METHODOLOGY FOR CO-FIRING OF BIOMASS PELLETS AND RECOVERY OF ITS COSTS IN THE FIXED AND VARIABLE CHARGES / ENERGY CHARGE RATE (ECR) IN BIOMASS CO-FIRED THERMAL POWER PLANTS.

AUGUST 2025

Gujarat Electricity Regulatory Commission

6th Floor, GIFT ONE, Road 5-C

Zone 5, GIFT City, Gandhinagar-382355

Gujarat, India

Contents

Abbreviations

CEA	Central Electricity Authority
CERC	Central Electricity Regulatory Commission
COD	Date of Commercial Operation
DISCOM	Distribution Companies
ECR	Energy Charge Rate
ESO	Total Energy Sent Out
FY	Financial Year
GCV	Gross Calorific Value
GEDA	Gujarat Energy Development Agency
GERC	Gujarat Electricity Regulatory Commission
GoG	Government of Gujarat
GoI	Government of India
GUVNL	Gujarat Urja Vikas Nigam Limited
KV	Kilo Volt
kW	Kilo Watt
kWh	Kilo Watt hours
kVARh	Kilo Volt Ampere Reactive Hour
MNRE	Ministry of New and Renewable Energy
MW	Mega Watt
MWh	Mega Watt hour
O&M	Operation and Maintenance
PPA	Power Purchase Agreement
RE	Renewable Energy
RPO	Renewable Purchase Obligation
RfS	Request for Selection
SERC	State Electricity Regulatory Commission
T&D	Transmission & Distribution
V	Volt

Order No. 03 of 2025

In the matter of:

METHODOLOGY FOR CO-FIRING OF BIOMASS PELLETS AND RECOVERY OF ITS COSTS IN THE FIXED AND VARIABLE CHARGES / ENERGY CHARGE RATE (ECR) IN BIOMASS CO-FIRED THERMAL POWER PLANTS.

Date of the Order: 13/08/2025

CORAM:

Anil Mukim, Chairman

Mehul M. Gandhi, Member

S. R. Pandey, Member

Chapter 1 Introduction

1.1 Background

The Gujarat Electricity Regulatory Commission (hereinafter referred to as 'the Commission) has taken note of the Policy for Biomass utilization for power generation through Co-firing in pulverised Coal fired Boilers (Biomass Policy) notified by Ministry of Power on 17.11.2017 including its amendments / modifications thereof from time to time, recognizing the use of biomass in biomass co-fired coal based thermal power plants in view of (i) reducing the coal dependence, (ii) improvement of air quality, (iii) creating market for Agro residue and (iv) generation of additional income for farmers. The Commission has taken note and the technical advisory dated 24.11.2017 of Central Electricity Authority (CEA) to thermal power plants for utilizing biomass in coal based thermal power plants.

The Commission initiated the process of specifying methodology for Co-firing of Biomass Pellets and Recovery of its Cost in the Fixed and Variable Charges / ECR in Biomass Co-fired Thermal Power Plant. While proposing the methodology in the approach paper, the Commission has considered the Policy / Guidelines / Office Memorandum/ Advisory issued by MoP / MNRE / CEA, Govt of India from time to time in the subject matter, including followings:

a) Ministry of Power, Government of India, Office memorandum -No. 11/86/2017- Th -II dated 17.11.2017 with regard to the "Policy for Biomass Utilization for Power Generation through Co-firing in Pulverized Coal Fired Boilers" (Biomass Policy) including the Revised Policy dated 08.10.2021 and subsequent addendum notified by MoP dated 03.05.2023 and 16.06.2023.

b) Central Electricity Authority (CEA) advisory- CEA/TETD-TT/2017/M-25/1137-1251 to thermal power plant generator for utilizing the biomass pellets in Coal based Thermal power plants.

c) Technical Specifications issued by CEA for Agro Residue Based Biomass pellets (Non-Torrefied/Torrefied) for Co- Firing in Coal Based Thermal Power Plants' dated 15.09.2018.

d) Model Standard Operating Procedure for biomass pellets co-firing in PF Boilers notified by Ministry of Power vide its letter bearing no. NBM/MD/21-22/03 dated 23.09.2021

e) Clarification issued by Ministry of New and Renewable Energy ("the MNRE"), Government of India issued vide reference letter dated 26.9.2019 stating that the power generated from co-firing of biomass in coal based thermal power plants is renewable energy and is eligible for meeting non-solar RPO.

f) Advisory issued by Ministry of Power vide letter dated 08.11.2023 on Price Benchmarking of Biomass Pellets for co-firing in Thermal Power Plants for Western Region.

1.2 Approach paper on methodology for Co-firing of Biomass Pellets and Recovery of its Cost in the Fixed and Variable Charges / ECR in Biomass Co-fired Thermal Power Plant

Accordingly, the Approach Paper was published by the Commission and Public Notices in this regard were issued on 30.09.2024 in English and Gujarati Daily Newspapers and also uploaded on the Commission's website www.gercin.org in downloadable format, for inviting comments/objections/suggestions from stakeholders by 18.10.2024.

A list of stakeholders communicated their views on the Approach Paper is provided at **Annexure-I.**

1.3 Public Hearing

The Commission fixed the date for public hearing on the approach paper on Approach paper on methodology for Co-firing of Biomass Pellets and Recovery of its Cost in the Fixed and Variable Charges / ECR in Biomass Co-fired Thermal Power Plant on 25.10.2024 at the Commission's Office, Gandhinagar.

A list of stakeholders participated in the public hearing and presented their objections/suggestions is provided at **Annexure-II.**

The Commission examined the objections / suggestions received on the Approach paper.

The main comments and views expressed by the stakeholders through their written submissions and the Commission's views thereon have been summarized in the following paragraphs. It may be noted that all the suggestions given by the stakeholders have been considered, and the Commission has attempted to elaborate all the suggestions as well as the Commission's decisions on each suggestion. However, in case any suggestion is not specifically elaborated, it does not mean that the same has not been considered. Wherever possible, the comments and suggestions have been summarised clause-wise, along with the Commission's analysis and ruling on the same.

The methodology for Co-firing of Biomass Pellets and Recovery of its Cost in the Fixed and Variable Charges / ECR in Biomass Co-fired Thermal Power Plant finalized by the Commission after previous publication and dealing with the objections/suggestions received from various stakeholders has been specified in Chapter 3 of this Order.

Chapter 2

COMMENTS AND SUGGESTIONS ON THE APPROACH PAPER AND COMMISSION'S VIEWS

2.1 Clause 2.1 (i to iii) Non-Compliance of provisions specified in Policy for Biomass utilization in coal based thermal power plant

2.1.1 Proposed in Discussion Paper

The Commission in the Approach paper under Clause 2.1 (i to iii) outlined the salient features of the revised MoP Policy for utilization of biomass in coal based thermal power plant dated 08.10.2021 with regard to type of material and blending percentage of biomass pellets as given below:

(i) All coal based thermal power plants of power generation utilities with bowl mill, shall on annual basis mandatorily use 5 per cent 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 generation utilities with bowl & 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 with 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 bowl & 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.

2.1.2 Suggestions/Objections of the Stakeholders

GUVNL submitted that any consequences towards non-compliance of the co-firing of biomass pellets by generating stations should be solely to the account of the generators and should not be a pass through to the beneficiaries

2.1.3 Analysis and Commission's Ruling

The Commission noted the submission of GUVNL. It is clarified that the obligation of utilizing specified percentage of biomass pellet along with coal as specified in Biomass Policy is the responsibility of thermal generators and hence the procuring entities (beneficiaries) cannot be held responsible for non-compliance on part of thermal generators.

2.2 Clause 3 (h) and (i to k) - Technical feasibility study by generators / Requirement of Capex

The Commission in clause 3(h) of the approach paper provided that the generating Power Plants shall consult the OEM regarding technical feasibility and impact on operation parameters before undertaking the technical feasibility study in terms of biomass Policy as stated above. The report of OEM and technical feasibility study shall be shared with the beneficiary for their comments and arriving at consensus. The cost of the study shall be borne by the beneficiary (ies).

The Commission under clause 3 (i to k) specified the treatment of Capex infused by the thermal generating stations under Section 62 and Section 63 of the Act, under commercial operation as on date of MoP notification dated 08.10.2021 for Biomass Utilization for Power Generation through Co-firing in Coal Based Power Plants.

The Commission specified that for thermal generating plant under section 62 of the Act, the capex would be treated as additional capitalization, subject to prudent check by the Commission at the time of True-up of the relevant control period. For thermal Generating Stations, under section 63 of the Act, under commercial operation as on date of MOP notification dated 08.10.2021, the capex, subject to applicable provisions of the PPA, may be allowed as one-time reimbursement or annuity stream over a period as may be determined by the Commission.

2.2.1 Suggestions/Objections of the Stakeholders

GUVNL submitted that the cost of technical feasibility study and CAPEX requirement towards compliance of co-firing of biomass pellets in thermal power plants should be reasonable and discovered through competitive bidding by the generators in a fair and a transparent manner. Further, the Commission is requested to fix the benchmark price for the same.

2.2.2 Analysis and Commission's Ruling

The Commission noted the suggestions of GUVNL. The generator supplying power to distribution licensees under Section 62 or 63 of the Electricity Act, 2003, shall conduct the technical feasibility study and ascertain the CAPEX requirement through reputed consultant at rate discovered through transparent competitive bidding process and share the information with the beneficiaries. The

Commission feel that fixing the benchmark price at this stage does not seem advisable considering the varied nature of scope, different technologies and different life-age of the power plants.

2.3 Clause 2.1 (viii) (d): Renewable Purchase Obligation and its Compliance

2.3.1 Proposed in Discussion Paper

The Commission in the Approach Paper referred the provision of Clause 2.1 (viii)(d) of the revised policy for utilization of biomass in coal based thermal power plant dated 08.10.2021 which states that the Obligated Entities such as Discoms can meet their Renewable Purchase Obligations (RPO) by buying such generation of co-firing.

2.3.2 Suggestions/Objections of the Stakeholders

M/s Abellon Clean Energy (Abellon) submitted that thermal power plant developer can buy power from the existing Waste to Energy (WTE) power plants. There may be existing WTE plants having no valid PPAs and new PPA will take time to be signed. If Thermal Developers buy Power from existing WTE Power plants, the consumption would be considered as part of Renewable Purchase Obligation of Thermal power plant Developers, and they do not need to co-fire that much Biomass in their Coal based power plant.

M/s Abellon further submitted that for the purpose of RPO compliance instead of co-blending of Biomass Pellets in thermal power plant. Thermal Power Plant to be allowed to purchase Biomass Power and fulfil their RPO obligation. The objector further submitted that since, the objective of the Biomass policy is to dispose Biomass fuel, either co-firing the Biomass fuel or purchasing energy from Biomass plants the same objective is being achieved.

GUVNL pointed out that in the Approach paper, it has been stated that the Generators using biomass pellets for co-firing shall approach the Commission on completion of each financial year with a petition for claiming RPO compliance. GUVNL requested to specify that in cases of supply of electricity by such Generators to Distribution Licensee, the same shall be construed towards the RPO Compliance of Distribution Licensee.

2.3.3 Analysis and Commission's Ruling

The Commission notes that the present proceedings are related to utilization of biomass in coal based thermal power plants' and not with respect to purchase of power from standalone Waste to Energy plants. The MNRE vide letter dated 26.9.2019 clarified that the power generated from co-firing of biomass in coal based thermal power plants is renewable energy and is eligible for meeting

non-solar RPO. The Obligated Entities under the RPO framework has been defined by the Commission in GERC (Procurement of Energy from Renewable Energy Sources) Regulations 2010 and the subsequent amendments thereof. The procurement of electricity from standalone Biomass / Waste to Energy based power projects by distribution licensee and other shall governed by the provisions under the respective Biomass / MSW Tariff order issued by the Commission from time to time.

2.4 Clause 2.3 (iii): Pricing of Biomass Pellet

2.4.1 Proposed in Discussion Paper

The Commission in the Approach Paper referred the Clause 2.3 (iii) of the revised MoP Policy dated 03.05.2023 for Biomass utilization in coal based thermal power Plant, wherein it is stated as under:

The price benchmarking would be carried out region-wise by a Committee constituted under the leadership of CEA for a period of 5 years with provision for periodic escalation. The benchmark price will not include the transportation cost from pellet manufacturing unit to the TPPs. TPPs shall determine the transportation cost from pellets manufacturing units to TPPs in a fair and transparent manner. The procurement of benchmark priced pellets shall be carried out on a first come, first serve basis. If TPPs are unable to procure biomass pellets at the benchmark price, they have the option to go for a short-term tender. However, it is important for TPPs to ensure that the price discovered in the short-term tender is determined in a fair and transparent manner. The price discovered should also be comparable to the benchmarked prices. The recommendation of price benchmarking committee will be effective from 1.1.2024. Meanwhile, the power utilities shall go for short-term tenders for meeting the immediate requirement of biomass pellets for their TPPs.

2.4.2 Suggestions/Objections of the Stakeholders

M/s Abellon submitted that the Biomass pellets manufacturing cost is higher as compared to using Biomass fuel itself. Therefore, while considering the Biomass fuel cost, the pellets manufacturing cost may be removed and only Biomass cost is to be considered.

2.4.3 Analysis and Commission's Ruling

The Commission notes that as per the MoP policy for Biomass utilization in coal based thermal power plant both the Non-Torrefied/ Torrefied biomass pellets are allowed to use for co- firing in Coal Based Thermal Power Plants. The Commission decides to retain provisions related to the benchmark cost for biomass pellet recommended by the Committee constituted under the leadership of CEA for computing the landed cost of Biomass pellet at location of Thermal power plant.

2.5 Clause 2.1(iii): Type of Biomass Pellet and volatile content

2.5.1 Proposed in Discussion Paper

The Commission in the Approach Paper referred to the provisions of Clause 2.1 (iii) under MoP revised Policy dated 03.05.2023 for Biomass utilization in coal based thermal power plant under, wherein it is stated that all coal based thermal power plants of power generation utilities with bowl & 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.

2.5.2 Suggestions/Objections of the Stakeholders

M/s Reliance Industries Limited (RIL) submitted that Non-torrified briquettes/pellets are available in abundance in areas near by Gujarat whereas availability of torrified biomass is limited and hence, this requirement should not be applicable for power generation plants in Gujarat. RIL submitted that based on their own operational experience volatile content of Biomass always remains higher. Hence it will be difficult to meet any such volatile content ceiling therefore limit of 22% should be removed.

2.5.3 Analysis and Commission's Ruling

The Commission notes that in the Revised Policy for Biomass utilization in coal based thermal power plant issued by MoP, it is recommended to use of Non-torrified and torrified briquettes/pellets depending on the design of pulverizer in a thermal power plant viz : thermal power plants' having bowl mill shall use non-torrefied biomass pellets, whereas thermal power plant having bowl and race mill and bowl and tube mill shall use torrified biomass pellets, limiting the volatile material in a biomass fuel within specified limit is important to avoid the emission from the thermal plant.

In view of above, the Commission decides to retain the provision related to type of biomass pellet and volatile content as specified in the revised Biomass Policy issued by MoP.

2.6 Clause 2.1 (vii): Minimum Contract period for procurement of Biomass Pellets

2.6.1 Proposed in Discussion Paper

The Commission in the Approach referred the Clause 2.1 (vii) of the Mop revised Policy dated 03.05.2023 for Biomass utilization in coal based thermal power plant wherein, it is stated that the minimum contract period for procurement of biomass pellets by generating utilities shall be for 7 years so as to avoid delays in awarding contracts by generating companies every year and also to

build up long terms 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, 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.

2.6.2 Suggestions/Objections of the Stakeholders

M/s RIL submitted that the nature of biomass generation is cyclical, and no supplier can guarantee consistency of supply. Biomass is also not very well-organized business and is mainly dominated by small players. Hence it is not possible to have long term commitment from any such supplier. Besides, generator should have flexibility in procurement of biomass based on cost economics which best suits to generator requirements.

2.6.3 Analysis and Commission's Ruling

The Commission feel that minimum contract period of 7 years for procurement of biomass pellets by generating utilities is conscious policy decision taken by MoP for maintaining the supply chain for fuel and long-term sustainable operation of biomass co-fire thermal plants' as such the Commission decides to retain the provision as per revised MoP Biomass Policy .

2.7 Clause 3.5: Methodology for estimation of electricity generated from biomass co-fired coal based Thermal Power Plants, including captive and co-generation power plants co-firing biomass.

2.7.1 Proposed in Discussion Paper

The Commission referred to the Clause No 3.5 of the MoP revised Policy wherein the methodology is specified for estimation of electricity generated from biomass in biomass co-fired coal based Thermal Power Plants, including captive and co-generation power plants co-firing biomass as given below:

Step-1:

1. The electricity generated from Biomass shall be estimated at Generator Terminal on monthly basis in accordance with the following formulae:

   Eb(G)=[(QbxGb)/((QcxGc)+(QbxGb))] xE(GT)

Where,

Eb(G) = Electrical energy generated by biomass at Generator terminal during the month (kWh);

Qb = Quantity of biomass consumed during the month (kg)

Gb = Weighted average Gross Calorific Value (GCV) of biomass consumed during month (kCal/kg)

E(GT) = Gross electrical energy generated at Generator Terminal during the month (kWh)

Qc = Quantity of coal burnt during the month (kg)

Gc = Weighted average GCV of coal burnt during the month (kCal/kg)

2. The product **(Qb x Gb)** represents heat (in Kcal) input through biomass during the month and shall be estimated on monthly basis by applying following formulae:

Qb x Gb (kCal) = {opening balance of biomass (kg) X weighted average GCV of opening balance of biomass (kCal/kg)} + {quantity of bio- mass received during the month (kg) X weighted average GCV of biomass received during the month (kcal/kg)} - {closing stock of biomass (kg) X weighted average GCV of the closing balance of biomass (kCal/kg)}

3. The product **(Qc x Gc)** represents heat (in Kcal) input through coal during the month (kcal) and shall be estimated on monthly basis by applying the following formulae:

Qc x Gc (kCal) = {opening balance of coal (kg)X weighed average GCV of opening balance of coal (kCal/kg)} + {quantity of coal received during the month (kg) X weighted average GCV of coal received during the month (kCal/kg)} – {closing stock of coal(kg) X weighted average GCV of the closing balance of coal (kCal/kg)}

Step-2:

1. The ex-bus electrical energy generated by using biomass shall be estimated on monthly basis by applying following formulae:

Eb (ex-bus) = Ebx (G){1-[(Ex(GT)-ESO)/Ex(GT)]}

Where,

Eb (ex-bus) = Electrical energy generated by biomass ex-bus during the month (kWh).

Eb(G) = Electrical energy generated by biomass at Generator terminal during the month arrived at Step-1(kWh)

E(GT) = Total electrical energy generated at generator terminal during the month (kWh)

ESO = Total Energy Sent Out(ex-bus) during the month (kWh)

2.7.2 Suggestions/Objections of the Stakeholders

M/s RIL submitted that the methodology proposed in the Approach Paper does not differentiate between conventional Plants and Cogeneration Plants. ln case of Cogeneration plant, part of the steam generated from co-firing of Biomass is used for process requirement. The present methodology does not capture such heat of Biomass used for process and thus effectively gives less credit to Power.

The objector suggested to consider an alternate methodology for Estimation of Electricity Generated from Biomass, and electricity equivalent to the quantum of steam generated and used for process requirement.

2.7.3 Analysis and Commission's Ruling

The Commission has gone through the methodology proposed by the objector for estimation of electricity generated from Biomass. The Commission notes that biomass pellets can be used in captive/cogeneration power plants similar to independent thermal power plant. The Commission is therefore of the view that the methodology for estimation of electrical energy generation from Biomass shall also be applicable to the captive/cogeneration power plant using co-firing of biomass pellet along with Coal.

With regard to contention of the objector that methodology proposed in the discussion paper does not differentiate between conventional Plants and Cogeneration Plants, the Commission is of the view that in case of thermal power plant/captive power plant, the entire heat generated from coal and biomass is used to generate power. Whereas, in case of co-generation plant, only part of the heat, is used to generate power. But the underlying principle remains the same i.e. the proportion of heat input from biomass to total heat input for power generation as specified in revised MoP Biomass Policy.

Principle of proportion shall be the basis to work out the energy generated from biomass. The energy output is estimated in proportion to the heat input from biomass out of total heat input from biomass and coal. Accordingly, the methodology specified in this order shall also be applicable for Captive as well as cogeneration power plant without any modification.

In view of above the Commission decides not to make any changes / modification in the Methodology for estimation of electricity generated from biomass co-fired coal based Thermal Power Plants.

Chapter 3

METHODOLOGY FOR CO-FIRING OF BIOMASS PELLETS AND RECOVERY OF ITS COSTS IN THE FIXED AND VARIABLE CHARGES / ECR IN BIOMASS CO-FIRED THERMAL POWER PLANTS.

3.1 Introduction

While framing the methodology for Co-firing of Biomass Pellets and Recovery of its Cost in the Fixed and Variable Charges / ECR in Biomass Co-fired Thermal Power Plant, the Commission has considered the Policy / Guidelines / Office Memorandum/ Advisory issued by MoP / MNRE / CEA, Govt of India from time to time in the subject matter, including followings;

a) Ministry of Power, Government of India, Office memorandum No. 11/86/2017- Th -II dated 17.11.2017 with regard to the "Policy for Biomass Utilization for Power Generation through Co-firing in Pulverized Coal Fired Boilers" (Biomass Policy) including the Revised Policy dated 08.10.2021 and subsequent addendum notified by MoP dated 03.05.2023 and 16.06.2023.

b) Central Electricity Authority ("CEA") advisory- CEA/TETD-TT/2017/M-25/1137-1251 to thermal power plant generator for utilizing the biomass pellets in Coal based Thermal power plants.

c) Technical Specifications issued by CEA for Agro Residue Based Biomass pellets (Non-Torrefied/ Torrefied) for Co- Firing in Coal Based Thermal Power Plants' dated 15.09.2018.

d) Model Standard Operating Procedure for biomass pellets co-firing in PF Boilers notified by Ministry of Power vide its letter bearing no. NBM/MD/21-22/03 dated 23.09.2021

e) Clarification issued by Ministry of New and Renewable Energy ("the MNRE"), Government of India issued vide reference letter dated 26.09.2019 stating that the power generated from co-firing of biomass in coal based thermal power plants is renewable energy and is eligible for meeting non-solar RPO.

f) Advisory issued by Ministry of Power vide letter dated 08.11.2023 on Price Benchmarking of Biomass Pellets for co-firing in Thermal Power Plants for Western Region.

Unless repugnant to the context or the subject-matter otherwise requires, words and expressions used in this methodology and not defined but defined in the above policy/ guidelines/ advisory shall have the meanings assigned to them respectively in the said documents.

3.2 Applicability of the Methodology

a) The methodology stipulated in this order shall be applicable to Biomass co-fired thermal generating stations including fossil fuel-based captive / co-generation power plants co-firing biomass.

b) The methodology shall become effective from the date of this Order.

c) For Thermal Generating Stations, under Section 62 of the Act, under commercial operation as on notification dated 08.10.2021 on policy for Biomass Utilization for Power Generation through Co-firing in Coal Based Power Plants issued by MoP, the said notification would constitute a Change in law for recovery of costs in the fixed and variable charges / ECR in such Biomass co-fired thermal power plants.

d) For Thermal Generating Stations, under Section 63 of the Act , under commercial operation as on notification dated 08.10.2021 on policy for Biomass Utilization for Power Generation through Co-firing in Coal Based Power Plants issued by MoP, the said notification would constitute a Change in law for recovery of costs in the fixed and variable charges / ECR in such Biomass co-fired thermal power plants subject to applicable provisions in the PPA.

3.3 Landed cost of Biomass Fuel

Where biomass fuel is used for blending with coal in the Thermal Power plants, the landed cost of biomass fuel shall be worked out based on the delivered cost of biomass at the unloading point of the generating station, inclusive of taxes and duties as applicable as provided under clause 3.4 of the revised MoP Biomass Policy, as under:

The energy charge rate of the blended fuel shall be worked out considering consumption of biomass based on blending ratio as specified by Authority or actual consumption of biomass, whichever is lower.

a) Energy generated from biomass shall be worked out based on the actual consumption of biomass and coal rather than on normative operational parameters of Station Heat Rate and Auxiliary Power Consumption.

b) Principle of proportion shall be the basis to work out the energy generated from biomass. The energy output is estimated in proportion to the heat input from biomass out of total heat input from biomass and coal.

c) Heat input shall be worked out based on consumption and quality (GCV) of the coal and biomass

d) Consumption of coal and biomass shall be worked out based on opening balance, receipt and closing balance of coal and biomass.

3.4 Methodology for estimation of electricity generated from biomass in biomass co-fired coal based Thermal Power Plants, including captive and co-generation power plants co-firing biomass.

The methodology approved by CERC vide Order dated 18.02.2000 in Suo Motu Petition No. 12/SM/2019 in the matter of "Methodology for estimation of electricity from Biomass in Biomass co-fired Thermal Plants" as reproduced hereunder shall be followed by Thermal Generating Stations for estimating electricity generated from Biomass in biomass co-firing Coal based Thermal Power Plants and captive / co-generation power plants using co-firing biomass.

Step-1:

1. The electricity generated from Biomass shall be estimated at Generator Terminal on monthly basis in accordance with the following formulae:

Eb(G)=[(Qb x Gb)/((Qc x Gc)+(Qb x Gb))] x E(GT)

Where,

Eb(G) = Electrical energy generated by biomass at Generator terminal during the month (kWh);

Qb = Quantity of biomass consumed during the month (kg)

Gb = Weighted average Gross Calorific Value (GCV) of biomass consumed during month (kCal/kg)

E(GT) = Gross electrical energy generated at Generator Terminal during the month (kWh)

Qc = Quantity of coal burnt during the month (kg)

Gc = Weighted average GCV of coal burnt during the month (kCal/kg)

2. The product (Qb x Gb) represents heat (in Kcal) input through biomass during the month and shall be estimated on monthly basis by applying following formulae:

Qb x Gb (kCal) = {opening balance of biomass (kg) X weighted average GCV of opening balance of biomass (kCal/kg)} + {quantity of bio- mass received during the month (kg) X weighted average GCV of biomass received during the month (kcal/kg)} -{closing stock of biomass (kg) X weighted average GCV of the closing balance of biomass (kCal/kg)}

3. The product (**Qc x Gc**) represents heat (in Kcal) input through coal during the month (kcal) and shall be estimated on monthly basis by applying the following formulae:

Qc x Gc (kCal) = {opening balance of coal (kg)X weighed average GCV of opening balance of coal (kCal/kg)} + {quantity of coal received during the month (kg) X weighted average GCV of coal received during the month (kCal/kg)} – {closing stock of coal(kg) X weighted average GCV of the closing balance of coal (kCal/kg)}

Step-2:

The ex-bus electrical energy generated by using biomass shall be estimated on monthly basis by applying following formulae:

Eb (ex-bus) = Eb(G){1-[(E(GT)-ESO)/Ex (GT)]}

Where,

Eb (ex-bus) = Electrical energy generated by biomass ex-bus during the month (kWh).

Eb(G) = Electrical energy generated by biomass at Generator terminal during the month arrived at Step-1(kWh)

E(GT) = Total electrical energy generated at generator terminal during the month (kWh)

ESO = Total Energy Sent Out(ex-bus) during the month (kWh)

3.5 The generating company shall provide various information to the beneficiaries and publish them in the manner given below:

a) The generating company shall maintain separate fuel accounts for coal and bio- mass, with opening balance, fuel stock received during the month and closing balance in kg. The generating company shall also maintain separate GCV (in kCal/kg) accounts for coal and biomass, with weighted average GCV of the opening balance, weighted average GCV of the fuel stock received during the month and weighted average GCV of the closing balance stock at the end of the month.

b) The monthly fuel and GCV accounts shall be made available to authorized representative(s) of the beneficiaries and RLDC/SLDC on demand. Any authorized representative of beneficiaries shall be allowed to witness the GCV testing of Bio- mass. Generating company shall keep beneficiaries informed about the co-firing of Bio- mass with coal. Authorized representatives of the beneficiaries shall be allowed inspection during the period when biomass is being co- fired.

c) The monthly accounts of fuel and GCV, duly signed by the authorized official of the generating company shall be published on its website along with the bills towards purchase of coal and Biomass.

d) The generating company shall publish the quantum of Biomass fired and the energy generated from Biomass based on the formula specified above on its website.

e) For Compliance to Bio -mass Policy dated 08.10.2021, in terms of mandatorily use of 5 per cent blend of biomass pellets along with coal with effect from one year of the date of issue of this guideline, Coal based thermal power plants, as a prerequisite, are required to assess useful economic life of plant, technical feasibility with any additional capital / operation expenditure required, if any, and technical constraints for enabling co-firing while ensuring safety aspects.

f) Coal based thermal power plants, as a prerequisite, are also required to assess procurement of Agro residue-based biomass pellets in line with technical specification issued by CEA, sourcing, and supply chain constraints against Model Contract document issued by MoP, frame site specific standard operating procedure (SOP) in line with standard SOP issued by MoP etc. The responsibility of procuring pellets in terms of the MOP directives issued from time to time shall be the responsibility of the Power Plants.

g) Subsequent to the assessment of above aspects, the plant can approach CEA as per Guidelines/procedure prescribed for examining the request of the power plants for seeking exemption/relaxation from biomass co-firing, in case of exemption/ relaxation required.

h) Generating Power Plants shall consult the OEM regarding technical feasibility and impact on operation parameters before undertaking the technical feasibility study in terms of biomass Policy as stated above. The report of OEM and technical feasibility study

shall be shared with the beneficiary for their comments and arriving at consensus. The cost of the study shall be borne by the beneficiary (ies).

i) Generating Stations shall estimate the capex viz., Biomass pellet handling & Feeding system, construction of storage facilities, any retrofitting or modifications in existing equipment or system for enabling co-firing of Biomass, etc.

j) For Thermal Generating Stations, under Section 62 of the Electricity Act, 2003, under commercial operation as on date of MOP notification dated 08.10.2021 for Biomass Utilization for Power Generation through Co-firing in Coal Based Power Plants issued by MoP on 08.10.2021, the capex would be treated as additional capitalization, subject to prudence check by the Commission at the time of True-up of the relevant control period.

k) For Thermal Generating Stations, under Section 63 of the Electricity Act, 2003, under commercial operation as on date of MOP notification dated 08.10.2021 for Biomass Utilization for Power Generation through Co-firing in Coal Based Power Plants issued by MoP on 08.10.2021, the capex, subject to applicable provisions of the PPA, may be allowed some time reimbursement or annuity stream over a period as may be determined by the Commission.

3.6 The details / information to be provided by the generator for claiming the electricity generated from the biomass pellets with coal as primary fuel for claiming the cost of utilization of Biomass as pass through in the tariff and claiming the RPO compliance against the energy generated from biomass pellets.

The data for verification of the biomass pellets utilized by the generator for co-firing are as under:

1) The details of power plant specifying the capacity of the plant, type of boiler, type of coal mill, layout of the power plants along with other technical details which are necessary for verifying usage of different type of fuels for generation of electricity.

2) The Original Equipment Manufacturer (OEM) manual for the equipment of the plant like Boiler, Turbine, Coal mill, etc., technical details and guaranteed efficiency parameters etc.

3) Performance test carried out by Independent Engineer for the plant for verification of guaranteed operational and technical parameters as per the OEM for supply of plants and equipment etc.

4) Test data for Commissioning of power plant along with certification from the Independent Engineer.

5) Type of Coal Mills.

6) Details of Auxiliary consumption of the plant as per the OEM manual.

7) Technical study carried out by the generating company/generator, if any, for mixing of biomass pellets with coal and its impact on the operational parameters of the plant, permissible limit of mixing of biomass fuel etc. and merits and demerits of such co-firing of fuel.

8) Fuel supply agreement with primary fuel supplier and biomass pellets supplier.

9) Billing invoices for supply of coal issued by coal supplier containing the details such as GCV of coal, quantum of coal supplied, its rates, loading and unloading charges, if any, etc.

10) Billing invoices of specific fuel issued by specific fuel supplier containing the GCV of specific fuel, quantum of specific fuel supplied, its rates, loading and unloading charges, if any.

11) Billing invoices of biomass pellets issued by biomass pellets supplier containing the GCV of biomass pellets, quantum of biomass pellets supplied, its rates, loading and unloading charges, if any.

12) Copy of transportation receipt for transportation of fuel i.e., primary fuel, specific fuel and biomass pellets issued by the transportation mode of railway and/or truck or other method consist of the quantum of fuel supplied, place of loading and place of unloading, e-challan, if any, etc.

13) Details/documents related to the GCV of fuel (i.e., specific oil, coal, biomass) measured at the power plant site as per testing conducted by an NABL-accredited third party for samples of the above fuels and GCV of fuel as per the billing carried out by the supplier as per the fuel supply contract / arrangement.

14) Quantum of fuel (weight) i.e., specific oil, coal and biomass pellets measures at power plant as per the weigh bridge receipt for each supply.

15) Details of difference in quantum (weight) of fuel, if any, in terms of supplied quantity as per billing invoice vis-à-vis received quantum as per weigh bridge receipt measured at plant site and details of claim raised with the supplier of fuel, if any.

16) Details of slippage in the GCV of fuel i.e. billed GCV vs. GCV measured at plant site as per third party testing for each type of fuel i.e., specific fuel, coal, biomass pellets in comparison to the GCV of fuel claimed by the supplier. Copy of fuel stock register i.e., specific fuel, coal, biomass pellets etc. containing the details such as opening stock of aforesaid fuel, receipt of the fuel during the month, utilization of fuel during the month and closing stock of fuel at the end of month alongwith details of GCV of fuel, price etc.

17) The details of power generation like, gross generation, auxiliary consumption and net generation and corresponding utilization of quantum of fuel with GCV.

18) The details/documents related to monthly return filed to GST authority for purchase of fuel and return filed to Chief Electricity Inspector for generation of electricity and duty paid thereof.

19) In case, wheeling of power through utilization of Distribution/Transmission network is involved, the copy of monthly State Energy Account (SEA) prepared by SLDC for certifying schedule of power from generating plant for consumption at consumer premises.

20) Mechanism of different types of fuel quantum utilized for generation of electricity i.e., specific fuel, coal, and biomass pellets during the process of generation to be submitted with necessary details of plant & equipment etc.

21) Details of payment made to fuel supplier against the supply of fuel as per FSA and billing invoices for supply of fuel.

22) Details of supply of biomass pellets, coal from the stock yard of the plant through feeders in coal mill and/or hopper of the plant to ascertain consumption of fuel for deciding energy generation from coal as primary fuel and Biomass during the month.

The above details are also required to be uploaded on the website of the generating company/generator along with the statutory auditor certificate and copy of the same be provided to the Commission and GEDA on monthly basis as well as within the month of completion of the financial year.

In case the generator is supplying the electricity to the licensee/third party, it should provide the aforesaid details to above entities and the above entity when claim the generation from the biomass pellets along with coal in co-firing of fuel, in that case they should provide the above details to prove their claim.

Provided that in case of co-fired coal based thermal power plants supplying power for captive use / third party sale, out of above particulars, such plants shall require to submit only operational & technical particulars related to utilization of fuels for ascertaining generation of electricity from utilization of Biomass for RPO compliance and such plants shall not require to submit financial particulars.

3.7 Monitoring and authentication mechanism for allowing energy generated from biomass pellets against RPO compliance:

a) The generator shall approach the Commission on completion of each financial year with Petition for compliance of RPO where the biomass pellets is utilized as co-firing by it, and electricity generated from it for claiming RPO compliance.

b) The Commission may decide such petition based facts of the case and if the Commission feel it necessary, may appoint an independent statutory auditor approved by CAG along with Chartered Engineer for verification of documents and to ascertain the utilization of biomass pellets along with coal and other fuel, if any and verify the electricity generated from the biomass pellets and certify the same for granting status of renewable energy to such generation and consider for RPO compliance.

c) The fees for verification and certification of the electricity generated from biomass pellets carried out by statutory auditor and chartered engineer be appointed by the Commission, in case it is required, the cost of the same may be borne by the concerned generating company/generator.

Sd/-	**Sd/-**	**Sd/-**
[S.R. Pandey]	**[Mehul M. Gandhi)**	**[Anil Mukim]**
Member	**Member**	**Chairman**

Place: Gandhinagar.

Date: 13/08/2025.

Annexure I: List of Stakeholders communicated their views on the Approach Paper

Sr. No.	Name of Stakeholders
1.	Gujarat Urja Vikas Nigam Limited
2.	Gujarat State Electricity Corporation Limited
3.	Reliance Industries Limited
4.	Abellon CleanEnergy Limited
5.	DCM Shriram Limited

Annexure II: List of Stakeholders who attended the Public Hearing and submitted their views on the subject matter

Sr. No.	Name of Stakeholders
1.	Gujarat Urja Vikas Nigam Limited
2.	Gujarat State Electricity Corporation Limited
3.	Reliance Industries Limited
4.	Abellon CleanEnergy Limited
5.	DCM Shriram Limited