.4 as well as Validation report (January 2008), section 4.3.

Issue 6:
6. The DOE shall further confirm to a fully adequate level that the following requirements have been met:
a. Approved baseline and monitoring methodologies have been applied appropriately;

TÜV Rheinland Response

As per paragraph no.9 of AMS I.D. /Version 10, baseline methodology i.e. baseline emission coefficient is calculated by combined margin or weighted average emission. The PDD in section B. 4 has mentioned the baseline methodology. The project participant has applied the combined margin approach and validation team has validated the baseline emission factor calculation. The calculations are correct and appropriate.

As per paragraph no.13 of AMS I.D. /Version 10, monitoring shall consist of metering electricity generated by renewable technology. When co-firing is done, the amount of biomass and fossil fuel input shall be monitored.
The PDD indicates the monitoring methodology and monitoring plan in section B.7 and included all monitoring parameters required for the calculation of emission reductions according to the selected methodology.

Thus DOE confirmed that the approved baseline and monitoring methodologies have been applied appropriately.

b. Provisions for monitoring, verification and reporting are appropriate.

TÜV Rheinland Response

The PDD stated the procedure for monitoring, verification and reporting in section B.7 and Annex 4. The DOE confirms that the organizational structure and procedure are appropriate. Also the project participant has submitted the standard operating procedure for the proposed project activity. The standard operating procedure describing provision for monitoring, verification and reporting as attached in Annex 8 to this response has been validated before submitting the request for registration. This process would be used from the time of registration of the project activity to monitor, verify and report GHG emission reduction.

Annex 1.

CDM Consideration by Project Participant

Koppal /TUV-ref/valid/4

r&a associates company secretaries

CERTIFICATE

This is to certify that we have verified the minutes of the Meeting of the Board of Directors of M/s. Koppal Green Power Limited, a Company registered under the Companies Act, 1956 and presently having its registered office situated at H.No. 1-88/101, 101, Sahanti Vanam, Kavuri Hills Extension, Hyderabad – 500 003 and hereby certify that the Board of Directors of the Company in their meeting held on 5th July, 2000 have discussed about the Clean Development Mechanism (CDM) benefits available to the Company and has resolved to work towards procuring the said benefits.

R & A ASSOCIATES HYD-16 COMPANY SECRETARIES

For R & A Associates
Company Secretaries

Date: November 23, 2006
Place: Hyderabad

(R.Ramakrishna Gupta)
Partner
C.P.No. 6696

R&A Associates, Company Secretaries
Flat # 101 Sapthagiri Residency, 1-10-98/A, Chikoti Gardens, Begumpet, Hyderabad 500016, India
Phone: +91 (40) 4003 2244 (4 Lines) Fax: +91 (40) 4003 2255 Email: info@rna-cs.com Internet: http://www.rna-cs.com

KOPPAL GREEN POWER LIMITED
REGD. OFFICE : H.No. 1-88/1/101, 101, Shanti Vanam, Kavuri Hills Extn.,
Hyderabad-500 033. Ph : 040-55133344, Fax : 040-23112623
E-mail : koppalgreen@rediffmail.com

// certified true copy//

MINUTES OF THE MEETING OF THE BOARD OF DIRECTORS OF THE COMPANY HELD ON 5TH JULY 2000 AT ITS REGISTERED OFFICE AT FLAT NO 401, GANGA RESIDENCY, SRINAGAR COLONY, HYDERABAD – 500 073 AT 10.00 A.M.

The following directors were present:

1. Shri. K. Sambasiva Rao - Chairman
2. Shri. P. Subba Rao - Director
3. Shri. M. V. S. R. Prasad - Director

Shri. K. Sambasiva Rao, Chairman took the chair and after ascertaining the quorum ordered for the commencement of the proceedings.

Item # 1: Approval of Previous Board Minutes:

The minutes of previous Board Meeting held on 20th June, 2000 was placed before the meeting and confirmed.

Item # 2: Review of General Progress of The Company

The Chairman informed the Board about the progress made by the Company, the same was discussed by the Board and noted.

Item # 3: Take Note of Certificate of Commencement of Business

The Chairman informed the Board that the Company had received the Certificate of Commencement of Business dated 4th July, 2000. The same was placed before the meeting and Board took the note of the same. Thereafter the following resolution was passed:

"RESOLVED THAT the Certificate of Commencement of Business be and is hereby noted and the same be kept in the safe custody of Mr. K. Sambasiva Rao, Director."

Item # 4: Considering the CDM benefits for the proposed Power Project of the Company:

The Managing Director introduced the idea to consider the Clean Development Mechanism Benefits (Carbon Credits) for the proposed power project of the Company. He highlighted to the Board that the proposed power project being environmentaly friendly and generating green energy should qualify for the CDM

KOPPAL GREEN POWER LIMITED
REGD. OFFICE : H.No. 1-88/1/101, 101, Shanti Vanam, Kavuri Hills Extn.,
Hyderabad-500 033. Ph : 040 55133344, Fax : 040-23112623
E-mail : koppalgreen@rediffmail.com

benefits. Directors present discussed at length on the CDM benefits and the endorsed the view that the proposed project should qualify for CDM benefits. Managing Director further stated that the Company should try towards getting the Carbon Credits to the project. The following resolution was passed in this regard:

"**RESOLVED** to note that the proposed power project of the Company being environmental friendly and generating green energy should qualify for the Clean Development Mechanism benefits (i.e. Carbon Credits).

RESOLVED FURTHER THAT the Company should work towards procuring these CDM benefits and secure the same."

Item # 5: Application to Karnataka Udyog Mitra, a State Level Single Window Agency for obtaining approvals from various departments.

Mr. K. Sambasiva Rao, Chairman informed the members it was proposed make application to Karnataka Udyog Mitra, a State Level Single Window Agency for obtaining clearance from various departments for setting up of the proposed power project. Then he requested the Board of Directors to discuss the same. Meeting discussed the same and thereafter the following resolution was passed:

"**RESOLVED THAT** an application be made to Karnataka Udyog Mitra, a State Level Single Window Agency for single window clearance from various departments.

FURTHER RESOLVED THAT Mr. K. Sambasiva Rao, Director be and is hereby authorised to make an application to Karnataka Udyog Mitra and to do such acts, things, etc. as may be required in this regard to get its approval."

There being no other business to transact, the meeting concluded with a vote of thanks to the Chair.

For Koppal Green Power Limited

(Director)

KOPPAL GREEN POWER LIMITED

Annex 2

IREDA Request to Project participant for implementation of CDM by TERI Consultant

इरेडा
IREDA
भारतीय अक्षय ऊर्जा विकास संस्था सीमित
(भारत सरकार का प्रतिष्ठान)
Indian Renewable Energy Development Agency Limited
(A Government of India Enterprise)

By Speed Post

No:IREDA/PTS/Cogen-Biomass/CDM/ 04.11.2003

Mr.N.Hari Krishna Rao, Executive Director
M/s. Koppal Green Power Ltd.
D.No. 1-88/1/101, Flat No.101,
Shanti Vanam, Kavuri Hills Extension,
Jubilee Hills, Hyderabad - 500 033. A.P.

Dear Sir,

Sub: National Strategy Study for implementation of CDM in India

We wish to inform you the there are a few carbon funds available in the World market and they are purchasing credits from emission reducing projects undertaken in developing countries like India under Clean Development Mechanism(CDM). Cogeneration/Biomass/Wind/Small Hydro projects being renewable and sustainable in nature are probable candidates for receiving such benefits.

We have been informed by The Energy and Research Institute(TERI)that they are looking for some such projects for taking up under National Strategy Study as pilot CDM projects. The project information note(PIN) for such projects need to be submitted to TERI by 20th November,2003.

On perusal of your project, we feel that there is a possibility of your project being identified as a CDM project and as such IREDA as a facilitator would like to develop the project till the PDD stage under TERI-NSS study. We therefore request you to authorise IREDA for providing project information note (PIN) on your project to TERI. You may also like to prepare the PIN yourself and send it to us for further processing.

We shall appreciate receiving your reply by 10th November, 2003 failing which it will be presumed that you are not interested for IREDA/TERI to take up your project under NSS study.

Thanking you.

Yours faithfully,
(Debashish Majumdar)
Director (Technical)

Encl: 1. Call for project information note
2. Format for Project Information Note(PIN)

पंजीकृत एवं मुख्य कार्यालय : भारत पर्यावास केन्द्र, कोर-4-ए, ईस्ट कोर्ट, प्रथम तल, लोधी रोड, नई दिल्ली-110 003 दूरभाष : 24682214-21
फैक्स : 011-24682202 तार : आल्टरनेट-एनडी 3, ई-मेल : mdireda@rediffmail.com वेब साईट : http://ireda.nic.com
Regd. & Head Office : India Habitat Centre, Core-4 'A' East Court, 1st Floor, Lodhi Road, New Delhi-110003 **Phones :** 24682214-21
Fax : 011-24682202, Gram : ALTERNATE-ND-3, E mail : mdireda@rediffmail.com Website : http://ireda.nic.com

शाश्वत ऊर्जा ● **ENERGY FOR EVER**

Letter to IREDA by KGPL - Acceptance of TERI as consultant by Project Participant (KGPL)

KOPPAL GREEN POWER LIMITED

Ref: KGPL/IREDA/160/2003-04 Date: 08.11.03

To,
The Managing Director
Indian Renewable Energy Development Agency Ltd
India Habitat Center, Core-4 'A' East Court
1st Floor, Lodhi Road
New Delhi

Kind Attn: Sri Debashih Majumdar, Director (Technical)

Dear Sir,

Sub: CDM – TERI-NSS Study - reg.
Ref: **Project No. – 1470**

This has reference to your letter dated 4th November, 2003 regarding TERI – NSS Study.

We are happy to note that IREDA has selected our project as a pilot CDM project under TERI – NSS study. Herewith, we are authorising IREDA to provide the Project Information Note (PIN) on our project to TERI.

Thanking you.

Yours sincerely,
for Koppal Green Power Ltd

(G.K.RAMA RAJU)
Jt. Managing Director.

Annex 3

First draft engagement of Ernst & Young for CDM Advisory services for Project Participant (KGPL)

ERNST & YOUNG

Ernst & Young Pvt. Ltd.
205, 2nd Floor,
Ashoka Bhoopal Chambers,
Sardar Patel Road,
Secunderabad - 500 003

Phone : (91) (40) 27898850
: (91) (40) 55260023
Fax : (91) (40) 27898851

5th December, 2005

Koppal Green Power Limited
H.No 1-88/1/101, 101,
Shanti Vanam
Kavuri Hills Extension
Hyderabad – 500 033

Attn: Mr.M Chandra Mohan, Managing Director

Sub: Engagement Letter – Climate Change Advisory Services

Dear Sir,

This letter will confirm Ernst & Young Pvt Ltd's ('E&Y') engagement to act as advisor to Koppal Green Power Limited., regarding matters related to Kyoto Protocol under United Nation Framework Convention to Climate Change (UNFCCC).This letter shall constitute an engagement agreement (***"the Agreement"***) between **Koppal Green Power Limited.**, (***"the Company"***) and Ernst & Young and sets out our understanding of the services you require us to provide. The Supplemental Terms and Conditions (Annexure-1) and Dispute Resolutions Procedures (Annexure-2), provide further details of our respective responsibilities and form part of this engagement letter.

1.0 Introduction

The Company has reported to undertake following Green House Gas (GHG) abatement project

- 6 MW Biomass Based Power Plant at Gangavati, Koppal Dist , Karnataka..

Hence Koppal Green Power Limited., has approached M/s Ernst & Young, hereafter referred to as E&Y, to assist in preparing the Project Information Note and Project Design Document as per the CDM requirements and to facilitate it in identification of the buyer for the above mentioned GHG abatement project as per the terms and conditions mentioned hereunder.

The Company hereby appoints E&Y to assist it in getting the potential benefits of the GHG abatement project(s) under the Clean Development Mechanism (CDM) of the Kyoto Protocol.

2.0 Scope of Services

Scope of services of E&Y is detailed below in this section

2.1 Assistance in Preparation of Project Idea Note (PIN)

The PIN document will test in brief suitability of the project as a CDM project. E & Y will provide assistance in the preparation of the PIN. The outcome of this stage is the PIN document.

2.2 Assistance in Preparation of PDD

E&Y will assist the Company, in preparing the Project Design Document (PDD) based on the guidelines of the United Nations Framework Convention on Climate Change (UNFCCC). The Company would provide E&Y all the technical information/data required for assisting in preparing the PDD. The following documents would be the outcome of this stage:

2.2.1 Baseline Study

E&Y would assist the Company in preparing baseline document as per the requirements of UNFCCC. The baseline will cover issues like additionality, leakage and excel sheet based calculation for the emission reductions.

First draft engagement of Ernst & Young for CDM Advisory services for Project Participant (KGPL)

ERNST & YOUNG

ERNST & YOUNG PVT. LTD.
205, 2nd Floor,
Ashoka Bhoopal Chambers,
Sardar Patel Road,
Secunderabad - 500 003

Phone : (91) (40) 27898850
: (91) (40) 55260023
Fax : (91) (40) 27898851

11th January, 2006

Koppal Green Power Limited
H.No 1-88/1/101, 101,
Shanti Vanam
Kavuri Hills Extension
Hyderabad – 500 033

Attn: Mr.M Chandra Mohan, Managing Director

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Annex 4

Appointment letter for Validator

KOPPAL GREEN POWER LIMITED
REGD OFFICE : H.No. 1-88/1/101, 101, Shanti Vanam, Kavuri Hills Extn.,
Hyderabad-500 033. Ph : 040-55138344, Fax : 040-23112623
E-mail : koppalgreen@rediffmail.com

Date 30/12/2005

To,

TUV Rheinland (India) Pvt Ltd.,
604,6th Floor ,
Pride Kumar Senate,
Senapati Bapat Road,
Pune – 411 016.

Sub : Appointment of Validators

Dear Mr.Sarang,

This has reference to your Quatation and our telephonic and mail discussion. We are pleased to appoint you as validator for our 6 MW Biomass based power plant located in Koppal ,Karnataka.

As per your mail dated 30/12/2005 the agreed fees for validation is Rs.3,25,000 (Rupees Three Lakh Twenty Five Thousand only). All other terms are as per your quote.

Kindely inform your accepatance as a validator and please send us a draft agreement copy.

Thanks & regards

For Koppal Green Power Ltd.,

Ramesh Talluri
Director.

Annex 5

PPA between KPTCL & KGPL and Termination of PPA

Koppal/TUVref/valid/7

POWER PURCHASE AGREEMENT

BETWEEN

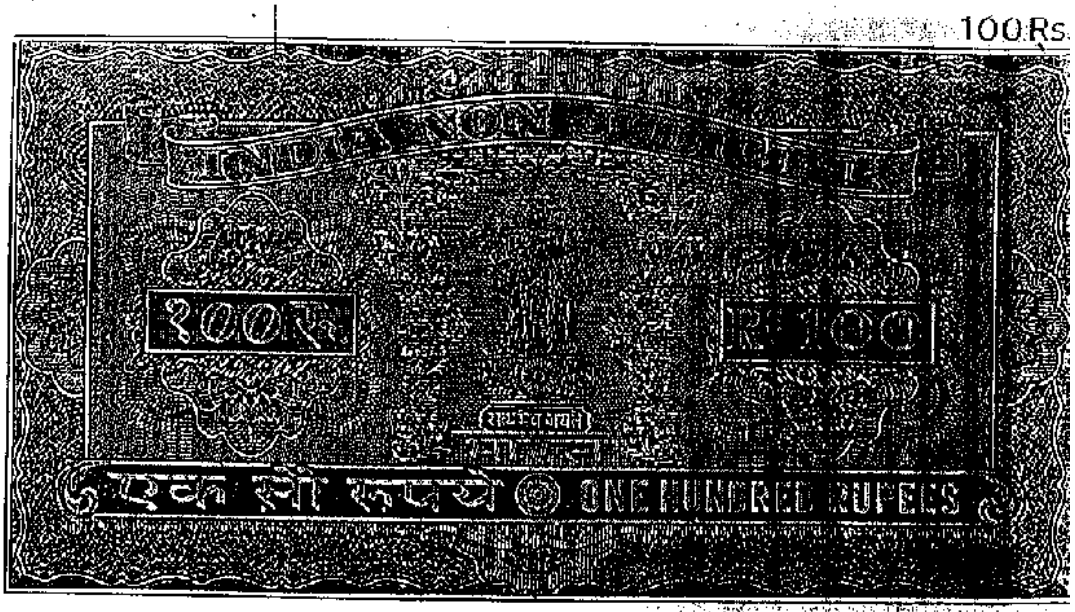
KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

AND

KOPPAL GREEN POWER LIMITED

BANGALORE

DATED: 30/03/2001



THIS POWER PURCHASE AGREEMENT is made and entered into at Bangalore this Thirtieth day of March Two thousand one between **KARNATAKA POWER TRANSMISSION CORPORATION LIMITED**, incorporated in India under the Companies Act, 1956 and having its registered office located at Kaveri Bhavan, Bangalore, State of Karnataka (hereinafter referred to as the **"Corporation"** which expression shall, unless repugnant to the context or meaning thereof, include its successors and permitted assigns) as party of the first part, and **KOPPAL GREEN POWER LIMITED**, a company formed and incorporated under the Companies Act, 1956, and a "Generating Company" under section 2(4-A) of the Electricity (Supply) Act, 1948 having its registered office at No. 1873, 31st Cross 11th Main, Banashankari 2nd Stage Bangalore – 560 070, India, hereinafter referred to as the **"Company"** (which expression shall, unless repugnant to the context or meaning thereof, include its successors and permitted assigns) as party on the second part..

WHEREAS:

i) The Govt. of Karnataka by its NOC Nos. DE 185 NCE 2000 Bangalore dated 26.02.2001 has accorded its sanction to the proposal of the Company for installation of a Biomass Power Generating Station of 6 MW gross and 5.4 MW exportable capacity at Karatagi Village, Gangavathi Taluk, Koppal District in Karnataka and permitted Corporation to enter into an agreement with the Company for purchase of Electricity.

ii) Pursuant to (i) the Company plans to develop, design, engineer, procure finance, construct, own, operate and maintain a Biomass based Power Generating Station, (hereinafter defined as the Project), with a Gross capacity of 6 MW and Net capacity of 5.4 MW at Karatagi Village, Gangavathi Taluk, Koppal District and desires to sell Electricity to Corporation and Corporation has agreed to purchase the Electricity from the company.

iii) Corporation is engaged in the purchase, transmission, distribution and supply of electricity has agreed to purchase the Electricity (as hereinafter defined) from the company to be generated at Karatagi Village, Gangavathi Taluk, Koppal District on the conditions setforth herein.

NOW **THEREFORE** IN VIEW OF THE FOREGOING PREMISES AND IN CONSIDERATION OF THE MUTUAL COVENANTS AND CONDITIONS HEREINAFTER SET FORTH, CORPORATION AND THE COMPANY, EACH TOGETHER WITH THEIR RESPECTIVE SUCCESSORS AND PERMITTED ASSIGNS, A PARTY AND COLLECTIVELY THE PARTIES, HEREBY AGREE AS FOLLOWS:

ARTICLE 5

RATES AND CHARGES

5.1 Monthly Energy Charges: Corporation shall for the Delivered Energy pay, for the first 10 years from the date of signing of Agreement, to the Company every month during the period commencing from the Commercial Operation Date on the basis of the base price applicable for the year 1994-95 at the rate of Rs. 2.25 (Rupees Two and twenty five paise) per kilowatt-hour (the tariff) for energy delivered to the Corporation at the Metering Point with an escalation at a rate of 5% per annum over the tariff applicable for the previous year as per guidelines issued by the Ministry of Non-Conventional Energy Sources of the GoI..

5.2 From the 11th year onwards, from the date of signing of Agreement, Corporation shall pay to the Company for the energy delivered at the Metering Point at a rate agreed by mutual negotiations. In case the Parties do not arrive at a mutual agreement on the tariff, the Company shall be permitted to sell power to third parties and enter into a Wheeling and Banking Agreement with Corporation to sell power through the Corporation grid for which it shall pay wheeling charges to Corporation at the rates applicable from time to time in addition to banking charges at the rates applicable from time to time as approved by the Commission, based on the month end balance of the energy banked.

5.3 The Company shall be permitted to use equivalent energy of 10% of the installed capacity for startup, after inspection by the concerned officers of the Corporation and 115% of such energy provided by the Corporation for startup purposes shall be deducted from the energy pumped into the Grid by the Company for determining the amount to be paid by the Corporation to the Company. If energy over and above the above requirement is drawn from the Grid, the same will be billed under the tariff applicable to HT industries (presently HT-2 a) of the Corporation.

Koppal /TUV ref / Valid / 4

KARNATAKA POWER TRANSMISSION CORPORATION LTD.

Phone : 080-2215187
Fax : 080-2294023
Email:pmg_kptcl@sify.com

Corporate Office
4th Floor, A Block
Kaveri Bhavan
Bangalore - 560 009.

No. KPTCL/035/SEE (P&M)/AEEE-I/4418

Dated: 05.06.2003

By REGD. Post A/D/Courier

The Managing Director
M/s. Koppal Green Power Limited,
1873, 31st Cross, 11th Main,
BSK II Stage,
Bangalore - 560 070.

Sir,

Sub: Termination of Power Purchase Agreement.

This is to inform that the Power Purchase Agreement entered into with your company on 30.03.2001 in respect of purchase of power from your proposed 6 MW capacity Biomass based Power project at Karatagi, Village, Gangavathi Taluk, Koppal District, has been terminated with immediate effect.

In case you intend to continue to develop the project and sell power to KPTCL, you are requested to enter into a fresh agreement as per the following tariff, terms and conditions approved by KPTCL by submitting necessary relevant documents.

A. Tariff: Rs. 2.80 per Kwhr., with an annual escalation of 2% on base tariff of Rs. 2.80 per Kwhr.

B. Terms and Conditions:

1. The tariff proposed above will be applicable for the next 10-years and after which the tariff for purchase of power from Biomass projects will be based only on operating cost and some incentives.

2. Financial Closure shall be achieved within three (3) months of signing of Power Purchase Agreement.

3. Construction work should commence at site within three (3) months of date of achievement of Financial Closure.

4. In case of failure to achieve Financial Closure / commence construction work within the time allotted, the Power Purchase Agreement shall automatically become null & void.

5. Benefits accruing on account of Carbon credits shall be shared between KPTCL and the Company in the ratio of 70:30.

6. The Power factor at which the project is operated shall be at the same level as that of KPTCL grid failing which compensation at the rate of Rs. 0.40 per KVARH shall be charged.

7. In case any of the developers desire to wheel the electricity generated by them to the third party they will be permitted to do so as per the provisions of the Tariff Order issued by KERC.

Receipt of this letter may please be acknowledged.

Yours faithfully,

05/07/03

General Manager (Technical)
KPTCL, Kaveri Bhavan, Bangalore.

Annex 6

Justification for selection of Simple Operating Margin

The Simple Operating Margin approach is appropriate to calculate the Operating Margin emission factor applicable in this case. As per ACM 0002 / Version 06, the Simple OM method can only be used where low cost must run resources constitute less than 50% of grid generation based on average of the five most recent years. The generation profile of the Southern grid in the last five years is as follows:

Generation in GWh	2005-06 *	2004-05	2003-04	2002-03	2001-02
Low cost/must run sources					
Hydro	33298.66	24,951	16,943	18,288	26,260
Wind & Renewable	6798.08	3,256	1,865	1,607	1,456
Nuclear	4711.80	4,408	4,700	4,390	5,244
Other sources					
Coal	108411.24	99,010	98,435	92,053	84,032
Diesel	14507.23	2,434	3,295	4,379	4,155
Gas		12,428	14,214	13,950	10,331
Total Generation	167727.01	146,487	139,451	134,667	131,478
Low cost/must run sources	44808.54	32,615	23,508	24,285	32,960
Low cost/must run sources	26%	22%	17%	18%	25%

Source: Table 3.4 of CEA General Review 2004-05, 2003-04, 2002-03, 2001-02
* Annual grid report 2005-2006, http://www.srldc.org/var/ftp/reports/yearlyrep/2005-06-year.pdf page 43

From the available information it is clear that low cost/must run sources account for less than 50% of the total generation in the Southern grid in the last five years. Hence the Simple OM method is appropriate to calculate the Operating Margin Emission factor applicable.

Annexure II C: Baseline Estimation Details

SOUTHERN REGION

Power Plant	Agency	Installed capacity (MW)	Fuel type	Generation[1] (gross) (GWh) 01-02	Generation[1] (gross) (GWH) 00-01	Auxiliary consumption[2] (GWh) (01-02)	Auxiliary consumption[2] (GWh) (00-01)	Gross heat rate[3] (kCal/kWh)	Net heat rate[4] (kCal/kWh)	Net generation (GWh) (01-02)	CO_2 emissions (ton)
Andhra Pradesh											
K'DEM A-D5	APGENCo	1170.00	Coal 3E	8036.00	7639.00	731.07	698.77	3050.00	3357.08	7304.93	9700181.63
VIJAYWADA5	APGENCo	1260.00	Coal 3E	10225.00	10199.00	882.42	881.19	2411.00	2639.01	9342.58	9752355.36
R'GUNDEM B5	APGENCo	62.50	Coal 3E	426.00	443.00	38.68	38.81	2956.00	3239.81	387.32	496351.84
NELLORE5	APGENCo	30.00	Coal 3E	155.00	171.00	20.55	23.03	3255.00	3761.70	134.45	200049.22
RAYALSEEMA5	APGENCo	420.00	Coal 3E	3412.00	3476.00	333.69	350.73	2303.00	2561.45	3078.31	3118884.14
R'GUNDEM	NTPC	2100.00	Coal 3E	15850.00	16422.00		1504.26	2419.00	2662.92	14398.14	15165844.25
SIMHADRI	NTPC	1000.00	Coal	15.00	0.00		0.00		2663.00	13.63	14258.13
VIJ'SWARAM CCGT		272.00	Gas HBJ	1950.00	1978.00		181.18		2062.00	1771.38	862066.17
JEGURUPADU CCGT	PVT	235.00	Gas HBJ	1616.00	1658.00		38.13		2062.00	1578.83	768360.07
GODAVARI CCGT	PVT	208.00	Gas HBJ	1493.00	1567.00		36.04		2062.00	1458.66	709877.22
KONDAPAALI CCGT	PVT	350.00	Gas HBJ	1735.00	679.00		15.62		2062.00	1695.10	824941.04
PEDDAPURAM CCGT	PVT	220.00	Gas HBJ	51.00	0.00		0.00		2062.00	49.83	24248.99
LVS POWER DG	PVT	36.00	Gas HBJ	93.00	0.00		0.00		2062.00	90.86	44218.74
AP Thermal		7363.50		45057.00	44232.00		3767.76			41304.01	41681636.79
AP Nuclear		0.00		0.00	0.00					0.00	0.00
AP.Hydro		3211.00		6115.00	7729.00		38.65			6084.43	0.00
AP.Total		10574.50		51172.00	51961.00		3806.41			47388.43	41681636.79
Karnataka											
RAICHUR	KPCL	1260.00	Coal 3e	8952.00	8904.00		723.00	2509.00	2730.74	8225.10	8884279.06
YELHANKA DG	KEB	120.00	Diesel	772.00	658.00		22.37		2062.00	745.75	477003.68
TORANGALLU IMPORT	PRI	120.00	Corex gas	921.00	1170.00		0.00		0.00	921.00	0.00
BELLARY DG	PRI	25.20	Diesel	188.00	13.00		0.44		2062.00	181.61	116161.52
TANIR BHAVI CCGT	PRI	220.00	Naptha	941.00	0.00		0.00		2062.00	20.51	9983.32
BELGAUM DG	PRI	81.30	Diesel	419.00	0.00		0.00		2062.00	14.25	9112.14
KAIGA APS	AEC	440.00	Nuc	2997.00	1886.00		231.79			2628.67	0.00
Karnataka Thermal		1826.50		12193.00	10745.00		745.82			10108.22	9496539.72
Karnataka Nuclear		440.00		2997.00	1886.00		231.79			2628.67	0.00
Karnataka Hydro		3066.60		9661.00	10892.00		113.28			9560.53	0.00
Karnataka Total		5333.10		24851.00	23523.00		1090.89			22297.41	9496539.72

Power Plant	Agency	Installed capacity (MW)	Fuel type	Generation[1] (gross) (GWh) 01-02	Generation[1] (gross) (GWH) 00-01	Auxiliary consumption[2] (GWh) (01-02)	Auxiliary consumption[2] (GWh) (00-01)	Gross heat rate[3] (kCal/kWh)	Net heat rate[4] (kCal/kWh)	Net generation (GWh) (01-02)	CO_2 emissions (ton)
Kerela											
BRAMHAPURAM DG	KSEB	106.50	Diesel	128.00	319.00		11.10	1785.00	2062.00	123.55	60125.15
KOZIKODE DG		128.80	Diesel	296.00	460.00		16.01	1785.00	2062.00	285.70	139039.40
KAYAMKULAM CCGT	NTPC	350.00	Gas	1331.00	1945.00		42.40	2130.30	2062.00	1301.98	633628.32
COCHIN CCGT		174.00	Gas	240.00	154.00		3.36	2130.30	2062.00	234.77	114253.04
Kerela Thermal		759.30		1995.00	2878.00		72.87			1946.00	947045.91
Kerela nuclear		0.00		0.00	0.00					0.00	0.00
Kerela Hydro		1828.50		6791.00	6221.00		27.99			6760.44	
Kerela Total		2587.80		8786.00	9099.00		173.73			8706.44	947045.91
Tamil Nadu											
ENNORE	TNEB	450.00	Coal 3E	1150.00	753.00		115.00	3629.00	4283.13	974.37	1650768.85
TUTICORIN	TNEB	1050.00	Coal 9T	8108.00	7931.00		606.00	2483.00	2688.42	7488.48	7910673.74
METTUR	TNEB	840.00	Coal 9T	6396.00	6423.00		520.00	2506.00	2726.76	5878.19	6298143.27
NORTH CHENNAI	TNEB	630.00	Coal 3E	4672.00	4358.00		406.00		2663.00	4236.75	4462776.81
NEYVELI I		600.00	Lignite	4195.00	4158.00		380.04	2633.00	2897.86	3811.58	4694309.88
NEYVELI II		1470.00	Lignite	10268.00	10519.00		961.44	2633.00	2897.86	9329.50	11490148.70
NEYVELI EXT		0.00	Lignite	0.00	0.00		0.00			0.00	0.00
B' BRIDGE GT	TNEB	120.00	Gas	173.00	165.00		3.94		2929.00	168.87	116734.71
NARIMANAM G.T.		10.00	Gas	0.00	16.00		0.38		2929.00	0.00	0.00
KOVIKALLAPAL CCGT		107.00	Gas	698.00	36.00		0.86		2062.00	681.32	331572.57
P'NALLUR CCGT		330.00	Gas	1036.00	0.00		0.00		2062.00	1011.24	492133.51
B'BRIDGE DG		200.00	Diesel	1234.00	1281.00		15.76		2062.00	1218.82	593156.21
SAMALPATTI DG		105.70	Diesel	645.00	91.00		1.12		2062.00	637.07	310037.08
SAMAYANALLUR DG		106.00	Diesel	250.00	0.00		0.00		2062.00	246.93	120169.41
K'KKAM NUC		340.00	Nuc	2244.00	2513.00		308.85			1968.21	
TN Thermal		6018.70		38825.00	35731.00		3010.54			35683.10	38470624.72
TN Nuclear		340.00		2244.00	2513.00		308.85			1968.21	0.00
TN Hydror		1995.90		4350.00	5441.00		20.68			4333.47	0.00
TN Total		8354.60		45419.00	43685.00		3340.06			41984.78	38470624.72
Pondichary											
KARAIKAL CCGT		32.50		250.00	233.00		17.20		2062.00	231.55	112686.96
Pondichary Thermal		32.50		250.00	233.00		17.20			231.55	112686.96
Pondichary Nuclear		0.00		0.00	0.00					0.00	0.00

Power Plant	Agency	Installed capacity (MW)	Fuel type	Generation[1] (gross) (GWh) 01-02	Generation[3] (gross) (GWH) 00-01	Auxiliary consumption[1] (GWh) (01-02)	Auxiliary consumption[2] (GWh) (00-01)	Gross heat rate[3] (kCal/kWh)	Net heat rate[4] (kCal/kWh)	Net generation (GWh) (01-02)	CO_2 emissions (ton)
Pondichary Hydro		0.00		0.00	0.00					0.00	0.00
Pondichary Total		32.50		250.00	233.00		17.20			231.55	112686.96
Southern region											
Thermal		**16000.50**		**98320.00**	**93819.00**					**89272.87**	**90708534.10**
Nuclear		**780.00**		**5241.00**	**4399.00**					**4596.88**	**0.00**
Hydro		**10102.00**		**26917.00**	**30283.00**					**26738.86**	**0.00**
Total		**26882.50**		**130478.00**	**128501.00**					**120608.61**	**90708534.10**

1 - Generation Report, 2001-02, Central Electricity Authority, Government of India.
2 - General Review 1998-99, Central Electricity Authority, Ministry of power, Government of India
3 - Preparatory and pre-planning for Geneff Project, Project report, Tata Energy Research Institute, New Delhi
4 - In case of Gas power plants the net heat rate is taken from generation norms, Report of the working group on Power for 10th Plan, Central Electricity Authority
5 - Heat rate from http://www.apgenco.com/performance.htm

Table No. 3.4

GROSS ENERGY GENERATION (UTILITIES ONLY) PRIMEMOVERWISE REGIONWISE/STATEWISE DURING 2002- 03

(IN GWh)

State/U.Ts.	Hydro	Steam	Diesel	Gas	Wind	Nuclear	Total
Haryana	3660.87	6122.27	0.00	0.00	0.00	0.00	9783.14
Himachal Pradesh	1650.00	0.00	0.00	0.00	0.00	0.00	1650.00
Jammu & Kashmir	323.00	0.00	0.00	58.00	0.00	0.00	381.00
Punjab	8691.00	13650.37	0.00	0.00	0.00	0.00	22341.37
Rajasthan	2197.36	14726.62	0.00	221.74	25.34	0.00	17171.06
Uttar Pradesh	1428.72	20948.51	0.00	0.00	0.00	0.00	22377.23
Uttaranchal	3426.13	0.00	0.00	0.00	0.00	0.00	3426.13
Chandigarh	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Delhi	0.00	1312.08	0.00	2039.22	0.00	0.00	3351.30
Central Sector (NR)	8957.95	43603.31	0.00	14943.49	0.00	8800.00	76303.75
Sub-Total (NR)	30335.04	100362.16	0.00	17262.45	25.34	8800.00	156784.99
Gujarat	588.45	30522.03	0.00	5824.31	179.36	0.00	37114.15
Madhya Pradesh	1771.34	13681.86	0.00	0.00	32.52	0.00	15484.72
Chhattisgarh	276.95	7593.22	0.00	0.00	0.00	0.00	7870.17
Maharashtra	5535.41	52204.04	0.00	5043.07	666.63	0.00	63449.16
Goa	0.00	0.00	0.00	273.05	0.00	0.00	273.05
D. & N. Haveli	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daman & Diu	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Central Sector (WR)	0.00	33391.85	0.00	7572.87	0.00	6200.00	47164.72
Sub-Total (WR)	8172.16	137392.00	0.00	18713.30	878.51	6200.00	171355.96
Andhra Pradesh	3469.81	23032.10	2.00	6878.15	95.94	0.00	33478.00
Karnataka	7248.46	11163.87	1134.00	1280.00	184.93	0.00	21011.26
Kerala	4845.14	0.00	802.24	135.00	2.42	0.00	5785.80
Tamil Nadu	2723.38	21079.79	2420.29	3274.35	1323.52	0.00	30821.33
Lakshadweep	0.00	0.00	20.89	0.00	0.00	0.00	20.89
Pondicherry	0.00	0.00	0.00	264.00	0.00	0.00	264.00
Central Sector (SR)	0.00	30777.98	0.00	2118.50	0.00	4390.00	43285.88
Sub-Total (SR)	18287.79	86053.94	4379.42	13950.00	1606.81	4390.00	134667.16
Bihar	59.43	535.09	0.00	0.00	0.00	0.00	594.52
Jharkhand	79.00	3827.00	0.00	0.00	0.00	0.00	3906.00
Orissa	3261.30	2621.13	0.00	0.00	0.00	0.00	5882.43
West Bengal	509.90	21468.07	0.57	0.19	0.32	0.00	21979.05
D.V.C.	294.19	8633.07	0.00	8.33	0.00	0.00	8935.59
A.& N. Islands	0.00	0.00	138.80	0.00	0.00	0.00	138.80
Sikkim	40.21	0.00	0.32	0.00	0.00	0.00	40.53
Central Sector (ER)	352.84	22838.67	0.00	0.00	0.00	0.00	22991.51
Sub-Total (ER)	4596.87	59743.03	139.69	8.52	0.32	0.00	64488.43
Assam	0.00	0.00	0.00	884.00	0.00	0.00	884.00
Manipur	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Meghalaya	573.51	0.00	0.00	0.00	0.00	0.00	573.51
Nagaland	23.45	0.00	0.10	0.00	0.10	0.00	23.65
Tripura	52.10	0.00	2.00	282.28	0.00	0.00	336.38
Arunachal Pradesh	10.00	0.00	17.00	0.00	0.00	0.00	27.00
Mizoram	6.87	0.00	3.08	0.00	0.00	0.00	9.95
Central Sector (NER)	1955.93	0.00	0.00	1586.00	0.00	0.00	3541.93
Sub-Total (NER)	2621.86	0.00	22.18	2752.28	0.10	0.00	5396.42
Total (All India)	64013.71	386550.33	4541.29	52586.58	2511.08	19390.00	532592.96

TABLE NO.3.4
GROSS ELECTRICAL ENERGY GENERATION (UTILITIES ONLY) PRIMEMOVERWISE, REGIONWISE/STATEWISE DURING 2003-04

(GWh)

State/U.Ts.	Hydro	Steam	Diesel	Gas	Wind	Nuclear	Total
Haryana	3864.42	7000.95	0.00	0.00	0.00	0.00	10865.37
Himachal Pradesh	2810.95	0.00	0.00	0.00	0.00	0.00	2810.95
Jammu & Kashmir	891.00	0.00	0.00	29.00	0.00	0.00	920.00
Punjab	9812.35	14235.54	0.00	0.00	0.00	0.00	24047.89
Rajasthan	2903.13	15457.42	0.00	238.53	15.00	0.00	18614.08
Uttar Pradesh	2154.27	20681.24	0.00	0.00	0.00	0.00	22835.51
Uttaranchal	4514.77	0.00	0.00	0.00	0.00	0.00	4514.77
Chandigarh	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Delhi	0.00	1286.69	0.00	3620.00	0.00	0.00	4906.69
Central Sector (NR)	11327.66	44569.93	0.00	14870.14	0.00	7380.00	78147.73
Sub-Total (N R)	**38278.55**	**103231.77**	**0.00**	**18757.67**	**15.00**	**7380.00**	**157662.99**
Gujarat	559.34	28394.29	0.00	8764.71	261.50	0.00	38269.84
Madhya Pradesh	2632.37	13168.47	0.00	0.00	1.24	0.00	15802.08
Chhattisgarh	298.94	7617.49	0.00	0.00	0.00	0.00	7916.43
Maharashtra	5491.73	54197.50	0.00	5432.23	1269.02	0.00	66390.48
Goa	0.00	0.00	0.00	202.27	0.00	0.00	202.27
D. & N. Haveli	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daman & Diu	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Central Sector (WR)	0.00	32685.70	0.00	7108.91	0.00	5700.00	45494.61
Sub-Total (W R)	**9282.38**	**136063.45**	**0.00**	**21508.12**	**1521.76**	**5700.00**	**174075.71**
Andhra Pradesh	3430.90	22465.29	2.09	6932.84	92.81	0.00	32913.93
Karnataka	7512.01	13577.51	674.91	908.86	322.14	0.00	22996.43
Kerala	3932.66	0.00	654.00	1039.87	2.49	0.00	5629.02
Tamil Nadu	2067.08	21959.26	1941.66	2938.06	1447.65	0.00	30353.93
Lakshadweep	0.00	0.00	21.87	0.00	0.00	0.00	21.87
Pondicherry	0.00	0.00	0.00	275.42	0.00	0.00	275.42
Central Sector (SR)	0.00	40442.55	0.00	2117.97	0.00	4700.00	47260.52
Sub-Total (S R)	**16942.65**	**98434.61**	**3294.75**	**14214.02**	**1865.09**	**4700.00**	**139451.12**
Bihar	95.00	352.38	0.00	0.00	0.00	0.00	447.38
Jharkhand	142.29	4296.54	0.00	0.00	0.00	0.00	4438.83
Orissa	6106.85	3010.48	0.00	0.00	0.00	0.00	9119.33
West Bengal	499.94	23007.43	0.58	0.00	0.47	0.00	23508.42
D.V.C.	304.17	9704.01	0.00	6.61	0.00	0.00	10014.79
A.& N. Islands	7.18	0.00	150.45	0.00	0.00	0.00	157.61
Sikkim	36.00	0.00	0.00	0.00	0.00	0.00	36.00
Central Sector (ER)	344.26	29183.16	0.00	0.00	0.00	0.00	29527.42
Sub-Total (E R)	**7537.67**	**69554.00**	**151.03**	**6.61**	**0.47**	**0.00**	**77249.78**
Assam	0.00	0.00	0.00	848.27	0.00	0.00	848.27
Manipur	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Meghalaya	597.03	0.00	0.00	0.00	0.00	0.00	597.03
Nagaland	23.45	0.00	0.10	0.00	0.00	0.00	23.55
Tripura	64.74	0.00	0.00	436.74	0.00	0.00	501.48
Arunachal Pradesh	11.00	0.00	18.00	0.00	0.00	0.00	29.00
Mizoram	9.81	0.00	0.75	0.00	0.00	0.00	10.56
Central Sector (NER)	2495.20	0.00	0.00	2157.00	0.00	0.00	4652.20
Sub-Total (N E R)	**3201.23**	**0.00**	**18.85**	**3442.01**	**0.00**	**0.00**	**6662.09**
Central Sector All India	**14167.12**	**146881.34**	**0.00**	**26254.02**	**0.00**	**17780.00**	**205082.48**
Total All India	**75242.48**	**407283.63**	**3464.63**	**57928.43**	**3402.32**	**17780.00**	**565101.69**

Annexure 2

Table 3.4 CEA General review

TABLE NO.3.4

GROSS ELECTRICAL ENERGY GENERATION (UTILITIES ONLY)
PRIMEMOVERWISE, REGIONWISE/STATEWISE DURING 2004-05

(GWh)

State/U.Ts.	Hydro	Steam	Diesel	Gas	Nuclear	Renewable Energy Sources				Total
						Wind	Biomass Power	Biomass Gasifier	(i & i)	
Haryana	2980.43	6866.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9847.31
Himachal Pradesh	2754.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2754.36
Jammu & Kashmir	686.98	0.00	0.00	23.74	0.00	0.00	0.00	0.00	0.00	710.72
Punjab	7293.15	14384.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21677.55
Rajasthan	2823.96	17641.59	0.00	353.85	0.00	331.53	34.87	0.00	0.00	20985.80
Uttar Pradesh	1207.62	19703.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20911.42
Uttaranchal	3113.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3113.13
Chandigarh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Delhi	0.00	1385.21	0.00	4091.20	0.00	0.00	0.00	0.00	0.00	5476.41
Central Sector NR	16457.90	40163.90	0.00	15522.20	7503.00	0.00	0.00	0.00	0.00	84647.00
Sub-Total (N R)	**38317.53**	**106155.78**	**0.00**	**19990.99**	**7503.00**	**331.53**	**34.87**	**0.00**	**0.00**	**170143.70**
Gujarat	872.75	30122.16	0.00	12885.89	0.00	350.00	0.00	0.00	0.00	44230.80
Madhya Pradesh	2493.88	13502.60	0.00	0.00	0.00	38.76	0.00	0.00	0.00	15975.24
Chhattisgarh	382.61	7924.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8307.60
Maharashtra	5588.48	55544.24	0.00	5450.59	0.00	486.56	0.00	0.00	0.00	67070.27
Goa	0.00	0.00	0.00	336.16	0.00	0.00	0.00	0.00	0.00	336.16
D. & N. Haveli	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daman & Diu	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Central Sector WR	1331.85	34870.38	0.00	6954.11	5100.00	0.00	0.00	0.00	0.00	48156.34
Sub-Total (W R)	**10669.57**	**141964.37**	**0.00**	**25626.35**	**5100.00**	**884.12**	**0.00**	**0.00**	**0.00**	**184684.41**
Andhra Pradesh	6514.76	23359.70	0.00	8289.89	0.00	180.79	0.00	0.00	0.00	37105.14
Karnataka	6935.47	12897.08	534.96	661.40	0.00	486.53	170.39	0.00	0.00	23615.43
Kerala	6081.50	0.00	312.06	119.89	0.00	2.50	0.00	0.00	0.00	6514.95
Tamil Nadu	4419.31	21358.71	1544.30	2401.10	0.00	2426.30	0.00	0.00	0.00	32229.72
Lakshadweep	0.00	0.00	22.61	0.00	0.00	0.00	0.00	0.00	0.00	22.61
Pondicherry	0.00	0.00	0.00	275.41	0.00	0.00	0.00	0.00	0.00	275.41
Central Sector SR	0.00	41593.90	0.00	621.74	4408.00	0.00	0.00	0.00	0.00	46623.64
Sub-Total (S R)	**24951.04**	**99209.39**	**2433.93**	**12428.43**	**4408.00**	**3079.12**	**170.39**	**0.00**	**0.00**	**146680.30**
Bihar	53.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	206.99	
Jharkhand	148.74	4010.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4159.29
Orissa	7142.64	3165.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10307.06
West Bengal	530.39	24336.79	0.63	0.00	0.00	0.45	0.00	0.00	0.00	24868.26
D.V.C.	258.91	10585.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10845.28
A.& N. Islands	6.80	0.00	122.80	0.00	0.00	0.00	0.00	0.00	0.00	129.60
Sikkim	58.67	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	58.83
Central Sector ER	369.73	34833.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	35203.03
Sub-Total (E R)	**8570.28**	**77113.92**	**123.59**	**0.00**	**0.00**	**0.45**	**0.00**	**0.00**	**0.00**	**85808.24**
Assam	0.00	0.00	0.00	903.24	0.00	0.00	0.00	0.00	0.00	903.24
Manipur	0.00	0.00	1.32	0.00	0.00	0.00	0.00	0.00	0.00	1.32
Meghalaya	637.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	637.65
Nagaland	3.40	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	3.50
Tripura	89.11	0.00	0.00	465.65	0.00	0.00	0.00	0.00	0.00	554.76
Arunachal Pradesh	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00
Mizoram	5.13	0.00	0.68	0.00	0.00	0.00	0.00	0.00	0.00	5.81
Central Sector NER	3935.67	0.00	0.00	2189.00	0.00	0.00	0.00	0.00	0.00	6024.67
Sub-Total (N E R)	**4351.96**	**0.00**	**2.10**	**3578.89**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**7932.95**
Central Sector All India	**20795.15**	**157481.48**	**0.00**	**25187.05**	**17811.00**	**0.00**	**0.00**	**0.00**	**0.00**	**220474.68**
Total All India	**84610.38**	**424244.06**	**2559.62**	**61524.66**	**17811.00**	**4295.22**	**211.26**	**0.00**	**0.00**	**594456.20**

(*): Includes the generation of Small Hydro Projects.

7 GENERATING STATIONS PERFORMANCE

7.1 SUMMARY OF REGIONAL ENERGY GENERATION OF SOUTHERN REGION DURING 2005-06

(Figures in Gross Mus.)

AGENCY	HYDRO	THERMAL	GAS/DIESEL	WIND/OTHERS	NUCLEAR	TOTAL
ANDHRA PRADESH	8033.90	20842.89	1840.51	0.66	–	30717.97
KARNATAKA	11421.86	9182.27	96.74	5.06	–	20705.93
KERALA	7449.56	–	148.98	2.05	–	7600.60
TAMILNADU	6136.93	18794.90	1984.68	14.67	–	26931.19
PONDICHERRY	–	–	258.39	–	–	258.39
CENTRAL SECTOR	–	57035.76	355.20	–	4711.80	62102.75
IPP	256.40	2555.42	9822.73	6775.63	0.00	19410.18
TOTAL	33298.66	108411.24	14507.23	6798.08	4711.80	167727.01

Annex 7

CM (Combined Margin Approach Calculation)

The simple operating margin and build margin data is taken from the published data by Central Electricity of Authority, Gov. of India

http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm

The values of the table are as follows

Simple Operating Margin (tCO2/MWh) (incl. Imports)

	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
North	0.98	0.98	1.00	0.99	0.98	0.99
East	1.22	1.19	1.17	1.20	1.17	1.13
South	1.03	1.00	1.01	1.00	1.00	1.01
West	0.98	1.01	0.98	0.99	1.01	0.99
North-East	0.73	0.71	0.74	0.74	0.84	0.70
India	1.01	1.02	1.02	1.02	1.02	1.02

Build Margin (tCO2/MWh) (not adjusted for imports)

	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
North					0.53	0.60
East					0.90	0.97
South					0.71	0.71
West					0.77	0.63
North-East					0.15	0.15
India					0.70	0.68

Combined Margin in tCO2/MWh (incl. Imports)

	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
North	0.76	0.76	0.77	0.76	0.75	0.80
East	1.06	1.05	1.04	1.05	1.04	1.05
South	0.87	0.85	0.86	0.86	0.85	0.86

West	0.87	0.89	0.88	0.88	0.89	0.81
North-East	0.44	0.43	0.44	0.44	0.49	0.42
India	0.85	0.86	0.86	0.86	0.86	0.85

As per ACM 0002 / Version 06, for simple operating margin approach average of last three years (2003-2004 to 2005-2006) is considered and latest value for build margin is considered.

Simple operating Margin (tCO2/MWh) incl. Imports				
Regional Grid	2003-2004	2004-2005	2005-2006	Avg of last 3 years
Southern	1.00	1.00	1.01	1.004
Build Margin (tCO2/MWh) not adjusted for Imports				
Regional Grid			2005-2006	Value of last year
Southern			0.711	0.711

As per ACM 0002 / Version 06, weighted average for operating margin and build margin is 50%.

Thus combined margin is

0.5 X 1.004 + 0.5 X 0.711 = 0.857

Thus Baseline emission factor is 0.857 tCO2/MWh.

Annex 8

Standard Plant Operating Procedures

CDM PROJECT – IMPLEMENTATION

STANDARD PLANT OPERATING PROCEDURES

Date: 01.01.2006, Rev No: KGPL/ 001

KOPPAL GREEN POWER LIMITED
6.0 MW Biomass Power Plant in Karnataka
Electricity Generation from Biomass Fuels

Project Site:
State Highway No. 23, Karatagi,
Opp: 110 KV KPTCL/GESCOM Substation,
Gangavathi Tq, Koppal Dstrict
Karanataka 583 229

Koppal Green Power Limited
H.No. 1-88/1/101, 101 Shanti Vanam,
Kavuri Hills Extn, Hyderabad – 500 033

Phone: 040- 55133344
Fax : 040-23112623
Email: koppalgreen@rediffmail.com

Document Name	***Standard Plant Operating Procedures***	
Rev No	*KGPL/ 001*	
Rev Date	*01.01.2006*	
Document Prepared by		Plant Manager
Document Reviewed by		General Manager
		Financial Adviser
Document Approved by		Director

I N D E X

Section I

Fuel Procurement and registering Methodology

Section II

Methodology of Plant operations & Maintenance

Section III

Fuel analysis Methodology

1. Biomass fuel analysis
2. Coal analysis

Section I V

Methodology - Miscellaneous

1. Recruitment methodology of personnel for plant and training
2. Procurement activity procedures
3. Internal audit team and scope of audit
4. Usage of computer systems
5. Data storage, protection and disposal procedure

SECTION I

FUEL PROCUREMENT & REGISTERING METHODOLOGY

1. Biomass supplier selection Procedure

Biomass fuel suppliers shall be identified by the Biomass Field Staff or Biomass Dept. Head. The Biomass Dept. Head shall assess the abilities of the Supplier by checking for the following key parameters. For this purpose, the Biomass Dept. Head shall interact orally with various people / Agencies, if required and the communication shall be kept confidentially by the Biomass Dept. Manager.

Key points for assessment of the Supplier:

- Financial strength
- Capability to supply biomass fuel of desired quantity and accepted quality
- Previous experience in similar field
- Clear track record with Forest Department
- Acceptance for non supply of restricted or banned wood
- Acceptance for supply of only permitted fuels
- Ability to provide a minimum of two good references

The Biomass Dept. Head shall assess the supplier based on the above key parameters and submits recommendation to General Manager for approval. If the supplier qualifies, he shall be recommended by the Biomass Dept. Head, if not shall be rejected. This report shall be kept as confidential document.

Also the supplier shall be reassessed once in a year.

The Biomass Dept. Head shall prepare a Half-yearly statement regarding the list of supplier's, assessment status and shall submit the same to the General Manager for approval.

Enclosures:

1. Internal assessment of Biomass supplier (format No. 1)

2. Biomass Fuel Procurement Procedure

Fuel shall be procured as per the rates surveyed by field staff periodically. According to the survey details given by field staff, biomass Manager shall negotiate the rate and tentative quantities of supply with parties. Subsequently, biomass Manager shall make a contract with the supplier and shall be approved by General Manager (Operation). However, the fuel price range approval shall be taken from Technical Director periodically whenever there is a change in range. Biomass Department Head shall obtain undertakings from the Suppliers (format-3) that they will not supply any fuel other than the ordered fuel, especially the fuels banned by the Forest Department. It is the responsibility of the Biomass Department that only the fuels permitted by the KS PCB are procured. To this effect a notice board shall be kept at the entrance of the Plant saying that only permitted fuels are procured, the language of the Board shall be preferably in Telugu. Supply of fuel by any means of transport (like truck, tractor trolley or bullock cart) is permitted.

Enclosures:

1. Biomass material supply contract Format (Format No.2)
2. Undertaking from Biomass suppliers (format No.3)

3. Fuel Inward Registering Procedure

When a Supplier supplies fuel to the Plant, initially it shall be checked at the Main gate for the variety of the Fuel. If the fuel is found to be permitted fuel, then it shall be registered in the Material Inward Register (format no. 4) at security manually. Then the gross weight of the vehicle will be taken in the electronic weighbridge situated inside the Plant and then the vehicle shall be sent to the fuel yard. The yard staff shall inspect the vehicle for any banned fuel and on their clearance, the fuel shall be unloaded in the yard. Fuel shall be stacked in the respective yards depending on the convenience. After unloading, the tare weight of the empty vehicle shall be taken in the weighbridge and the weight of the fuel will be arrived accordingly. Weigh bridge staff shall enter the details in the Weigh bridge register (format no. 5) and shall generate two weighment slips, out of which, One Weigh slip (marked as 'Party Copy') shall be given to the Fuel Supplier / vehicle driver for their records, and the other slip (marked as 'Office Copy') duly signed by yard staff, driver of the vehicle and security staff jointly shall be sent to security gate for entering into the records, subsequently to the office staff for registering the entry in Raw Material Receipt Register (format no. 6). Biomass Department head shall check the registers and the weigh slips on daily basis.

Enclosures:

1. Raw Material Inward Register (Format No.4)
2. Raw Material Receipt Register (format No.6)

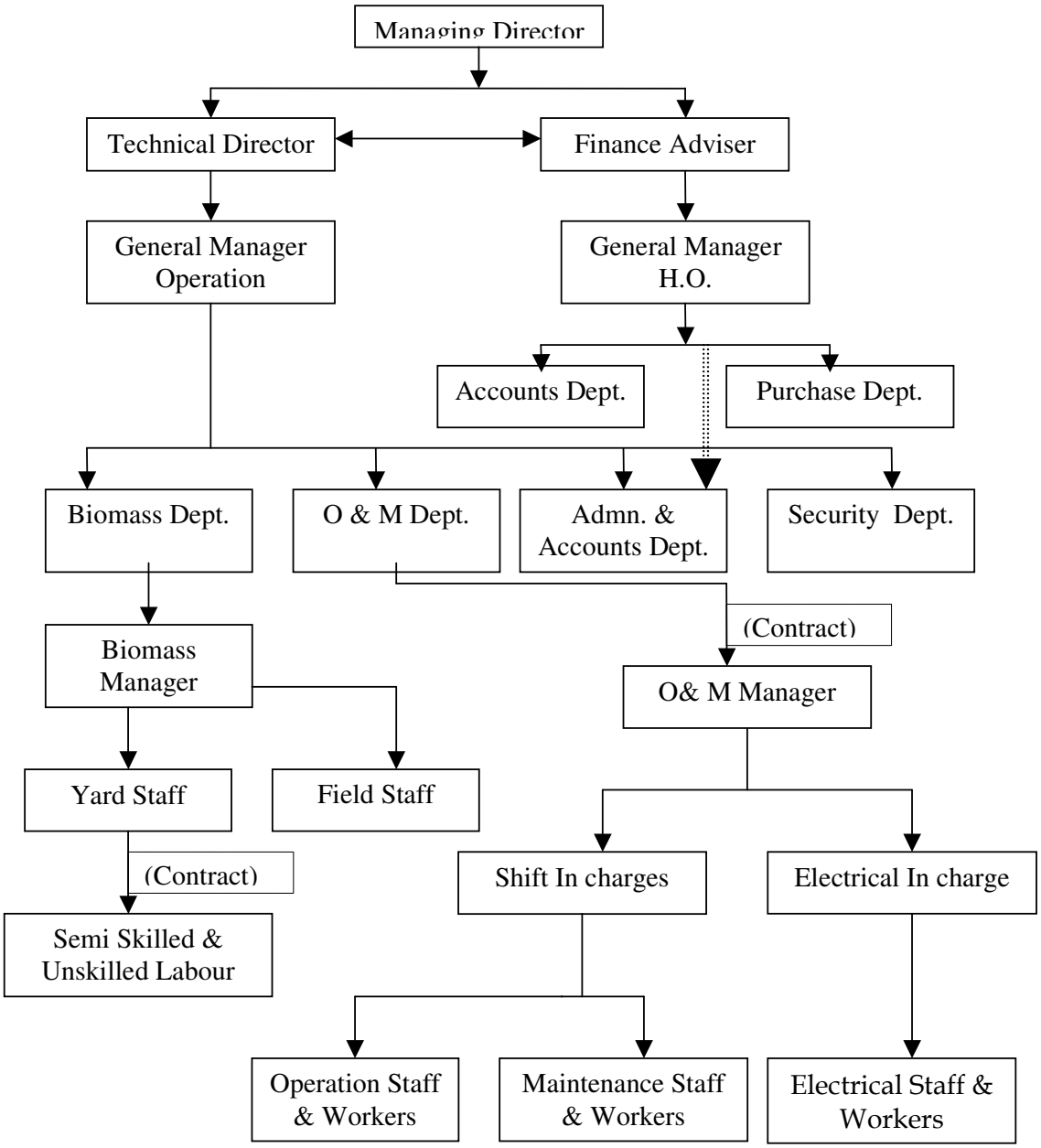
4. Fuel Accounting Procedure

Accounts staff shall check the weigh slip submitted by supplier's representative, for the signatures of yard staff, security stamp & signature and the signature of the biomass manager with the rate confirmation. Daily vouchers shall be prepared on supplier wise for the received fuel quantities and amount shall be arrived accordingly.

SECTION II

METHODOLOGY OF PLANT OPERATIONS & MAINTENANCE

1. Project Organization Chart



2.Operation & Maintenance procedure of Plant critical equipment

Boiler and Auxiliaries

Startup procedure

Water stock in DM water storage system will be checked. All the vents and drains will be kept open. Water level in the deareator and drum will be checked and sufficient water level is ensured. All manholes will be checked for closing. Boiler will be lighted up and furnace temp will be raised gradually. Ash handling conveyors will be kept running. ESP wrapping mechanism will be switched ON. ID, FD and PA fans will be switched on and fuel feeders will be switched on and fuel will be taken into the furnace. After reaching 5 kg/cm^2 pressure of SH steam drum vents will be closed. SH steam pressure and temp. will rise slowly. Boiler feed pump will be started. SH steam temp. will be raised gradually by means of startup vent. When SH steam temp reaches 420^{0}C, by pass valve will be opened and steam will be admitted into the line for warming up. After reaching line temp to 495^{0}C, steam will be taken to the turbine for vacuum buildup and turbine rolling. After plant synchronization, all drains and vents will be closed.

The following items shall be monitored frequently during the operation of the Boiler and if there are any deviations from the desired values, immediate action will be taken to bring to the normal operating conditions.

- Material handling conveyors
- Boiler Feed Pump
- Fuel feeders
- Fuel distribution in the furnace
- Water levels in the Drum & Deareator
- Blow down system
- Steam / vapour / flue gas leaks
- Steam parameters

- Air parameters
- Water parameters
- Position and condition of fans & dampers
- Condition of ESP
- Condition of Air compressors
- Pressure drop across strainers of BFP suction
- Safety valves

During annual maintenance period the following works shall be carried out:

- Inspection of Air and Fuel nozzles
- Inspection of drum feeders
- Arresting of steam / flue gas leakages
- Ash cleaning at various places
- Inspection of refractory work

The following works will be carried out on daily basis

- Greasing of all drag chains
- Checking of oil levels in the gear boxes
- Checking of oil level in the ash conveyor lubrication systems
- Checking of oil level for BFP bearing lubrication
- Checking of fuel and ash handling conveyors
- Checking of cooling tower fans
- Checking of air compressors

Startup procedure

All the drains shall be kept open. AOP and barring gears shall be switched on till lube oil temp reaches 40-45^{0}C. After checking the hot well level, CEPs will be switched on. CCW pump will be started and Main steam line kept in warm up condition. Ejectors will be charged. Glands will be charged after obtaining condenser vacuum upto –0.3 kg/cm^2. Starting ejector will be closed at –0.6 vacuum. Barring gear stopped, solenoid valve resetting and local emergency Push button resetting will be done at –0.7 vacuum. After opening of ESV slowly turbine rolling will be started. Full speed of the Turbine will be reached in stages (110 – 115 min duration to reach 8000 rpm) of intervals. At 8000 rpm AOP will be stopped. At 8315 (rated) rpm all the required parameters like oil temp, pressure, vacuum, expansion, vibrations, noise etc will be checked and after satisfaction, Generator excitation will be started. All drains will be closed after synchronization.

The following items shall be monitored frequently during the operation and if there are any deviations from the desired values, immediate action will be taken to bring to the normal operating conditions.

- Hot well level
- Lube oil temperature
- Bearing temperatures
- Oil pressures in lube oil system, Governing oil system, Stop valve oil system
- Condenser vacuum
- Condenser inlet & outlet water temperatures
- Inlet & outlet water temperature and pressure of generator air coolers
- Inlet steam pressure and temperature
- Load on generator and frequency
- Noise of the machine
- Oil temp in the coolers

- Gland steam front & rear packing pressure and temperatures
- Exhaust steam pressure and temp
- Ejector steam pressure and temp
- PRDS pressure and temp
- Bleed
- Opening of governor spindle
- Thermal expansions and vibrations
- Condition of drives
- Oil level in the Oil storage tanks
- Condition of oil
- Diff. Pressure across lube oil filters
- Speed of rotor

During annual maintenance period the following works shall be carried out:

- Inspection of bearings, if required
- Inspection of stop valve and governing system
- Inspection of lube oil
- Cleaning of filters (when ever required)
- Cleaning and inspection of condenser
- Inspection of pumps

Generator

Startup procedure

It will be ensured that sufficient lube oil is circulating for the generator bearings. No unusual noise or rubbing sounds or knocks should be there during acceleration of the generator. Bearing vibrations will be monitored carefully. Bearing out let oil temp. and proper cooling water circulation shall be checked frequently.

After reaching 8315 rpm of the turbine, AVR field breaker shall be ON and excitation voltage shall be buildup slowly up to rated Voltage of 11KV. Sync. Switch will be switched ON and adjustment to "coarse mode" to match the generator voltage to grid voltage. Then set to "fine control mode" and frequencies of Generator and grid shall be matched. Once the green lamp glows then after seeing the Voltage and frequency, generator breaker shall be closed for synchronization. Loading of generator will be done slowly by observing the vibrations.

The following parameters shall be monitored continuously during operation.

- Bearing vibrations
- Lube oil temperatures
- Cooling water inlet and outlet temps
- Winding temps
- Excitation Voltage and current
- Mains Voltages
- Mains currents

During maintenance period the following works shall be carried out:

- Thorough cleaning of generator (regular)
- Quality of lube oil (regular)
- Exciter diodes will be cleaned thoroughly and checked for tightness (quarterly)

- All instruments will be checked for zero adjustment (regular)
- Tightness of field wiring and control panel wiring will be checked (quarterly)
- Tightness of alternator terminals will be checked (quarterly)

Water Treatment Plant

Tube Settler and Clarifier (Coagulant)

This system is installed prior to DM Plant to eliminate the suspended solids (Turbidity, Slit and Clay)

DM Plant

DM feed water should be with nil turbidity and FRC should be 0.2 ~ 0.5 ppm. FRC shall be monitored frequently. Feed water shall pass through Cation bed and subsequently through Anion bed. The outlet water from anion bed shall enter into the Mixed Bed and is used for Boiler makeup. Plant shall be operated without exceeding the recovery levels more than the design condition. It will be ensured that dosing chemicals are used as per the requirement.

The following items shall be monitored daily:

- Outlet Raw water quality of Clarifier system
- Outlet Raw water quality of Cation bed
- Outlet Raw water quality of Anion bed
- Outlet Raw water quality of MB
- Dosing of chemicals
- Condition of pumps and blowers
- Pressure drop across filters

During maintenance period the following works shall be carried out:

- Cleaning of PSF
- Cleaning of MB
- Inspection of resin, if required
- Inspection of valves
- Water Leakages

Fuel processing equipment:

Chippers are being used for preparation of wood. It will be ensured that feed size will not exceed the specified limits. Fly knives shall be changed at regular intervals to constantly maintain the output of the chippers. If there are any barks in the chipped fuel, the dead knife shall be replaced immediately. It will be seen that no foreign material will enter into the chippers, except wood, which will damage the knives / machine parts.

The following items shall be monitored daily:

- Machine sound
- Frequent replacement of knives
- Checking of drives and transmission systems
- Checking of gear oil levels and makeup
- Checking of bearings
- Lubrication of bearings at frequent intervals

During maintenance period the following works shall be carried out:

- Inspection of knife holders
- Inspection of liners
- Lubrication of bearings
- Replacement of gear oil
- Repairs of conveyors / skirts
- Machine body inside cleaning

Material handling conveyors

The following items shall be monitored regularly shift wise and immediate necessary actions will be taken, if there is any abnormality.

- Condition of the conveyor belts
- Position and alignment of belts
- Condition of pulleys, idlers etc.,
- Checking of bearings
- Checking of gear boxes and drives
- Make up of lube oil in the gearboxes, if required
- Checking of skirts / skirt rubbers
- Checking of transmission systems
- Checking of glands in case of screw feeders

During maintenance period the following works shall be carried out:

- Replacement of belts, if required
- Repairing of inspection doors
- Make up of lube oils
- Replacement of bearings, if required
- Replacement of skirts / skirt rubbers, if required
- Inspection of gear boxes and repairing

Cooling Tower:

The water level in the basin shall be maintained as per the limits. Blow down shall be taken regularly without exceeding the max. Specified limits and accordingly makeup will be given. Dosing of chemicals / acid will be done continuously. Inlet and out let temperatures shall be monitored continuously.

On shift basis, the following items shall be done:

- Inspection of fans
- Inspection of gear boxes
- Vibrations

- Checking of oil level in the gear boxes

During maintenance period the following works shall be carried out:

- Opening and inspection of gear boxes
- Inspection of valves
- Cleaning of basin
- Inspection of nozzles and replacement, if required

3. Monitoring Parameters and Formats

The following parameters of the Plant shall be monitored as per the approved formats.

- Power Generation, Export and Auxiliary consumption recording
- Quantity of Fuel consumed
- Biomass Fuel Analysis
- Coal Analysis

Enclosures:

- Format of Monthly Power Generation, Export, Auxiliary consumption, and Fuel consumption recording (format No.7)
- Format of Biomass Fuel Analysis recording (format No 8)
- Format of Coal Analysis recording (format No 9)

4. Power Generation & Export Recording Procedure

As the O & M activities are looking after by external agency, Power generation and export shall be monitored on continuous basis from the installed meters at the Plant and the O & M team shall record readings in the respective log sheets accordingly. The Electrical Supervisor (O & M) shall record the shift-wise parameters and this shall be reported daily in the form of daily generation report to the General Manager by the O& M Manager. Daily generation report shall be prepared by the Shift In charge (O & M). A monthly consolidated statement of Power Generation, Export & Aux. Consumption shall be prepared by the O&M In charge on billing month basis and approved by the General Manager.

Encl: Daily generation report (format No. 10)

5. Monthly Fuel Consumption Recording Procedure

Day-wise fuel consumption for different type of fuels for the Plant operations shall be arrived by the Yard- Staff. This shall be calculated based on the usage, for biomass and other Agro waste fuels depending on the dumping quantity of JCB bucket, which shall be arrived by weighing different fuels. This daily fuel consumption report shall be prepared by yard staff. The same will also be countersigned by O&M staff. If any difference of opinion, the same will be recorded on the fuel consumption report. Monthly consolidated statement will be prepared and sent to HO for verification and comments if any.

Enclosures:

1. Format of monthly Generation and fuel consumption report (format No .7)

6. Monthly metering & Billing Procedure

There are two energy meters installed at the Sattenapalli sub station namely Main Meter and Check Meter to measure the export of power to the KPTCL/GESCOM and import of Power from the KPTCL/GESCOM.

On 23rd or 24th day of every month meter readings at the substation shall be recorded and export of power to the KPTCL/GESCOM and import of Power from the KPTCL/GESCOM shall be arrived. This statement shall be jointly certified by the representatives of the Company and KPTCL/GESCOM. Based on this statement, invoice shall be raised by the Company to KPTCL/GESCOM as per the fixed unit rate.

Encl: Format of meter readings (format No.11)

Format of the Invoice (format No.12)

7. Plant Operation logs

The following logs sheets for recording various parameters of the equipment during Plant operations shall be maintained.

- Water Analysis report (format No.13)
- Turbine Log Sheet (format No 14)
- Boiler Log sheet (format No 15)
- Electrical Log Sheets (format No 16)

Formats of the above log sheets are enclosed.

8. Plant Maintenance Register

The Plant maintenance register for recording the performance of the equipment shall be maintained.

- Turbine Auxiliaries – Daily
- Boiler Auxiliaries - Daily
- Fuel Preparation System - Daily
- Fuel Handling System – Daily
- Ash Handling System – Daily
- Balance of Plant – Daily
- Water Treatment Plant – Daily

Enclosures: Format of maintenance Register (format 17)

Monthly Maintenance Report

Monthly maintenance report shall be prepared by O& M Manager for all the above equipments and shall be incorporated in the monthly performance report. And the same shall be submitted to General Manger.

Enclosures: Format of Monthly maintenance Report (format 18)

Annual Maintenance Report

Annual maintenance report shall be prepared by O& M Manager for all the above equipments and shall be incorporated in the annual performance report. And the same shall be submitted to General Manger.

Enclosures: Format of Annual Report (format 19)

Emergency DG set Operations

Emergency DG sets installed in the Plant are meant for emergency Power requirement in case of any black out (grid fails). The DG sets shall be tested weekly to check their running condition. A record shall be maintained for the operations of the DG sets.

Enclosure:

1. Format of DG Set operation record (format No. 20)

9. Daily Plant Performance Reporting Procedure

The shift-wise parameters like Power Generation, Export, Aux. Consumption, steam consumption shall be recorded in the Daily Generation & Fuel consumption Report by the Shift In charge, reviewed and signed by the O & M Manager. This shall be reported daily to the General Manager.

Encl: Format of DGR (format 10)

10. Calibration Procedures for Monitoring Equipment

Energy Meters:

The Energy Meters installed at the Sattenapalli Sub station shall be tested against the requirements of KPTCL/GESCOM and shall be carried out by KPTCL/GESCOM – MRT Division. For testing purpose a standard injection test kit shall be used by KPTCL/GESCOM and this test kit is the master tool for testing of the energy meters. The test results shall be jointly signed by the representatives of the Company and KPTCL/GESCOM. The Company shall authorize a Dy. Manager (E&I) or Electrical supervisor, who shall be a minimum Diploma Holder in Electrical Engineering, for witnessing / reviewing of the test results.

Instruments:

Instruments installed in the Plant like relays, instruments, pressure gauges, temperature gauges, flow meters etc shall be calibrated once in a year or as per the recommendations of the Supplier. The instruments shall be tagged with the calibration date and next calibration due date.

11. Emergency preparedness Plan

The following are the approved emergency preparedness plans for the Plant critical equipment and these shall be displayed at the respective places to meet any emergencies.

Emergency Preparedness Plan – Control Room

IF PLC FAILS

IF PLC FAILS ALL REMOTE SELECTION DRIVES WILL STOP.

Action Plan for Turbine

- Generator breaker should be opened / tripped manually
- Excitation push button should be closed.
- Turbine to be tripped locally.
- All remote selector switches to be changed in to local mode in MCC.
- Close Steam stop valve near Turbine manually.
- Open Main Steam line & MSV drains.
- CEP to keep in Recirculation mode.
- To keep CW pump running

Action Plan for Boiler

- All remote selector switches to be changed in to local mode in MCC & start the boiler feed pump.
- Minimum water level to be maintained in the main drum.

- Close all drains and vents.
- FD, PA & ID to be kept in running.

If Grid Power Fails

- First accept the all the alarms
- Simultaneously start the 82.5 KVA DG set and close ACB (air circuit breaker). Then normalise the LT Power supply for emergency equipments.

Action Plan for Turbine

- Start the Emergency Oil Pump
- When Turbine rotor rpm is zero immediately start the baring gear.
- Check the MSV is in open/ close condition. If MSV is in open condition immediately close the steam stop valve manually
- Open the steam line & MSV drains
- Start the auxiliary cooling water pump

Action Plan for Boiler

- Close all the vents and drains.
- FD, PA & ID to be kept in running.
- Main steam stop valve should be closed manually.

- Main drum water level and steam pressure to be monitored till Boiler pressure reaches 10 kg/sq.cm.

Emergency Preparedness Plan – Turbine

Emergency Stop for Turbine

- Generator breaker should be opened / trip manually
- Excitation push button should be closed.
- Turbine will be tripped in Auto (DCS). If Turbine is not tripped from DCS trip locally.
- Check the Oil pump is started in Auto. If not started change the position of selector switch in MCC and start locally.
- Turbine rotor rpm is zero immediately start the baring gear.
- Check the MSV is in open/ close condition. If MSV is in open condition immediately close the steam stop valve manually.
- Open Steam Line & MSV drains.
- Hot well level to be maintained locally.

Emergency Preparedness Plan – Boiler

Emergency Stop for Boiler

- Stop the fuel feeding.
- Stop the PA & FD Fans through DCS. If not stopped change the position of selector switch in MCC and stop locally
- Check the Boiler Feed Pump is running.
- Main drum water level and pressure to be monitored.

12. Air / Water Analysis

The following parameters shall be checked and recorded for monitoring of the particulate matter from the Boiler chimney (Stack) and the quality of ambient air inside the Plant:

- Stack Analysis, Ambient Air Quality (to be measured at three places inside the Plant) - shall be monitored on monthly basis.
- Waste Water Analysis – shall be monitored on quarterly basis.

For the purpose of above monitoring, an external laboratory shall be engaged.

13. Ash Disposal Methodology:

The ash generated by the Plant shall not be stocked in the Plant beyond 10 days. It shall be disposed off to local brick manufacturers on day-to-day basis at free of Cost.

SECTION III

FUEL ANALYSIS METHODOLOGY

1.Biomass Fuel Analysis

Biomass fuel as received shall be randomly sent for analysis to out side Govt. approved laboratory whenever there is a change in supply for GCV, FC, VM, ash % age, shall be maintained in a format and this shall be reviewed by the General Manager.

2.Coal analysis

The carbon content of the coal shall be arrived as per the following formula –

Carbon content (% of fixed carbon) = 100 – (inherent moisture in % + volatile matter in % + ash content in %)

Inherent moisture, volatile matter and ash content of the coal shall be taken from the analysis reports.

GCV of the coal shall be analyzed in the outside Govt. approved laboratory and these values shall be recorded.

The above records shall be reviewed by the General Manager.

Enclosure:

Formats of Biomass Fuel analysis and Coal analysis (format No. 8 & 9)

SECTION IV

METHODOLOGY - MISCELLANEOUS

1. Recruitment methodology of personnel for plant and training

Personnel required for the administration or finance activities shall be recruited based on the minimum competency levels fixed.

As the personnel for plant operation & maintenance, security are being outsourced, General Manager shall oversee the methodologies that are being maintained by the respective contractors.

2. Procurement Activity Procedure

General Manager (H.O) is responsible for procurement of necessary spare parts and consumables (Except Biomass fuel) required for Plant operations and add on equipment, required for improving the performance of the existing systems.

To this effect, a Purchase requisition form shall be raised by concerned person with recommendation by General Manager (Operation). This form shall be addressed to Technical Director. Technical Director shall approve the request made and advise General Manager (H.O) for procurement. Depending on the requirement General Manager (H.O) shall obtain proposals from identified or selected suppliers / authorized distributors / OEMs (Original Equipment Manufacturers) and after negotiations with the suppliers, Purchase Order / service Order shall be prepared and released by General Manager (H.O). The Purchase orders / Service Orders shall be signed by General Manager (H.O) or his authorized representative.

Enclosures:

1. Purchase Requisition format (format No.21)
3. Purchase Order Format (format No.23)
3. Service order Format (format No.24)

3. Internal audit team and scope of audit

An internal audit team shall be formed by Project Head (CDM) for auditing of CDM Project activities. The periodicity of the audit shall be once in six months. However, auditing may be performed, prior to the schedules as per the requirement or a request from General Manager (Operation) or an advice by Financial Adviser.

The scope of internal audit team includes,

- Checking of Power Generation, export and Aux. consumption recording details
- Checking of daily and monthly fuel consumption recording details
- Checking of fuel analysis reports
- Review of Biomass fuel supplier assessment records
- Review of fuel inward recording procedures
- Review of calibration reports of critical equipment
- Checking of Security activities & performance
- Review of financial & accounts department status & performance
- Review of O & M activities and team performance
- Review of welfare activities
- Suggesting discrepancies in the records, if any
- Suggesting improvement measures to be taken

3. Usage of computer systems:

Sl. No	Location	Minimum No. of Computer Systems to be made available	Persons authorized to use the Computer Systems
1	Administration Department	1	Admn. Officer
2	Accounts Department	1	Sr. Accounts Officer
3	Weigh Bridge	1	Clerk

4. Data Storage & protection procedure

Electronic data:

The following data shall be stored in electronic form (backup in compact discs) on yearly basis apart from the hard copies, which shall be filed on monthly / yearly basis:

1. Monthly Power Generation, Export & Aux. Consumption details
2. Monthly Fuel Consumption Details
3. Daily generation and fuel consumption records

Data in Hard Copies:

The following data shall be stored in form of hard copies and shall be filed on monthly / yearly basis:

1. Operation Log sheets
2. Maintenance Register
3. Accounting Vouchers along with weigh slip
4. Material inward register
5. Calibration certificates

All the above documents, both hard and soft copies shall be kept in the documentation room. No person is allowed to access the documents without prior permission from the General Manager. The data shall be stored for a minimum period of two (2) years during the credit period and after issuance of CERs whichever is later. After two years, the hard copies shall be destroyed or disposed off as per the instructions of Technical Director/ Finance Adviser.