KARNATAKA POWER CORPORATION LTD.

KARNATAKA POWER CORPORATION LIMITED

(A GOVERNMENT OF KARNATAKA ENTERPRISE)

Tender Notification No: KPCL/2024-25/SE0122 **Dated: 14.06.2024**

BID DOCUMENT

FOR

"Conducting Techno-commercial feasibility study & preparation of the report on implementation of Bio-mass co-firing and preparation of tender document including technical specification for inviting tender for supply, fabrication, installation & commissioning of the Biomass co-firing system at Raichur Thermal Power Station (RTPS) – 7X210 MW, 1X250MW, Bellary Thermal Power Station (BTPS)–2X500MW, 1X700MW and Yeramarus Thermal Power Station (YTPS) – 2X800MW in the state of Karnataka, India."

OFFICE OF
THE CHIEF ENGINEER (THERMAL DESIGNS)
KARNATAKA POWER CORPORATION LIMITED
NO. 3, 2ND FLOOR, GREEN BUILDING,
(DRUGS CONTROL DEPARTMENT PREMISES),
PALACE ROAD,
BENGALURU-560 001.

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BRIEF BID NOTIFICATION (BBN)

ABSTRACT BID NOTIFICATION (ABN)

DOMESTIC COMPETITIVE BIDDING (TWO COVER SYSTEM)

(Through e-procurement portal only)

Tender Notification No: KPCL/2024-25/SE0122 **Dated: 14.06.2024**

Name of Work: Consultancy services for implementation of Bio-mass co-firing at Raichur Thermal Power Station (RTPS) – 7X210 MW, 1X250MW, Bellary Thermal Power Station (BTPS) – 2X500MW, 1X700MW and Yeramarus Thermal Power Station (YTPS) – 2X800MW.

Karnataka Power Corporation Limited invites bids through GOK e-procurement platform www.kppp.karnataka.gov.in from the qualified bidders for the following brief scope of consultancy work:

"Conducting Techno-commercial feasibility study & preparation of the report on implementation of Bio-mass co-firing and preparation of tender document including technical specification for inviting tender for supply, fabrication, installation & commissioning of the Biomass co-firing system at Raichur Thermal Power Station (RTPS) – 7X210 MW, 1X250MW, Bellary Thermal Power Station (BTPS)–2X500MW, 1X700MW and Yeramarus Thermal Power Station (YTPS) – 2X800MW in the state of Karnataka, India."

Those who have not registered in the e-procurement portal www.kppp.karnataka.gov.in may do so in order to participate in the bid.

The brief bid notification containing the pre-qualifying criteria for the bidders, EMD, calendar of bid activities and other details can be accessed from the e-procurement portal.

Further details can be had from:

Chief Engineer (Thermal Designs),
Karnataka Power Corporation Ltd.,
No.3, 2nd Floor, Green Building,
Drug Controller Department Premises,
Palace Road, Bengaluru - 560 001.

Mob. +91 94484 36926
E-mail: kpclcetd@gmail.com
kpclbiomass@gmail.com
Website: www.kpcl.karnataka.gov.in

BRIEF BID NOTIFICATION (BBN)

DOMESTIC COMPETITIVE BIDDING (TWO COVER SYSTEM)

(Through e-procurement portal only)

Tender Notification No: KPCL/2024-25/SE0122 **Dated: 14.06.2024**

KARNATAKA POWER CORPORATION LIMITED invites bids through GoK e-procurement platform **www.kppp.karnataka.gov.in** from the qualified bidders for "Consultancy services for implementation of Bio-mass co-firing at Raichur Thermal Power Station (RTPS) – 7X210 MW, 1X250MW, Bellary Thermal Power Station (BTPS) – 2X500MW, 1X700MW and Yeramarus Thermal Power Station (YTPS) – 2X800MW.

1.0 SCOPE OF WORK:

The scope of this enquiry covers the following:

"Conducting Techno-commercial feasibility study & preparation of the report on implementation of Bio-mass co-firing and preparation of tender document including technical specification for inviting tender for supply, fabrication, installation & commissioning of the Biomass co-firing system at Raichur Thermal Power Station (RTPS) – 7X210 MW, 1X250MW, Bellary Thermal Power Station (BTPS)– 2X500MW, 1X700MW and Yeramarus Thermal Power Station (YTPS) – 2X800MW in the state of Karnataka, India."

2.0 BRIEF SCOPE OF WORK:

Plant specific Techno – commercial feasibility study shall cover Methodology & supply chain management, study of the existing system & consequent impact on the performance of the system by adopting biomass co-firing, modification requirement in the existing plant equipment & additional equipment needs to be installed, biomass handling, unloading & storage methodology, CAPEX and OPEX implications and Safety aspects etc.,

The bidder shall conduct a Techno-Commercial feasibility study by selecting any one of following capacity of unit from each plant as detailed below:

i) Raichur Thermal Power Station(RTPS) – 1X210MW
ii) Yeramarus Thermal Power Station (YTPS) – 1X800MW
iii) Bellary Thermal Power Station (BTPS) – 1X500MW

As such bidder shall do the Techno-commercial feasibility study for the 03 units from the above 03 Power Plants. Based on the techno-commercial feasibility study conducted for the selected unit from each plant, recommendations for remaining units of the plant / whole plant shall also be extended.

The scope of work shall be broadly divided into following 02 categories. Firm shall quote price separately for each category and brief scope of work shall include but not limited to the following:

I. Techno-commercial feasibility study:

a) Biomass Pellets specifications for firing in boilers (Non-Torrefied/ Torrefied etc.)
b) Blending Methodologies for achieving 5 – 10% co-firing.
c) Technical assessment of maximum feasible Biomass Co-firing and various technological alternatives to achieve Biomass co-firing beyond 10%.
d) Plant specific study - Boiler & Auxiliaries, Material Handling, Fire Protection and other systems to assess the feasibility of Biomass Co-firing.
e) Impact on the boiler with respect to combustion, slagging, fouling, erosion.
f) Impact on Pulverisers, Boiler auxiliaries, Ash handling and Coal handling systems.
g) Impact on Heat rate, Boiler efficiency and Auxiliary Power consumption at various Co-firing combinations.
h) Impact on emissions (CO2, SO2, NOx, etc.) and Ash utilization.
i) Other challenges and safety aspects for various Co-firing ratios and mitigation measures.
j) Unloading and storage options and the methodology
k) Biomass handling systems (stacking and reclaiming).
l) Recommendation on Pelletisation system specification.
m) Modification requirement in the existing Plant equipment
n) Integration of facilities for handling and co-firing with existing system.
o) Impact on Equipment maintenance requirements and suggestions on O&M practices along with cost implications.
p) Additional systems / equipment to be incorporated for achieving the stipulated (5-10%) as well as higher feasible biomass co-firing.
q) Techno-commercial feasibility shall cover all the points mentioned in attached CEA letter No.CEA-TH-17-13/2/2021-TETD Division dated: 04.02.2022, which is required to be submitted to concerned authorities for seeking exemption / relaxation from mandatory co-firing of Biomass.
r) CAPEX requirements for Biomass co-firing such as additional systems / facilities, modification in existing systems / facilities, storage, handling, fire protection system, etc.
s) Additional financial implication in terms of OPEX.
t) Impact on Energy Charge Rate (ECR).
u) Detailed Survey on feasible sources for procurement of pellets for the power plant (Availability of pellets nearer to our Thermal Power plants to cut down transportation cost to the possible extent) v/s Total biomass pellets requirement for the power plant.
v) Recommendations to ensure availability of consistent quality and quantity of pellets throughout the year.
w) Trial run of the unit with stipulated blending percentage of biomass along with the coal.

In the Techno-commercial feasibility study, consultant shall recommend the owner about the feasibility of implementing the Biomass Co-firing in the subject Power Plants.

Any other points apart from the above but required for successful implementation of biomass co-firing shall include in the scope of bidder.

II. Preparation of tender document including Technical specification (for the plant in which techno-commercially feasible to implement the biomass co-firing):

Preparation of tender document including detailed technical specification for inviting tender for supply, fabrication, installation and commissioning of biomass co-firing system at the plant in which it is techno-commercially feasible to implement the biomass co-firing.

Consultant shall prepare detailed technical specification for implementation of biomass co-firing in all the desired plant/s. The scope of preparation of technical specification shall cover all modifications required in the existing system of the plants and additional equipment/system required for the plant/s to implement the biomass co-firing.

Any other points apart from the above but required for the successful implementation of biomass co-firing shall be in the scope of the firm.

3.0 DELETED

4.0 INSTRUCTIONS REGARDING E-PROCUREMENT:

i. The bid is to be submitted in the GoK e-procurement platform www.kppp.karnataka.gov.in system only.

ii. Bidders, who have not registered in the e-procurement portal, may do so by registering through the website www.kppp.karnataka.gov.in

iii. The bidders can access bid documents on the website, fill them and submit the completed bid documents into electronic tender on the website itself within the stipulated date. The blank bid documents can be accessed through the e-procurement portal website www.kppp.karnataka.gov.in

iv. Bidders shall attach scanned copies of all the certificates pertaining to the qualification requirement as mentioned under “Minimum Qualification. Requirements” clause. Whenever required, bidders shall furnish the original certificates to the KPCL authorities, failing which, the bidder will be disqualified.

v. Conditional bids, incomplete bids, bids without EMD, bids not properly uploaded and bids submitted late shall be rejected.

vi. Bidders shall refrain from altering/modifying/revising the price bids after the date and time fixed for submission of bids in the calendar of events even though if it is accepted by the portal. Date and time stamp of the portal shall be final in deciding the time and date of submission of bid. Decision of the Corporation in this regard is final and acceptable to all the bidders.

5.0 MINIMUM QUALIFYING REQUIREMENTS:

The Bidder should meet the following qualifying requirements:

a. Technical criteria:

i) The Bidder must be an EPC contractor for a coal-based thermal power plant in India for 210MW and above capacity (necessarily includes Boiler, Mill and Coal Handling Plant Packages)

OR

ii) The Bidder must be a consultant for an EPC contract of a coal-based thermal power plant in India for 210MW and above capacity (necessarily includes Boiler, Mill and Coal Handling Plant Packages)

OR

iii) The Bidder must be a consultant who has successfully carried out at least one similar consultancy service of techno-commercial feasibility study on Bio-mass co-firing implementation in Thermal Power Plant in India for 210MW and above capacity.

As proof of the above, the intending bidder shall furnish relevant satisfactory performance certificates from the firm for which services were rendered.

Satisfactory performance Certificates shall be on the letterhead with the Corporate Identification Number, signed by the competent authority/CEO of the respective Thermal Power Station certifying the satisfactory performance of the firm.

b. Financial Criteria:

i) The minimum annual financial turnover of the Bidder, in at least Two (2) of the preceding five (5) financial years (2019-20, 2020-21, 2021-22, 2022-23, 2023-24) as on the original scheduled date of Techno-Commercial bid opening, shall not be less than **Rs.3,31,00,000/-** (Rupees Three Crore Thirty-One lakh only). In the event the Bidder is a joint venture companies, the said annual turnover criteria may be met by any one member of JV or by the combined annual turnover of all the JV members.

ii) The Net Worth of the Bidder as on the last day of the preceding financial year (ending on 31-03-2024) should be positive.

6.0 Notwithstanding anything stated above, KPCL reserves the right to assess the capability and capacity of the bidder and or Joint venture partners to perform the contract, should the circumstances warrant such assessment in the overall interest of the KPCL. If such an assessment calls for rejection of any or all bids, KPCL reserves right to reject any or all bids.

7.0 Any agency whose performance in the ongoing projects of KPCL is observed to be not satisfactory such agency shall be liable for rejection.

8.0 Documentary evidences to be submitted by the bidder along with the Bid:

a) Documentary evidence to satisfy the qualifying requirements mentioned in the Clauses 5(a) & 5(b) shall be furnished with details.

b) Annual financial statements or reports duly certified by the chartered accountant in at least Two (2) of the preceding five (5) financial years (2019-20, 2020-21, 2021-22, 2022-23, 2023-24) as on the original scheduled date of Techno-Commercial bid opening.

c) The bidder shall upload scanned copies of the following documents:
   i. Income tax – PAN No.
   ii. Independent PF code
   iii. GST Registration certificate
   iv. Labour certificate

d) Upload duly filled and signed copies of all the Annexures/Schedules except price schedule as per the formats enclosed.

Non-submission of any of said formats will make the bid liable for rejection.

9.0 The intending bidder shall quote in Indian Rupees only.

10.0 Bids received from Bidders whose EMD has been forfeited and contracts have been terminated/ foreclosed by KPCL or Government or Central/ State PSU's or any other utility in India or whose performance has not been satisfactory while executing the contracts for KPCL or Government or Central/ State PSU's or any other utility in India during the past three years from the date of submission of the bid will not be considered. Bidder shall furnish the Notarised Affidavit as indicated in **Annexure-F.**

11.0 Bids duly filled in shall be submitted through the e-procurement portal only. The bids shall be submitted in two cover formats.

i. Cover-I shall contain EMD, Technical and Commercial bid documents to establish qualifying requirements, signed copies of all the Annexures/Schedules except price schedule and will be opened first, document furnished will be scrutinized to determine the bidders meeting qualifying criteria. Bidder shall not enclose price schedule with Cover–I and shall be submitted along with Cover–II only.

ii. Cover-II shall contain only Price Bid. The date of opening of the cover-II would be intimated in advance to those bidders who are qualified.

12.0 The EMD furnished by unsuccessful bidders will be returned, after opening of the price bid. For the successful bidder, the EMD will be returned, only after he enters into a contract agreement and furnishes the contract performance guarantee (Security Deposit) in an acceptable form.

13.0 The intending Bidders shall upload all the documents along with the bid.

14.0 Tenders (Cover-I & Cover-II) must be electronically submitted (online through e-portal) within the date and time published in e-procurement portal. Cover -I of Tender will be opened at prescribed time and date in the e-procurement portal and opening of Cover-II will be intimated later.

15.0 The following are the Calendar of bid events for two cover tender system:

1.	Date of Publishing of ABN and BBN in i) **www.kpcl.karnataka.gov.in** ii) **www.kppp.karnataka.gov.in**	14.06.2024
2.	Last date for receipt of queries if any through e-portal only.	24.06.2024 @ 17.00 Hours
3.	Date of the pre-bid meeting, if required for technical clarification at KPCL, O/o CETD, Bangalore	28.06.2024 @ 11.00 Hours
4.	Uploading replies to queries	03.07.2024
5.	Last date and time for submission of technical bid cover-I along with EMD and Price bid cover-II through e-portal.	15.07.2024 @ 17.00 Hours
6.	Opening of Technical bids (cover-I)	18.07.2024 @ 11.00 Hours
7.	Opening of Price bids (cover –II)	Will be intimated later

16.0 BID VALIDITY:

The validity of the bid shall be **180 days** from the date of opening of the Technical bid (Cover-I) or extended period.

17.0 EARNEST MONEY DEPOSIT:

i. EMD amount is Rs.2,48,000/- (Rupees Two Lakh Forty-Eight Thousand only). The e-payment through e-portal shall be made for Rs.1,00,000/- (Rupees One lakh only) (direct debit, credit card & National Electronic Fund Transfer (NEFT) or Over The Counter (OTC) only through ICICI Bank and remaining Rs.1,48,000/-(Rupees One lakh Forty-Eight thousand only) either in the form of crossed demand draft in favour of KARNATAKA POWER CORPORATION LIMITED, payable at Bangalore or Bank Guarantee from a Scheduled Bank on Rs.200/- stamp paper as per the KPCL Proforma. The Bank Guarantee submitted towards EMD shall be valid for a period of 210 days from the scheduled date of opening of the technical bid (Cover-I). In case, the validity of the Bid is required to be extended, the validity of the BG furnished towards EMD shall be extended up to 30 days beyond such an extended bid validity period. The Bank guarantee shall be furnished in the prescribed format. Only on receipt of full EMD BG of Rs.2,48,000/- (Rupees Two Lakh Forty-Eight Thousand only). along with the technical bid, Price bid will be opened and considered for evaluation.

ii. The EMD furnished by unsuccessful bidders will be returned, after opening of the price bid. For the successful bidder, the EMD will be returned, only after he enters into a contract agreement and furnishes the contract performance guarantee (Security Deposit) in an acceptable form.

iii. No interest is payable to the bidders for the Earnest Money Deposit (EMD).

iv. Part and incomplete bid / bids not accompanied with EMD / belated bids will not be accepted.

18.0 CONTRACT PERFORMANCE SECURITY:

The successful bidder shall furnish a Bank Guarantee from a Scheduled Bank towards Contract Performance, equivalent to **10%(Ten)** of the contract value with an appropriate validity period (including a guarantee period of one year in addition to the completion period of the work envisaged), at the time of entering into contract agreement. The BGs furnished shall be through a Nationalized/Scheduled Bank on Rs.200/- stamp paper as per KPCL format (Annexure-C). The security deposit will be released only after satisfactory completion of the contract & guarantee period.

19.0 CONTRACT AGREEMENT:

The successful bidder shall sign the contract agreement within 30 days from the date of issue of letter of award, on Non-Judicial stamp paper for a value of Rupees Five hundred and in addition Rupees Five hundred for every Rupees ten lakhs of the contract amount or part thereof in excess of Rupees ten lakhs of the contract amount, subjected to a maximum of Rupees Ten lakhs purchased in Karnataka strictly in the KPCL format (will be furnished to the successful Bidder) for due fulfilment of the contract, failing which Bid Security shall be forfeited.

Agreement will be signed in one original only. Original would be kept with the corporation and certified copy given to the contractor.

Subsequent to signing of the contract, the contractor shall provide the KPCL with 10 hard copies duly bound and soft copies of the contract agreement at his cost.

20.0 TERMS OF PAYMENT:

a) For Techno-commercial feasibility study:

i) **20%** payment of respective units along with applicable taxes shall be payable after the first visit of consultant executives to site for finalization of action plan for conducting techno-commercial feasibility study.

ii) **50%** payment of respective units along with the applicable taxes shall be payable on submission of the draft feasibility report.

iii) **30%** payment of respective units along with the applicable taxes shall be payable on submission and acceptance of the final feasibility report.

b) For preparation of tender document including technical specification

i) **20%** payment of respective plant along with applicable taxes shall be payable after completion of the first visit of consultant executives to respective thermal power plant for the preparation of tender document along with the technical specification.

ii) **50%** payment of respective plant along with the applicable taxes shall be payable on submission of the draft tender document along with the technical specification.

iii) **30%** payment of respective plant along with the applicable taxes shall be payable on submission of the final tender document along with the technical specification.

21.0 COMPLETION PERIOD:

The completion period for entire scope of work is as follows:

i) 06 months from the date of issue of the Letter of Award (LOA) for conducting a Techno-commercial feasibility study and submission of the final feasibility report.

ii) 06 months from the date of issue of Notice to Proceed (NTP) for the Preparation of tender document including technical specification for the requisite modification in plants.

As such the total completion period for the given scope of work is 12 months from the date of issue of the LOA

22.0 LIQUIDATED DAMAGES:

The total Completion period for the consultancy services shall be 12 (Twelve) months from the date of issue of LOA. Any modification of the above-mentioned time schedule due to a substantiated request by either party shall be mutually agreed upon in writing.

If the Consultant fails to perform in due time, any of the services under this Contract for reasons he must warrant, the Employer shall be authorized to inflict a penalty of 0.5% of the Total Contract Value for every week of delay which, however, may not exceed 10% of the Total Contract Value.

23.0 INSURANCE & PF:

Insurance of all the personnel deployed for this work and also that of the equipment/material used for carrying out the work shall be arranged by the contractor. The contractor/bidder shall have their own independent provident fund code, to which PF of the personnel engaged shall be remitted by the contractor.

24.0 KPCL reserves the right to verify the information / document furnished by the bidder, should the circumstances so warrant in the overall interest of the corporation. In case the information or the documents furnished are found to be incorrect or invalid, then the EMD furnished by such bidders will be forfeited.

25.0 Corporation reserves the right to award whole or part of the work should be the situation so warrant.

26.0 Bids with stipulations for settlement of dispute by reference to arbitration shall be liable for rejection. The bids containing conditions whatsoever will be liable for rejection.

27.0 Corporation reserves the right to accept or reject any/ or all bids. However, reasons for rejection will be recorded as per KTPP act.

28.0 Part and incomplete bids / bids not accompanied by EMD / belated bids will not be accepted.

29.0 The prospective bidder should not coerce any other bidders to derail the healthy and competitive bidding process. Such acts entail the disqualification for participating in the tender process. The prospective bidder shall not resort to anti-competitive practices like price rigging, cartelization, ring formation or adopt unfair practices both civil and criminal aimed at preventing other bidders from quoting for the bid, any act inhibits competition or any act that will be detrimental to the interest of the KARNATAKA POWER CORPORATION LIMITED. If the bidder is found to have resorted to such practices as specified above, he and others who act in concert with him shall be debarred from quoting for this bid and for future bids for a period of three years.

30.0 Corrigendum/Modification/Corrections, if any will be published on the website only. For any clarification on e-procurement, request for e-procurement training, Bidders can contact HELP DESK at 080-46010000 & 080-22631200

31.0 Any other information required may be obtained from the office of the undersigned during office hours.

Chief Engineer (Thermal Designs),
Karnataka Power Corporation Ltd.,
No.3, 2nd Floor, Green Building,
Drug Controller Department Premises,
Palace Road, Bengaluru - 560 001.

Mob. +91 94484 36926
E-mail: kpclcetd@gmail.com
kpclbiomass@gmail.com
Website: www.kpcl.karnataka.gov.in

INSTRUCTION TO BIDDERS

INSTRUCTION TO BIDDERS

1.00 GENERAL INSTRUCTIONS

1.01 KARNATAKA POWER CORPORATION LIMITED (KPCL), herein after called the 'Corporation' invites Bids for the scope of work detailed in the accompanying specifications.

The Chief Engineer (Thermal Designs), KARNATAKA POWER CORPORATION LIMITED (KPCL), or his authorized representative will receive bids through e-procurement portal of GOK for availing consultancy services for "Conducting Techno-commercial feasibility study & preparation of the report on implementation of Bio-mass co-firing and preparation of tender document including technical specification for inviting tender for supply, fabrication, installation & commissioning of the Biomass co-firing system at Raichur Thermal Power Station (RTPS) – 7X210 MW, 1X250MW, Bellary Thermal Power Station (BTPS)–2X500MW, 1X700MW and Yeramarus Thermal Power Station (YTPS) – 2X800MW in the state of Karnataka, India"

1.02 As set forth in the accompanying specification, all bids shall be prepared and submitted in accordance with the bid instructions.

1.03 Tender documents may be downloaded from Government of Karnataka e-procurement website https://kppp.karnataka.gov.in under login for contractors.

1.04 Only interested contractors who wish to participate should remit online transaction fee for the bid after registering in the portal. The transaction fee is non-refundable.

1.05 Bids (both cover-I and cover-II) must be electronically submitted (online through Internet) within the date and time published in e-procurement portal. Bids submitted within the scheduled date and time shall only be eligible for further processing of the bids. Any bid submitted after the date and time specified shall be rejected even if it is accepted by the e-portal. Date and time stamp of the e-portal system shall be final in deciding the time of submission of bid. Decision of the Corporation in this regard shall be final and acceptable to all the bidders.

1.06 The Corporation at its discretion may extend the last date for the submission of bids and/or may amend the bidding documents.

1.07 The Bidders shall bear all costs associated with the preparation and uploading of Bids to e-procurement portal and the Corporation shall in no case be responsible or liable for these costs.

1.08 No bid shall be considered which does not bear the signature, address and company seal at the bottom of each page of the bid including the schedule in which the rates are entered. Bids with major deviations are not acceptable. Deviation against terms of payment, delivery schedule, force majeure, Contract agreement and performance

security, suit or proceedings, performance guarantee clauses of bid documents are not acceptable.

1.09 The Bidder is required to conduct a techno-commercial feasibility study & Preparation of tender document including technical specification for inviting tender for supply, fabrication, installation & commissioning of the Biomass co-firing system at RTPS, BTPS and YTPS.

1.10 The Corporation does not bind itself to accept the lowest or any bid and reserves the right to select from any bid, only such services as may be considered expedient to accept.

1.11 No enhancement of rates once accepted will be considered during the currency of contract, except as provided in the contract.

1.12 In case of a dispute regarding the services to be provided as per the performance of the contract, the decision of the Corporation is final.

1.13 The Corporation reserves the right to accept any or reject any/or all the bids without assigning any reasons.

1.14 Incomplete Bids and/or bids not accompanied by the Earnest Money Deposit (EMD) will not be accepted and the Corporation will not be responsible for delays in uploading of documents or incorrect uploading of documents, if any.

2.00 MODIFICATION AND WITHDRAWAL OF BIDS

2.01 The bidder may modify or withdraw his bids after the bid submission, provided that such modification or withdrawal is uploaded to the e-portal prior to the deadline prescribed for the submission of bids.

2.02 No bid is allowed to be modified after the last date for submission of bids.

3.00 GENERAL CONDITIONS

3.01 Bidders shall quote in Indian Rupees only.

3.02 The Corporation reserves the right to verify the information/documents furnished in respect of consultancy services provided by the Bidder under the circumstances so warrant in the overall interest of the Corporation. If the Corporation, on detailed verification/investigation finds the Bidder not satisfying the qualification requirement, the Bid will be rejected.

4.00 BID DOCUMENTS

4.01 The scope of consultancy work, bidding procedures and contract terms are prescribed in the bidding documents which consists of following parts. The content of each part is given below.

a) ABN & BBN
b) Instructions to Bidders (with all Annexures, Declaration Formats)
c) General conditions of contract
d) Special Conditions of Contract
e) Technical specifications
f) Schedules
g) Drawings

4.02 The bidder is expected to examine all instructions, forms, terms and specification in the Bid Document. The bidder shall visit the site to study the project features and scheme proposed. In case of failure to furnish all information required in the Bid document or submission of a Bid not substantially responsive in the view of the Corporation to the requirement in the Bid document, the bids are liable to be rejected as per the terms of the Karnataka Transparency in Public Procurement Act (KTPP).

4.03 **Clarification on bidding document:** Prospective bidders requiring any further information or clarification on the bidding documents may notify in writing to the Corporation on or before the date specified for the receipt of such request for clarification as indicated in the brief bid notification. The Corporation will respond in writing to any request for information or clarification of the bidding documents. The Corporation's response/ clarification will be posted in e-portal. These responses/clarifications furnished by the Corporation will form a part of bidding document.

4.04 **Amendment to bidding document:** At any time prior to the dead line for submission of bids, the Corporation may, for any reason, whether on its own initiative, or in response to a clarification requested by the prospective bidders, modify the bidding document by an amendment which will be notified in e-portal and this amendment will be binding on them.

4.05 **Pre Bid meeting**: A pre bid meeting shall be arranged by the corporation at its discretion inviting all prospective bidders. The purpose of the pre bid meeting is to clarify the Commercial and Technical Condition of the bids if any. The bidder may visit site or Chief Engineer (Thermal Design) office, to collect/know the details of projects for the purpose of clarity.

4.06 The bidder is requested to study the proposal in detail and get clarifications from the corporation. The clarification if any as sought by the bidders through e-portal and the clarification issued by the Corporation shall be posted in e-portal and shall form a part of Bid document. The clarification or questions raised in the pre-bid meeting and the

answer or clarification issued by the Corporation shall also be included in the pre-bid meeting recordings that form a part of bid document.

4.07 Verbal clarifications and information given by the Corporation or its employees or its representatives shall not in any way be binding on the Corporation.

5.00 SCOPE OF PROPOSAL

5.01 The scope of proposal shall completely cover the services to be provided as specified under bid documents in general. The scope shall include "Conducting Techno-commercial feasibility study & preparation of the report on implementation of Bio-mass co-firing and preparation of tender document including technical specification for inviting tender for supply, fabrication, installation & commissioning of the Biomass co-firing system at Raichur Thermal Power Station (RTPS) – 7X210 MW, 1X250MW, Bellary Thermal Power Station (BTPS)–2X500MW, 1X700MW and Yeramarus Thermal Power Station (YTPS) – 2X800MW in the state of Karnataka, India."

5.02 Bids not covering the entire scope of works for the proposal quoted will be treated as incomplete and are liable to be rejected in terms of the "Karnataka Transparency in Public Procurement Act".

6.00 SUBMISSION OF BIDS

6.01 Tenders (both Cover-1 & 2) must be electronically submitted (online through e-portal) within the date and time published in e-procurement portal. First Cover of Tender will be opened at prescribed time and date in the e-procurement portal, in the presence of the Tenderers who wish to attend at the office of the Chief Engineer (Thermal Designs), KPCL, No.3, 2nd Floor, Green Building, Drug Controller Department Premises, Palace Road, Bangalore-560001. Opening of Cover-2 shall be intimated later.

6.02 Cover-1 shall contain the scanned copies of the following documents as documentary evidence to substantiate the qualification requirement specified above the fulfillment of which is prerequisite for opening of cover-2 containing the price bid.

A. COVER-I (Technical Bid)

a) Documents to meet the Eligibility criteria specified in NIT.
b) **Declaration–I:** Declaration by the bidder that he has studied the site conditions, labour conditions and read the bid documents and related matters carefully and diligently and that he has submitted the bid having studied, understood and accepted the full implications of the bid document and bidder's offer has no conditions contravening the commercial conditions of the bid as per Annexure-D format. At any circumstance, the rate quoted by the bidder will not be varied for any alleged misconception concerning the work.
c) **Declaration – II:** Declaration regarding EMD, performance Guarantee, Completion period etc. as per Annexure-E format

d) **Declaration – III:** The notarized declaration by the bidder that none of his contracts have been subject to forfeiture of EMD/foreclosure/termination of their Contract in KPCL/Government or any other utility and blacklisted for participating in tender by KPCL or Government or any other utility in India during the past three years as per Annexure-F format.

e) **Declaration – IV:** Declaration regarding GST as per Annexure-G format

f) **Form of Bid** – Annexure -A duly filled shall be uploaded in e-portal.

g) The bidder shall upload scanned copies of following documents:
   a) Income Tax – Pan No.
   b) GST registration certificate
   c) Independent PF code
   d) Labour license certificate

h) Upload duly filled and signed copies of all the schedules except price schedule as per the formats enclosed.

B. <u>COVER-II (Price Bid)</u>

Price schedule only (Price Bid) online.

6.03 Corporation reserves the right to request for additional information and also reserves the right to reject the proposal of any bidders, if in its opinion the qualification and other data are incomplete.

6.04 Deleted

6.05 The bid prepared by the Bidder, all correspondence and documents relating to the bid shall be written in the English language. If any printed literature furnished by the bidder is written in any other language, it shall be accompanied by an English translation of its pertinent passages, duly certified by the bidder's authorised signatory, in which case, for purposes of interpretation of the bid, the English translation shall govern.

6.06 Bidder's bid and the document attached there to shall be considered as forming part of contract document.

6.07 Bids submitted within the scheduled date and time shall only be eligible for further processing of the bids. Any bid submitted after the date and time specified shall be rejected. Date and time stamp of the e-portal system shall be final in deciding the time of submission of bid. Decision of the Corporation in this regard shall be final and acceptable to all the bidders.

6.08 Any bid which is not submitted in accordance with the instructions stipulated above is liable for rejection. Incomplete Bids/e-mail Bids / Bids not accompanied with EMD/belated Bids will not be accepted.

7.00 SIGNATURE OF BIDS

7.01 The Bid must contain the name, residence and place of business of the person or persons submitting the bid and must be signed. The name of the person signing should be typed or printed below the signature.

7.02 Bids by Corporation/Company shall be signed with the legal name of the company by the President or Managing Director or Secretary or other person authorized by President/Managing Director/Board of Directors.

7.03 The Bidder's name stated in the proposal shall be the exact legal name of the firm.

7.04 Erasures or other changes in the bid shall be initialed by the person signing the bid along with the seal of the company.

7.05 Bids not conforming to the above requirements are liable to be rejected.

8.00 LOCAL CONDITIONS

8.01 It is imperative for each bidder to fully inform himself of all local conditions and factors which may have an effect on the execution of the scope of work covered under Bid document by inspecting the site of work.

8.02 It must be understood and agreed that all the factors that may have an effect on the execution of the scope of work have been properly investigated and considered while submitting the proposals. No claim for financial adjustment to the contract awarded under this specification and document will be permitted by the Corporation. Neither any change in time schedule of the contract nor any financial adjustment arising thereof, which are based on the lack of such clear information or its effect on the cost of services to the bidder shall be permitted by the Corporation.

9.00 EARNEST MONEY DEPOSIT (EMD)

9.01 An Earnest Money Deposit for an amount of Rs.2,48,000/- (Rupees Two Lakh Forty-Eight Thousand only) shall be furnished by the bidder.

9.02 Bidder shall furnish EMD of Rs.2,48,000/- (Rupees Two Lakh Forty-Eight Thousand only). The e-payment through e-portal shall be made for Rs.1,00,000/- (Rupees One lakh only) (direct debit, credit card & National Electronic Fund Transfer (NEFT) or Over The Counter (OTC) only through ICICI Bank and remaining Rs.1,48,000/-(Rupees One lakh Forty-Eight thousand only) either in the form of crossed demand draft in favour of KARNATAKA POWER CORPORATION LIMITED, payable at Bangalore or Bank Guarantee from a Scheduled Bank on Rs.200/- stamp paper as per the KPCL Proforma. The Bank Guarantee submitted towards EMD shall be valid for a period of 210 days from the scheduled date of opening of the technical bid (Cover-I). In case, the validity of the Bid is required to be extended, the validity of the BG furnished towards EMD shall be extended up to 30 days beyond such an extended bid validity period. The Bank

guarantee shall be furnished in the prescribed format. Only on receipt of full EMD BG of Rs.2,48,000/- (Rupees Two Lakh Forty-Eight Thousand only). along with the technical bid, Price bid will be opened and considered for evaluation.

9.03 Bids not accompanied by the requisite EMD shall be summarily rejected.

9.04 If the bidder withdraws his bid before the expiry of the bid validity period prescribed in the bid specification or if the successful bidder fails to submit the contract performance guarantee as specified in the bid and or fail to enter into a contract with the Corporation in the form prescribed with related requirement within 30 days of the date of Letter of Award/Detailed Order whichever is earlier, the bid guarantee will be forfeited.

9.05 The EMD furnished by unsuccessful bidders will be returned, after opening of the price bid.

9.06 For the successful bidder, the EMD will be returned, only after he enters into contract agreement and furnishes the contract performance guarantee (Security Deposit) in an acceptable form.

9.07 No interest is payable to the bidders for the Earnest Money Deposit amount.

10.00 INFORMATION REQUIRED WITH THE BID

10.01 Oral statements made by the bidder or his representatives at any time regarding the consultancy/engineering service shall not be considered.

10.02 Standard catalogue pages and other documents of the bidder may be used in the bid to provide additional information and data as deemed necessary by the bidder.

10.03 Bidder shall furnish the Bid with all relevant information as called for in scope of work. Bids with incomplete information are liable to be rejected.

10.04 A comment against specific Clause “Noted” or “Understood” will not be acceptable. A categorical response e.g. an affirmative reply like “we comply” against each Clause is necessary.

10.05 If at any later date, it is found that documents, information, averments and data submitted by the Bidder in the Bid, and based on which the Bidder has been considered eligible or successful or has been awarded the Contract is incorrect or false to the extent that had the correct or true information been made available to the Owner at the time of tender evaluation, the bid would have been declared ineligible or unsuccessful, the Bidder shall be forthwith disqualified or, as the case may be, the contract awarded based on such incorrect or false information shall be cancelled and the Bid Security shall be forfeited.

11.00 BID OPENING

11.01 The Corporation will open Cover-I first in the presence of the representatives of the Bidders who choose to attend at the date, time and at the address indicated in the notice inviting bids/brief bid notification.

11.02 Documents furnished in Cover-I will be scrutinized to determine the bidder's eligibility criteria. Cover-II of only those bidders who are found eligible will be opened thereafter. The qualified bidders will be intimated in advance to be present for witnessing the opening of Cover-II.

11.03 If the bid opening day turns out to be a holiday for some reason, the bids will be opened on the following working day at the same time and location address.

12.00 PRELIMINARY EXAMINATION

12.01 The Corporation will examine the bids to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed and whether the bids are generally in order etc.

12.02 Since Bids are on e-portal, there is no scope for Arithmetical errors.

12.03 Prior to the detailed evaluation, the owner will determine the substantial responsiveness of each bid and those that are considered incomplete will be rejected. A substantial responsive bid is one who conforms to all the terms and condition of the Bidding document without material deviation.

13.00 POLICY FOR BIDS UNDER CONSIDERATION

Bids shall be deemed to be under consideration immediately after they are opened and until such time official intimation of award/rejection is made by the owner to the Bidders. While the Bids are under consideration, Bidders and/or their representatives or other interested parties are advised to refrain from contacting by any means, the "Corporation"/"Engineer" and/or its employees on matters related to the bids under consideration. The 'Engineer' if necessary will obtain clarifications on the bids by requesting such information from any or all the bidders as may be necessary. The bidder will not be permitted to change the substance of the bids after the bid has been opened.

14.00 Deleted

15.00 EFFECT AND VALIDITY OF BID

15.01 The submission of any bid connected with these documents and specifications shall constitute an agreement that the Bidder shall have no cause of action or claim against the owner for rejection of his Bid. The owner shall always be at liberty to reject or accept any Bid or all the Bids at his sole discretion and any action will not be called in to

question and the Bidder shall have no claim in this regard against KPCL. Reasons for rejection will be recorded as per KTPP Act.

15.02 The bids should be kept valid for a period of 180 calendar days from the date set for opening the bids (Cover-1) unless otherwise specified. In case, the validity of the bid is required to be extended, the validity of the EMD shall be extended upto 30 days beyond such extended bid validity period.

16.00 EVALUATION AND COMPARISON OF BIDS

16.01 The Bids which are found substantially responsive and accepted will be evaluated by Corporation to ascertain the technically acceptable lowest bid.

16.02 Since Bids are on e-portal, there is no scope for Arithmetical errors.

16.03 Deleted

16.04 The bids will be evaluated on the basis of Lumpsum price (inclusive of all taxes) quoted by the bidder in e-portal.

17.00 CONTRACT PERFORMANCE GUARANTEE (SECURITY DEPOSIT)

The successful bidder shall furnish a Bank Guarantee from a Scheduled Bank towards Contract Performance, equivalent to **10%(Ten)** of the contract value with an appropriate validity period (including a guarantee period of one year in addition to the completion period of the work envisaged), at the time of entering into contract agreement. The BGs furnished shall be through a Nationalized/Scheduled Bank on Rs.200/- stamp paper as per KPCL format (Annexure-C). The security deposit will be released only after satisfactory completion of the contract & guarantee period.

17.01 The performance guarantee (security deposit) will be returned to the 'contractor' after 'guarantee period'.

17.02 No interest is payable on the contract performance guarantee.

18.00 CONTRACT AGREEMENT

The successful bidder shall sign the contract agreement within **30** days from the date of issue of letter of award, on Non Judicial stamp paper for a value of Rupees Five hundred and in addition Rupees Five hundred for every **Rupees Ten lakhs of the contract amount or part thereof in excess of Rupees Ten lakhs of the contract amount, subjected to a maximum of Rupees Ten lakhs** purchased in Karnataka strictly in the KPCL format (will be furnished by the successful Bidder) for due fulfillment of the contract, failing which Bid Security will be forfeited.

The agreement will be signed in one original only. The original would be kept with the corporation and a certified copy given to the contractor.

Subsequent to signing of the contract, the contractor shall provide the KPCL with **10 copies** of each hard copy duly bound and soft copies of the contract agreement at his cost.

19.00 ARBITRATION:

At the first instance, settlement shall be attempted with the Appellate Authority i.e. Managing Director, Karnataka Power Corporation Limited, Karnataka.

In case the dispute is unresolved the agency has to approach the Arbitration Centre – Karnataka (Domestic and International), Bengaluru established under the aegis of the High Court of Karnataka.

In case the dispute is still unresolved then the agency has to approach the City Civil Courts in Bangalore, Karnataka State.

It is agreed that no other court shall have jurisdiction to entertain any suit or proceedings even though part of the cause of action might arise within the jurisdiction of any such courts.

20.00 SUIT OR PROCCEDINGS

Any suit or proceedings arising out of this contract shall be initiated in appropriate law courts at Bangalore, Karnataka State.

ANNEXURE - A

FORM OF BID

(To be furnished along with the Bid)

To
The Office of Chief Engineer (Thermal Designs),
Karnataka Power Corporation Limited.,
No. 3, 2nd Floor, Green Building,
Drug Controller Department Premises,
Palace Road, Bengaluru - 560 001.

Sir,

We hereby bid for the Consultancy services for implementation of Bio-mass Co-firing at RTPS – 7X210 MW, 1X250MW, BTPS – 2X500MW, 1X700MW and YTPS – 2X800MW in the Schedule subject to the under mentioned conditions of Contract:

This bid will hold good for a period of 180 days from the date fixed for opening of cover-1 of bids or extended period.

1. We certify that equipment/materials/work offered by us will strictly conform to the specifications of the enquiry or to such modifications thereof as have been fully explained in our tender

2. The Consultancy services for "Conducting Techno-commercial feasibility study & preparation of the report on implementation of Bio-mass co-firing and preparation of tender document including technical specification for inviting tender for supply, fabrication, installation & commissioning of the Biomass co-firing system at Raichur Thermal Power Station (RTPS) – 7X210 MW, 1X250MW, Bellary Thermal Power Station (BTPS)– 2X500MW, 1X700MW and Yeramarus Thermal Power Station (YTPS) – 2X800MW in the state of Karnataka, India." will be completed within the contract period mentioned in the contract.

3. We note that withdrawal from this tender within the period referred to in Clause (1) above or failure to provide services offered in the bid, which is accepted by the Chief Engineer (Thermal Designs), Karnataka Power Corporation Ltd., after the order is placed will entail the forfeiture of Bank Guarantees and shall also be debarred either permanently or for a fixed period at the discretion of purchaser from participating in any of the purchaser's tenders.

4. Further, we also note that the Chief Engineer (Thermal Designs) Karnataka Power Corporation Ltd., does not bind himself to accept the lowest or any bid and reserves the right to consider/reject any or all the bids without assigning any reasons thereof.

We hereby agree to all the terms and conditions of the bid except those which are specifically commented upon by us. We also note that Chief Engineer (Thermal Designs) reserves the right to place orders for a portion of the items and/or quantities.

Yours faithfully,

Station:
Dated :

Signature : _____
Full address : _____
With seal _____

ANNEXURE- B

FORM OF CONTRACT AGREEMENT

(On Stamp paper to be purchased in Karnataka State only)
(To be stamped in accordance with the Karnataka Stamp Act Article no. 5(i-d)

The agreement entered into this day of……Two thousand and ---------- between……M/s…….(Name and address …… ……(hereinafter referred to as the 'Contractor' which terms shall include their successors and legal representatives) and Karnataka Power Corporation Limited, a company registered under the Companies Act, 1956(hereinafter referred to as the 'Corporation' which term shall include its successors and assigns).
WHEREAS

1. The bid No …….of the Contractor submitted against the Chief Engineer (Thermal Designs) Karnataka Power Corporation Ltd., Bengaluru, enquiry No…… for the work "Conducting Techno-commercial feasibility study & preparation of the report on implementation of Bio-mass co-firing and preparation of tender document including technical specification for inviting tender for supply, fabrication, installation & commissioning of the Biomass co-firing system at Raichur Thermal Power Station (RTPS) – 7X210 MW, 1X250MW, Bellary Thermal Power Station (BTPS)–2X500MW, 1X700MW and Yeramarus Thermal Power Station (YTPS) – 2X800MW in the state of Karnataka, India." was accepted by the said Chief Engineer on behalf of Karnataka Power Corporation Limited, subject to the Terms and Conditions detailed in the said Chief Engineer (Thermal Designs) letter of award No……(hereinafter referred to as order).

2. The Contractor having accepted the order was required to execute agreement and to furnish a Bank Guarantee towards the security Deposit for the due fulfillment of the agreement.

3. The Contractor has furnished a Bank Guarantee bearing No…… dated…….. in favour of the Corporation for sum of……. only towards the Security deposit, for the due fulfillment of the agreement from the……Bank and has further agreed to renew it to the extent required to cover the full guarantee period under the agreement.

Now this indenture witnessed and it is hereby agreed and declared as follows, that is to say, in consideration of the payments to be made to the Contractor by the Corporation as herein after mentioned, the Contractor hereby covenants with the Corporation, that the Contractor shall perform the works and things in the agreement subject to the terms and conditions and stipulations mentioned in the agreement that is to say General Conditions of contract, and Technical Specification, annexed to this agreement and deemed to be part of the agreement.

In witness whereof the parties (1) KPCL and (2)…… (Bidder) to this agreement have signed this indenture in the presence of the following witnesses.

Contractor's Signature (with seal) for KARNATAKA POWER CORPORATION LTD.

Witnesses:

1. 1.

2. 2.

1. Instruction for filling the Proforma: Only stamp paper purchased in Karnataka State and in the name of the Contractors should be used.
2. All blank spaces should be filled in with appropriate information, any additions, deletions or corrections done subsequently should be countersigned.

ANNEXURE-C

FORMAT FOR PERFORMANCE SECURITY OR PERFORMANCE BANK GUARANTEE

(On Rs.2OO/- Stamp Paper)
(To be issued by a Nationalized/Scheduled Bank)
(To be stamped in accordance with the Stamp Act in force)

Guarantee No:
Amount of Guarantee. Rs.
Guarantee Cover from: to
Last date of lodgment of claim:

In Consideration of the Karnataka Power Corporation Limited (hereinafter referred to as the Corporation) having agreed to grant to _____ (full expanded name, E-mail ID, Phone No. of the Contractor with complete address) (hereinafter referred to as the Contractor) from the demand, under the terms and conditions specified in the Work Order / Job Order No. ……dtd. ……. (hereinafter referred to as the said WO/JO) for a value of Rs. …… (Rupees ……..only) issued by Karnataka Power Corporation Limited of initial Security Deposit for the due fulfillment by the said Contractor(s) of the terms and conditions contained in the said Work Order / Job Order to be followed by an agreement, on production of a Bank Guarantee for Rs……..(Rupees ……. only).

1. We …… (indicate the name, E-mail ID, Phone No. and full address and other particulars of the Bank) (hereinafter referred to as the Bank) do hereby undertake to pay to the Corporation an amount not exceeding Rs. ……. only against any loss or damage caused to or suffered or would be caused to or suffered by the Corporation by reason of any failure / breach by the said Contractor(s) of any of the terms or conditions contained in the said Work Order / Job Order.

2. We……(indicate the name of Bank) do hereby undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from the Corporation stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the Corporation by reasons of any breach by the said Contractor(s) of any of the terms or conditions contained in the said Work Order / Job Order by reason of the Contractor's failure to perform in accordance with the said Work Order / Job Order. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs…….. (Rupees……..only).

3. We……(indicate the name of Bank) further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Work Order / Job Order and that it shall continue to be enforceable till all the dues to the Corporation under or by virtue of the said Work Order / Job Order having been fully paid and its claims satisfied or discharged or till the ……..(indicate the name of the KPCL Authority) of the Corporation certifies that the terms and conditions of the said Work Order / Job Order /agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges the guarantee. Unless a demand or claim under this guarantee is made on us in writing on or before the ……. We shall be discharged from all liability under this guarantee thereafter.

4. We……(indicate the name of Bank) further agree with the Corporation that the Corporation shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Work Order / Job Order or to extend time or performance by the said Contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the Corporation against the said contractor(s) and to forbear or enforce any of the terms and conditions relating to the said Work Order / Job Order and we shall not be relieved from our liability by reasons of any such variation or extension, being granted to the said Contractor(s) or for any forbearance, act or omission on the part of the Corporation on any indulgence by the Corporation to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

5. We…….. (indicate the name of Bank), lastly undertake not to revoke this guarantee during its currency, except with the previous consent of the Corporation in writing.

6. Notwithstanding anything contained herein before our liability under this guarantee is restricted to Rs……..only and for guarantee shall remain in force until ……..Unless a demand or claim in writing is made on us on or before……..all your rights under this guarantee shall be forfeited and we shall be relieved and discharged from all liability thereunder.

"Dated the ……day of …….. year……for……(indicate the name of the Bank).

Signature of the issuing Authority with seal

For _____Bank

ANNEXURE – D

DECLARATION-I

Name of work: "Conducting Techno-commercial feasibility study & preparation of the report on implementation of Bio-mass co-firing and preparation of tender document including technical specification for inviting tender for supply, fabrication, installation & commissioning of the Biomass co-firing system at Raichur Thermal Power Station (RTPS) – 7X210 MW, 1X250MW, Bellary Thermal Power Station (BTPS)–2X500MW, 1X700MW and Yeramarus Thermal Power Station (YTPS) – 2X800MW in the state of Karnataka, India."**.**

***

I / We have studied the site conditions and read the Bid documents and related matters carefully and diligently and that I/We have submitted the Bid having studied understood and accepted the full implications of the Bid document.

The requirements of the BID documents as stated above will be fulfilled by me/us to the satisfaction of the Corporation.

I / We hereby declare that the bid submitted by me / us has no conditions contravening the commercial conditions of the bid.

Name of the BIDDER
Signature with seal
Date

ANNEXURE – E

DECLARATION - II

Memorandum

I/We hereby tender for execution for the KARNATAKA POWER CORPORATION LIMITED, (herein before and herein after referred to as the Corporation) of the work specified in the under mentioned memorandum within the time specified in such memorandum at the rates quoted for each item specified in the Price Bid (memorandum showing the items of work to be carried out) and in accordance in all respects with specifications in writing.

a)	Name of work	**"**Conducting Techno-commercial feasibility study & preparation of the report on implementation of Bio-mass co-firing and preparation of tender document including technical specification for inviting tender for supply, fabrication, installation & commissioning of the Biomass co-firing system at Raichur Thermal Power Station (RTPS) – 7X210 MW, 1X250MW, Bellary Thermal Power Station (BTPS)– 2X500MW, 1X700MW and Yeramarus Thermal Power Station (YTPS) – 2X800MW in the state of Karnataka, India."
b)	Earnest money deposit	**Rs. 2,48,000/-**
c)	Contract performance Guarantee	The successful bidder shall furnish a Bank Guarantee from a Scheduled Bank towards Contract Performance, equivalent to **10%(Ten)** of the contract value with an appropriate validity period (including guarantee period of one year in addition to the completion period of the work envisaged), at the time of entering into contract agreement. The BGs furnished shall be through a Nationalized/Scheduled Bank on Rs.200/- stamp paper as per KPCL format (Annexure-C)
d)	Completion period	a) 06 months from the date of issue of Letter of Award (LOA) for conducting Techno-commercial feasibility study and submission of final feasibility report. b) 06 months from the date of issue of Notice to Proceed (NTP) for Preparation of tender document including technical specification for the requisite modification in plants. As such the total completion period for the given scope of work is 12 months from the date of issue of LOA
e)	Contract Period	Completion period + 12 months guarantee period

Should this tender be accepted I/We agree to abide by and fulfill all the terms and provisions of the conditions of the contract annexed hereto and all the terms and provisions contained in the Notice inviting tenders so far as applicable and in default thereof to forfeit and pay to Corporation, the sum of money mentioned in the said conditions.

A sum of Rs. **2,48,000/-** is paid as Earnest Money Deposit through e-portal.

I/We agree that should I/We fail to execute the agreement or to commence the work specified in the above memorandum, Earnest Money shall be forfeited to the Corporation.

I/We hereby distinctly and expressly declare and acknowledge that before the submission of this tender, I/We have carefully followed the instructions, read the relevant Indian Standard Specifications, and I/We have made examination of the contract documents and plans, specifications and quantities and of the locations where such work is to be done and have made myself/ourselves aware of the scope and specifications of the work to be done and availability of the quantities of materials required.

I/We distinctly agree that I/We would hereafter make no claim or demand upon the Corporation based upon or arising out of any alleged misunderstanding or misconceptions or mistake on my/our part of the said covenants, agreements, stipulations, restrictions and conditions.

Any notice required to be served on me/us shall be delivered to me/us personally or forwarded to me/us by post (registered or ordinary) or left on my/our address given in the tender.

I/We fully understand the terms and conditions of the contract to be entered into between me/us and the Corporation and the written contract shall be foundation of the rights of the both the parties.

Name of the BIDDER
Signature with seal
Date

ANNEXURE – F

DECLARATION - III

DECLARATION regarding Non-Forfeiture of EMD

(Notarised Affidavit to be executed on Rs.100/- Non-Judicial stamp paper)

We hereby declare that in respect of Tender/contract with KPCL/Government or any other utility in India during the past three years i.e., 2021-22, 2022-23, 2023-24 and the period up to the date of submission of the bid.

i. Our EMD has not been forfeited.

ii. None of our contracts have been terminated / foreclosed on account of our default in KPCL or elsewhere.

iii. We have not been blacklisted / subject to procedure initiated for blacklisting for participating in tender issued by KPCL or Government or Central /State PSU's or any other utility in India and would not attract terms & conditions relating to rejection of bids.

Name of the BIDDER
Signature with seal
Date

ANNEXURE – G

DECLARATION -IV

GSTIN DECLARATION

NAME OF WORK: "Conducting Techno-commercial feasibility study & preparation of the report on implementation of Bio-mass co-firing and preparation of tender document including technical specification for inviting tender for supply, fabrication, installation & commissioning of the Biomass co-firing system at Raichur Thermal Power Station (RTPS) – 7X210 MW, 1X250MW, Bellary Thermal Power Station (BTPS)–2X500MW, 1X700MW and Yeramarus Thermal Power Station (YTPS) – 2X800MW in the state of Karnataka, India.".

Ref: Tender Notification No. **KPCL/2024-25/SE0122** Dated: 14.06.2024

To,

Chief Engineer (Thermal Designs),
Karnataka Power Corporation Ltd.,
No.3, 2nd floor, Green Building,
(Drugs Control Department Premises)
Palace Road.
BENGALURU - 560 001

From,

Bidder's name and address

Declaration of Method of payment of GSTIN

1. We are constituted as :
   a. Proprietary concern.
   b. Hindu Undivided Family.
   c. Partnership firm.
   d. Private/ Public Limited Company.
   e. Co-operative Society/ Society.

2. The prices quoted are inclusive of GST payable by us. The obligation to pay the said tax lies with us.

3. We are registered as GST Assesse. Our GST registration No. is …….

4. We are paying GST under one of the following HSN / SAC Codes.

5. We declare that the foregoing details disclosed by us and options chosen by us are true and correct.

Signature: …….
Place: Name of the Signatory: …….
Date: Name of the Contractor/ Firm:

Note: Strike out whichever provision is inapplicable to you.

ANNEXURE – H

FORMAT FOR BANK GUARANTEE FOR BID SECURITY(EMD)

(To be executed on a non-judicial Paper of Rs.200/-)

Ref. No

1. IN CONSIDERATION of Karnataka Power Corporation Limited having its Registered Office at No.82, Shakthi Bhavan Race course Road, Bengaluru – 560 001 (hereinafter called 'The Corporation' which expression shall unless repugnant to the subject or context includes its successors and assigns having agreed to exempt _____(hereinafter called 'the said Bidders)' which expression shall unless repugnant to the subject or context includes his successors and assigns) from the demand under the terms and conditions. of Bid No _____ (hereinafter called 'the said Bid') of such Earnest Money for the due fulfilment and compliance by the said Bidder(s) of the terms and conditions contained in the said Bid _____ for _____ on production of Bank Guarantee for ---------- (----------only), we _____ Bank (hereinafter referred to as 'the Bank') do hereby irrevocably unconditionally and without reservation guarantee the due and faithfully fulfilment and compliance of the terms and conditions of the Bid by the said Bidder(s) and unconditionally and irrevocably undertake to pay forthwith to the Corporation an amount not exceeding _____ (_____only) without any demur, reservation, recourse, contest or protest and without reference to the Bidder(s), if the Bidder(s) fail to fulfil or comply with any of the terms and conditions contained in the said Bid . A letter from the Corporation stating that the Bidder(s) is in default in the due and faithful fulfilment and compliance with the terms and conditions contained in the said Bid shall be final, conclusive and binding on the Bank.

2. WE, _____ Bank do hereby unconditionally undertake to pay the amounts due and payable under this Guarantee without any demur reservation, recourse, contest or protest and reference merely on first demand from the Corporation stating that the amount claimed is due to the Corporation by reason of failure of the said Bidder(s) to fulfil and comply with the terms and conditions contained in the said Bid including failure of the said 'Bidder('s) to keep his Bid open during the Bid validity period as set forth in the said Bid for any reason whatsoever. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding_____ (_____only).

3 Subject to the above, any claim for payment under this Guarantee shall be in the form of a written declaration by the Corporation specifying the sum claimed hereunder and indicating the event or events purely for our information which entitle the Corporation to payment of the amount claimed.

4. We ---------- Bank further agree that the Corporation shall be the sole judge to decide as to whether the Bidder(s) is in default of due and faithful fulfilment and compliance with the terms and conditions contained in the said Bid including inter alia, the failure of the said Bidder(s) to keep its bid open during the bid validity period set forth in the said Bid and the

decision of the Corporation that the said Bidder(s) is in default as aforesaid shall be final and binding on us, notwithstanding any differences between the Corporation and the said Bidder(s) or any dispute pending before any Court, Tribunal, Arbitrator or any other authority.

5. WE, _____ Bank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the finalization of the said Bid and that it shall continue to be enforceable till the said Bid is finally decided and order placed on the Successful Bid(s) and/or till all the dues of the Corporation under / or by virtue of the said Bid has been fully paid and its claims satisfied or discharged or till a duly authorized officer of the Corporation certifies that the terms and conditions of the said Bid have been duly, faithfully, fully and properly carried out by the said Bid(s) and discharges this Guarantee, or ---------- plus a claim period of 6 (six) months from the said ---------- whichever is later. Unless a demand or claim under this guarantee is made on us in writing on or before the _____, unless extended, plus a claim period of 6 months from the said ----------, We shall be discharged from all liability under this guarantee thereafter.

6. The Corporation shall have the fullest liberty without affecting in any way the liability of the Bank under this Guarantee from time to time vary any of the terms and conditions of the said Bid or to extend time of the Bid or the period for fulfilment and compliance with the terms and conditions contained in the said Bid by the said Bidder(s) or to postpone for any time and from time to time any of the powers exercisable by it against the said Bidder(s) and either to enforce or forbear from enforcing any of the terms and conditions contained in the said Bid or the securities available to the Corporation and the bank shall not be released from its liability under these presents by any exercise by the Corporation of the liberty with reference to the matters aforesaid or by reason of time being given to the said Bidder(s) or any other forbearance, act or omission on the part of the Corporation or any indulgence by the Corporation to the said Bidder(s) or of any other matter or thing whatsoever which under the law relating to sureties would but for this provision have the effect of a releasing the Bank from its such liability.

7. Any notice by way of request, demand or otherwise hereunder shall be sent by courier or by registered mail to the Bank, addressed as aforesaid.

8. We undertake to make the payment on receipt of notice of claim from the corporation on us addressed to ---------- (name of Bank along with branch address) and delivered at our above branch who shall be deemed to have been duly authorized to receive the said notice of claim.

9. It shall not be necessary for the Corporation to proceed against the said Bidder(s) before proceeding against the bank and the Guarantee herein contained shall be enforceable against the bank, notwithstanding any other security which the Corporation may have obtained from the said Bidder(s), shall at the time when proceedings are taken against the bank hereunder, be outstanding or unrealized.

10 WE _____ Bank lastly undertake not to revoke this guarantee during its currency except with the previous express consent of the Corporation in writing and agree that any change in the constitution of the Bank or the said Bidder(s) shall not discharge our liability hereunder.

11 The Bank declares that it has the power to issue this guarantee and the undersigned have full powers to do so on behalf of the Bank.

Dated_____day of_____20_____

Signature of the Issuing Authority with seal

CORPORATE SEAL

For_____Bank

GENERAL CONDITIONS OF CONTRACT

GENERAL CONDITIONS OF CONTRACT

1.1.0 DEFINITION OF TERMS

1.1.1 In construing these general conditions and the annexed specifications, the following words shall have the meanings herein assigned to them unless there is something in the subject or context inconsistent with such construction.

1.1.2 "OWNER/CORPORATION" means Karnataka Power Corporation Limited having its registered office at No.82, Shakti Bhavan, Race course road Bangalore – 560 001 and shall include its successors and assignees.

1.1.3 The "Client" shall also mean Karnataka Power Corporation Limited and shall include its successors and assignees.

1.1.4 "Consultant"/contractor shall mean whose bid has been accepted by the Owner and shall include his heirs, legal representatives; successors and permitted assigns authorized to work as Consultant or such other person as may be duly authorized and appointed by the Owner to act as Consultant.

1.1.5 The "Engineer" shall mean the Chief Engineer (Thermal Designs) or such other officer as may be duly authorised and appointed in writing by the OWNER to act as Engineer for the purpose of the contract. In cases where no such Engineer has been so appointed, the word "Engineer" shall mean the OWNER or their duly authorised representatives.

1.1.6 Agency(s) / Sub-agency(s) shall mean the person or firm authorized to undertake a part of the work or any person or firm to whom a part of contract has been sub-let with the consent in writing of the 'Corporation'/'Engineer' and shall include his legal representative, successors and permitted assigns.

1.1.7 "Project" shall mean the project specified in the project information - SCC of the contract.

1.1.8 "Work" or "Works" shall mean and include direct and associated services / works, with which consultant would be associated.

1.1.9 The "Contract" shall mean the order and associated specifications executed by the Owner and the consultant, including other documents between the parties, implied to form a part of the contract.

1.1.10 The "Specification" shall mean collectively all the terms and stipulations contained in those portions of the contract.

1.1.11 The "Contract Price" shall mean the price referred to in the "Letter of Award" and agreed to in the "Contract Document".

1.1.12 The "Contract Period" shall mean Completion period envisaged for the Consultancy work plus 12 months guarantee thereafter.

1.1.13 "Notice in writing" or 'written notice' shall mean a notice in written, typed or printed characters sent (unless delivered personally or otherwise proved to have been received) by registered post to the last known private business address, or the registered office of the addressee.

1.1.14 "Correspondence" shall mean any letter, telex, telegram, e-mail, or other written communication related to the contract but excluding 'notices'.

1.1.15 "Services" means consultancy services, provision of technical assistance, and other such obligations of the services covered under the contract.

1.1.16 "Letter of Award" or "LOA" or "Job Order" means the formal communication in writing by the Owner to the Contractor of the acceptance of the Contractor's Bid. The date of issue of Letter of Award /Job Order will be reckoned as "zero date" of the contract for the purpose of monitoring the Work schedule/ Milestones of the contract.

1.1.17 The "Site" shall mean the actual place of the proposed "project" as detailed in the technical specification or any other place where the project work has to be executed under the contract and includes all the areas in which operations in respect of the project are carried out, materials stacking yard and the area where temporary structures are put for plant, dump yard etc.,

1.1.18 "Notice to Proceed" or "NTP" means the formal communication in writing by the owner to the contractor to proceed with the preparation of the tender document and allied works as specified in the scope of work.

1.1.19 'Month' shall mean the calendar month and 'Day' shall mean the calendar day

1.1.20 "Writing" shall include any manuscript, type written or printed statement, under or over signature of/or seal as the case may be.

1.1.21 "Persons" shall include firm, company, Owner and other body of persons whether incorporated or not.

1.1.22 "The Inspector" shall mean the OWNER for the time being or such other person as may be duly authorised and appointed in writing by the OWNER to act as inspector for the purpose of the contract.

1.1.23 "Approved" shall mean the written approval of the Engineer or of the Inspector as the case may be.

1.1.24 Words imparting the singular only shall also include the plural and vice-versa when the context so required

1.1.25 "Guarantee" means all guarantees provided or agreed to be provided under the consultancy Contract for and in respect of the consultancy work as per the scope detailed in Technical specification.

1.2.0 SCOPE OF THE WORK:

The scope of consultancy work in respect of the techno-commercial feasibility study on implementation of bio-mass co-firing and preparation of technical specification for requisite modification in the existing systems in the subject thermal plants, Karnataka is as detailed in Technical specification**.** The brief scope is as under:

"Conducting Techno-commercial feasibility study & preparation of the report on implementation of Bio-mass co-firing and preparation of tender document including technical specification for inviting tender for supply, fabrication, installation & commissioning of the Biomass co-firing system at Raichur Thermal Power Station (RTPS) – 7X210 MW, 1X250MW, Bellary Thermal Power Station (BTPS)–2X500MW, 1X700MW and Yeramarus Thermal Power Station (YTPS) – 2X800MW in the state of Karnataka, India."

1.3.0 COMPLETENESS OF CONSULTANCY SERVICES

The consultancy services to be provided by the "consultant" shall include all such areas of work as specified in the enclosed Technical specification.

1.4.0 INTERPRETATION

1.4.1 Words imparting persons or parties shall include firms, consortiums and Corporations and any organisation having legal capacity. Words imparting the singular also include the plural and vice versa where the context requires. Words imparting one gender also include other genders.

1.5.0 EFFECT AND JURISDICTION OF CONTRACT

1.5.1 The contract shall be considered as having come into force from the date of issue of 'Letter of Award' by the "Corporation" to the "Consultant". The law applicable to this contract is the law in force in India.

1.5.2 **Dispute Resolution:**

If any dispute of difference of any kind whatsoever is to arise between the Owner and the Contractor on the following matters viz.

i) The meaning of the specification, designs, drawings and instructions.
ii) The quality of workmanship or materials used.
iii) Any other question, claim, right, matter, thing whatsoever in anyway arising out of or relating to the contract, estimates, orders or those conditions or failure to execute the same whether arising during the progress of the work or after the completion, termination or abandonment thereof, the dispute shall be referred to the concerned Chief Engineer.

The Chief Engineer shall within a period of 30 days from the date of being requested by the Contractor to do so, give written notice of his decision to the Contractor.

Subject to other form of settlement hereafter provided, the Chief Engineer's decision in respect of every dispute or difference so referred shall be final and binding upon the Contractor. The said decision shall forthwith be given effect to and Contractor shall proceed with the execution of the work with all due diligence.

In case the decision of the Chief Engineer is not acceptable to the Contractor, the Contractor will request to convene the meeting of MD KPCL, The owner and CEO of the Contractor for amicable settlement of the dispute.

Arbitration:

Any dispute or difference of claim arising out of or in connection with, or relating to the present contract or the breach, termination or invalidity thereof shall be referred and settled under the Arbitrations Centre – Karnataka (Domestic and International) Rules 2012 by one or more Arbitrators appointed in accordance with its rule.

Any suit or proceedings arising out of this contract shall be initiated in appropriate law courts at Bangalore, Karnataka State.

1.6.0 CONTRACT SECURITY DEPOSIT AND / PERFORMANCE GUARANTEE

1.6.1 The successful bidder shall furnish a Bank Guarantee from a Scheduled Bank towards Contract Performance, equivalent to 10% (Ten percent) of the contract value with an appropriate validity period (including guarantee period of one year in addition to the completion period of the work envisaged), at the time of entering into contract agreement. The BGs furnished shall be through a Nationalized/Scheduled Bank on Rs.200/- stamp

paper as per KPCL format (Annexure-C). The security deposit will be released only after satisfactory completion of the contract & guarantee period.

Guarantee period of 12 months have been fixed considering 03 months for awarding the tender for implementation of Biomass co-firing system and 09 months for complete takeover of biomass co-firing system from the contractor (for whom implementation of biomass co-firing system has been awarded). However, if this period gets delayed for whatsoever the reason, guarantee period for consultancy works shall be extended for further 6 months on request of Owner. As such, maximum guarantee period of 18 months shall be factored while quoting for the bid.

1.6.2 The performance guarantee (security deposit) will be returned to the 'contractor' after 'Guarantee period'.

No interest is payable on the contract performance guarantee.

1.7.0 CONTRACT AGREEMENT

1.7.1 The successful bidder shall sign the contract agreement within 30 days from the date of issue of letter of award, on Non-Judicial stamp paper for a value of **Rupees Five hundred and in addition Rupees Five hundred for every Rupees Ten lakhs of the contract amount or part thereof in excess of Rupees Ten lakhs of the contract amount, subjected to a maximum of Rupees Ten lakhs** purchased in Karnataka strictly in the KPCL format for due fulfilment of the contract, failing which Bid Security shall be forfeited.

The agreement shall be strictly in the KPCL format (Annexure-B) for due fulfilment of the contract, failing which Bid Security (EMD) shall be forfeited.

17.2 Agreement shall be signed in one original only. Original would be kept with the corporation and certified copy given to the contractor.

17.3 Subsequent to signing of the contract, the contractor shall provide KPCL with **10** hard copies duly bound along with the soft copy of the contract agreement.

1.7.4 All orders or instructions and communications to the consultant shall, except as herein otherwise provided, be given by the Engineer on behalf of the OWNER.

1.8.0 Deleted

1.9.0 STANDARDS

The Consultant shall in all professional matters provide the services to the Employer to the best of his knowledge and belief. The Consultant shall exercise all skill, reasonable care and diligence in the discharge of his duties under this Contract. He shall carry out the services in conformity with common professional practices and in accordance with current scientific and nationally & internationally accepted engineering standards.

1.10.0 SUBLETTING OF CONTRACT

The consultant shall not, without the consent in writing of the Engineer or the OWNER, withheld, assign or sub-let this contract, or any substantial part thereof, or for any part of the work provided that any such consent shall not relieve the consultant from any obligation, duty or responsibility under the contract. Any assignment or subletting shall be with the prior written consent of the owner.

1.11.0 PATENT RIGHTS & COPYRIGHT INDEMNIFICATION

1.11.1 Contractor shall fully indemnify and save harmless and defend the Owner Indemnified Parties from and against any and all damages that the Owner Indemnified Parties may suffer, incur or pay in connection with infringement (or assertions of infringement) of any patent rights, copyrights or other intellectual property, proprietary or confidentiality rights with respect to equipment, designs, techniques, processes and information designed or used by Contractor or any sub-Contractor in performing the Work hereunder or under the sub-contracts in any way incorporated in or related to the Project other than any such equipment, designs, techniques, processes and information provided by the Owner Indemnified Parties.

1.11.2 If, in any suit or claim relating to the foregoing, a temporary restraining order or preliminary injection is granted, Contractor shall make every effort to secure the suspension of the injunction or restraining order. If, in any such suit or claim, the project, or any part, combination or process thereof, is finally held to constitute an infringement and its use is permanently enjoined, Contractor shall promptly make every reasonable effort to secure for Owner a license, at no Cost to Owner, authorising continued use of the infringing work if Contractor is unable to secure such license within a reasonable time, Contractor shall, at its own expense and without impairing performance requirements, either replace the affected Work, or part, combination or process thereof with non-infringing components or parts or modify the same as that they become non-infringing.

1.12.0 CO-ORDINATION AND ENGINEERING

The consultant shall totally co-operate with the OWNER's and freely exchange with them such technical information as is necessary to obtain the most efficient and economical

design and subsequent satisfactory operation and shall avoid unnecessary duplications. All copies of correspondence shall invariably be marked to the OWNER.

Consultant shall provide all design and engineering services necessary for design, engineering, construction / erection, supply of equipment for the implementation of biomass co-firing in thermal plants in accordance and conformity with the Contract, Good Engineering Practices and Prudent Utility Practices including:

(a) Preparation of

(i) The conceptual design including the design basis of equipment; and
(ii) The engineering and design necessary to describe and detail the equipment and the project.

(b) Provision of criteria for the detailed design by other suppliers of Equipment/ system/ structures for incorporation into the equipment.

(c) Preparation of design, engineering drawings, plans, bill of material, schedule and estimates for the equipment and the project and the performance by Contractor of its obligations hereunder so that the equipment constructed and commissioned by the Contractor and will be such as could be legally, safely and reliably placed in commercial operation by the Owner in accordance with Prudent Utility Practices.

1.13.0 DEATH, BANKRUPTCY ETC.

If the consultant goes into liquidation for reconstruction purposes or if its business is carried on by a receiver, the executors, successors, or other representatives in law of the estate of the consultant or any such receiver, liquidator, or any person in whom the contract may become vested shall forthwith give notice thereof in writing to the OWNER and shall for one month, during which he shall take all reasonable steps to prevent stoppage of the work, have the option of carrying out the contract subject to his or their providing such guarantees as may be required by the OWNER but not exceeding the value of the work for the time being remaining unexecuted. In the event of stoppage of the works, the period of option under this clause shall be fourteen days only, provided that, should the above option not be exercised, the contract may be determined by the OWNER by notice in writing to the consultant.

The powers and provisions reserved to the OWNER in the last preceding clause on the taking or the work out of the consultant's hands, shall apply as for may be when the contract is so determined.

1.14.0 REGULATIONS OF LOCAL AUTHORITIES

The consultancy service/ studies shall be such that, all works be in accordance with the Indian Electricity Rules or any applicable statutory rules in force from time to time, whenever they are applicable unless otherwise agreed to in writing by the Engineer.

1.15.0 CONSTRUCTION OF CONTRACT

The contract shall in all respects be construed and operated as contract as defined in the Indian Contract Act 1872 and all payments there under shall be made in Indian Rupees.

1.16.0 PAYING AUTHORITY

1.16.1 Invoices shall be addressed to Deputy General Manager (Finance)-1, KPCL, Bangalore for RTPS & BTPS plants and General Manager Finance (RPCL), Bangalore for YTPS plant with a copy to the Chief Engineer (Thermal Designs) or any other person as authorized by the "Corporation" in the contract.

1.16.2 The Invoices will become payable after the conditions stipulated in the "Terms of Payment" are satisfied / fulfilled.

1.17.0 CONSULTANT'S DEFAULT

1.17.1 If the "Consultant" neglects to execute the 'Consultancy Works' with due diligence and expedition or refuse or neglect to comply with reasonable orders given to him in writing by "Corporation" or "Engineer" in connection with the 'consultancy works' or contravenes the provision of the contract, the "Corporation" may give notice in writing to the "Consultant" to make good the failure, neglect or contravention complained of. Should the "Consultant" fail to comply with the notice within 30 days from the date of service thereof then in such case, the "Corporation" shall be at liberty to employ other agency and forthwith execute the part of the works as the "Consultant" has neglected to do or if the "Corporation" think it fit and shall be lawful to the Corporation, without prejudice to any other right the Corporation may have under the contract, to take 'consultancy works' wholly or partly out of the "Consultant" hands and reconstruct with any other person or persons, complete the works or any part thereof and in that event "Corporation" shall have free use of all 'Consultant' material that may have been at the time in connection with the works without being responsible to the "Consultant" and to the exclusion of any right to the "Consultant" over the same and the corporation shall be entitled to retain and apply any balance which otherwise due on the contract by him to the "Consultant", or such part thereof as may be necessary to the payment of the cost of executing the said part of the 'consultancy works' or of completing the works as the case may be. If the cost of completing the works or executing the part thereof as aforesaid exceed the balance due to the "Consultant"; the "Consultant" shall pay such excess. Such

payment of the excess amount shall be independent of the penalty for delay if the "Consultant" shall have to pay if the completion of works is delayed.

1.17.2 The termination of contract under this clause shall not entitle the "Consultant" to reduce the value of performance bond (Security deposit) nor the time thereof. The performance bond shall be valid for the full value and full period as originally stipulated in the contract.

1.18.0 TERMINATION OF CONTRACT

1.18.1 The 'Corporation' may terminate the contract after giving fifteen days' notice if any of the following occur:

A. **The "Consultant"**

i. being an individual or a firm commits any act of insolvency.

ii. shall be adjudged an insolvent or shall make an assignment or composition for the greater part in number of amount of his creditors or shall enter into a deed of assignment with his creditors.

iii. being an incorporated company shall have an order made against it or pass an effective resolution for winding up either compulsorily or subject to the supervision of the court or voluntarily or if the official assignee of the "Consultant" shall repudiate the contract or if the official assignee or the liquidator in any such winding up shall be unable, within seven days (7) after the notice to him requiring him to do so to show to the reasonable satisfaction of the "Corporation" or the "Engineer" that he is able to carryout and fulfil the contract and if required by the "Corporation" or the "Engineer" to give security thereof.

iv. Whether an individual firm or incorporated company shall suffer execution to be issued.

v. Assigns or sublets the 'contract' without obtaining the consent in writing of the "Corporation" or if the "Consultant" shall charge or encumber this' contract' for any payment due or which may become due to the "Consultant" there under.

B. If the 'Engineer' shall certify in writing to the "Corporation" that in his opinion, the "Consultant"

i. has abandoned the contract or

ii. has failed to perform any other obligation under contractor or

iii. has failed to rectify/make good his failures within a period of 30 days or

iv. has failed to proceed with the works with due diligence and failed to make such due progress as would enable the works to be completed within the time agreed upon or

v. has neglected or failed persistently to observe and perform all or any of the act, matters or things by this contract to be observed and performed by the "Consultant" for seven (7) days after written notice have been given to the "Consultant" requiring the "Consultant" to observe and perform the same,

Then in any of the said cases, the "Corporation" may not-withstanding any previous waiver, after giving fifteen (15) days notice in writing to the "Consultant" determine the "contract" but without thereby affecting the obligation and liabilities of the "Consultant"; the whole of which shall continue to be in force as fully as if the 'contract' had not been so determined and as if the 'consultancy works' subsequently executed has been executed by or on behalf of the "Consultant".

1.18.2 On termination of the 'contract' for any cause the "Consultant" shall see to the orderly suspension and termination of operation with due consideration to the interest of the "Corporation".

1.19.0 SHORT CLOSURE OF CONTRACT

1.19.1 In the event when both the parties mutually agree to short close the contract, on account of any reasons, the short closure shall take effect from the date and time to be agreed upon mutually.

1.19.2 In the event of short closure of contract, payment shall be paid to the Consultant for all services performed up to the date of short closure. In addition, the consultant shall be paid proportionately for such of those items of work, which have been partially completed.

1.20.0 CERTIFICATE NOT TO AFFECT THE RIGHT OF "CORPORATION" AND LIABILITY OF 'CONSULTANT'

No interim payment certificate of the "Corporation" or the 'Engineer', nor any sum paid on account by the "Corporation" nor any extension of time for execution of the 'works' granted by the "Corporation" or the" Engineer" shall affect or prejudice the right of the '"Corporation" against the "Consultant" or relieve the "Consultant" of his obligation for the due performance of the 'contract' or be interpreted as approval of the 'consultancy works' done and no certificate shall create liability in the 'Corporation' to pay for alteration, amendment, variation or additional 'consultancy works' not ordered in writing by the "Corporation" or the engineer or discharge the liability of the 'Consultant' for the payment of damages whether due, ascertained or certified or not or any sum against the payment of which he is bound to indemnify the "Corporation" nor shall any such certificate nor the acceptance by him of any sum paid on account or otherwise affect or prejudice the right of the "Corporation " against the "Consultant."

1.21.0 ENFORCEMENT OF TERM

The failure of either party to enforce at any time any of the provisions of this 'contract' or any rights in respect thereto or to exercise any option herein provided shall in no way be construed to be a waiver of such provisions, rights or options or in any way to affect the validity of the contract. The exercise by either party of any of its rights herein shall not

preclude or prejudice either party from exercising the same or any other right if any have hereunder.

1.22.0 SUSPENSION OF WORKS

1.22.1 The "Corporation" reserves the right to suspend and reinstate execution of the whole or any part of the 'works' without invalidating the provision of the 'Contract'. Orders for suspension or reinstatement of the works will be issued by the 'Corporation' to the "Consultant" in writing. The time for completion of the works will be extended for a period equal to duration of the suspension.

1.22.2 The "Corporation" shall not be responsible for any liabilities if suspension or delay is due to some default on the part of the "Consultant" or his agency / sub agency.

1.22.3 In case of suspension of works by Owner, issue of demobilization and remobilization charges will be discussed with the consultant and agreed mutually.

1.23.0 POWER TO VARY OR OMIT WORKS

1.23.1 In the event of "Corporation" or the "Engineer" requiring any variation such reasonable and prompt notice shall be given to the "Consultant" to enable him to work his arrangement.

1.23.2 In any case in which the "Consultant" has received instructions from "Corporation" or the "Engineer" as to the requirement of carrying out the altered or additional substitutes work, the addition or deletion of the scope of work will be governed by the unit / lump sum price indicated in the price schedule or on worked out prorate basis of similar nature of works indicated in schedule.

1.23.3 In the event of Owner requiring any variation, such reasonable and proper notice shall be given to Consultant to enable him to work out arrangements accordingly.

1.23.4 In any case in which Consultant has received instructions from Owner as to the requirement of performing the altered or additional or substituted services which involves a claim for additional payments, Consultant shall immediately and in no case later than fifteen (15) days after receipt of the instructions and before carrying out the instruction, advise Owner to that effect.

1.23.5 However, Owner shall not become liable for the payment of any charges in respect of any such variations, unless the instructions for the performance of the same are confirmed by it in writing.

1.23.6 If any variation in the work results in reduction of Contract Price, the parties shall agree, in writing, to the extent of any change in the price, before Consultant proceeds with the change. Necessary amendment to that extent will be issued by the owner.

1.23.7 In all the above cases, in the event of a disagreement as to the reasonableness of the said sum, the decision of Owner shall prevail.

1.24.0 GUARANTEE

1.24.1 The "Consultant" shall guarantee that the consultancy services provided will be in accordance with the contract document and be free from defects for a period of 12 months (and extensions if any) from the date of completion of Consultancy work. In case the defective consultancy work of his own, or those of his sub agency, under normal use, prevents Commercial use of the plant, the consultant liability shall be to make good the consequential loss suffered by the Corporation in addition to the setting right the faulty design. However, the maximum limit of compensation of the consequential loss is limited to 115% of the contract price which shall be claimed out of professional indemnity policy furnished by the Consultant.

1.24.2 If it becomes necessary for the "Consultant" to set right the faulty design of biomass co-firing system under this clause, the provision of this clause shall apply to the portion of the faulty design set right, until the expiration of 12 months from the date of setting right the faulty design. If any defect is not remedied within a reasonable time, the "Corporation" or the Engineer may proceed to do the work at the 'consultant's' risk and cost but without prejudice to any other rights which the "Corporation" may have against the' contract' in respect of such defects.

1.24.3 In the event of an emergency, where, in the judgement of "Corporation" or the 'Engineer' delay would cause serious loss or damage, repairs or replacement, adjustment may be made by the "Corporation" or the Engineer or a third party chosen by "Corporation" or the Engineer, without advance notice to the "Consultant" and the cost of such works shall be paid by the "Consultant". In the event such action is taken by the "Corporation" or the Engineer, the "Consultant" will be notified promptly and he shall assist wherever possible in making necessary correction. This shall not extinguish the "Consultant's" liability under the terms and conditions of the contract.

1.24.4 The acceptance of the consultancy work by the 'Corporation' or the 'Engineer' shall in no way relieve the 'Consultant' of his obligation under this clause.

1.24.5 At the end of the 'guarantee period' the consultant's responsibility ceases.

1.25.0 INSURANCE & PF

Insurance of all the personnel deployed for this work and also that of the equipment/material used for carrying out the work shall be arranged by the contractor. The contractor/bidder shall have their own independent provident fund code, to which PF of the personnel engaged shall be remitted by the contractor.

1.26.0 LIABILITY OF THE CONSULTANT

Should any design defect or inadequacy appear in the system designed and engineered by the consultant, prior to 12 months from the date of takeover of the biomass co-firing system which has been designed/erected/commissioned in accordance with the technical specification recommended by consultant, the consultant shall perform at his own initiative and free of any cost to Owner, all such review of design and consultancy service which shall be necessary to remedy the said defect or inadequacy.

The Consultant shall provide an insurance coverage to an extent of 115% of contract value to indemnify the Corporation against any losses suffered on account of defective design/consultancy work and said policy shall be obtained from Indian insurance companies only and same shall be valid till expiry of guarantee period and extension if any. A copy of the insurance policy shall be furnished to the Corporation before the conclusion of the agreement.

1.27.0 DEFENCE OF SUITS

1.27.1 If any action in court is brought against the ‘Corporation’ or the ‘Engineer’ or an officer or agent of the ‘Corporation’ for the failure, omission or neglect on the part of the ‘consultant ’ to perform any acts, matters, covenants or things under the ‘contract’ or for damage or injury caused by the alleged omission or negligence on the part of the ‘consultant’ or his sub agency in connection with any claim based on lawful demands of sub agency, employees and the ‘consultant ’ shall in all such cases indemnify and keep the ‘corporation’ and the “Engineer” and /or his representative harmless from all losses, damages, expenses or decrees arising out of such action.

1.27.2 The ‘Corporation’ shall have full power and right at its discretion to defend or compromise any suit or pay claim or demand brought or made against it as aforesaid whether pending or threatened, as it may consider necessary or desirable and shall be entitled to recover from the ‘consultant ’ all sums of money including the amount of damages and compensation and all legal costs, charges and expenses in connection with any compromise or award which shall not be called into question by the ‘Consultant’ and shall be final and binding upon him.

1.28.0 ASSIGNMENTS

All covenants and agreements contained in NIT will be extended to and binding upon the successors and assigns of the consultant and OWNER. The Agreement will not be transferred or assigned in whole or in part by consultant without the prior written approval of the OWNER to any other firm, person or organization.

1.29.0 LANGUAGE

English language will be used in all written communications between the OWNER and consultant with respect to the services to be performed hereunder and with respect to all documents procured or prepared by consultant in connection with this assignment.

1.30.0 SECRECY

Consultant shall use all the documents and other data and information received from OWNER for this assignment, solely for the purpose of performing and carrying out the obligation on its part; under this Agreement, and shall not disclose the same to any other person except to the extent required in the performance of its work for this assignments and shall maintain utmost secrecy.

1.31.0 CO-OPERATION BETWEEN PARTIES

OWNER shall nominate an officer for the purpose of co-operation and the name, designation and address of the officer so nominated shall be intimated to consultant. Similarly, consultant will nominate and intimate in writing particulars of an officer who represent the consultant. It is, however, understood and agreed to by and between the parties here to that the parties shall work in close co-operation with each other at all times to ensure timely completion of the project.

1.32.0 APPROVALS

Any approvals to be obtained by either party from the other under this agreement shall not be unreasonably denied, withheld or delayed.

SPECIAL CONDITIONS OF CONTRACT

SPECIAL CONDITIONS OF CONTRACT

2.1.0 PROJECT DESCRIPTION AND SALIENT FEATURES

2.1.1 INTRODUCTION:

Karnataka Power Corporation Ltd. (KPCL) is a state-owned Company and is in the business of generation of electric power having Hydro-Electric Stations, Thermal Power Plants (TPP), Windmills and Solar PV Plants. KPCL having three thermal plants viz., Raichur Thermal Power Station (RTPS): 1720 MW, Bellary Thermal Power Station (BTPS): 1700 MW, Yeramarus Thermal Power Station (YTPS): 1600 MW. In the wake of the Biomass policy by GoI, it is required to implement Bio-mass co-firing in our thermal power plants.

2.1.2 SITE FEATURES

2.1.2.1 BRIEF DESCRIPTION OF THE RTPS PROJECT:

The Raichur Thermal Power Station site is located at Edlapur village, Raichur District, Karnataka State, INDIA on the Bank of river Krishna about 18 KM North of Raichur Town, on National Highway 167.

The coal for RTPS is linked-up with Singareni Collieries (Belampalli Coal Fields) of Andhra Pradesh and Talcher in Orissa and is transported by rail. A linkage has also been made with Western India Coal Fields.

The entire raw water requirement to the RTPS will be met from Krishna river and released from upstream which is about 2 to 3 Kms away from the plant.

The power generated from 210MW Units-1, 2 & 3 of Raichur Thermal Power Station at 15.75KV is stepped upto 220KV by 250MVA Generator Transformers and connected to 220KV ODY switchyard. The power generated from Unit-4, 5, 6, 7 at 15.75 KV & Unit-8 at 16.5 KV is stepped upto 400KV and connected to 400KV bus through 250MVA, 15/400KV Generator Transformer. The existing 220 KV switchyard is interconnected to 400KV system through 2 Nos. 315 MVA, 400/ 220/ 33KV Interconnecting Transformer.

Power generated from the station at Raichur is evacuated at two voltage levels namely, 220 KV and 400 KV.

CLIMATIC CONDITIONS OF RTPS:

Salient features of the Project	Latitude – 16°21′18″N & Longitude 77°20′31″E
Nearest Railway	Edlapur Railway Station (about 1Km from site)
Nearest Airport	Hyderabad (about 163 Km)

Nearest Seaport	Chennai (about 410 Km)
Elevation above mean sea level	351 m
Design Temperature	50 deg C
Basic wind speed	Avg-9.61 Km/hr (2.67 kmr/sec , Max 15.9 km/hr(4.42 m/sec)
Terrain category & class assumed	Terrain category – 2, Class – A/B/C structure
Risk co-efficient factor- K1	K1 value 1.06
Terrain, height and structure size factor-K2	Terrain Category shall be 2 and corresponding values shall be taken for K2
Topography factor-K3	K3 value 1.0
Seismic Zone	Zone – III
Importance factor	1.75

The following table furnishes the information regarding various climatic conditions, humidity etc., for the information of the supplier. It shall be noted by the supplier that the equipment will be subjected to very hot and humid conditions and as such the equipments shall be designed to withstand such a climate.

1. Altitude - 351 meters above MSL.

2. Ambient Air Temperature:
   a) Maximum - 45°C.
   b) Minimum - 6°C.
   c) Design Temperature for all Electrical Equipment - 50°C ambient.

3. Relative Humidity:
   a) Maximum during monsoon - 85%
   b) Minimum - 20%
   c) Average - 65%

4. Rainfall:
   a) Annual average - 720 mm
   b) Period - June to September

5. Wind Velocity:
   a) Average - 17 Km/hr.
   b) Maximum - 100 Km/hr.
   c) Prevailing wind direction - NE, SW, SE & W

2.1.2.2 BRIEF DESCRIPTION OF THE YTPS PROJECT:

The Yeramarus Thermal Power Station site is located at Yeramarus, Raichur District, Karnataka State, India. It is situated at about 8 Kms from Raichur on the Raichur-

Hyderabad State Highway-167 and 12 kms away from Bank of river Krishna and about 5 kms from Raichur Thermal Power Station. The project having an installed capacity of 2X800 MW steam turbo generator set.

The coal for YTPS will be received by rail from Western Coalfields Ltd., Mahanadi Coalfields Ltd. and SCCL.

The plant's water requirement is met by pumping raw water from the Krishna River.

The power generated from Units of Yeramarus Thermal Power Station at 21KV is stepped up to 400KV.

Evacuation of power generated at YTPS, will be through 220KV and 400 KV grid of PGCIL/KPTCL

CLIMATIC CONDITIONS:

Salient features of the Project	Latitude – 16°16’ 55.9”N Longitude – 77°20’ 38.6”E
Nearest Railway	Chicksugur Railway Station which is about 2 kms from site.
Nearest Airport	Hyderabad (about 200 Km)
Nearest Seaport	Chennai around at about 410 kms from site.
Elevation above mean sea level	350-375 meters
Design Temperature	50 deg C
Basic wind speed	Avg. 9.61 Km/hr (2.67 m/s); Max. 15.9 Kms / hr (4.42 m/s).
Terrain category & class assumed	Terrain category – 2, Class – A/B/C structure
Risk co-efficient factor- K1	K1 value 1.06
Terrain, height and structure size factor-K2	Terrain Category shall be 2 and corresponding values shall be taken for K2
Topography factor-K3	K3 value 1.0
Seismic Zone	Zone – III
Importance factor (I)	1.75

The following table furnishes the information regarding various climatic conditions, humidity etc., for the information of the supplier. It shall be noted by the supplier that the equipment will be subjected to very hot and humid conditions and as such the equipment shall be designed to withstand such a climate.

1. Altitude : 325 meters above MSL.

2. Ambient Temperature
   i. Maximum temperature : 45°C

ii. Minimum temperature : 6°C
iii. Design temperature for all Ele/mech equipment : 50°C

3. Relative Humidity
   i. Maximum during monsoon :85%
   ii. Minimum :25%
   iii. Average :65%

4. Rainfall
   i. Annual average rain : 720 mm
   ii. Max for one day : 115 mm
   iii. Max intensity : 38 mm/hr
   iv. Period : June to September

5. Wind Speed
   i. Prevailing wind direction :West, South-East, North-West
   ii. Maximum mean wind speed : South-West 15.9 Kms / hr (4.42 m/s)
   iii. Average :9.61 Km/hr (2.67 m/s)

2.1.2.3 BRIEF DESCRIPTION OF THE BTPS PROJECT:

The Bellary Thermal Power Station site Located at Kudithini village, Bellary District, Karnataka State, India is situated at about 22 km from Bellary on the National Highway No. 63. The project at present having an installed capacity of 2X500 MW and 1X700 MW steam turbo generator set.

The coal for BTPS will be received by rail from MCL and SCCL.

The entire raw water requirement to the BTPS will be met from re-generated water from Maralihalla (tributary to river Tungabhadra), downstream of River Tungabhadra, which is about 36 Kms away from the plant.

The power generated from Units of Bellary Thermal Power Station at 21KV is stepped up to 400KV.

Evacuation of power generated at BTPS, will be through 220KV and 400 KV grid of PGCIL/KPTCL

CLIMATIC CONDITIONS:

Salient features of the Project	Latitude – 15° 11' 58"N Longitude – 76° 43' 23"E
Nearest Railway	Kudithini Railway Station (about 2.5Km from site)
Nearest Airport	Bangalore (about 320 Km)
Nearest Seaport	Karwar (about 350 Km)
Elevation above mean sea level	475 m
Design Temperature	50 deg C
Basic wind speed	Mean 8.4k m/hr; Max. 19.0km/hr. (39 m/s for design of structures)
Terrain category & class assumed	Terrain category – 2, Class – A/B/C structure
Risk co-efficient factor- K1	K1 value 1.06
Terrain, height and structure size factor-K2	Terrain Category shall be 2 and corresponding values shall be taken for K2
Topography factor-K3	K3 value 1.0
Seismic Zone	Zone – III
Importance factor	2.5 for Electrical and 1.5 for others

The following table furnishes the information regarding various climatic conditions, humidity etc., for the information of the supplier. It shall be noted by the supplier that the equipment will be subjected to very hot and humid conditions and as such the equipment shall be designed to withstand such a climate.

1. Altitude : 478 meters above MSL.
2. Ambient Air Temperature:
   a) Maximum : 42.50 C
   b) Minimum : 14.60 C
   c) Design Temperature for all Electrical Equipment : 50 C ambient.
3. Relative Humidity:
   a) Maximum during monsoon : 70%
   b) Minimum : 11%
4. Rainfall:
   a) Annual average : 492 to 846mm
   b) Period : August to October
5. Wind Velocity:
   a) Average : 8.4 Km/hr.
   b) Maximum : 19 Km/hr.

2.1.3 COMMUNICATION AND TRANSPORT

2.1.3.1 The Raichur Thermal Power Station (RTPS) is easily approachable by road and rail. The National Highway No. 167 passes adjacent to the site. The nearest Railway Station for transport of goods to RTPS is Edlapur Railway Station on SC railway, which is about 1 KM away from the site.

2.1.3.2 The Yeramarus Thermal Power Station (YTPS) is easily approachable by road and rail. The National Highway Raichur -Hyderabad passes adjacent to the site. It is near the Chiksugur, Wadloor and Yermaras villages by the National Highway No. 167 and about five (5) kilometers from the existing Raichur Thermal Power Plant site towards Raichur town. The nearest Railway Station for transport of goods to YTPS is Chiksugur Railway Station on SC railway, which is about 2 KM away from the site.

2.1.3.3 The Bellary Thermal Power Station (BTPS) is easily approachable by road and rail. The National Highway No. 63 passes adjacent to the site. The nearest Railway Station for transport of goods to BTPS is Kudithini Railway Station on SC railway, which is about 2.5 KM away from the site.

2.2.0 MODERN ENGINEERING PRACTICE

All works covered in the consultancy services shall be carried out in accordance with modern engineering practice and only engineers experienced in this field shall be deployed for this work.

The review of selection of various equipment and their parameters is expected to be made only after techno-economic and optimization studies, Thermo-dynamic, chemical effect and meteorological studies corresponding to operation and ambient conditions of subject Thermal power plants.

While reviewing selection of various options, it is preferred that they are in line with the available manufacturing ranges. The details of the design calculation for deciding the operating parameters of equipment selected shall be furnished to Owner. Review of optimization studies shall be carried out and reports submitted to the Owner-together with design calculations for each and every selection of equipment such as type and sizing with capacities, etc.,

2.3.0 STATUTORY REQUIREMENTS

While preparing the techno commercial feasibility study & detailed technical specification for inviting tender for supply, fabrication, installation & commissioning of the Biomass co-firing system at RTPS, BTPS and YTPS the Consultants must ensure to satisfy the statutory regulations such as provisions of Indian Boiler regulations, CEA, Biomass

mission, Indian Electricity Act & Rules, Environmental protection act, KSPCB, CPCB, and any other environmental authorities of India in addition to applicable laws.

2.4.0 WORK COMPLETION PERIOD

The completion period for entire scope of work is as follows:

i) 06 months from the date of issue of Letter of Award (LOA) for conducting Techno-commercial feasibility study and submission of final feasibility report.

ii) 06 months from the date of issue of Notice to Proceed (NTP) for Preparation of tender document including technical specification for the requisite modification in plants.

As such the total completion period for the given scope of work is 12 months from the date of issue of LOA.

2.5.0 TIME - THE ESSENCE OF CONTRACT

2.5.1 The time and date of completion of the works as stipulated by the 'Corporation' and accepted by the 'Consultant' shall deemed to be the essence of 'contract'. The 'Consultant' shall so organise his resources and perform his work as to complete it not later than the date agreed.

The time for completion of the 'works' contracted for shall be reckoned from the date of the issue of the 'LOA' to the 'Consultant' for the preparation of feasibility study

And

Completion period shall be reckoned from the date of issue of Notice to Proceed (NTP) for preparation of tender document & technical specification for inviting tender for supply, fabrication, installation & commissioning of the Biomass co-firing system.

2.5.2 **Contract Period:**

The "Contract Period" shall mean Completion period envisaged for the Consultancy work plus 12 months guarantee thereafter and extensions if any.

2.6.0 PRICES

The price for the consultancy services covered under this specification shall be as indicated in price schedule (schedule-F1) shall be firm throughout the period of contract. All applicable taxes payable under the proposed consultancy agreement shall be the liability of the consultant. However, any variation in the rates of taxes during the contractual period will be to the account of the Corporation.

2.7.0 TERMS OF PAYMENT

2.7.1 Payment for Techno-commercial feasibility study:

i) **20%** payment of respective units along with applicable taxes shall be payable after the first visit of consultant executives to site for finalization of action plan for conducting techno-commercial feasibility study.

ii) **50%** payment of respective units along with the applicable taxes shall be payable on submission of the draft feasibility report.

iii) **30%** payment of respective units along with the applicable taxes shall be payable on submission and acceptance of the final feasibility report.

2.7.2 Payment for preparation of tender document including technical specification:

i) **20%** payment of respective plant along with applicable taxes shall be payable after completion of the first visit of consultant executives to respective thermal power plant for the preparation of tender document along with the technical specification.

ii) **50%** payment of respective plant along with the applicable taxes shall be payable on submission of the draft tender document along with the technical specification.

iii) **30%** payment of respective plant along with the applicable taxes shall be payable on submission of the final tender document along with the technical specification.

2.7.3 Paying Authority

Invoices shall be addressed to Deputy General Manager (Finance)-1, KPCL, Bangalore for RTPS & BTPS plants and General Manager Finance (RPCL), Bangalore for YTPS plant with a copy to the Chief Engineer (Thermal Designs) or any other person as authorized by the "Corporation" in the contract.

The Invoices will become payable after the conditions stipulated in the "Terms of Payment" are satisfied / fulfilled.

2.7.4 Provident Fund

The tenders shall submit Registration Certificate and Independent PF code number issued by the PF authorities along with offer. The contractor shall remit instalments of PF to his independent code only, in respect of his workmen engaged for the work to the PF authorities and submit the proof of remittance along with the bills (Invoices). The

contractor/agency shall be aware of the provisions of "Employees Provident Fund and Miscellaneous Provisions Act 1952" and amendments thereof.

2.8.0 INCOME TAX

The amounts towards Income Tax shall be deducted at source on the total value of each invoice at the prevailing rates and remitted by the Owner to the concerned authorities as per requirement of relevant rules. Necessary TDS will be issued by the Owner. The bidder shall furnish the Income Tax PAN number allotted by Income Tax department.

2.9.0 DEDUCTION FROM THE CONTRACT PRICE

All costs, damages or expenses, which Corporation may have paid for which under the contract the Consultant is liable, will be claimed by the Corporation. All such claims will be deducted from any money due or becoming due under law or otherwise the clarification/explanation for such deduction made by the Corporation will be furnished to the Consultant on request.

2.10.0 REVIEW MEETINGS

The Consultant's Engineer shall attend periodically review meetings with Owner's design offices, Bangalore whenever required. All expenses such as travel, boarding & lodging etc. related to such visits shall include in the prices indicated in the schedule of prices.

2.11.0 Deleted

2.12.0 Deleted

2.13.0 FORCE MAJEURE

In the event that either party is prevented, wholly or in part by any force majeure clause, as defined herein after, from performing or accepting performance by the other party under this agreement, it is agreed that either party shall have the right to terminate the agreement immediately or extend the completion period as mutually agreed upon giving notice and full particulars of such act of force majeure in writing to the other party as soon as possible after the cause relied on, as in such an event, the consultant shall be entitled to the amount due to him as on that date, under this agreement.

Force majeure is herein defined as:

a) act of God;
b) an act of war, (whether declared or undeclared), invasion, armed conflict or an act of foreign enemies, blockage, embargo, revolution, riot, terrorist or military action, civil commotion or sabotage.
c) contamination by radio-activity from any nuclear fuel, or form any nuclear waste from the combustion of nuclear fuel, radioactive toxic explosive, or other hazardous

properties of any explosive nuclear assembly or nuclear component of such assembly;

d) riot, civil commotion, terrorism or disorder, unless solely restricted to employees of the Contractor or of his subcontractors.

e) any failure by a Governmental Instrumentality to grant any Applicable Permit within a reasonable time after application therefor having been duly made and the conditions for the issuance thereof having been duly satisfied.

2.14.0 OWNERSHIP OF DOCUMENTS

On completion of the assignment, all the documents like techno commercial feasibility study reports, tender document, detailed technical specification required for the modification shall at all stages be and remain the property of the OWNER and while in the custody of the consultant, shall be fully available to the OWNER and its duly authorised representatives. On completion of the assignment, all the drawings, etc., mentioned herein above shall be delivered by the consultant to the OWNER.

2.15.0 INDEMNITY

The consultant shall be liable for and shall indemnify the OWNER in respect of all damages or injury to any of the consultant's personnel or property assigned to this project.

2.16.0 CORRESPONDENCE

All communication and notices to be given by either party to the other in connection with rights and obligations of both parties under or pertaining to this agreement shall be sent by post, postage pre-paid and if given by telegram, telephone or verbally, they shall be confirmed by registered letter postage pre-paid and addressed as follows:

E-mail service shall be used to the maximum extent to save on time for design and engineering.

Chief Engineer (Thermal Designs)
Karnataka Power Corporation Ltd.,
No.3, 2nd Floor, Green Building,
Drug Controller Department Premises,
Palace Road, Bengaluru - 560 001.
Mob. +91 9448436926
E-mail: kpclcetd@gmail.com
kpclbiomass@gmail.com
Website: www.kpcl.karnataka.gov.in

2.17.0 CHANGE OF DESIGNATED INDIVIDUALS

Either party may change the individual designated to receive notices or addresses and in such an event notice shall be given to the other party by means of a written notice of any such change.

2.18.0 Deleted

2.19.0 SAFETY AND SECURITY:

i. Agency shall arrange group insurance/ workmen compensation insurance for their crew. In the event of any accident/Injury/fatal to the Contractor's employee/ employees during the course of his employment in pursuance of the present contract, the Contractor shall be responsible to pay the compensation or any sum payable to such employee under the provisions of Law or Regulations made there under including the provisions of Workmen Compensation Act. The Contractor shall arrange for medical treatment for the injured employee. Contractor shall take the responsibility of dealing with statutory /legal authorities in case of such events.

ii. The KPCL thermal plants and surrounding area being a prohibited area, the agency shall obtain entry pass for himself and other employees employed by him in the respective thermal power station from the concerned competent authority of KPCL for the entry in to the thermal plants. The Contractor and his employees shall abide and follow the rules of security and instructions of the security officer at thermal plants.

iii. DISCIPLINE :

The Contractor shall ensure that he and his employees maintain proper discipline and decorum at all power stations while dealing and executing the contract works so that there should not be any hindrance for the smooth running of the Power station etc. If any of the employees of the Contractor is found unsuitable by the Engineer-in-Charge at any plant, then on demand by KPCL, such employee shall be removed.

2.20.0 SAFETY REQUIREMENTS TO BE OBSERVED BY THE CONTRACTORS ON KPCL PREMISES:

The following instructions must be read carefully by the Contractor. No variation is allowed, whatever may be the pressure for speedy completion of the works, proper attention to the safety of the worker's persons must at all times be ensured.

2.21.0 GENERAL SAFETY REQUIREMENTS:

a) The contractor's employees shall be at all times under proper supervision when working on TPS premises.

b) The contractor must ensure that all equipment's brought to site are in good conditions and are used erected safely. Personal protective clothing and equipment's must be ensured.

c) The contractors must keep their site of work clean and tidy and clear of obstructions. .All floors and walk way must be kept clear off materials in order that a secure footing can be maintained. Suitable precautions are to be taken so as not to pollute the atmosphere, ground or water.

d) If it is necessary to remove any type of floor section, permission must be obtained from the concerned Engineer. Substantial, secure barriers must be erected around any hole. Warning notices must be posted by day and suitable lamps displayed during hours of darkness. All floor sections must be replaced and secured as soon as practicable.

e) The contractor must ensure proper scaffolding and safe means of access to work place wherever necessary.

f) Whenever electrical supply is made available by KPCL the contractor should provide and maintain the whole of the installation on the local side. All the portable tools, hand lamps must be connected to the system by means of plugs and sockets of a good quality. The cable used must be in good condition. All joints must be electrically and mechanically sound. Portable hand lamps must be operated not more than 24 volts with a suitable transformer.

g) Safety Appliances / Equipment : Contractor shall provide required safety appliances / equipment to their workers like safety shoes, helmet, goggles, welding screen, safety belts, hand-gloves etc. depending upon the working condition and nature of the work in hand. Contractor shall arrange the appliances / equipment at their own cost.

h) Supervisors: Adequate Nos. of supervisors to be appointed by the contractor to ensure all safety provisions and use of personnel protective equipment by contractor workers.

i) All personnel must wear protective equipment's and clothing suitable to the tasks and location in which they are employed. Safety helmets, respiratory protection equipment's like dust mask, eye protection devices like goggles and noise masks like earplugs must be used wherever necessary.

j) Consultant personnel working at a height, which is unsafe, shall wear safety belts with its hook attached to a permanent structure.

k) It is the responsibility of the contractor to provide necessary safety equipment's and to ensure usage of the same by the Consultant personnel wherever necessary.

l) Safety of contractor's workers and staff is his sole responsibility & contractor shall arrange to pay full compensation to his workers/staff. In case of accident to any of them and in any circumstances KPCL will not be responsible for and liable to pay any compensation as per WORKMENS COMPENSATION ACT.

m) Medical: In case of injury of person, arrangement for shifting of the injured person for medical treatment is to be made immediately by the contractor. The contractor should keep "First aid box" ready at site.

n) Electrical Safety:

- Every portable electrical tool should be used with three pin plugs and three wire systems to avoid electric shock while at work proper earthling should be checked both at supply end and at tool end before commencement of work.
- Three wire sockets and properly insulated portable electrical boards with fuses & with earth leakage circuit breaker are to be used by contractor. On/Off switch should be connected in the live wire and not in neutral wire.
- Color coding of three wire system should be below. Red: Live, Grey / Black: Neutral, Green: Earth.

Sd/-

Chief Engineer (Thermal Designs)
Karnataka Power Corporation Ltd.,
No.3, 2nd Floor, Green Building,
Drug Controller Department Premises,
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Website: www.kpcl.karnataka.gov.in

TECHNICAL SPECIFICATION

TECHNICAL SPECIFICATION

1.0 Intent of Specification

This section is intended to broadly describe the Employer's minimum requirement which are to be complied with. However, various requirements specified in this document shall, in no way relieve the bidder's responsibilities to meet the targeted objective of retrofitting or of providing sustained, safe commercial operation of the Boiler.

The specification includes detailed scope of work and endeavors to cover all major activities and work necessary for conducting techno-commercial feasibility study, conducting trial run using 5 to 10% of biomass blending with the coal, preparation of feasibility report and preparation of tender document & technical specification for inviting tender for supply, fabrication, installation & commissioning of the Biomass co-firing system at RTPS, BTPS and YTPS. However, any other minor item/works, which is not specified but is necessary for successful completion of the intended work shall also be treated as part of scope of work. The bidder is therefore advised to visit the site to collect all necessary data/ drawings and acquaint himself with the status of the plant and equipment for assessment of the scope of complete job assignment.

2.0 Preamble:

a) Ministry of Power vide letter No.11/86/2017-Th.II, dated: 17.11.2017 **(Attached as Annexure-1)** has directed Central Electricity Authority (CEA) to issue 'Policy for Biomass Utilization for Power Generation through Co-firing in Pulverized Coal fired Boilers" to all the Power Plants/Utilities (public or private), State Governments, Power equipment manufacturers and other stake holders.

b) Central Electricity Authority (CEA) vide letter No.CEA/TETD-TT/2017/M-25/1137-1251, Dated: 24.11.2017 **(Attached as Annexure-2)** has issued an advisory to all central, state power utilities, Power equipment manufacturer & IPP's as follows: "**In order to promote use of the Biomass pellets, all fluidized bed and pulverized coal units (coal based thermal power plants) except those having ball and tube mill, of power generating utilities, public or private, located in India, shall endeavor to use 5-10% blend of Biomass pellets made, Primarily, of agro residue along with coal after assessing the technical feasibility, viz. safety aspects etc."**

c) Ministry of Power vide letter No.11/86/2017-Th.II, dated: 08.10.2021 **(Attached as Annexure-3)** have issued the 'Revised Policy for Biomass Utilization for Power Generation through Co-firing in coal based Power Plants'. The following are the highlights of modified policy:

i) All coal based thermal power plants of power generation utilities with Bowl Mill, shall on annual basis mandatorily use 5% blend of biomass pellets made, primarily, of agro residue along with coal w.e.f one year of the date of issue of this guideline. The obligation shall increase to 7% w.e.f two years after the date of issue of this order and thereafter.

ii) Generating Utilities having certain units under Reserve Shutdown or not being dispatched due to MOD consideration would ensure to increase the percentage of

co-firing up to 10% in their other operating units/plants (5% in plants having ball & tube mills).

iii) Any Power plants seeking exemptions/relaxation from co-firing may be considered on case to case basis, based on recommendations of CEA.

iv) The policy for co-firing of biomass would be in force for 25 years or till useful life of thermal power plants whichever is earlier.

v) The minimum contract period for procurement of biomass pellets by generating utilities shall be for 7 years so as to avoid delay in awarding contracts by generating companies every year and also to build up long term supply chain.

vi) Provisions related to tariff determination and scheduling shall be as given below:

- For Projects set up under section 62 of Electricity Act 2003, the increase in cost due to co-firing of biomass pellets shall be pass through in Energy Charge Rate (ECR).
- For Projects set up under section 63 of Electricity Act 2003, the increase in ECR due to biomass co-firing can be claimed under change in Law provisions.
- Such additional impact on ECR shall not be considered in deciding Merit Order Dispatch (MOD) of the power plant.
- Obligated Entities such as Discoms can meet their Renewable Purchase Obligations (RPO) by buying such generation of Co-firing.

d) Central Electricity Authority (CEA) vide letter No.CEA-TH-17-13/2/2021-TETD, Dated: 04.02.2022 **(Attached as Annexure-4)** have issued the 'Guidelines for exemption/ relaxation from mandatory co-firing of Biomass by Thermal Power Plants'. Exemption / relaxation from mandatory co-firing of Biomass to a Thermal Power plants will be granted after the concurrence of Ministry of Power.

3.0 Project information : Karnataka Power Corporation Limited (KPCL) being a Public Sector organization of Govt of Karnataka intends to implement the biomass co-firing across our following thermal power plants located in the state of Karnataka, India after assessing the plant specific techno-commercial feasibility study on implementation of the policy laid down by MoP,

Sl. No	Plant	Capacity	Location
1	Raichur Thermal Power Station (RTPS)	7x210MW & 1x250MW	Raichur
2	Bellary Thermal Power Station (BTPS)	2x500MW & 1x700MW	Bellary
3	Yeramarus Thermal Power Station (YTPS)	2x800MW	Raichur

Detailed project information is given in the "Project Information Section"

4.0 SCOPE OF WORK:

"Conducting Techno-commercial feasibility study & preparation of the report on implementation of Bio-mass Co-firing at Raichur Thermal Power Station (RTPS) – 7X210 MW, 1X250MW, Bellary Thermal Power Station (BTPS)–2X500MW, 1X700MW and Yeramarus Thermal Power Station (YTPS) – 2X800MW in the state of Karnataka, India. Preparation of tender document & technical specification for inviting tender for supply, fabrication, installation & commissioning of the Biomass co-firing system at RTPS, BTPS and YTPS".

5.0 BRIEF SCOPE OF WORK:

Plant specific Techno – commercial feasibility study shall cover Methodology & Supply chain management, Study of existing system & consequent impact on the performance of the system by adopting biomass co-firing, modification requirement in the existing plant equipment & additional equipment needs to be installed, biomass handling, unloading & storage methodology, CAPEX and OPEX implications and Safety aspects etc.,

The bidder shall conduct a Techno-Commercial feasibility Study by selecting any one of following capacity of unit from each plant as detailed below:

i) Raichur Thermal Power Station(RTPS) – 1X210 MW
ii) Yeramarus Thermal Power Station (YTPS) – 1X800MW
iii) Bellary Thermal Power Station (BTPS) – 1X500MW

After mutual discussion and agreement with the owner, the bidder shall strategically select any of the units of the above capacity from each plant for feasibility study. Consultant shall assess the suitability of the unit on which it is required to conduct a techno-commercial feasibility study.

Based on the techno-commercial feasibility study conducted for the selected unit from each plant, recommendations for the remaining units of the plant / whole plant shall also be extended.

The scope of work shall be broadly divided into the following 2 categories. Bidder shall quote price separately for each category and brief scope of work shall include but not be limited to the following:

I. Techno-commercial feasibility study:

a) Biomass Pellets specifications for firing in boilers (Non-Torrefied/ Torrefied etc.)
b) Blending Methodologies for achieving 5 – 10% co-firing.
c) Technical assessment of maximum feasible Biomass Co-firing and various technological alternatives to achieve Biomass co-firing beyond 10%.
d) Plant specific study - Boiler & Auxiliaries, Material Handling, Fire Protection and other systems to assess the feasibility of Biomass Co-firing.
e) Impact on the boiler with respect to combustion, slagging, fouling, erosion.
f) Impact on Pulverisers, Boiler auxiliaries, Ash handling and Coal handling systems.

g) Impact on Heat rate, Boiler efficiency and Auxiliary Power consumption at various Co-firing combinations.
h) Impact on emissions (CO2, SO2, NOx, etc.) and Ash utilization.
i) Other challenges and safety aspects for various Co-firing ratios and mitigation measures.
j) Unloading and storage options and the methodology
k) Biomass handling systems (stacking and reclaiming).
l) Recommendation on Palletization system specification.
m) Modification requirement in the existing Plant equipment
n) Integration of facilities for handling and co-firing with existing system.
o) Impact on Equipment maintenance requirements and suggestions on O&M practices along with cost implications.
p) Additional systems / equipment to be incorporated for achieving the stipulated (5-10%) as well as higher feasible biomass co-firing.
q) Techno-commercial feasibility shall cover all the points mentioned in attached CEA letter No.CEA-TH-17-13/2/2021-TETD Division dated: 04.02.2022 (Annexure-4), which is required to be submitted to concerned authorities for seeking exemption / relaxation from mandatory co-firing of Biomass.
r) CAPEX requirements for Biomass co-firing such as additional systems / facilities, modification in existing systems / facilities, storage, handling, fire protection system, etc.
s) Additional financial implication in terms of OPEX.
t) Impact on Energy Charge Rate (ECR).
u) Detailed Survey on feasible sources for procurement of pellets for the power plant (Availability of pellets nearer to our Thermal Power plants to cut down transportation cost to the possible extent) v/s Total biomass pellets requirement for the power plant.
v) Recommendations to ensure availability of consistent quality and quantity of pellets throughout the year.
w) Trial run of the unit with stipulated blending percentage of biomass along with the coal.

Any other points apart from the above but required for successful implementation of biomass co-firing shall include in the scope of bidder.

II. Preparation of tender document including technical specification for the requisite modification in plants (for the plant in which techno-commercially feasible to implement the biomass co-firing):

Based on the recommendation of the techno-commercial feasibility study, the owner is free to decide the unit/plant in which it is required to implement the Biomass co-firing.

Consultant shall prepare detailed tender document including technical specification for requisite modification in the existing system and additional equipment/system required in thermal power plants for which owner chooses to implement the Biomass co-firing. Consultant shall follow the latest engineering practice in line with the prevailing Indian / international standard while preparation of technical specifications.

Based on the tender document prepared by the consultant, owner shall float the tender for inviting the prospective bidders for the implementation of recommendations / modifications suggested in the feasibility study.

Any other points apart from the above but required for successful implementation of biomass co-firing shall include in the scope of bidder.

6.0 Bidder shall visit all power plants viz., RTPS, BTPS and YTPS to ascertain the site condition before quoting the bid. Any ignorance in this regard does not relieve the Consultant to fulfill the obligation envisaged by the owner in the contract.

While furnishing the bid, bidder shall upload a details of data required to be furnished by the owner for enabling bidder to conduct a Techno-commercial feasibility study.

After awarding LOA, the successful bidder shall once again visit the plant and identify the strategic units (one unit from each plant as specified in clause 5.0) which are required for conducting a techno-commercial feasibility study along with a trial run and to collect any specific input data required for the study.

Consultant shall furnish the following data well in advance before conducting a trial run for enabling the Owner for arranging the same and to plan the shutdown of units in coordination with SLDC.

i. Quantity of biomass required considering one unit from each power plant.
ii. Quality of biomass required for feasibility study.
iii. Temporary Storage means for safe storage of biomass pellets.
iv. Safety measures to be followed during trial run.
v. Means for transporting pellets from storage place to mixing place.
vi. Means (Manual/auto) for feeding pellets with the coal.
vii. Days from which the pellets required after placing LOA.
viii. Is unit should be in loading condition during feasibility study
ix. Is the feasibility study will be conducted sequentially or parallel in RTPS, BTPS and YTPS.
x. If yes: Loading condition (full load/partial load) of unit during co-firing.
xi. Duration for which units to be in loading mode (in a stretch)
xii. Is it required to repeat the feasibility study in the eventuality of any trip/shutdown of the unit.
xiii. How long we can store the pellets in the closed shed.

During the site visit, a joint meeting between the Owner's design team, site officials and Consultant engineering team shall be conducted. In the meeting, the consultant shall brief the details of modalities to be followed for conducting a feasibility study and collect all the required data which are necessary for the successful completion of a given scope of work.

Consultant shall furnish a detailed action plan and schedule based on the outcome of the meeting for owner review and approval.

Consultant shall propose all necessary recommendations which are required to operate the plant as per the Standard Operating Procedure (SOP) issued by the National Biomass Mission **(Annexure-5).**

In general, consultant shall take care of the policy on Biomass co-firing, the Guideline for exemption, and the Standard operating procedure laid down by the Biomass mission in the completion of the scope of work assigned.

Based on the techno-commercial feasibility study conducted by the Consultant for the selected units, **recommendations for the remaining units of the plant shall also be extended.**

KPCL reserves the rights to whether to assign the scope of work mentioned in clause No, 5(II) to the firm or not. This decision shall be taken based on the outcome of the feasibility study. If KPCL decides not to go with it, a reduction in prices for deletion in scope of the work shall be governed by the price quoted for the given scope of work in the price schedule furnished by the consultant.

It is left to the discretion of the Consultant to carry out the preparation of technical specifications once the techno-commercial feasibility study is over for the respective unit/plant, while conducting the feasibility study for the other unit/plant or to commence the preparation of technical specifications after completion of the techno-commercial feasibility study for units envisaged from all the plant.

However, it is mandatory to get clear instruction from the owner (Notice to Proceed) before proceeding with the preparation of technical specifications for all units/plants.

Consultant shall propose a modification to be carryout in the existing system and prepare the technical specification by duly following the latest and modern engineering practices complying with the latest environmental norms, for all mechanical, electrical, Civil and Control & Instrumentation component/system that are required to be procured/install in the plant in order to facilitate the safe and reliable and efficient operation of the plant during co-firing.

Consultant shall prepare all necessary engineering and fabrication drawings/documents for the equipment/system which are required to be procured by Owner for implementation of Co-firing. Consultant shall recommend all necessary modifications in the plant logic to facilitate co-firing.

Apart from the above, any other works which are required for safe, reliable, and efficient operation of the plant during co-firing lies with the consultant.

KARNATAKA POWER CORPORATION LIMITED

Annexure-1

Ministry of Power Policy on Biomass

F.No. 11/86/2017-Th.II
Ministry of Power
Government of India
****

Shram Shakti Bhawan, Rafi Marg,
New Delhi-110001
Dated: 17th November, 2017

To

The Chairman,
Central Electricity Authority,
Sewa Bhawan,
R.K.Puram,
New Delhi

Sir,

Stubble burning has been cited as a major cause of recent smog in north-west India. Stubble burning is deliberate setting fire of the straw stubble that remains after harvesting of paddy and other crops. During the months of October and November of each year, farmers in north-west India burn an estimated 30-40 million tonnes of crop waste from their paddy fields after harvesting.

2. Biomass co-firing in coal based power plants

The estimated 30-40 million metric tonnes of paddy straw that remains un-utilised and burnt in north-west India has potential to generate about 6000-8000 MW and 45000 million units of electricity annually, by co-firing it along with coal in existing coal fired power plants. Biomass co-firing has a potential to create a market for large scale consumption of agro residue and convert it into electricity in eco-friendly and cost effective manner while mitigating problem of air quality deterioration and generate additional income to farmers.

2.1 The existing power plant infrastructure cannot directly use raw agro residue bio-mass in a pulverised coal fired type boiler and it is required to be processed into dense bio-mass in the form of pellets.

2.2 Biomass co-firing is a well proven technology. With increasing environmental awareness, power plants all over the world has adopted, biomass co-firing as a strategy to combat pollution. UNFCC recognizes biomass co-firing as a carbon neutral technology for mitigation of carbon emission from coal based power plants.

3. Status of Biomass co-firing in India

NTPC has successfully demonstrated the co-firing of 7% blend of biomass pellets with coal in its Dadri power plant. This can be replicated in other coal fired power plants having bowl mills/vertical roller mills/beater mills.

Contd. 2/-

4. Benefits of using biomass pellets co-firing in coal based power plants

a) Eliminate/minimize burning of agro-residue and create economic value of agro residue by promoting its use as fuel in power plants in co-firing mode.

b) Improve the air quality index while creating additional income for farmers.

c) Encourage the establishment of decentralised pellets manufacturing units and generate employment opportunities.

5. Biomass Utilisation for Power Generation through Co-firing in Coal based Power Plants.

Therefore, in order to promote use of the bio-mass pellets, it has been decided, with the approval of competent authority, to advise all the power plants/utilities as follows:

a) All fluidised bed and pulverised coal units(coal based thermal power plants) except those having ball and tube mill, of power generation utilities, public or private, located in India, shall endeavour to use 5-10% blend of biomass pellets made, primarily, of agro residue along with coal after assessing the technical feasibility, viz. safety aspects etc.

b) CEA shall develop/issue specifications for the pellets. CEA will also provide technical assistance/advise to Utilities on how to use bio-mass pellets for blending with coal in coal based thermal power plants.

c) The Appropriate Commission will determine the compensation (for plants other than those whose Tariff has been already determined under section 62 of Electricity Act) to be allowed in tariff for increase in cost of generation on account of using bio-mass pallets, viz., cost of pellets, increase in auxiliary power consumption (APC) and plant heat rate (HR) etc. Increase in cost of generation will not be taken into account for the purpose of merit order for despatch of electricity. Further, Appropriate Commission shall devise a suitable mechanism to ensure the use of biomass as per (a) above.

6. CEA is requested to issue the enclosed "Policy for Biomass Utilisation for Power Generation through Co-firing in Pulverised Coal Fired Boilers" to all the Power plants/Utilities, State Governments, Power equipment manufacturers and other stake holders. The Policy may be placed on CEA website.

Yours faithfully,

17/11/2017

(S.K. Kassi)
Director (Thermal)

Biomass Utilisation for Power Generation through Co-firing in Coal Based Power Plants

1. Introduction

Stubble burning has been cited as a major cause of recent smog in north-west India. Stubble burning is deliberate setting fire of the straw stubble that remains after harvesting of paddy and other crops. During the months of October and November of each year, farmers in north-west India burn an estimated 30-40 million tonnes of crop waste from their paddy fields after harvesting. The primary reasons for stubble burning are; (a) reduce the cost of clearing the field for next crop, (b) reduce the turnaround time between harvesting and sowing for next (winter) crop and (c) lack of other alternatives, viz. availability of appropriate agricultural implements, viz., implements to take out the stubble and "Happy Seeders" for zero tilling sowing etc.

1.1. Various options for safely disposing such bio-mass are (i) setting up power plants exclusively based on bio-mass, (ii) co-firing of pellets made out of bio-mass in the coal based thermal plants, (iii) *in-situ* in-corporation of bio-mass into the soil using appropriate agricultural implements or composting and (iv) manufacturing of various products such as Ethanol, Bio CNG and Board etc.

2. Biomass co-firing in coal based power plants

The estimated 30-40 million metric tonnes of paddy straw that remains un-utilised and burnt in north-west India has potential to generate about 6000-8000 MW and 45000 million units of electricity annually, by co-firing it along with coal in existing coal fired power plants. Biomass co-firing has a potential to create a market for large scale consumption of agro residue and convert it into electricity in eco-friendly and cost effective manner while mitigating problem of air quality deterioration. Market mechanism for agro residue utilisation will also enable additional income to farmers.

2.1 The existing power plant infrastructure cannot directly use raw agro residue bio-mass in a pulverised coal fired type boiler and it is required to be processed into dense bio-mass in the form of pellets. The densification of biomass in the form of pellets also reduces its transportation cost, which is a major component in overall fuel price. Promoting agro-residue processing capacity into pellets for power sector shall also create employment opportunities and develop entrepreneurship.

2.2 Biomass co-firing is a well proven technology. With increasing environmental awareness, power plants all over the world has adopted, biomass co-firing as a strategy to combat pollution. According to open source data, 230 plants across globe, majority located in European and American countries, have experience of biomass co-firing. UNFCC recognizes biomass co-firing as a carbon neutral technology for mitigation of carbon emission from coal based power plants.

3. Status of Biomass co-firing in India

NTPC has successfully demonstrated the co-firing of 7% blend of biomass pellets with coal in its Dadri power plant. This can be replicated in other coal fired power plants too. The blend of coal and pellets can safely be pulverized in power plants having bowl mills/vertical roller mills/beater mills. However, this method is not suitable for power plant having ball and tube type of mills due to higher risk of fire hazard. Approximately, 2.5 to 3.0 lakh tonnes of Biomass pellets are required for 7% blending in a thermal power plant of 1000MW capacity.

4. Benefits of using biomass pellets co-firing in Coal based power plants

a) Eliminate/minimize burning of agro-residue and create economic value of agro residue by promoting its use as fuel in power plants in co-firing mode.
b) Improve the air quality index while creating additional income for farmers.
c) Encourage the establishment of decentralised pellets manufacturing units and generate employment opportunities.

5. Biomass Utilisation for Power Generation through Co-firing in Coal based power plants.

Therefore, in order to promote use of the bio-mass pellets, all the Power plants/Utilities are hereby advised as follows:

a) All fluidised bed and pulverised coal units(coal based thermal power plants) except those having ball and tube mill, of power generation utilities, public or private, located in India, shall endeavour to use 5-10% blend of biomass pellets made, primarily, of agro residue along with coal after assessing the technical feasibility, viz. safety aspects etc.
b) CEA shall develop/issue Specifications for the pellets. CEA will also provide technical assistance/advise to Utilities on how to use bio-mass pellets for blending with coal in coal based thermal power plants.
c) The Appropriate Commission will determine the compensation (for plants other than those whose Tariff has been already determined under section 62 of Electricity Act) to be allowed in tariff for increase in cost of generation on account of using bio-mass pallets, viz., cost of pellets, increase in auxiliary power consumption (APC) and plant heat rate (HR) etc. Increase in cost of generation will not be taken into account for the purpose of merit order for despatch of electricity. The Appropriate Commission shall devise a suitable mechanism to ensure the use of biomass as per (a) above.

KARNATAKA POWER CORPORATION LIMITED

Annexure-2

CEA Advisory

सत्यमेव जयते

भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केंद्रिय विद्युत प्राधिकरण
Central Electricity Authority
सचिव कार्यालय
Office of the Secretary

No. CEA/TETD-TT/2017/M-25/1137-1251 **Dated: 24.11.2017**

To

All State Power Secretaries, Thermal Power Generating Plants/ Utilities (Public or Private), Power Equipment Manufacturers – As per list

Subject: Biomass Utilization for Power Generation through Co-firing in Pulverised Coal Fired Boilers- Advisory के बारे में ।

Dear Sir,

As you may be aware that stubble burning has been cited as a major cause of recent smog in North- West India. Stubble burning is deliberate setting fire of the straw stubble that remains after harvesting of paddy and other crops. Instead of burning in open fields, these can be collected, processed and can be used as Biomass fuel to generate power.

Biomass Co-firing is a well proven technology. With increasing environmental awareness, power plants all over the world have adopted Biomass Co-firing as a strategy to combat pollution. UNFCCC recognizes Biomass Co-firing as a carbon neutral technology for mitigation of carbon emission from coal based power plants.

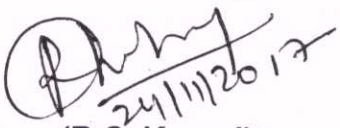
NTPC have successfully demonstrated the Co-firing of 7% blend of Biomass pellets with coal in its Dadri Power Plant. This can be replicated in other coal fired power plants having bowl mills/vertical roller mills/ beater mills.

Ministry of Power vide letter No. 11/86/2017-Th.II dated 17th November, 2017 have forwarded 'Policy for Biomass Utilization for Power Generation through Co-firing in Pulverised Coal Fired Boilers' and has requested to issue the same to all the Power Plants/ Utilities (public or private), State Governments, Power equipment manufacturers and other stake holders. The Policy has been uploaded on CEA website www.cea.nic.in

सेवा भवन, नवम तल, आर.के.पुरम, नई दिल्ली- 66, टेलीफैक्स: 011- 26715475 ई-मेल cetetd-cea@gov.in वेबसाइट: www.cea.nic.in
Sewa Bhawan,9th Floor,R K Puram,New Delhi-66,Telefax:011- 26715475, e-mail Website www.cea.nic.in

'In order to promote use of the Biomass pellets, all fluidized bed and pulverized coal units (coal based thermal power plants) except those having ball and tube mill, of power generating utilities, public or private, located in India, shall endeavor to use 5-10% blend of Biomass pellets made, primarily, of agro residue along with coal after assessing the technical feasibility, viz. safety aspects etc.'

Yours faithfully,



(P.C. Kureel)
Secretary, CEA

सेवा भवन, नवम तल, आर.के.पुरम, नई दिल्ली- 66, टेलीफैक्स: 011- 26715475 ई-मेल cetetd-cea@gov.in वेबसाइट: www.cea.nic.in
Sewa Bhawan,9th Floor,R K Puram,New Delhi-66,Telefax:011- 26715475, e-mail Website www.cea.nic.in

To

Central Utilities

1. Chairman & Managing Director, NTPC Ltd., NTPC Bhawan, Scope Complex, 7, Institutional Area, Lodhi Road, New Delhi-110003.

2. Chairman, Damodar Valley Corporation, DVC Towers, VIP Road, Kolkata- 700 054

3. Chairman & Managing Director, Neyveli Lignite Corporation Ltd., Corporate Office, Block-I, Neyveli - 607801 , Tamil Nadu

State Utilities

1. Managing Director, Andhra Pradesh Power Generation Corporation Limited, Vidyut Soudh, Hyderabad- 500 049 Andhra Pradesh

2. Managing Director, Assam Power Generation Corporation Ltd. , Bijuli Bhawan, 4th Floor, Palton Bazar, Guwahati 781001 Assam

3. Managing Director, Bihar State Power Generation Company Ltd., 1st Floor, Vidyut Bhawan, Bailey Road, Patna 800 021

4. Managing Director, Chhattisgarh State Power Generation Corporation Ltd., Dagniya, Raipur - 492 013 Chhattisgarh

5. Managing Director, Durgapur Projects Ltd., Dr. B C Roy Avenue, Disrict Burdwan, Durgapur- 713 201 West Bengal

6. Managing Director, Gujarat State Electricity Corporation Ltd., Sardar Patel Vidyut Bhawan, Race Course, Vadodara 390 007 Gujarat

7. Managing Director, Gujarat Urja Vikas Nigam Ltd., Sardar Patel Vidyut Bhawan, Race Course Road, Vadodara- 390 007 Gujarat

8. Managing Director, Haryana Power Generation Corporation Ltd., Room No. 411, 3rd Floor, Urja Bhawan, C-7, Sector-6, Panchkula - 134 112 Haryana

9. Managing Director, Jharkhand Urja Vikas Nigam Limited, Engineering Building HEC, Dhurwa, Ranchi 834 004 Jharkhand.

10. Managing Director, Karnataka Power Corporation Ltd., Shakti Bhawan, 82, Race Course Road, Bangalore- 560 001

11. Managing Director , Maharashtra State Power Generation Corporation Limited, Plot No. G-9, Prakashgad, Bandra (East), MUMBAI-400 051

12. Managing Director, Madhya Pradesh Power Generation Corporation Ltd., Shakti Bhawan, Vidyut Nagar, Rampur P.O. , Jabalpur- 482 008

13. Managing Director, Odisha Power Generation Corporation Ltd., Zone- A, 7th Floor, Fortune Towers, Chandrashekharpur, Bhubaneshwar -751 023 Odisha

14. Chairman & Managing Director, Punjab State Power Corporation Limited, The Mall, Patiala -147 001 Punjab

15. Chairman & Managing Director, Rajasthan Rajya Vidyut Utpadan Nigam Ltd., Vidyut Bhawan, R.C. Dave Marg, Jyoti Nagar, Janpath Jaipur – 302 005 Rajasthan

16. Chairman & Managing Director, Tamil Nadu Generation and Distribution Corporation Limited, 10th Floor, NPKRR Maaligai, 144, Anna Salai, Chennai- 600 002

17. Chairman & Managing Director, Telangana State Power Generation Corporation Limited, Vidyut Soudha, Khairatabad, Hyderabad – 500082

18. Managing Director, U.P. Rajya Vidyut Utpadan Nigam Ltd., 7th Floor, Shakti Bhawan, 14, Ashok Marg, Lucknow – 226 001

19. Chairman & Managing Director, West Bengal Power Development Corporation Ltd., Bidyut Unnayan Bhaban, Block- LA, Plot No. 3/C. Sector- III, Salt Lake City, Kolkata- 700 098 West Bengal

19. Managing Director, Indraprastha Power Generation Co. Ltd. , Office of PRO, Himadri, Rajghat Office Complex, New Delhi - 110 001

State Government

1. Chairman & Managing Director, Rural Electrification Corporation, Core- 4, SCOPE Complex, 7, Lodhi Road, New Delhi – 110003.
2. Chairman & Managing Director, Power Finance Corporation Ltd., Urjanidhi, 1,Barakhamba Lane, Connaught Place, NEW DELHI-110 001.
3. Principal Secretary Head (Energy Dept.), Government of Andhra Pradesh Secretariat, Hyderabad- 500 022 Andhra Pradesh
4. Additional Chief Secretary (Power), WPT&BC, Assam Secretariat, (Government of Assam), P.O. Assam Sachivalaya, Block-C, Ground Floor, Dispur - 781 006 Assam
5. Principal Secretary (Energy), Government of Bihar, Irrigation Building, Sinchai Bhawan, 1st Floor, Patna – 800 015 Bihar
6. Principal Secretary (Energy), Government of Chhattisgarh, Room No. 308, DKS Bhawn, Mantralaya, Raipur, Chhattisgarh
7. Chief Secretary (Power), Government of NCT of Delhi, 8th Floor, Players Building, Delhi Secretariat, I.P. Estate, New Delhi – 110 002
8. Principal Secretary (Energy Deptt.), Government of Gujarat, Sachivalaya, Block No. 5, 5th floor, Gandhi Nagar-382 010 Gujarat
9. Financial Commissioner & Principal Secretary (Power), Government of Haryana Room No. 603, 6th floor, New Secretariat Building, Sector-17, Chandigarh – 160 017 Haryana
10. Principal Secretary (Energy) , Government of Jharkhand , Nepal House, Room No. 6, Doranda, Ranchi – 834002 Jharkhand

11. Addl. Chief Secy. & Principal Secy. (Energy), Energy Department, Government of Karnataka, Room No. 236, 2nd floor , Vikasa Soudha, Dr. Ambedkar Road, Bangalore - 560 001 Karnataka

12. Secretary (Energy), Government of Madhya Pradesh, Mantralaya, Bhopal- 462 001 Madhya Pradesh

13. Secretary (Energy), Government of Maharashtra, Industries Energy & Labour Deptt. , 4th floor, Mantralaya, Room no. 401 , Mumbai- 400 032

14. Commissioner-cum- Secretary, Department of Energy, Government of Odisha, Odisha Secretariat, Bhubaneshwar - 751 001 Orissa

15. Secretary (Power), Government of Punjab, Mini Secretariat, Sector- 9, Chandigarh – 160 009 Punjab

16. Secretary (Power), Chief Secretariat, Goubert Avenue, Puducherry – 605 001

17. Secretary (Energy), Government of Rajasthan, Main Building Secretariat, Janpath, Jaipur- 302 001 Rajasthan

18. Principal Secretary (Energy), Energy Department, Government of Tamil Nadu, Secretariat, Chennai - 600 009 Tamil Nadu

19. Principal Secretary, Energy Department, Government of Telangana, Room No. 328A, 2nd Floor, D- Block, T.S. Secretariat, Hyderabad – 500022 Telangana

20. Principal Secretary (Energy) , Government of Uttar Pradesh , Lal Bahadur Shastri Bhawan, Annexe, 5th Floor, Lucknow - 226 004 Uttar Pradesh

21. Principal Secretary (Energy) , Department of Power & NCES, Govt. of West Bengal, New Secretariat Building, I.K.S. Roy Road, 7th floor, Block 'A' , Kolkata-700 001 West Bengal

Power Equipment Manufacturers

1. Chairman & Managing Director, Bharat Heavy Electrical Ltd., BHEL House, Asiad Village, Siri Fort, New Delhi – 110 049

2. General Manager, L&T MHI Boilers Private Ltd., 12/4 Delhi Mathura Road, Near Sarai Khawaja Chowk, Faridabad – 121003 Haryana

3. General Manager, L&T – MHI Turbine & Generators Pvt. Ltd., 1st Floor, Pankaj Building, Chhani Road, Vadodara – 390 024 Gujarat

4. CEO, Alstom Bharat Forge Power Limited, IHDP Building, Plot # 7, Sector- 127, NOIDA – 201301 Uttar Pradesh

5. Managing Director, Toshiba JSW Power Syatems Private Limited, S. No. 74-95, Vaikkadu Village, Andarkuppam Check Post, Manali New Town, Chennai – 600103 Tamil Nadu

6. Vice President, Thermax Babcock & Wilcox Energy Solutions Private Limited, Energy House, D-2 Block, Plot No. 38 & 39, MIDC Area, R.D. Aga Road, Chinchawad, Pune – 411019

7. Managing Director, Doosan Power Systems India Pvt. Ltd., 18/2A, Sennerkuppam Bye-pass, Poonamallee, Chennai – 600056

IPPs / Generating Companies

1. Vice President, M/s Adani Power Limited, 8 A, Sambhav Building, Judges Bungalow Road, Bodakdev, Ahemdabad – 380 015 (Gujarat)

2. M/s Athena Chhattisgarh Power Pvt. Ltd., 7-1-24, B- Block, 5th Floor, B Block, Roxana Towers, Green Lands, Begumpet, Hyderabad- 500 016 Andhra Pradesh

3. M/s Atlas Power India Pvt. Limited, A-2, II Floor, Regency Splendour Apartments No. 25, Hall Road, Richards Town, Bangalore-560005

4. M/s Amaravati Thermal Power Private Limited, 6-3-1090, TSR Towers, Rajbhavan Road, Somajiguda, Hyderabad- 500082

5. M/s Astaranga Power Company Limited, 1259, Lakshmi Towers, Road No 36, Jubilee Hills, Hyderabad- 500033

6. Aban Power Company Ltd., 3rd Floor, 25 GN Chetty Road, T Nagar, Chennai – 600 017

7. Adhunik Power & Natural Resources Ltd., 208-209, 2nd Floor, Padma Tower-II, 22 Rajendra Place, New Delhi – 110 008

8. Alfa Infraprop Private Limited, 3rd Floor, Rider House, 136, Sector – 44, Gurgaon – 122 002

9. AES (India) Private Limited, 9th Floor, Tower – B, DLF Building No. 10, Cyber City, Phase – II, Gurgaon – 122 002 Haryana

10. BPL Power Projects (AP) Pvt. Limited, H. No. 8-2-293/82/NG/03, Plot No. 3, Road No. 69, Nandagiri Hills, Jubilee Hills, Hyderabad – 500 033

11. BGR Energy Systems Ltd., 443, Anna Salai Teynampet, Chennai – 600 018

12. Coastal Energen Pvt. Ltd., 7th Floor, Buhari Towers, 4, Moores Road, Chennai -600 006

13. M/S Corporate Power Ltd., Insignia Tower, EN1, Sector-V, Salt Lake, 3rd Floor, Kolkatta 700 091

14. CESC Limited, CESC House, Chowringhee Square, Kolkata- 700 001

15. CLP Power India Private Liimited, 15th Floor, Oberoi Commerz, International Business Park, Oberoi Garden City, Goregaon (E), Mumbai – 400 063

16. Coastal Gujarat Power Limited (A Tata Power Company), Tunda Vandh Road, Tunda Village, Mundra , Kutch – 370 421

17. DHARIWAL Infrastructure (P) Ltd., CF-366, Salt lake City, Sector-1, Kolkata – 700064

18. Himanshu Jhawar, Sr. Vice President, D.B. Power Ltd., G-3A / 4-6, Kamanwala Chambers, New Udyog Mandir – 2, Mogul Lane, Mahim (W), Mumbai- 400 016

19. M/s East Coast Energy Pvt. Limited, 7-1-24, B Block, 5th Floor Roxena Towers, Greenland, Begumpet, Hyderabad 550 016 Andhra Pradesh

20. Essar Power Limited, Essar House, Prakash Deep, 10th Floor, 7 Tolstoy Marg, New Delhi – 110 001

21. Executive Vice President (Power Projects), GMR Energy Limited, IBC Knowledge Park, Phase 2, D- Block, 9th Floor, 4/1, Bannerghatta Road, Bangalore- 560 029

22. GVK Power & Infrastructure Limited, Paigah House, 156-159, Sardar Patel Road, Secundrabad – 500 003 Andhra Pradesh

23. M/s India Bulls Realtech Limited, "Indiabulls House", 448-451, Udyog Vihar, Phase-V, Gurgaon-122001

24. M/s Ind-Barath Power (Utkal) Limited, Plot No 30-A, Road No 1, Film Nagar, Jubilee Hills, Hyderabad- 500 033

25. M/s. Ideal Energy Projects Ltd., 122, Telecom nagar, Pratap Nagar, Nagpur – 410022.

26. Director, Jindal Power Limited, Jindal Centre, 12, Bhikaji Cama Place, New Delhi-110066

27. M/s Jindal India Thermal Power Limited, Plot No 12, Local Shopping Complex, Sector B-1, Vasant Kunj, New Delhi- 110 070

28. Sr. Vice President, M/s JSW Energy Limited, Jindal Mansion, 5A, Dr. G. Deshmukh Marg, Mumbai- 400026

29. M/S Jhabua power Ltd., 6th-7th Floor, Vatika Point, M.G.Road Phase II, Opposite First India Palace, Sector- 53, Gurgaon – 122 002

30. Avantha Power & Infrastructure Limited, 6th & 7th Floor, Vatika City Point, M.G. Road, Gurgaon – 122002

31. M/s Krishnapatnam Power Corporation Limited, Plot No 322, Road No 25, Jubilee Hill, Hyderabad-500033

32. M/s KVK Energy & Infrastructure (P) Limited, 6-3-1109/A/1, 3rd Floor, Navabharath Chambers, Somajiguda, Raj Bhavan Road, Hyderabad-500082

33. M/s Kineta Power Private Limited, Uma Enclave, 5th Floor, Road No. 9, Banjara Hills, Hyderabad-500 034

34. Head of SBU & CEO, Lanco Infratech Limited, Plot No 397, Udyog Vihar, Phase-III, Gurgaon-122 016 Haryana

35. Vice President (Technical), Lanco Anpara Power Limited, Plot No 397, Udyog Vihar, Phase-III, Gurgaon-122 016 Haryana

36. General Manager, Fuel Sourcing Group (E&C Power), Larsen & Toubro Limited, G-4, 2nd Floor, Gate No.1, Powai Campus, Saki-Vihar Road, Mumbai- 400072

37. M/S Lanco Amarkantak power Ltd., Plot No. 397, Phase-III, Udyog Vihar, Gurgaon-122016, Haryana

38. M/s Maithon Power Limited, (JV of Tata Power & DVC), C- 43, Sector-62, Noida 201 307 (UP)

39. M/s Moser Baer Power & Infrastructure Limited, 43 B, Okhala Industrial Estate, New Delhi- 110020

40. Meenakshi Energy Private Limited, Meekashi House, 8-2-418, Road No. 7, Banjara Hills, Hyderabad – 500 034

41. M/s NSL Power Limited, NSL ICON, Door No. 8-2-684/2/A, Plot Nos. 1to 4, 4th Floor Road No. 12, Banjara Hills, Hyderabad-500034

42. M/s Reliable Thermal Power limited, C-101, Ground Floor, East of Kailash, New Delhi-110065

43. Shri J. P. Chalsani, Chief Executive Director, Reliance Power Limited, Reliance Energy Centre, Shanta Cruz East, Mumbai-400 055

44. R.K.M. POWERGEN PVT LTD, 2nd & 3rd Floor, 14 Dr. Giri Appa Road, T. Nagar, Chennai-600017

45. M/s Sahara India Power Corporation Limited, Sahara India Centre, 5th Floor, 2, Kapoorthala Complex, Aliganj, Lucknow-226024

46. M/s Sheshadri Power & Infrastructure (P) Ltd., Surya Towers, 6th Floor, 105, Sardar Patel Road, Secundrabad-500003

47. M/s SJK Powergen Limited, 501, Waves Apartments, 4th Floor, Opp. R.K. Beach, Adjacent to SAIL Office, Visakhapatnam- 530 003

48. M/s SKS Ispat and Power Limited, 501 B, Elegant Business Park, Andheri Kurla Road, J.B. Nagar, Andheri (E), Mumbai-400 059

49. M/s SLS Energy Private Limited, 1445, "Vajras", 1st Floor, 28th Main, Southend 'A' Cross Jayanagar, 9th Block (East), Bangalore-560069

50. M/s Sophia Power Company Ltd., Indiabulls House, 448-451, Udyog Vihar, Phase-V, Gurgaon-122001

51. Chief Operating Officer, Spectrum Power Generation Limited, Plot No 231, 8-2-293/82/A/231, 3rd Floor, Road No. 36, Jubilee Hills, Hyderabad-500 033

52. M/s SRM Energy Private Limited, 43, Free Press House,215, Nariman Point, Mumbai-400021

53. M/s Sterlite Energy Pvt. Ltd., 1st Floor, City Mart Commercial Complex, Baramundra, Bhubaneswar-751003

54. M/s. Simhapuri Energy pvt. Ltd., Madhucon, Greenland, 6-3-866/2, 3rd Floor, Begumpet, Hyderabd-500016

55. Managing Director, Tata Power Company Limited, 24, Homi Mody Street, Mumbai-400 001

56. Shri K. Chandrashekhar, Director (Projects), Tata Power Company Limited, Dharavi Receiving Station, Matunga, Mumbai-400 019

57. M/s Torrent Power Limited, Torrent House, Off Ashram Road, Ahemdabad-380009

58. DGEN Mega Power Project, Torrent Energy Limited, Plot No. Z-9, Dahej SEZ Area (Eastern Side), Taluka Vagra, Distt. Bharuch – 392130 Gujarat

59. M/s VIDEOCON Industries Limited, VIDEOCON Towers, 12th Floor, E-1, Jhandewalan Extn., New Delhi-110055

60. VANDANA VIDYUT Ltd., Vandana Bhawan, MG Road, Raipur – 492 001, Chhattisgarh

61. Wardha Power Company Private Limited, Sony Apartment, 2nd Floor, 19, REbella Road, Bandra West, Mumbai – 400 050

62. CEO, Jinbhuvish Power Generation Pvt. Limited, 155- A, Mittal Tower, Nariman Point, Mumbai- 400 021

63. Managing Director, Godawari Power and Ispat Ltd., Plot No. 428/2, Phase I, Industrial Area, Distt. Raipur, Siltara – 493111 Chhattisgarh

64. Managing Director, Godawari Power and Ispat Ltd., Hira Arcade, 1st Floor, New Bus Stand, Pandri, Raipur – 492001 Chhattisgarh

KARNATAKA POWER CORPORATION LIMITED

Annexure-3

Revised Policy on Biomass co-firing

No. 11/86/2017-Th.II
Government of India
Ministry of Power
.....

Shram Shakti Bhawan, Rafi Marg,
New Delhi, dated the 8th October, 2021

To,

1. Principal Secretary/Secretary in charge of Energy/Power Departments, All States/UTs
2. Chairman, CEA
3. CMDs of all CGSs

Subject: Revised Policy for Biomass Utilisation for Power Generation through Co-firing in Coal based Power Plants

Sir/Madam,

The undersigned is directed to refer to this Ministry's "Policy for Biomass Utlisation for Power Generation through Co-firing in Pulverised Coal Fired Boilers" issued in November, 2017

2. In order to further promote use of biomass pellets in coal based thermal power plants, the above Policy is further modified. A copy of "Revised Policy for Biomass Utlisation for Power Generation through Co-firing in Coal based Power Plants" is enclosed for information and necessary action please.

Yours faithfully

Encls: As Above

Kumar Saurabh
Deputy Director(Thermal)
Ministry of Power

Copy to:
(i) PS to Hon'ble Minister,
(ii) PS to Hon'ble MoS for Power,
(iii) Sr. PPS to Secretary(Power),
(iv) PPS to AS(SKGR), PPS to AS&FA, PPS to AS(VKD)
(v) All Joint Secretaries/EA/Chief Engineer, Ministry of Power
(vi) Incharge, NIC, Ministry of Power - with a request to upload this document on the website of MoP.

REVISED POLICY OF MINISTRY OF POWER FOR BIOMASS UTILIZATION FOR POWER GENERATION THROUGH CO-FIRING IN COAL BASED POWER PLANTS

1. The current availability of biomass in India is estimated at about 750 million metric tonnes per year. The estimated surplus biomass availability is at about 230 million metric tonnes per annum covering agricultural residues.

2. Ministry of Power (MoP) vide its policy dated 17-11-2017 on biomass utilization for power generation had advised that all fluidized bed and pulverized coal units (coal based thermal power plants) except those having ball and tube mill, of power generation utilities, public or private, located in India, to use 5-10% blend of biomass pellets made, primarily, of agro residue along with coal after assessing the technical feasibility, viz. safety aspect etc.

3. In order to further promote use of biomass pellets in coal based thermal power plants, the above Policy is further modified. The modifications in the above Policy are as under:

(i). All coal based thermal power plants of power generation utilities with **bowl mill**, shall on annual basis mandatorily use 5 percent blend of biomass pellets made, primarily, of agro residue along with coal with effect from one year of the date of issue of this guideline. The obligation shall increase to 7 percent with effect from two years after the date of issue of this order and thereafter.

(ii). All coal based thermal power plants of power generation utilities with **ball & race mill**, shall on annual basis mandatorily use 5 % blend of biomass pellets (torrefied only) made, primarily, of agro residue along with coal. This is to be complied within one year starting from this order. Two years from the date of issue of this order and thereafter the obligation will increase to 7 percent.

(iii). All coal based thermal power plants of power generation utilities with **ball & tube mills**, shall on annual basis mandatorily use 5 % blend of torrefied biomass pellets with volatile content below 22%, primarily made of agro residue along with coal. This is to be complied within one year.

(iv). Generating Utilities having certain units under Reserve Shutdown or not being despatched due to MOD (Merit Order Despatch) consideration would ensure to increase the percentage of co-firing up to 10 % in their other operating units/ plants (5 % in plants having ball and tube mills).

(v). Any power plants seeking exemptions / relaxation from co-firing may be considered on case to case basis, based on recommendations of CEA. A Committee headed by Chief Engineer (TE&TD), CEA, including representatives from NTPC, BHEL, CPRI, Ministry of Agriculture and Mission

Directorate shall examine the request of power plants for their exemption/relaxation from mandatory co-firing of biomass, as mentioned at para (i) to (iv) above.

(vi). The policy for co-firing of biomass would be in force for 25 years or till the useful life of the thermal power plant whichever is earlier. The minimum percentage of biomass for co-firing will be reviewed from time to time.

(vii) The minimum contract period for procurement of biomass pellets by generating utilities shall be for 7 years so as to avoid delay in awarding contracts by generating companies every year and also to build up long term supply chain. There may be provision of firm price of biomass pellets for the first year of the contract and yearly rate variation from second year onwards where rates can vary as per terms and conditions of the contract. In order to enable its implementation, a model RfP and contract shall be issued by MOP by 15.11.2021 for adhering to by all generating utilities. However, the ongoing process of contracting for biomass co-firing by generating utilities shall not be affected till issue of Model Contract.

(viii). Provisions related to tariff determination and scheduling shall be as given below:

a. For projects set up under Section 62 of the Electricity Act 2003, the increase in cost due to co-firing of biomass pellets shall be pass through in Energy Charge Rate (ECR).
b. For projects set up under Section 63 of the Electricity Act 2003, the increase in ECR due to biomass co-firing can be claimed under Change in Law provisions.
c. Such additional impact on ECR shall not be considered in deciding Merit Order Despatch (MOD) of the power plant.
d. Obligated Entities such as Discoms can meet their Renewable Purchase Obligations (RPO) by buying such generation of co-firing.

*****

KARNATAKA POWER CORPORATION LIMITED

Annexure-4

Guideline for Exemption

(Computer No: 6050)

भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केंद्रीय विद्युत प्राधिकरण
Central Electricity Authority
तापीय अभियांत्रिकी एवं प्रौद्योगिकी विकास प्रभाग
Thermal Engineering & Technology Development Division

Subject: Guidelines / procedure for examining the request of the power plants for seeking exemption / relaxation from biomass co-firing - regd.

Ministry of Power vide letter (No. 11/86/2017-Th.II) dated 08.10.2021 issued the revised policy for biomass utilization for power generation through co-firing in coal based thermal power plants.

In pursuance to para 3(v) of the above policy, the guidelines / procedure for examining the request of the power plants for seeking exemption / relaxation from co-firing, duly approved by the Ministry of Power is attached herewith for information to all the coal based thermal power plants in the country.

Above guidelines/procedure also includes the format for furnishing the requisite information by the power plants seeking exemption / relaxation from biomass co-firing.

Encl: As above.

04/02/2022

Om Kant Shukla / (ओमकान्त शुक्ल)
Director (TE&TD) / निदेशक (टी.ई. एंड टी.डी.)

To,
All coal based Thermal Power Generating Plants / Utilities (Public or Private) in the Country

सेवा भवन ,आर.के .पुरम – 1, नई दिल्ली – 110066 टेलीफ़ोन: 011-26732977, ईमेल: cetetd-cea@gov.in, वेबसाइट: www.cea.nic.in
Sewa Bhawan, R.K Puram-I, New Delhi -110066, Telephone: 011-26732977, Email: cetetd-cea@gov.in, Website: www.cea.nic.in

Guidelines for exemption / relaxation from mandatory co-firing of Biomass by Thermal Power plants

I. Background

MoP vide its policy dated 17-11-2017 ("Policy") on biomass utilization for power generation had advised all fluidized bed and pulverized coal units (coal based thermal power plants) except those having ball and tube mill, of power generation utilities, public or private, located in India, to endeavor to use 5-10% blend of biomass pellets made, primarily, of agro residue along with coal after assessing the technical feasibility, viz. safety aspect etc. (**Copy of the "Policy" enclosed for reference**)

In order to further promote the use of biomass pellets in coal based thermal power plants, MoP modified the above policy vide its letter no. 11/86/2017-Th.II dated 8th October, 2021 (Copy of the "**Revised Policy**" enclosed for reference) where-in it was stated that coal fired thermal plants in India have to mandatorily co-fire the biomass with coal in their power plant. The "**Revised Policy"** would be in force for a period of 25 years or till the useful life of the power plant, whichever is earlier.

As per the **revised policy** following has been mandated:

1. All coal based thermal power plants of power generation utilities with **bowl mill**, shall on annual basis mandatorily use 5 percent blend of biomass pellets made, primarily, of agro residue along with coal with effect from one year of the date of issue of this guideline. The obligation shall increase to 7 percent with effect from two years after the date of issue of this order and thereafter.
2. All coal based thermal power plants of power generation utilities with **ball & race mill**, shall on annual basis mandatorily use 5% blend of biomass pellets (torrefied only) made, primarily, of agro residue along with coal with effect from one year of the date of issue of this guideline. This is to be complied within 1 year starting from this order. Two years from the date of issue of this order and thereafter the obligation will increase to 7 percent.
3. All coal based thermal power plants of power generation utilities with **ball & tube mills**, shall on annual basis mandatorily use 5% blend of torrefied biomass pellets with volatile content below 22%, primarily made of agro residue along with coal. This is to be complied within 1 year.

4. Generating utilities having certain units under Reserve shutdown or not being despatched due to MOD (Merit Order Despatch) consideration would ensure to increase the percentage of co-firing upto 10% in other operating units/ plants (5% in plants having ball and tube mills).

   Exemption/ relaxation from co-firing may be considered on case to case basis, based on recommendations of Central Electricity Authority (CEA). A Committee headed by Chief Engineer (TE&TD), CEA including representatives from NTPC, BHEL, CPRI, Ministry of Agriculture and Mission Directorate shall examine the request of power plants for their exemption/ relaxation from mandatory co-firing of biomass, as mentioned at Para 1, 2, 3 and 4 above.

II. Purpose of these guidelines

a. The purpose of these guidelines is to provide the TPPs a process including a format for furnish requisite information for seeking exemption from mandatory co-firing of biomass as per the revised policy of the MoP.

b. For the purpose of these Guidelines and also in regard to the implementation of the above MoP revised policy, the above committee has been referred as "CEA Exemption Committee for Biomass - CEA-ECB"

III. Steps for Filing of the application by Utility for exemption from co-firing of biomass and Examination of exemption request/ application by the CEA Exemption Committee for Biomass (CEA-ECB)

The exemption request/ application would follow the below mentioned process/stages:

1. Applications would be submitted in On-Line mode at Mission Directorate web portal*****. Mission Directorate would make provision for auto-generation and allotment of a unique application No. (Format – Region (NR/ER/WR/SR/NER)/State or UT Abbreviation (2 letters as per the attached list)/Sector (Central/State/Pvt/JV)/Short name of utility/YYYY/MM/DD/2 digit counter) to each of application so received. These applications shall be accessible to the Committee members as

well as the Sub-Groups of National Mission for their requisite scrutiny and inputs.

*__Note__: Till the time portal for National Mission on use of biomass in thermal power plants is finalized and operational, the applications for exemption shall be submitted through e-mail to National Biomass Mission<md-biomass-power@gov.in> and "TETD Division, CEA" <cetetd-cea@gov.in> along with the filled-in format (as enclosed at **Annexure-I**) with all necessary attachment as applicable. Thereafter, the applications shall be submitted as per procedure explained above.

2. All the applicants would necessarily submit the action taken (i.e. prior to date of submission of the exemption request/application) so far in respect of co-firing the biomass as per the advisory issued by CEA based on the MoP policy dated 17th November, 2017.
3. All the requisite information as per the Format (enclosed as **Annexure-I**) would be submitted along-with the application by the Utilities applying for exemption.
4. Necessary pre-checks for the completeness of the requisite information as per the above referred Format shall be carried out by the CEA-ECB and deficiencies in the information would be got rectified by the applicants seeking exemption in a time bound manner. Necessary inputs shall also be taken from the concerned Subgroups under the National Mission on use of Biomass in TPP (depending on the reasons submitted by the applicants while seeking exemption from co-firing) by CEA-ECB.
5. The CEA-ECB would examine the submissions of the applicants in a regular monthly meeting. Additional meetings of the committee can also be held, depending upon the requirements. The assessment/examination of the exemption requests would be based on the two step process:

   i. Document Level Verification (including the inputs of the above Sub-Group(s) of Mission Directorate);
   ii. Actual Physical Site visit, on case to case basis, to ascertain the factual position about the submissions of the Applicant.

   Outcomes of both the stages (i.e. (i) & (ii) above) would be considered by the CEA-ECB.
6. The exemption committee would send its recommendations for granting the exemption to MoP after completing the above

examination process. Representative of Mission Directorate in CEA-ECB would retain a copy of such recommendations for its necessary records.

IV. Timelines of the processing of the application

1. Zero date - date of receipt of the application as per procedure explained at Para III, Sub-Para-1 above
2. Within one (1) week from Zero date – Preliminary scrutiny by the Committee to look into the completeness of the application and seek additional inputs from the Utility (if required) to make it self sufficient. Necessary inputs shall be taken from the concerned Subgroups under the National Mission on use of Biomass in TPP (depending on the reasons submitted by the applicants while seeking exemption from co-firing) by the Committee.
3. Two (2) weeks from zero date or 1 week from the date when needed additional inputs (as per pt.2 above) are received by the CEA-ECB to meet and analyse the issues raised in the Utility's application and seek additional inputs/ supporting documents, from the applicant, if needed.
4. Upto 7th working day of the month - Committee to review the applications received during the preceding month (i.e. for those applications recd. till 7th working day of the preceding month) and convey the recommendations to MoP with regard to those applications on which the Committee is ready with its final recommendations.
5. Exemption / relaxation from mandatory co-firing of Biomass to a Thermal Power plants will be granted after the concurrence of Ministry of Power.

V. Criteria of Assessment of Exemption claims

A. General information
B. Useful economic life of plant
C. Technical feasibility study
D. Project management time lines
E. Technical constraints for enabling co-firing while ensuring safety of the plant
F. Sourcing & supply chain constraints
G. Possibilities of meeting the co-firing commitments as per alternate regulatory provisions
H. List of documents furnished in support of stated constraints

VI. Review of Guidelines

Current Guidelines as proposed above have been framed envisaging the current scenario and experience so far. However, as the situation evolves depending on the type of applications received, the Guidelines may be reviewed by the Committee, as and when required. Proposal for revision of the guidelines shall be forwarded to MoP for necessary approval.

*****

Annexure-I

Details to be submitted by Thermal Power Plants for seeking exemption / relaxation from mandatory co-firing of biomass

(All details/documents/drawings to be submitted by the Applicants would have clear legible fonts/drawings and in the PDF formats)

	Space where details are to be furnished by TPPs

S. No.	Description	Remarks by the committee on the Response from the station
(A)	General Information	
1	Name of Utility	
2	Sector (Central/State/Private)	
3	Region (NR/WR/ER/SR/NER)	
4	Name of the Plant	
5	Location (District, State)	
6	Capacity of Plant (No. Of units x Unit size)	
7	PLF & PAF for last two years	
8	Details of OEM for various equipment	
9	Name and Contact details (Mobile No., E-mail) of Nodal officer for necessary actions regarding biomass co-firing	
10	Name and Contact details of the Plant Head (Mobile No., E-mail)	
(B)	Criteria: Useful Economic Life of Plant	
1	Date of COD for each units	

2	Age of the Plant/Unit as on (date)		
3	Balance useful economic life (in years) of the units under consideration		
(C)	Criteria: Technical Feasibility Study		
1.a	Whether Techno-Economic Study is conducted or NOT for enabling co-firing of biomass along with coal in the thermal units? Tick the appropriate box	**Yes** **NO**	
1.b	If yes, attach the feasibility report. If no, date by when the Report on Feasibility Study will be furnished.		
2	Furnish details / Attach Recommendation of OEM, if any		
(D)	Criteria: Project management Time lines		
1	List and details of the major works including civil works with activity on critical path as per Detailed Feasibility Study.		
2	The period of shut down (if required) needed for enabling co-firing related works		
(E)	Criteria: Technical constraints for enabling co-firing while ensuring safety of the plant		
1	Mill type (as per the types mentioned in above MoP Policy) and configuration of mills		
2	Sizing limitations of Cold/Hot air ducting and/ or fans to ensure		

	parameters including mill inlet and outlet temperatures as per the SOP circulated by Mission directorate. (Refer to the SOP circulated by Mission directorate for biomass co-firing)	
3	Volatile matter in the biomass pellets being used / proposed.	
4	Space/ Layout /Design constraints/ spatial fouling faced / envisaged in carrying out the necessary modification works identified in the feasibility study, which were got conducted as **at (C) above**. This may include constraints like fouling with existing facilities like pipelines/ foundations/ cabling/ etc.,	
5	Any other technical constraints specific to the power plant for claiming relaxation (Details and Document proof to be attached)	
6	Incomplete or non-availability of the design details of existing facilities and lack of availability of the complete details of the existing underground facilities (Type, size and layout etc.), if any.	
(F)	Criteria: Sourcing of biomass pellets as per specifications circulated by CEA & Supply chain constraints	

1	Sourcing Constraints, if any, of biomass pellets as per specifications circulated by CEA	
2	Quantity / Supply constraints, if any? (*List out constraints and relevant details of the tendering process, biomass supplier, shortfall quantum etc)*	
	i. Whether the quantity of biomass pellets (Torrefied / Non-torrefied as per suitability of the plant) which has been offered by all the participating biomass suppliers in the open tender called for the same by the Utility, is less than the prescribed quantity for the Power Plant. ii. Whether, after the award of contract to supply biomass pellets, the vendor is not supplying Biomass pellet to the power plant due to reasons beyond the control of Power generator. iii. Whether the Power generator has taken adequate measure for arranging the shortfall quantity as per terms and condition of the contract, in case of eventuality as at (i) and/or (ii) above. iv. Any other constraints in sourcing biomass pellets specific to the power plant for claiming relaxation (Document proof to be attached)	
(G)	Criteria: Possibilities of meeting the co-firing commitments by any other means as per the extant Policy	

(H)	List of documents needed in support of constraint as applicable (to be attached) 1. Layout diagram of constraint area, 2. Ducting arrangement and size, 3. Mill design details, 4. Fan (PA, ID, FD) design details, 5. FGD details, as applicable, 6. ESP and/or fabric filter details, 7. Any other document in support of the constraint	

*****

No. 11/86/2017-Th.II
Government of India
Ministry of Power
.....

Shram Shakti Bhawan, Rafi Marg,
New Delhi, dated the 8th October, 2021

To,

1. Principal Secretary/Secretary in charge of Energy/Power Departments, All States/UTs
2. Chairman, CEA
3. CMDs of all CGSs

Subject: Revised Policy for Biomass Utilisation for Power Generation through Co-firing in Coal based Power Plants

Sir/Madam,

The undersigned is directed to refer to this Ministry's "Policy for Biomass Utlisation for Power Generation through Co-firing in Pulverised Coal Fired Boilers" issued in November, 2017

2. In order to further promote use of biomass pellets in coal based thermal power plants, the above Policy is further modified. A copy of "Revised Policy for Biomass Utlisation for Power Generation through Co-firing in Coal based Power Plants" is enclosed for information and necessary action please.

Yours faithfully

Encls: As Above

Kumar Saurabh
Deputy Director(Thermal)
Ministry of Power

Copy to:
(i) PS to Hon'ble Minister,
(ii) PS to Hon'ble MoS for Power,
(iii) Sr. PPS to Secretary(Power),
(iv) PPS to AS(SKGR), PPS to AS&FA, PPS to AS(VKD)
(v) All Joint Secretaries/EA/Chief Engineer, Ministry of Power
(vi) Incharge, NIC, Ministry of Power - with a request to upload this document on the website of MoP.

REVISED POLICY OF MINISTRY OF POWER FOR BIOMASS UTILIZATION FOR POWER GENERATION THROUGH CO-FIRING IN COAL BASED POWER PLANTS

1. The current availability of biomass in India is estimated at about 750 million metric tonnes per year. The estimated surplus biomass availability is at about 230 million metric tonnes per annum covering agricultural residues.

2. Ministry of Power (MoP) vide its policy dated 17-11-2017 on biomass utilization for power generation had advised that all fluidized bed and pulverized coal units (coal based thermal power plants) except those having ball and tube mill, of power generation utilities, public or private, located in India, to use 5-10% blend of biomass pellets made, primarily, of agro residue along with coal after assessing the technical feasibility, viz. safety aspect etc.

3. In order to further promote use of biomass pellets in coal based thermal power plants, the above Policy is further modified. The modifications in the above Policy are as under:

(i). All coal based thermal power plants of power generation utilities with **bowl mill**, shall on annual basis mandatorily use 5 percent blend of biomass pellets made, primarily, of agro residue along with coal with effect from one year of the date of issue of this guideline. The obligation shall increase to 7 percent with effect from two years after the date of issue of this order and thereafter.

(ii). All coal based thermal power plants of power generation utilities with **ball & race mill**, shall on annual basis mandatorily use 5 % blend of biomass pellets (torrefied only) made, primarily, of agro residue along with coal. This is to be complied within one year starting from this order. Two years from the date of issue of this order and thereafter the obligation will increase to 7 percent.

(iii). All coal based thermal power plants of power generation utilities with **ball & tube mills**, shall on annual basis mandatorily use 5 % blend of torrefied biomass pellets with volatile content below 22%, primarily made of agro residue along with coal. This is to be complied within one year.

(iv). Generating Utilities having certain units under Reserve Shutdown or not being despatched due to MOD (Merit Order Despatch) consideration would ensure to increase the percentage of co-firing up to 10 % in their other operating units/ plants (5 % in plants having ball and tube mills).

(v). Any power plants seeking exemptions / relaxation from co-firing may be considered on case to case basis, based on recommendations of CEA. A Committee headed by Chief Engineer (TE&TD), CEA, including representatives from NTPC, BHEL, CPRI, Ministry of Agriculture and Mission

Directorate shall examine the request of power plants for their exemption/relaxation from mandatory co-firing of biomass, as mentioned at para (i) to (iv) above.

(vi). The policy for co-firing of biomass would be in force for 25 years or till the useful life of the thermal power plant whichever is earlier. The minimum percentage of biomass for co-firing will be reviewed from time to time.

(vii) The minimum contract period for procurement of biomass pellets by generating utilities shall be for 7 years so as to avoid delay in awarding contracts by generating companies every year and also to build up long term supply chain. There may be provision of firm price of biomass pellets for the first year of the contract and yearly rate variation from second year onwards where rates can vary as per terms and conditions of the contract. In order to enable its implementation, a model RfP and contract shall be issued by MOP by 15.11.2021 for adhering to by all generating utilities. However, the ongoing process of contracting for biomass co-firing by generating utilities shall not be affected till issue of Model Contract.

(viii). Provisions related to tariff determination and scheduling shall be as given below:

a. For projects set up under Section 62 of the Electricity Act 2003, the increase in cost due to co-firing of biomass pellets shall be pass through in Energy Charge Rate (ECR).
b. For projects set up under Section 63 of the Electricity Act 2003, the increase in ECR due to biomass co-firing can be claimed under Change in Law provisions.
c. Such additional impact on ECR shall not be considered in deciding Merit Order Despatch (MOD) of the power plant.
d. Obligated Entities such as Discoms can meet their Renewable Purchase Obligations (RPO) by buying such generation of co-firing.

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F.No. 11/86/2017-Th.II
Ministry of Power
Government of India
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Shram Shakti Bhawan, Rafi Marg,
New Delhi-110001
Dated: 17th November, 2017

To

The Chairman,
Central Electricity Authority,
Sewa Bhawan,
R.K.Puram,
New Delhi

Sir,

Stubble burning has been cited as a major cause of recent smog in north-west India. Stubble burning is deliberate setting fire of the straw stubble that remains after harvesting of paddy and other crops. During the months of October and November of each year, farmers in north-west India burn an estimated 30-40 million tonnes of crop waste from their paddy fields after harvesting.

2. Biomass co-firing in coal based power plants

The estimated 30-40 million metric tonnes of paddy straw that remains un-utilised and burnt in north-west India has potential to generate about 6000-8000 MW and 45000 million units of electricity annually, by co-firing it along with coal in existing coal fired power plants. Biomass co-firing has a potential to create a market for large scale consumption of agro residue and convert it into electricity in eco-friendly and cost effective manner while mitigating problem of air quality deterioration and generate additional income to farmers.

2.1 The existing power plant infrastructure cannot directly use raw agro residue bio-mass in a pulverised coal fired type boiler and it is required to be processed into dense bio-mass in the form of pellets.

2.2 Biomass co-firing is a well proven technology. With increasing environmental awareness, power plants all over the world has adopted, biomass co-firing as a strategy to combat pollution. UNFCC recognizes biomass co-firing as a carbon neutral technology for mitigation of carbon emission from coal based power plants.

3. Status of Biomass co-firing in India

NTPC has successfully demonstrated the co-firing of 7% blend of biomass pellets with coal in its Dadri power plant. This can be replicated in other coal fired power plants having bowl mills/vertical roller mills/beater mills.

Contd. 2/-

4. Benefits of using biomass pellets co-firing in coal based power plants

a) Eliminate/minimize burning of agro-residue and create economic value of agro residue by promoting its use as fuel in power plants in co-firing mode.

b) Improve the air quality index while creating additional income for farmers.

c) Encourage the establishment of decentralised pellets manufacturing units and generate employment opportunities.

5. Biomass Utilisation for Power Generation through Co-firing in Coal based Power Plants.

Therefore, in order to promote use of the bio-mass pellets, it has been decided, with the approval of competent authority, to advise all the power plants/utilities as follows:

a) All fluidised bed and pulverised coal units(coal based thermal power plants) except those having ball and tube mill, of power generation utilities, public or private, located in India, shall endeavour to use 5-10% blend of biomass pellets made, primarily, of agro residue along with coal after assessing the technical feasibility, viz. safety aspects etc.

b) CEA shall develop/issue specifications for the pellets. CEA will also provide technical assistance/advise to Utilities on how to use bio-mass pellets for blending with coal in coal based thermal power plants.

c) The Appropriate Commission will determine the compensation (for plants other than those whose Tariff has been already determined under section 62 of Electricity Act) to be allowed in tariff for increase in cost of generation on account of using bio-mass pallets, viz., cost of pellets, increase in auxiliary power consumption (APC) and plant heat rate (HR) etc. Increase in cost of generation will not be taken into account for the purpose of merit order for despatch of electricity. Further, Appropriate Commission shall devise a suitable mechanism to ensure the use of biomass as per (a) above.

6. CEA is requested to issue the enclosed "Policy for Biomass Utilisation for Power Generation through Co-firing in Pulverised Coal Fired Boilers" to all the Power plants/Utilities, State Governments, Power equipment manufacturers and other stake holders. The Policy may be placed on CEA website.

Yours faithfully,

17/11/2017

(S.K. Kassi)
Director (Thermal)

Biomass Utilisation for Power Generation through Co-firing in Coal Based Power Plants

1. Introduction

Stubble burning has been cited as a major cause of recent smog in north-west India. Stubble burning is deliberate setting fire of the straw stubble that remains after harvesting of paddy and other crops. During the months of October and November of each year, farmers in north-west India burn an estimated 30-40 million tonnes of crop waste from their paddy fields after harvesting. The primary reasons for stubble burning are; (a) reduce the cost of clearing the field for next crop, (b) reduce the turnaround time between harvesting and sowing for next (winter) crop and (c) lack of other alternatives, viz. availability of appropriate agricultural implements, viz., implements to take out the stubble and "Happy Seeders" for zero tilling sowing etc.

1.1. Various options for safely disposing such bio-mass are (i) setting up power plants exclusively based on bio-mass, (ii) co-firing of pellets made out of bio-mass in the coal based thermal plants, (iii) *in-situ* in-corporation of bio-mass into the soil using appropriate agricultural implements or composting and (iv) manufacturing of various products such as Ethanol, Bio CNG and Board etc.

2. Biomass co-firing in coal based power plants

The estimated 30-40 million metric tonnes of paddy straw that remains un-utilised and burnt in north-west India has potential to generate about 6000-8000 MW and 45000 million units of electricity annually, by co-firing it along with coal in existing coal fired power plants. Biomass co-firing has a potential to create a market for large scale consumption of agro residue and convert it into electricity in eco-friendly and cost effective manner while mitigating problem of air quality deterioration. Market mechanism for agro residue utilisation will also enable additional income to farmers.

2.1 The existing power plant infrastructure cannot directly use raw agro residue bio-mass in a pulverised coal fired type boiler and it is required to be processed into dense bio-mass in the form of pellets. The densification of biomass in the form of pellets also reduces its transportation cost, which is a major component in overall fuel price. Promoting agro-residue processing capacity into pellets for power sector shall also create employment opportunities and develop entrepreneurship.

2.2 Biomass co-firing is a well proven technology. With increasing environmental awareness, power plants all over the world has adopted, biomass co-firing as a strategy to combat pollution. According to open source data, 230 plants across globe, majority located in European and American countries, have experience of biomass co-firing. UNFCC recognizes biomass co-firing as a carbon neutral technology for mitigation of carbon emission from coal based power plants.

3. Status of Biomass co-firing in India

NTPC has successfully demonstrated the co-firing of 7% blend of biomass pellets with coal in its Dadri power plant. This can be replicated in other coal fired power plants too. The blend of coal and pellets can safely be pulverized in power plants having bowl mills/vertical roller mills/beater mills. However, this method is not suitable for power plant having ball and tube type of mills due to higher risk of fire hazard. Approximately, 2.5 to 3.0 lakh tonnes of Biomass pellets are required for 7% blending in a thermal power plant of 1000MW capacity.

4. Benefits of using biomass pellets co-firing in Coal based power plants

a) Eliminate/minimize burning of agro-residue and create economic value of agro residue by promoting its use as fuel in power plants in co-firing mode.
b) Improve the air quality index while creating additional income for farmers.
c) Encourage the establishment of decentralised pellets manufacturing units and generate employment opportunities.

5. Biomass Utilisation for Power Generation through Co-firing in Coal based power plants.

Therefore, in order to promote use of the bio-mass pellets, all the Power plants/Utilities are hereby advised as follows:

a) All fluidised bed and pulverised coal units(coal based thermal power plants) except those having ball and tube mill, of power generation utilities, public or private, located in India, shall endeavour to use 5-10% blend of biomass pellets made, primarily, of agro residue along with coal after assessing the technical feasibility, viz. safety aspects etc.
b) CEA shall develop/issue Specifications for the pellets. CEA will also provide technical assistance/advise to Utilities on how to use bio-mass pellets for blending with coal in coal based thermal power plants.
c) The Appropriate Commission will determine the compensation (for plants other than those whose Tariff has been already determined under section 62 of Electricity Act) to be allowed in tariff for increase in cost of generation on account of using bio-mass pallets, viz., cost of pellets, increase in auxiliary power consumption (APC) and plant heat rate (HR) etc. Increase in cost of generation will not be taken into account for the purpose of merit order for despatch of electricity. The Appropriate Commission shall devise a suitable mechanism to ensure the use of biomass as per (a) above.

KARNATAKA POWER CORPORATION LIMITED

Annexure-5

Standard Operating Procedure

National Mission on use of Biomass in Thermal Power Plants

Standard Operating Procedure

for

Biomass co-firing in FBC Boilers

Standard Operating Procedure for Biomass co-firing in FBC Boilers

INDEX

1.0 Introduction

Biomass is an important energy source. Biomass is any organic matter—wood, crops, seaweed, stubble, animal wastes—that can be used as an energy source. Biomass is probably our oldest source of energy after the sun. For thousands of years, people have burned wood to heat their homes and cook their food. Biomass gets its energy from the sun. All organic matter contains stored energy from the sun. Biomass is a renewable energy source as it can replenish in a relatively shorter time. Stubble is the straw-type material that remains after grains, like paddy, wheat, etc., have been harvested. Stubble burning is intentionally setting fire to the straw stubble to clear agricultural residue that is left on the land, to make it ready for the next round of seeding. Stubble burning in fields emits a large amount of ash/soot/ unburnt carbon to the atmosphere which is the real cause of air pollution and elevates the PM 2.5 and PM 10 level in the atmosphere. It is learned that farmers burn stubble as they find it the cheapest, quickest and easiest means to prepare the land for the next crop because of the short time available. Stubble burning in fields also reduces soil fertility by killing the critical bacterial and fungal populations.

But this stubble is a good biomass resource that has the potential to create efficient biomass-to-energy chains. Torrefaction of biomass stubble, combined with densification (Pelletisation or briquetting), is a promising step towards overcoming the logistical challenges in developing large-scale sustainable energy solutions, by making it easier to transport and store. Pellets or briquettes have higher density, contain less moisture, and are more stable in storage than the biomass they are derived from.

When agro residue-based fuel, in the form of pellets, is utilized in coal-fired power plants, it burns completely in the power plant, and ash emitted from its combustion gets absorbed in Electro Static Precipitator (ESP) which prevents air pollution while generating power from it.

The majority of power plants are running on coal. To reduce greenhouse gas emissions from its coal-based power plants, the Power plant intends to utilize agro residue-based pellets/torrefied pellets along with coal for power generation through biomass co-firing which is a technology recognized by UNFCCC to mitigate carbon emission. It is worth mentioning that the equivalent amount of CO2 (carbon-di-oxide) emitted from the combustion of agro residue-based pellets/ torrefied pellets in a power plant gets absorbed in the next crop cycle by photosynthesis. CO2 emission from agro residue-based pellets combustion does not increase CO2 concentration in the atmosphere and thus it is also termed as carbon neutral fuel which is a renewable source of energy. Further, CO2 emission from diesel and electricity consumption for agro residue collection, processing and transportation is quite negligible as compared to saving in CO2 emissions from its utilization in large coal-fired power plants having higher efficiency which makes biomass co-firing a greener alternative.

In addition to reducing carbon emission from the coal-based power plant, the utilization of agro residue-based pellets/ torrefied pellets in the power plant will also reduce air pollution due to the burning of stubble (i.e. paddy straw and other agro residues) in the

fields by farmers. Emissions of sulfur and mercury are reduced by the co-firing percentage.

Ministry of Power on 17.11.2017 had issued a policy regarding Biomass utilization for power generation through co-firing in coal-based power plants. This was followed by an advisory dated 24.11.2017 from CEA to all the TPPs to utilize Biomass pellets in coal-based TPPs to the extent of 5-10%. Keeping the above in mind, the National Mission on use of Biomass in TPPs has been constituted by the Ministry of Power in July 2021.

This Standard Operating Procedure for Biomass co-firing in FBC Boilers has been prepared and issued under the Mission for use by all the TPPs in Central Sector, State Sector, and Independent Power Producers.

Further, Ministry of Power vide letter no.11/86/2017-Th.II dtd 7th April 2022 has clarified that the "Revised policy for Biomass Utilization for power generation through Co-firing in coal based power plant " dated 08.10.2021 is also applicable to Bubbling Fluidized Bed Combustion (BFBC) and Circulating Fludized Bed Combustion (CFBC) Boilers. This Standard Operating Procedure is being issued for use by all FBC boiler based TPPs.

2.0 Superseded Documents

Nil

3.0 Scope

This SOP shall apply to all FBC boiler based stations in operation.

4.0 Types and Properties of biomass:

There are three types of pellets:

a. Non-torrefied biomass pellets
b. Torrefied biomass pellets
c. Briquetted Biomass

4.1 Non-Torrefied biomass pellets are pellets made from agro based residue without torrefaction. The main disadvantage with these pellets is that they are hygroscopic in nature and absorbs moisture readily.

The typical properties of non-torrefied pellets are as follows:

1. Carbon Content: 10-20 %
2. Volatile Matter: 60-66%
3. Moisture: 9-14%
4. Density: 700 kg/m3
5. Ash content: approx. 20%
6. GCV: 3400-4000 Kcal/kg

These properties are indicative in nature; however, the properties of pellets should be taken from torrefied pellets procurement terms and conditions.

The main constraints with these pellets are

1. Release of volatiles at lower temperature than coal at around 240 ^{O} Celsius
2. Moisture affinity: Very high

To overcome these constraints, the torrefaction process will greatly help.

4.2 Torrefied biomass pellets:

Torrefaction is a thermal process to convert biomass into a coal-like material, which has better fuel characteristics than the original biomass. Torrefied biomass is more brittle, making grinding easier and less energy-intensive. Compared to fresh biomass, storage of the torrefied material can be substantially simplified since biological degradation and water uptake are minimized. Torrefaction involves the heating of biomass in the absence of oxygen to a temperature of typically 200 to 400°C. The structure of the biomass changes in such a way, that the material becomes brittle and more hydrophobic. Although the weight loss is about 30%, the energy loss is only 10%. The main product is solid, torrefied biomass. During the torrefaction process combustible gas is released, which is utilized to provide heat to the process.

4.3 Briquetted Biomass:

The briquettes are generally bigger in size than pellets, the typical briquette size is 75 mm or higher.

In CFBC boilers, biomass briquettes shall be used with adequate precaution in crusher system, feeding system to maintain desired size range recommended by OEM.

For CFBC Boilers, feeding these bigger particles into furnace directly may be carried out in consultation with OEM. Alternatively, these bigger size particles can be crushed to the desired size range along with primary fuel. Hence, adequate precautions are to be taken while crushing briquettes as biomass fuel is fibrous in nature.

For **BFBC** boilers, briquettes are not suitable for feeding along with primary fuel (under the bed). Feeding over the bed is suggested by providing a separate bunker & feeding system as per the recommendation of OEM.

Table: Comparison of biomass pellets and briquettes

Biomass Pellets	Biomass Briquettes
During pelletisation process, the raw biomass fuel are chopped into finer size (1 to 6 mm).	During briquetting process, the raw biomass fuel is not processed to the finer size.
The size of pellet is typically less than 20 mm diameter and up to 150 mm length	The size of briquettes are more than 75 mm and varied length
Easier to use in crusher and range of particle size after crusher fall into the desired size ranges of CFBC/BFBC boiler	Difficult to crush to the desired size in the crusher due to fibrous nature (less brittle). Adequate precautions to be taken while using in CFBC boilers and it is not recommended for BFBC boilers

5.0 Handling, storage and blending of Biomass:

a. The following steps are involved in handling
   i. Receipt
   ii. Unloading
   iii. storage
   iv. Feeding to Bunkers

b. Receipt and unloading:
   i. The truck containing Biomass pellets / briquettes enters plant premises
   ii. The vendor test report accompanied the lot shall be checked.
   iii. Sample collection and result at station end by chemistry group.
   iv. Necessary arrangements for safe sample collection like platforms etc., are to be ensured at the site.
   v. Acceptance of the lot based on the result given by the chemistry group
   vi. After acceptance, the truck shall be weighed.
   vii. After weighment truck to be unloaded at designated unloading point.
   viii. Truck unloading mechanism: truck unloader should be available at the site if more quantity of pellets is used for blending.
   ix. The empty truck shall be weighed.
   x. After weighment empty truck to be released from plant premises.

c. Storage:
   i. Area for Biomass storage needs to be identified by the site. This area should have firefighting facilities.

ii. The volatile matter in biomass is very high and can easily catch fire. Hence continuous monitoring of the area needs to be done.

iii. The Biomass storage area should be different from the coal stockyard.

iv. Facilities should be developed to transport the biomass from the storage area to the blending area.

v. The maximum percentage of blending allowed is only 5% to 10% (blending by heat value) depending on plant operating conditions and combustion and other operational issues.

vi. The bunkers in which blended coal with biomass pellets need to be identified along with the operation group and all necessary interlocks to be ensured before dumping coal in bunkers.

vii. Avoid giving Hot work permits on/near biomass feeding path

viii. Don't spray water / dry Fog / plain water fogging system on the biomass and its bunker feeding path. The biomass pellets are hygroscopic in nature. After absorbing water or moisture, the pellets lose their shape and converts to powdery form, so water cannot be used. However, the system for dust suppression like dry fog/plain water and spray water should be available and for use in case of emergency.

ix. Don't compact the pellets.

d. Bunkering and blending

i. The bending ratio needs to be maintained at 5 to 10 % only (Blending by heat value).

ii. Site-specific Bunkering methodology is to be formulated by considering the following points

1. Point of blending
2. Methodology of feeding pellets
3. TP or chute where blending shall be done.
4. Control methodology for blending like using belt weigh scales etc.,
5. No of bunkers to be used for pellets blending
6. Level to be maintained in bunkers in which pellets are bunkered

iii. The pellets do not require crushing; hence blending is to be done after crusher output. Briquettes need to be blended before the crusher. Depending upon the type / size of bio mass particles, feeding of biomass briquettes into furnace (over bed feeding) directly may also be carried out in consultation with OEM

iv. Feeding to be done only along with the coal, as the biomass pellets are highly inflammable as volatiles release at lower temperatures due to high

VM content. Hence conveyor interlock is to be modified so that pellets go only when coal is in the conveyor, and not otherwise.

v. Conveyor streams and chutes used for pellet firing must be thoroughly emptied after feed operations. Left-over pellet blends in conveyors and chutes must be emptied to minimize fire hazards.

e. Safety

During receiving and internal operations, special precautions should be taken so that ignition and explosion can be avoided.

Considering all the above factors, the site should develop an SOP to be followed right from receipt to bunkering and blending with thrust on site specific systems and procedures.

6.0 Monitoring of chemistry parameters:

Biomass Pellets / Briquettes:

a. Sample collection:

i. Done from every truck arriving at the station.

ii. Sample collection is done from truck-top. The top 25 cm is removed and then randomly samples are collected from 4-5 spots and should be kept in air tight bags.

b. Sample Preparation:

i. The collected sample is brought immediately to the Chemistry lab premises and all portions collected are thoroughly mixed followed by coning-quartering until the sample quantity reduces to approximately 3 kg.

ii. This 3 kg sample is divided into 3 equal parts - one part for power plant Owner, one part for the seller, third part for referee purpose.

c. The Power Plant Owner part of the sample is to be made homogeneous powder by mortar and pestle method. Moisture, ash and, GCV determination are done with this sample.

d. If moisture value (ARB*) exceeds Specified %, the consignment shall be rejected.

e. GCV value (ARB*) is less than Specified kcal/kg, the vendor is cautioned against any such deviation in subsequent lots. In case of repeated/frequent deviations in GCV or other technical parameters, a warning letter is issued to the supplier by EIC and the contract may also be canceled if the supplier continues with the practice.

ARB: As-Received Basis.

7.0 Impact of biomass co-firing on combustion:

a. The process of biomass combustion may be associated with certain risks that do not occur during the combustion of coal. These include fuel pre-processing (fire-explosion risk), combustion e.g. including excessive bed agglomeration, slagging and ashing, and chlorine corrosion. Therefore, knowledge of the physicochemical properties of plant biomass helps to determine its potential application in heat or electricity production. The knowledge of these parameters allows proper selection of the amount of combusted biomass to ensure its minimal impact on the boiler system or the use of preventive measures minimizing the negative impact on biomass combustion.

b. The content of Oxygen in biomass is very high compared to coal.

c. The substantial proportion of volatile matter in the biomass fuel can be a positive factor in the improvement of ignition and flame stability. However, volatile matter enhances the fire explosion risk in the pre-processing system.

d. Biomass pellets may have a very low content of Sulphur and nitrogen compared to coal which makes them environmentally friendly by reduced SOX levels.

e. Burning biomass fuels or biomass-coal mixtures containing low Sulphur content is valuable for major reduction of SOx/SO2 emissions but might negatively influence the ash deposition behavior, in particular Chloride's deposition. It has been generally accepted that the occurrence of Sulphur can alleviate corrosion problems associated with chloride deposits via the following sulphation mechanism

f. An important consideration in the use of biofuels in the power plant arises due to higher alkaline content in biomass w.r.t. coal. In particular, during the combustion process, biomass ash has a high tendency for slagging and fouling due to its low melting temperature caused by presence of alkalis. Ca and Mg compounds usually increase the ash melting temperature, while K and Na reduce it. In combination with potassium, silicon can induce the formation of low-melting silicates in volatile ash particles that may deposit on the walls of furnaces or heated surfaces.

g. Another effect of biomass co-firing with coal is the emission of vapours of potassium compounds and subsequent condensation on the surface of ash particles and boiler pipes. For example, sodium and potassium may react with SO_2 or SO_3 in the gas to form alkali sulphates, K_2SO_4 and Na_2SO_4, which can condense and deposit on surrounding surfaces. The affected surface acquires a characteristic thin, dense, and reflective deposit layer and may accelerate fouling & corrosion phenomenon found in boilers.

h. Estimating the amount of water-soluble alkalis can give us an approximation of amount of alkalis present that can be readily volatilized. This would give us an understanding of the scale of impact of the above effects of co-firing biomass.

i. Increased levels of potassium & chlorine compounds in biomass are a highly unfavorable phenomenon due to the process of slagging, ashing and corrosion. However, the effect of other elements such as Calcium is relatively benign or neutral.

j. In biomass, elements such as chlorine and potassium are mostly present as water-soluble inorganic salts, and primarily as chloride, nitrates, and oxides, etc. which can be easily volatilized during the combustion, resulting in high mobility for alkali materials and, consequently, may pose a pollution hazard.

All the stations should get the biomass pellets/briquettes ultimate analysis done and get the consultation of OEM regarding co-firing proportion before the start of the biomass pellets/briquettes co-firing and understand the impact on the combustion based on the ultimate analysis. Ash elemental analysis is also to be done during the initial days of firing in the boiler and furnace temperature measurement is to be done frequently during the initial days of biomass co-firing. The Boiler is to be monitored for the ash build-up and slagging during the biomass co-firing. Combustion has to be monitored closely while biomass co-firing takes place.

8.0 Unit Operational issues while handling Biomass:

a. In view of detrimental effects of alkali (present in the biomass) on the refractory, suitability / usability of existing refractory while co-firing of biomass with primary fuels shall be checked with OEM.

b. Replacement provision of appropriate quantity of Bed material (alkali free) to avoid agglomeration issues during biomass co-firing is recommended.

c. Monitoring of Halides content (Cl, F) in biomass to be ensured in addition to Alkali content to enable trouble free operation.

d. Fuel Feeding capacity when mixing biomass pellets with coal after crusher should be checked with OEM due to lower bulk density of biomass than coal.

e. Increased Flue gas volume at higher proportion (more than 10% by weight) of biomass co-firing to be checked for any draft side limitation (ID Fan & Motor). However, it depends on the fuel characteristics.

f. Ash particle size distribution (PSD) to be checked after ESP while biomass co-firing, if there is a significant deviation in PSD from 100% coal, it may be discussed with OEM.

9.0 Actions to be taken in bunker/ feeder system having a fire during Biomass firing:

a. Call the fire personnel in the plant for immediate assistance.

b. Site-specific SOP to be prepared for handling bunker/feeder fires in stations

c. Do not get in contact with any part of the bunker/feeder (observe components for any inspection until the temperature comes down to normal value)

10.0 Combustion issues in Biomass firing

a. Clinkering and slagging tendency to be observed by any rise in SH zone FG temperatures. Frequency of Soot blowing and LRSB to be determined accordingly.

b. Flue gas temperature profile change, increased unburnt, changes in Spray and metal temperature to be monitored, and any abnormality to be discussed with OEM.

c. Elemental analysis of biomass for each sample/lot to be done to keep a check on the chlorine and alkali content which have high slagging and fouling tendencies.

11.0 Impact of ash and usage in the cement industry

If fly ash from a plant is currently being sold to the market, that impact needs to be studied during co-firing.

12.0 Safety aspects of Biomass firing:

a. Pellets have got very high amount of volatile matter

b. The storage area must be predefined and proper barricading is to be ensured. No cutting and welding works should be carried out near that area. The area should be clearly demarcated a “No Smoking Area”.

c. Conveyor firefighting system should always be healthy as the fuel is highly inflammable; hence all protection needs to be healthy.

d. The storage areas should have proper firefighting provisions like hydrants and water monitors.

e. MSDS for these pellets are to be displayed near the storage area

13.0 Infrastructural requirements of biomass handling

a. Truck tippler – 60 tons two nos.

b. Closed shed (from sides also) covering feeding Area as well as Storage space as the fuel is highly susceptible to atmospheric moisture if left in open for a reasonable amount of time. The Shed should cover the feeding point and the storage yard and should allow the movement of dozing equipment like pay-loader or bob-cat. The site team shall decide the dimensions / size and location of the shed. The shed should be provided with flameproof lighting

c. Long storage of biomass pellets/briquettes are to be avoided as it may undergo biological degradation and even it may rot in presence of wet conditions.

d. Weighbridges calibrated for weighing of the trucks

e. Belt weighing scales for proper blending

f. Pay-loader or more preferably by Skid Steer Loaders for feeding and for achieving finer control over the feed rate.

g. Safe Working Platform for collecting a sample from the truck.

h. Methane, CO, Multi-gas detectors at the storage location

i. CCTVs for monitoring at different points like unloading Points, Blend points, Feed points, and conveying path.

14.0 Site-specific SOP's to be prepared against this Model SOP

a. SOP for unloading, storage and bunkering, and blending for use in CHP with all precautions to be taken.

b. SOP for main plant operation activities from bunker/feeder to ESP including parameters to be monitored, Emergency instructions and logic modification, etc., is to be done.

c. SOP for chemistry for sample preparation to analysis.

15.0 Further actions required:

a. Proximate and Ultimate analysis of biomass pellets to be done.

b. Ash elemental analysis after biomass firing and ash fusion temperature monitoring.

c. Impact of biomass on the quality of ash as required for cement industries.

d. Effect of pellet-ash on the performance of wet/dry ash handling system to be checked periodically by stations. (like scaling inside pipes, hoppers, sumps, silos, etc. and evacuation & flowability of dry ash from hoppers)

e. All parameters impacting heat rate shall be recorded and Heat rate before the start of biomass co-firing and during biomass co-firing should be recorded to analyse its commercial impact.

16.0 Combustion and clinkering issues

An important element in the use of biofuels in the power industry, in particular in the combustion process, is their adverse effect on the agglomeration, slagging and fouling processes.

17.0 Review

The Head of the respective TPP, will be responsible for reviewing this SOP on yearly basis or as necessary.

SCHEDULES

SCHEDULE-F1

PRICE SCHEDULE

"Consultancy services for implementation of Bio-mass co-firing at Raichur Thermal Power Station (RTPS) – 7X210 MW, 1X250MW, Bellary Thermal Power Station (BTPS) – 2X500MW, 1X700MW and Yeramarus Thermal Power Station (YTPS) – 2X800MW"

Sl.No	Description	Price in Rs. including GST @18%			Total Price including GST
		RTPS	BTPS	YTPS	
1.0	Techno-commercial Feasibility Study				
2.0	Preparation of tender document including Technical specification				
3.0	Lumpsum Price For Others, if any				
Grand Total (1.0+2.0+3.0)					

Note

1. Bidder to indicate Others, if any, in Sl.No.3.0
2. The bidder shall quote the Lumpsum price (inclusive of all taxes) in e-portal for the scope of the work indicated in the description.
3. Bid evaluation shall be based on the total Lumpsum price quoted by the bidder in e-portal. The rates quoted by the bidder shall be firm and shall include all GST, taxes & duties, PF, local conveyance, accommodation and any other incidental charges.
4. Bidder shall furnish price breakup for quoted lumpsum price in the closed envelope as per above format on or before opening of financial bid for the tender.

SIGNATURE…….

SEAL OF THE COMPANY

NAME…….

DESIGNATION……

SCHEDULE-F2

SCHEDULE OF MILESTONES

(Bidder to fill-in and submit along with Bid)

SL.No	Work Description	Months from LOA Date	
		Start	Finish
1	Preparation of feasibility reports		
2	Preparation of technical specification		
3	Preparation of tender document		

Note:

1. Time Schedule indicated above for Items shall not exceed the time period indicated in clause No.21.0 of BBN.
2. Detailed schedule shall be furnished after award of contract.

SIGNATURE _____

NAME _____

SEAL OF THE COMPANY DESIGNATION _____

COMPANY _____

DATE _____

SCHEDULE – F3

DELETED

SCHEDULE-F4

SCHEDULE OF DEVIATION FROM TECHNICAL SPECIFICATIONS

PROFORMA OF UNDERTAKING
(To be furnished on Letter head of the bidder along with Cover -I)

It is to confirm that, we have not taken any deviations on technical Specifications of the tender, pre–bid replies and subsequent addendums issued.

SIGNATURE _____

NAME _____

DESIGNATION _____

COMPANY _____

DATE _____

SEAL OF THE COMPANY

SCHEDULE- F5

SCHEDULE OF DEVIATIONS FROM GENERAL CONDITIONS OF CONTRACT

PROFORMA OF UNDERTAKING
(To be furnished on Letter head of the bidder along with Cover -I)

It is to confirm that, we have not taken any deviations on the conditions of the contract and commercial conditions of the tender, pre–bid replies and subsequent addendums issued.

SIGNATURE _____

NAME _____

DESIGNATION _____

COMPANY _____

DATE _____

SEAL OF THE COMPANY

SCHEDULE-F6

SCHEDULE OF GENERAL PARTICULARS

(BIDDER shall furnish the following particulars with his bid)

Sl. No.	Description	
1.0	Name of Company	
2.0	Address (postal)	
3.0	Year of establishment under quoted name	
4.0	Correspondence address	
5.0	Telex/Fax number	
6.0	Type of organization	Proprietary/Partnership/ Pvt. Ltd., /Public Ltd., /Govt.
7.0	Name and designation of the officer of BIDDER to whom all reference shall be made for expeditious technical co-ordination	
8.0	Details of service facilities available	
9.0	Bidder's proposal No. and date	

SIGNATURE _____

NAME _____

SEAL OF THE COMPANY DESIGNATION _____

DATE _____

SCHEDULE-F7

SCHEDULE OF COMMERCIAL PARTICULARS

(Shall be confirmed by the BIDDER)

Sl. No.	Description	
1.0	Terms of payment as laid down in General Conditions of Contract agreeable?	YES/NO
2.0	All technical particulars called for in the schedules and prices as called for in the price schedule filled up?	YES/NO
3.0	Has BIDDER quoted the price F.O.R site?	YES/NO
4.0	Are prices FIRM during tenure of contract?	YES/NO
5.0	Validity of offer from the date of bid opening (shall not be less than 180 days from the date of bid opening)	YES/NO
6.0	Contract completion period acceptable	YES/NO
7.0	Is penalty for delayed delivery/completion as stipulated in Clause No. 22.0 of BBN	YES/NO
8.0	Guarantee period of 12 months and extensions if any from the date of completion of consultancy work	YES/NO
9.0	EMD furnished	YES/NO
10.0	Is the firm agreeable to furnish security Deposit/performance Guarantee?	YES/NO
11.0	Is the firm agreeable to Execute contract agreement	YES/NO
12.0	Is the firm agreeable to replace the defective work/material	YES/NO
13.0	Is the firm agreeable for force Majeure conditions	YES/NO
14.0	Insurance	YES/NO

SIGNATURE _____
NAME _____
DESIGNATION _____
DATE _____

SEAL OF THE COMPANY

SCHEDULE – F8

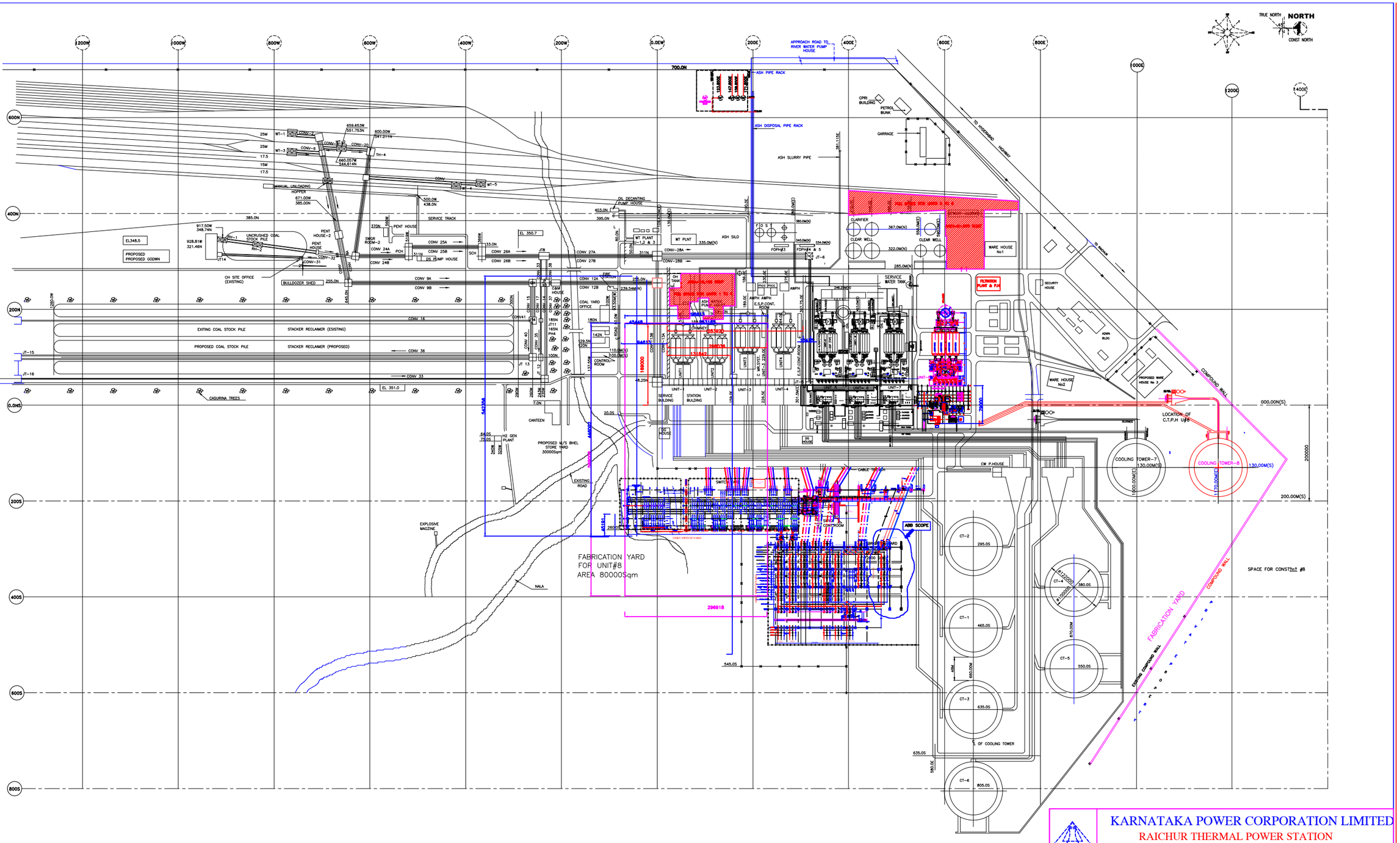
DECLARATION SHEET

I, certify that all the above typed-in data and information pertaining to this specification are correct and are true representation of the offer covered by our formal proposal number ..... dated.....

I hereby certify that I am duly authorised representative of the bidder whose name appears above my signature.

Tenderer's Name	:	.....
Authorised Representative's Signature	:	.....
Authorised Representative's Name (Typed)	:	.....
Tenderer's Intent	:	The Bidder hereby agrees fully to comply with the requirements and intent of this specification for the price indicated.
Authorised Representative's Signature	:	.....

DRAWINGS



NOTES:

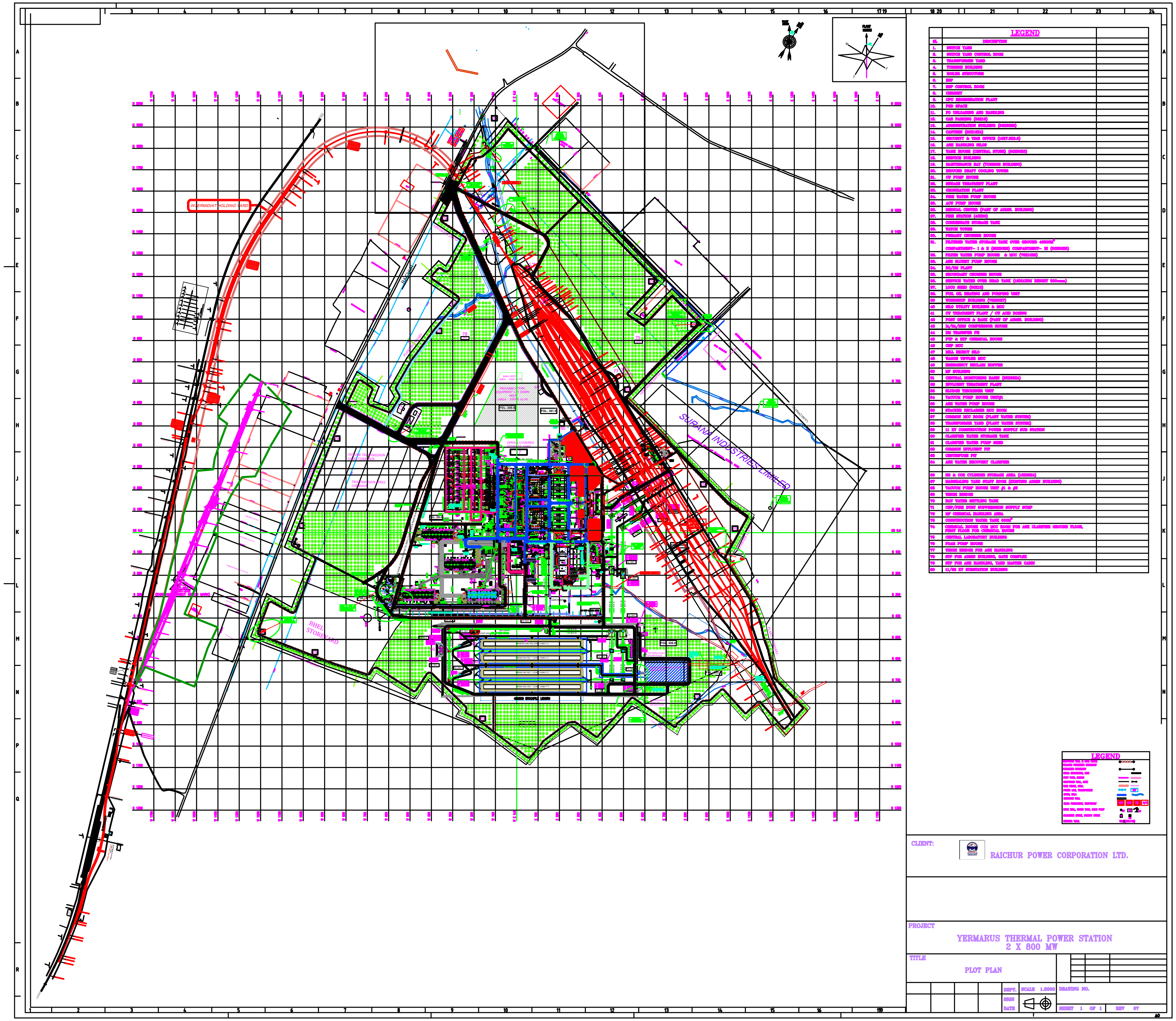
DO NOT SCALE, ASK WHEN IN DOUBT.
ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

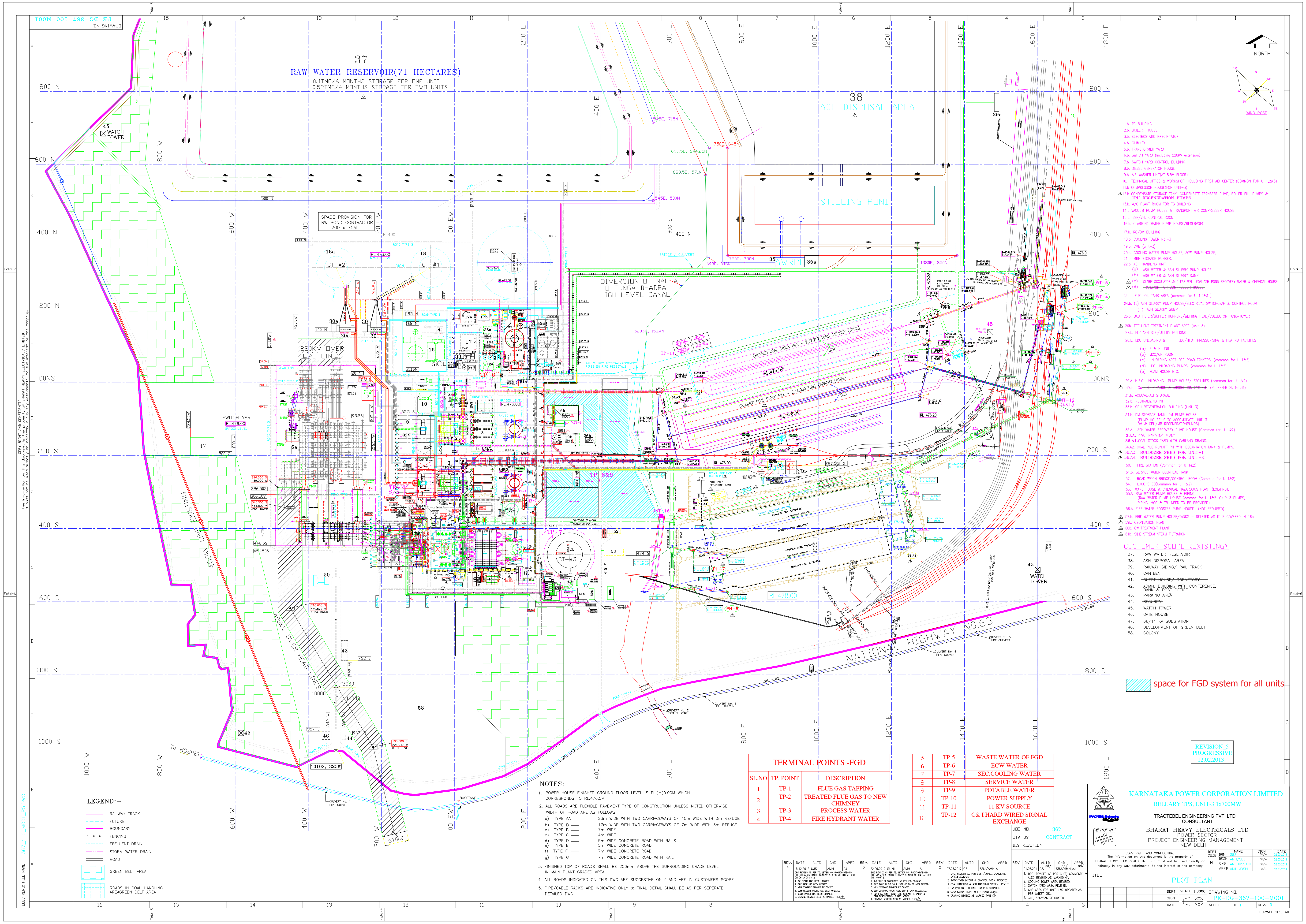
KARNATAKA POWER CORPORATION LIMITED
RAICHUR THERMAL POWER STATION
CHIEF ENGINEER THERMAL DESIGNS
BANGALORE

RTPS UNIT-1 X 250 MW

TITLE: PLOT PLAN

DATE: 19/05/2008
CADD BY: P.S.NARENDRAN AEE(M)
DEPT.
SIGN
DATE
SCALE 1:100
DRAWING NO. RTPS PP -1x250MW-M-006
SHEET 1 OF 1
REV. 0


INTERMEDIATE HOLDING YARD
SURANA INDUSTRIES LIMITED
BHEL STORE YARD
LEGEND
CLIENT:
RAICHUR POWER CORPORATION LTD.
PROJECT
YERMARUS THERMAL POWER STATION
2 X 800 MW
TITLE
PLOT PLAN
DEPT.
SCALE 1.5000
DRAWING NO.
SIGN
DATE
SHEET 1 OF 1
REV 07
A0



RAW WATER RESERVOIR(71 HECTARES)
0.4TMC/6 MONTHS STORAGE FOR ONE UNIT
0.52TMC/4 MONTHS STORAGE FOR TWO UNITS
ASH DISPOSAL AREA
STILLING POND
DIVERSION OF NALLA TO TUNGA BHADRA HIGH LEVEL CANAL
220KV OVER HEAD LINES
400KV LINE EXISTING
400KV OVER HEAD LINES
SWITCH YARD
NATIONAL HIGHWAY NO.63
To HOSPET
WATCH TOWER
NORTH
space for FGD system for all units
TERMINAL POINTS -FGD
SL.NO | TP. POINT | DESCRIPTION
1 | TP-1 | FLUE GAS TAPPING
2 | TP-2 | TREATED FLUE GAS TO NEW CHIMNEY
3 | TP-3 | PROCESS WATER
4 | TP-4 | FIRE HYDRANT WATER
5 | TP-5 | WASTE WATER OF FGD
6 | TP-6 | ECW WATER
7 | TP-7 | SEC.COOLING WATER
8 | TP-8 | SERVICE WATER
9 | TP-9 | POTABLE WATER
10 | TP-10 | POWER SUPPLY
11 | TP-11 | 11 KV SOURCE
12 | TP-12 | C& I HARD WIRED SIGNAL EXCHANGE
CUSTOMER SCOPE (EXISTING)
LEGEND:-
RAILWAY TRACK
FUTURE
BOUNDARY
FENCING
EFFLUENT DRAIN
STORM WATER DRAIN
ROAD
GREEN BELT AREA
ROADS IN COAL HANDLING AREAGREEN BELT AREA
NOTES:-
REVISION_5 PROGRESSIVE 12.02.2013
KARNATAKA POWER CORPORATION LIMITED
BELLARY TPS, UNIT-3 1x700MW
TRACTEBEL ENGINEERING PVT. LTD
CONSULTANT
BHARAT HEAVY ELECTRICALS LTD
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NEW DELHI
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JOB NO. 367
STATUS CONTRACT
TITLE
PLOT PLAN
SCALE 1:3000
DRAWING NO.
PE-DG-367-100-M001
SHEET 1 OF 1
REV. 5
FORMAT SIZE A0