



Discussion Paper

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DETERMINATION OF TARIFF FOR PROCUREMENT OF POWER BY DISTRIBUTION LICENSEES AND OTHERS FROM BIOMASS BASED POWER PROJECTS AND BAGASSE BASED CO-GENERATION PROJECTS AND OTHER COMMERCIAL ISSUES FOR THE STATE OF GUJARAT



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Abbreviations

%	Percentage
ABT	Availability-Based Tariff
AC	Alternating Current
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CER	Certified Emission Reduction
CERC	Central Electricity Regulatory Commission
COD	Commercial Operation Date
CUF	Capacity Utilization Factor
DISCOMs	Distribution Companies
DC	Direct Current
FY	Financial Year
GEDA	Gujarat Energy Development Agency
GERC	Gujarat Electricity Regulatory Commission
GETCO	Gujarat Energy Transmission Corporation Ltd.
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
M	Meter
MNRE	Ministry of New and Renewable Energy
MW	Mega Watt
MWh	Mega Watt hour
NEP	National Electricity Policy
NTP	National Tariff Policy



O&M	Operation and Maintenance
PPA	Power Purchase Agreement
PLF	Plant Load Factor
RE	Renewable Energy
REC	R`enewable Energy Certificate
RPO	Renewable Purchase Obligation
SERC	State Electricity Regulatory Commission
T&D	Transmission & Distribution
V	Volt



1. INTRODUCTION

1.1. Background

The Gujarat Electricity Regulatory Commission (GERC or Commission) vide Order No.03 of 2022 dated 27.06.2022 had issued Order on Determination of tariff for procurement of power by Distribution Licensees and others from Biomass and Bagasse based Cogeneration projects and others Commercial issues for the State of Gujarat. The Control period of the Order No. 03 of 2022 was effective from 01.04.2020 to 31.03.2023.

The Ministry of Power notified the Electricity (Promoting Renewable Energy Through Green Energy Open Access) Rules, 2022 on 6th June 2022 (“MoP Rules”) outlining the policy and regulatory provisions for promotion of renewable sources of energy through Open Access. Further, the MoP Rules are effective from the date of its Notification. The previous Order No. 03 of 2022 dated 27.06.2022 was having control period up to 31.03.2023 and thereafter no extension in control period of said order is granted. Therefore, in order to give effect to the provision of Green Energy Open Access Rules 2022 notified by Ministry of Power under the Electricity Act, 2003 and specifically when there was no tariff order of the Commission after 31.03.2023 with respect to Biomass and Bagasse based Co-generation Power Projects, the Commission feel it more appropriate to adopt the regulatory provisions outlined in MoP Green Energy Open Access Rules, 2022 and propose to defined the Control Period of new tariff order effective from 01.04.2023 i.e. after expiry of Control Period of previous Order No.03 of 2022.

Accordingly, the Commission intends to provide clarity on the tariff framework for the next Control Period effective from 01.04.2023 to 31.03.2027, for procurement of power generated from Biomass and Bagasse based Cogeneration Projects in the State of Gujarat by Distribution Licensees, under the powers conferred to it under Sections 61(h), 62(1) (a), and 86(1) (b) & (e) of the Electricity Act, 2003, and National Electricity Policy, 2005, and Tariff Policy, 2016.

The Commission presents this Discussion Paper as part of the regulatory process for Determination of Tariff for Procurement of Power by Distribution licensee and Others from Biomass and Bagasse based Cogeneration projects and other commercial issues for the state of Gujarat for next Control Period based on comments received from stakeholders on this Discussion Paper.



The Commission has duly considered the various provisions of the Statutory / Policy documents, while preparing the present Discussion Paper:

1.2. The Electricity Act, 2003

The following provisions of the Act provide the enabling legal framework for promotion of renewable sources of energy by the State Electricity Regulatory Commissions (SERCs):

1.2.1. The Section 62(1)(a) of the Act provides for determination of tariff for supply of electricity by a Generating Company to a distribution licensee as under:

“Supply of electricity by a generating company to a distribution licensee: Provided that the Appropriate Commission may, in case of shortage of supply of electricity, fix the minimum and maximum ceiling of tariff for sale or purchase of electricity in pursuance of an agreement, entered into between a generating company and a licensee or between licensees, for a period not exceeding one year to ensure reasonable prices of electricity;”

1.2.2. Section 61(h) of the Act provides that, while specifying the terms and conditions of determination of tariff, the Commission shall be guided by the objective of promotion of co-generation and generation of electricity from renewable sources of energy.

The Section 86 (1) (b) of the Act provides to regulate the procurement process of electricity by the distribution licensees as under:

“regulate electricity purchase and procurement process of distribution licensees including the price at which electricity shall be procured from the generating companies or licensees or from other sources through agreements for purchase of power for distribution and supply within the State;”

1.2.3. The Section 86 (1) (e) of the Act mandates promotion of co-generation and generation of electricity from renewable sources of energy:

“Promote co-generation and generation of electricity from renewable sources of energy by providing suitable measures for connectivity with the grid and sale of electricity to any person,



and also specify, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution licensee.”

1.2.4. Section 3 (1) of the Act requires the Central Government to formulate, inter alia, the National Electricity Policy in consultation with the Central Electricity Authority (CEA) and State Governments for inter-alia, development of the renewable sources of energy. The provision is quoted below:

“The Central Government shall, from time to time, prepare the National Electricity Policy and tariff policy, in consultation with the State Governments and the Authority for development of the power system based on optimal utilization of resources such as coal, natural gas, nuclear substances or materials, hydro and renewable sources of energy.”

1.3. National Electricity Policy (NEP)

Clause 5.2.20 of the NEP stipulates the need for fully exploiting the feasible potential of non-conventional energy sources, as reproduced below:

“5.2.20 Feasible potential of non-conventional energy resources, mainly small hydro, and Solar and bio-mass would also need to be exploited fully to create additional power generation capacity. With a view to increase the overall share of non-conventional energy sources in the electricity mix, efforts will be made to encourage private sector participation through suitable promotional measures.”

Clause 5.6.1 of the Policy stipulates about the need for Technology Development and R&D on non-conventional energy systems, as reproduced below:

“Special efforts would be made for research, development demonstration and commercialization of non-conventional energy systems. Such systems would need to meet international standards, specifications and performance parameters.”

Clause 5.12 stipulates several conditions for promotion and harnessing of renewable energy sources. The salient features of the said provisions of NEP are reproduced below.



5.12.1 : *Non-conventional sources of energy being the most environment-friendly, there is an urgent need to promote generation of electricity based on such sources of energy. For this purpose, efforts need to be made to reduce the capital cost of projects based on non-conventional and renewable sources of energy. Cost of energy can also be reduced by promoting competition within such projects. At the same time, adequate promotional measures would also have to be taken for development of technologies and a sustained growth of these sources.*

5.12.2 : *The Electricity Act, 2003, provides that co-generation and generation of electricity from non- conventional sources would be promoted by the SERCs by providing suitable measures for connectivity with the grid and sale of electricity to any person and also by specifying, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution licensee. Such percentage for purchase of power from non-conventional sources should be made applicable for the tariffs to be determined by the SERCs at the earliest. Progressively, the share of electricity from non-conventional sources would need to be increased*

5.12.3 *As prescribed by State Electricity Regulatory Commissions. Such purchase by distribution companies shall be through competitive bidding process. Considering the fact that it will take some time before non-conventional technologies compete, in terms of cost, with conventional sources, the Commission may determine an appropriate differential in prices to promote these technologies.*

1.4. Tariff Policy-2016 (TP)

In compliance with the Section (3) of the Act, the Central Government has notified the revised Tariff Policy on 28 January, 2016. The Tariff Policy elaborates the role of Regulatory Commissions, the mechanism for promoting renewable energy, the time-frame for implementation, etc. Clause 5.2 of the Tariff Policy provides as under:

“Provided also that the State Government can notify a policy to encourage investment in the State by allowing setting up of generating plants, including from renewable energy sources out of which a maximum of 35% of the installed capacity can be procured by the Distribution Licensees of that State for which the tariff may be determined under Section 62 of the Electricity Act, 2003.”



Clause 6.4 of the Tariff Policy states about various aspects associated with promoting and harnessing renewable sources of energy generation including co-generation from renewable energy sources, as reproduced below:

1) *“Pursuant to provisions of Section 86(1)(e) of the Act, the Appropriate Commission shall fix a minimum percentage of the total consumption of electricity in the area of a distribution licensee for purchase of energy from renewable energy sources, taking into account availability of such resources and its impact on retail tariffs. Cost of purchase of renewable energy shall be taken into account while determining tariff by SERCs. Long term growth trajectory of Renewable Purchase Obligations (RPOs) will be prescribed by the Ministry of Power in consultation with MNRE.*

Provided that cogeneration from sources other than renewable sources shall not be excluded from the applicability of RPOs.

(i) *Within the percentage so made applicable, to start with, the SERCs shall also reserve a minimum percentage for purchase of solar energy from the date of notification of this policy which shall be such that it reaches 8% of total consumption of energy, excluding Hydro Power, by March 2022 or as notified by the Central Government from time to time.*

(ii) *Distribution Licensee(s) shall compulsorily procure 100% power produced from all the Waste-to-Energy plants in the State, in the ratio of their procurement of power from all sources including their own, at the tariff determined by the Appropriate Commission under Section 62 of the Act.*

(iii) *It is desirable that purchase of energy from renewable sources of energy takes place more or less in the same proportion in different States. To achieve this objective in the current scenario of large availability of such resources only in certain parts of the country, an appropriate mechanism such as Renewable Energy Certificate (REC) would need to be promoted. Through such a mechanism, the renewable energy based generation companies can sell the electricity to local distribution licensee at the rates for conventional power and can recover the balance cost by selling certificates to other distribution companies and obligated entities enabling the latter to meet their renewable power purchase obligations. The REC mechanism should also have a solar specific REC.*



(iv) *Appropriate Commission may also provide for a suitable regulatory framework for encouraging such other emerging renewable energy technologies by prescribing separate technology based REC multiplier (i.e. granting higher or lower number of RECs to such emerging technologies for the same level of generation). Similarly, considering the change in prices of renewable energy technologies with passage of time, the Appropriate Commission may prescribe vintage based REC multiplier (i.e. granting higher or lower number of RECs for the same level of generation based on year of commissioning of plant).*

2) *States shall endeavor to procure power from renewable energy sources through competitive bidding to keep the tariff low, except from the waste to energy plants. Procurement of power by Distribution Licensee from renewable energy sources from projects above the notified capacity, shall be done through competitive bidding process, from the date to be notified by the Central Government.*

However, till such notification, any such procurement of power from renewable energy sources projects, may be done under Section 62 of the Electricity Act, 2003. While determining the tariff from such sources, the Appropriate Commission shall take into account the solar radiation and Solar intensity which may differ from area to area to ensure that the benefits are passed on to the consumers.

3) *The Central Commission should lay down guidelines for pricing intermittent power, especially from renewable energy sources, where such procurement is not through competitive bidding. The tariff stipulated by CERC shall act as a ceiling for that category.*

4) *In order to incentivize the Distribution Companies to procure power from renewable sources of energy, the Central Government may notify, from time to time, an appropriate bid-based tariff framework for renewable energy, allowing the tariff to be increased progressively in a back-loaded or any other manner in the public interest during the period of PPA, over the life cycle of such a generating plant. Correspondingly, the procurer of such bid-based renewable energy shall comply with the obligations for payment of tariff so determined.*

5) *In order to promote renewable energy sources, any generating company proposing to establish a coal/lignite based thermal generating station after a specified date shall be required to establish such renewable energy generating capacity or procure and supply renewable energy*



equivalent to such capacity, as may be prescribed by the Central Government from time to time after due consultation with stakeholders. The renewable energy produced by each generator may be bundled with its thermal generation for the purpose of sale. In case an obligated entity procures this renewable power, then the SERCs will consider the obligated entity to have met the Renewable Purchase Obligation (RPO) to the extent of power bought from such renewable energy generating stations.

6) Provided further that in case any existing coal and lignite based thermal power generating station, with the concurrence of power procurers under the existing Power Purchase Agreements, chooses to set up additional renewable energy generating capacity, the power from such plant shall be allowed to be bundled and tariff of such renewable energy shall be allowed to be pass through by the Appropriate Commission. The Obligated Entities who finally buy such power shall account towards their renewable purchase obligations.

7) Provided also that scheduling and despatch of such conventional and renewable generating plants shall be done separately.

8) In order to further encourage renewable sources of energy, no inter-State transmission charges and losses may be levied till such period as may be notified by the Central Government on transmission of the electricity generated from solar sources of energy through the inter-State transmission system for sale.

9) Appropriate Commission may provide regulatory framework to facilitate generation and sale of electricity from renewable energy sources particularly from roof-top solar system by any entity including local authority, Panchayat Institution, user institution, cooperative society, Non-Governmental Organization, franchisee or by Renewable Energy Service Company. The Appropriate Government may also provide complementary policy support for this purpose.”

1.5. Government of Gujarat Renewable Energy 2023

The Government of Gujarat notified the ‘Renewable Energy Policy-2023’ on 4th October 2023 for development of Renewable Energy projects in the State. Some important provisions of this Policy are listed below:



- This Policy came into force with effect from the date of notification and shall be remained in operation till 30th September 2028.
- The Policy states that the RE projects can be set up under this policy for captive use and / or for selling electricity to any other third party whether registered under the REC mechanism or not, or selling electricity to distribution licensees, subject to the provisions of this Policy and in accordance with the provisions of the Electricity Act 2003, as amended from time to time.
- There shall be no capacity restriction for setting up of RE projects for captive use or for selling electricity to third party consumer with respect to the consumer's contracted demand / sanctioned load (kW/kVA) with DISCOMs.
- Energy accounting and banking for all renewable energy projects shall be as per the regulations framed by GERC from time to time in accordance with the Green Energy Open Access Rules 2022 notified by the Ministry of Power, Govt of India.
- For utilization of State transmission / distribution network for wheeling of power from RE projects located within the state or from outside the state to consumer end, transmission and wheeling charges and losses as determined by GERC shall be levied as applicable to normal open access consumer depending on the location of the RE plant and the point of consumption.
- GUVNL shall be implementing, facilitating and monitoring agency for this policy while GEDA shall act as the State Nodal Agency (SNA) for implementation of policy.

1.6. GERC (Terms and Conditions for Green Energy Open Access) Regulations, 2024.

The Commission has notified the GERC (Terms and Conditions for Green Energy Open Access) Regulations, 2024. While preparing this discussion paper, the Commission has also considered the provisions of GERC (Terms and Conditions for Green Energy Open Access) Regulations, 2024. The GERC (Terms and Conditions for Green Energy Open Access) Regulations, 2024 stipulates various provisions related to grant of Open Access from Green



Energy Generating Projects for consumption of green energy for captive use as well as purchase of green energy from third party generators.

1.7. Renewable Purchase Obligation in Gujarat

The GERC (Procurement of Energy from Renewable Sources), (Third Amendment) Regulations, 2022 dated 08.04.2022, specify the Renewable Purchase Obligation (RPO) targets till FY 2024-25 and beyond as below:

Table 1. : Renewable purchase obligation in Gujarat for FY 2017-18 to 2024-25

Financial Year	Total RPO	Non-Solar RPO		Solar RPO	Hydro
		Wind	Biomass Bagasse and other	Solar	
2017-18	10.00%	7.75%	0.50%	1.75%	
2018-19	12.70%	7.95%	0.50%	4.25%	
2019-20	14.30%	8.05%	0.75%	5.50%	
2020-21	15.65%	8.15%	0.75%	6.75%	
2021-22	17.00%	8.25%	0.75%	8.00%	
2022-23	17%	8.25%	0.75%	8.00%	
2023-24	18.70%	8.40%	0.75%	9.50%	0.05%
2024-25	20.70%	8.55%	0.8%	11.25%	0.10%

Source: Gujarat Electricity Regulatory Commission (Procurement of Energy from Renewable Sources) (Third Second Amendment) Regulations, 2022

As per the RPO regulation, the obligated entities have the obligation to purchase electricity (in kWh) from specified RE sources. The said purchase shall be at a defined minimum percentage of the total consumption of its consumers including T&D losses during a year.

This renewable purchase obligation applies to:

- distribution licensees; and



- any other captive and open-access users consuming electricity (i) generated from conventional captive generating plant having capacity of 5 MW and above for their own use and/or (ii) procured from conventional generation through open access and third party sale.

The aforesaid Regulations also provides that the targets specified for Obligated Entities for FY 2024-25 shall be continued beyond for FY 2025-26 and onwards unless specified by the Commission separately.

Further, this Regulation recognises the certificates issued within the scope of Central Electricity Regulatory Commission's (CERC) Renewable Energy Certificate (REC) as the valid instruments for the discharge of the mandatory obligations set out in these Regulations for the obligated entities to purchase electricity from renewable energy sources termed as Renewable Energy Certificates (REC).

1.8. GERC Biomass & Bagasse based Cogeneration Tariff Order, 2018

GERC issued Order No. 01 of 2018 for determination of tariff for Biomass and Bagasse based Cogeneration projects. The fixed and variable components of tariff for Biomass and Bagasse based Cogeneration projects for a period from 15.03.2018 to 31.03.2019 notified by the Commission were as follows

Table 2.: Tariff for Biomass and Bagasse based Cogeneration Project

Biomass Tariff	Biomass based Power Project with Water -Cooled Condenser	Biomass based Power Project with Air -Cooled Condenser
Levellized Fixed Component of Tariff	(a) Without AD Benefit – Rs 1.80/ kWh (b) With AD Benefit Rs 1.65/kWh	(a) Without AD Benefit – Rs 1.91/ kWh (b) With AD Benefit Rs 1.75/kWh
Energy Charge/ Variable	<ul style="list-style-type: none"> ▪ FY 2017-18 – Rs 3.63/kWh ▪ FY 2018-19- Rs 3.82/kWh ▪ FY 2019-20 –Rs 4.01/kWh 	<ul style="list-style-type: none"> ▪ FY 2017-18 – Rs 3.78/kWh ▪ FY 2018-19- Rs 3.97/kWh ▪ FY 2019-20 – Rs 4.17/kWh



Component		
Biomass Tariff	Biomass based Power Project with Water -Cooled Condenser	Biomass based Power Project with Air -Cooled Condenser
Levellized Fixed Component of Tariff	(c) Without AD Benefit – Rs 1.80/ kWh (d) With AD Benefit Rs 1.65/kWh	(c) Without AD Benefit – Rs 1.91/ kWh (d) With AD Benefit Rs 1.75/kWh
Energy Charge/ Variable Component	<ul style="list-style-type: none"> ▪ FY 2017-18 – Rs 3.63/kWh ▪ FY 2018-19- Rs 3.82/kWh ▪ FY 2019-20 –Rs 4.01/kWh 	<ul style="list-style-type: none"> ▪ FY 2017-18 – Rs 3.78/kWh ▪ FY 2018-19- Rs 3.97/kWh ▪ FY 2019-20 – Rs 4.17/kWh
Bagasse Cogen Tariff		
Levellized Fixed Component of Tariff	(e) Without AD Benefit – Rs 1.90/ kWh (f) With AD Benefit Rs 1.74/kWh	
Energy Charge/ Variable Component	<ul style="list-style-type: none"> ▪ FY 2017-18 – Rs 3.63/kWh ▪ FY 2018-19- Rs 3.81/kWh ▪ FY 2019-20 –Rs 4.00/kWh 	

1.9. GERC Biomass & Bagasse based Cogeneration Tariff Order, 2022

GERC vide Order No. 03 of 2022 dated 27.06.2022, determined the Tariff for Procurement of Power by Distribution Licensees and Others from Biomass and Bagasse based Cogeneration Projects and Other Commercial issues for the State of Gujarat.

The fixed and variable components of tariff for Biomass and Bagasse based Cogeneration projects for a period from 01.04.2020 to 31.03.2023 notified by the Commission were as follows

Table 4 Tariff for Biomass and Bagasse based Cogeneration Project



Biomass Tariff	Biomass based Power Project with Water -Cooled Condenser	Biomass based Power Project with Air -Cooled Condenser
Levellized Fixed Component of Tariff	(g) Without AD Benefit – Rs 1.87/ kWh (h) With AD Benefit Rs 1.72/kWh	(e) Without AD Benefit – Rs 1.99/ kWh (f) With AD Benefit Rs 1.82/kWh
Energy Charge/ Variable Component	<ul style="list-style-type: none"> ▪ FY 2020-21 – Rs 4.21/kWh ▪ FY 2021-22 - Rs 4.42/kWh ▪ FY 2022-23 –Rs 4.65kWh 	<ul style="list-style-type: none"> ▪ FY 2020-21 – Rs 4.38/kWh ▪ FY 2021-22 - Rs 4.60/kWh ▪ FY 2022-23 –Rs 4.84/kWh

Bagasse Cogen Tariff	
Levellized Fixed Component of Tariff	(i) Without AD Benefit – Rs 1.98/ kWh (j) With AD Benefit Rs 1.81/kWh
Energy Charge/ Variable Component	<ul style="list-style-type: none"> ▪ FY 2020-21 – Rs 4.20/kWh ▪ FY 2021-22 - Rs 4.41/kWh ▪ FY 2022-23 –Rs 4.63kWh

END OF CHAPTER 1



2. TARIFF FOR BIOMASS AND BAGASSE BASED COGENERATION PROJECTS

2.1. Approach and Methodology

The Order No 1 of 2018 and Order No 3 of 2022 provides for procurement of power by the distribution licensees from Biomass and Bagasse based Cogeneration projects as per the tariff determined by the Commission under Section 62 of the Act.

The Commission notes that the Tariff Policy 2016 notified by the Central Government on 28 January 2016 in pursuance of the Section 3 of the Act stipulates that the Appropriate Commission may determine preferential tariff for procurement of power by distribution licensees from non-conventional sources of energy till issue of notification of procure power from renewable energy sources through competitive bidding by Central Government. The relevant extract of para 6.4 of the Tariff Policy is given below.

“.....(2) States shall endeavor to procure power from renewable energy sources through competitive bidding to keep the tariff low, except from the waste to energy plants. Procurement of power by Distribution Licensee from renewable energy sources from projects above the notified capacity, shall be done through competitive bidding process, from the date to be notified by the Central Government.”

However, till such notification, any such procurement of power from renewable energy sources projects, may be done under Section 62 of the Electricity Act, 2003. While determining the tariff from such sources, the Appropriate Commission shall take into account the solar radiation and wind intensity which may differ from area to area to ensure that the benefits are passed on to the consumers.

(3) The Central Commission should lay down guidelines for pricing intermittent power, especially from renewable energy sources, where such procurement is not through competitive bidding. The tariff stipulated by CERC shall act as a ceiling for that category.”



2.1.1. The Commission notes that the Central Government had yet not laid down guidelines for procurement of power from Biomass and Bagasse based Cogeneration projects through tariff based competitive bidding. The Commission is of the opinion that until sufficient players invest in biomass and bagasse based power projects and the quantum of such projects increased, the adoption of competitive bidding process for procurement of power from Biomass and Bagasse based power projects by the distribution licensees shall not be advisable.

The Commission has observed that the Central Electricity Regulatory in CERC (terms and conditions for tariff determination from Renewable Energy Sources) Regulations 2024 has recommended procurement of power from Biomass and Bagasse based Cogeneration projects under Section 62 of the Act.

In view of above, the Commission decides to continue with the cost plus tariff determination methodology under Section 62 of the Act, as being adopted by the Commission in the previous Tariff Orders for procurement of power from biomass and bagasse based co-generation projects by the distribution licensees in the state, during the control period of new tariff order. Accordingly, the tariff for procurement of power by distribution licensees from the prospective Biomass and Bagasse based Cogeneration Projects shall be as per the tariff determined by the Commission under Section 62 of the Act.

The Ministry of Power, Government of India had notified Green Energy Open Access Rules, 2022 effective from date of its notification i.e. effective from 06th June, 2022. The said Rules, 2022 applicable to green energy project consists of various provisions on Transmission Charges, Wheeling Charges, Cross Subsidy Surcharge, Additional Surcharge, Banking etc. As the Rules framed under Section 176 of the Electricity Act, 2003, it is necessary to give effect to them. It is also need to be considered that the control period of previous Biomass and Bagasse Cogeneration Tariff Order No. 03 of 2022 was expired on 31.03.2023 and no extension in the control period of said Order is granted. Therefore, it is considered appropriate that the provisions of new Order should be made effective from 01.04.2023 i.e. after expiry of Control Period of Order No. 03 of 2022 dated 27.06.2022.

In view of same, the Commission proposes to fix the Control Period of this Order effective from 01.04.2023 up to 31.03.2027.



2.2. General Principles

In this section, the general principles proposed for determination of Tariff for Biomass and Bagasse based Cogeneration projects in new Tariff Order such as control period, tariff period, tariff structure, tariff design, plant life, etc., has been discussed.

a) Control Period

As discussed above, the control period of Biomass and Bagasse based Cogeneration Tariff Order No 03 of 2022 was up to 31st March 2023, the Commission proposes that the control period of this Tariff Order shall be effective from 01.04.2023 up to 31.03.2027.

b) Plant and Machinery

The Biomass and Bagasse based power projects using new plant and machinery as proposed in this discussion paper will be eligible to sell power to distribution licensees of Gujarat at the tariff proposed by the Commission in this Order.

c) Useful life of Plant & Tariff Period

The Useful Life and tariff period shall be 25 years for the Biomass and Bagasse based Cogeneration Projects to be commissioned under PPAs signed during the new Control Period.

d) Tariff Structure & design

The Commission proposes to determine a single-part tariff with two components for procurement of electricity from biomass based power projects and bagasse based co-generation projects by the distribution licensee to be commissioned under PPAs signed during the control period of new tariff order.

Fixed component of tariff shall be levelised over the useful life of the plant and the depreciation benefit shall be internalised for those availing the accelerated depreciation benefit. Variable cost component of tariff shall be specified for each year of the control period by considering annual escalation of fuel cost as proposed in the discussion paper. The biomass power and bagasse based co-generation project to be commissioned under the PPA signed during the control period of new tariff order shall eligible to get the fixed



component of tariff over the useful life of 25 years of the plant and yearly variable component of tariff as specified in the tariff order. The Biomass and Bagasse Cogeneration Projects Commissioned during the control period of previous tariff Orders of the Commission shall be eligible for yearly variable cost component of tariff determined by the Commission in this new tariff order while they shall continue to get levelled fixed cost component as per the previous tariff orders of the Commission as applicable. At the end of the control period, the Commission shall re-assess the fuel price market and re-determine the variable cost component of tariff for Biomass and Bagasse based Cogeneration projects, which will be specified in the subsequent tariff orders to be issued by the Commission.

e) Eligibility Criteria

The biomass power project based on Rankine Cycle Technology and Bagasse based Cogeneration projects using non fossil fuel and new boilers, turbine, generators and associated auxiliaries, to be commissioned during the new control period as proposed in this discussion paper shall be eligible to sell power to distribution licensees of Gujarat at tariff determined by the Commission under the new tariff order. The bagasse based co-generation projects to be commissioned under the PPA signed during the control period of new tariff order needs to fulfil the following minimum qualification requirements of bagasse/non fossil-fuel based co-generation project as specified by Ministry of Power.

Qualifying criteria for Bagasse based Co-generation/non fossil fuel based Co-generation projects

A project may qualify to be termed as a Bagasse based Co-generation project/non fossil fuel based Co-generation project, if it is in accordance with the definition specified by Ministry of Power and also meets the qualifying requirement outlined below.

- Ministry of Power, GoI in its resolution dated 6 November 1996 has defined co-generation as: “A Co-generation facility is defined as one, which simultaneously produces two or more forms of useful energy such as electrical power and steam, electric power and shaft (mechanical) power etc.”



- Topping cycle mode of co-generation: Any facility that uses non-fossil fuel input for the power generation and also utilizes the thermal energy generated for useful heat applications in other industrial activities simultaneously.

Provided that for the co-generation facility to qualify under topping cycle mode, the sum of useful power output and one half the useful thermal output be greater than 45% of the facility's energy consumption, during season.

Explanation

- (a) 'Useful power output' is the gross electrical output from the generator. There will be an auxiliary consumption in the co-generation plant itself (e.g. the boiler feed pump and the FD/ID fans). In order to compute the net power output, it would be necessary to subtract the auxiliary consumption from the gross output. For simplicity of calculation, the useful power output is defined as the gross electricity (kWh) output from the generator.
- (b) 'Useful thermal output' is the useful heat (steam) that is provided to the process by the co-generation facility.

'Energy consumption' of the facility is the useful energy input that is supplied by the fuel (normally bagasse or other such biomass fuel)

f) Scheduling of Power and applicability of Intra-Sate ABT

In the previous tariff Orders, the Commission noted that the generation from biomass based power projects and bagasse based co-generation projects is predictable and hence, can be scheduled in accordance with the intra-state ABT guidelines. Therefore, the Biomass and Bagasse based Cogeneration projects are required to follow Scheduling and Despatch procedures as per the Intra -State ABT order / Regulations notified by the Commission during the control period of new tariff order. However, biomass power projects up to 4 MW capacity would be exempted from the provision of scheduling due to its small size and difficulties of monitoring by the SLDC. The Commission proposes to continue with the same provisions of scheduling.

g) Applicability of Merit Order Dispatch Principle



The Biomass and Bagasse based Cogeneration plants irrespective of plant capacity shall be considered as 'MUST RUN' power plants and shall not be subjected to 'Merit Order Dispatch' principles.

h) Metering point and interconnection point

The interconnection point shall be at the line isolator on outgoing feeder on HV side of generator transformer and the metering point shall be at the interconnection point of the generator bus-bar with the transmission or distribution system concerned, as the case may be.

i) Treatment for Subsidy or incentive by the Central/State Government

The Commission while calculating the tariff shall take into account any incentive or subsidy offered by the Central and State Government, including the AD benefit if availed by the generating company, for the Biomass and Bagasse based Cogeneration plant.

2.3. Benchmarking of Capital Cost and Other Performance Parameters for Biomass Power and Bagasse based Cogeneration Projects

2.3.1. Benchmark capital cost for Biomass based Power Project

Capital cost is the most critical component while determining tariff in a regulated environment. The main cost components of Biomass based power project are:

(i) boiler, (ii) turbine and generators, (iii) condenser, (iv) control cabinets, (v) chimney for flue gases, (vi) transformer and associated equipment, (vii) land and its development, (viii) processing fee of Gujarat Energy Development Agency (GEDA), (ix) erection and commissioning charges, (x) creation of evacuation system up to the interconnection point.

The Commission under its biomass power Tariff Order No 1 of 2018 had specified the capital cost of Rs. 4.77 Cr/MW for biomass power project using water-cooled condenser and Rs. 5.07 Cr/MW for biomass power projects using Air-Cooled condenser which also includes cost towards creation of evacuation system up to the interconnection point. It was decided that



GETCO/DISCOM shall be responsible for laying the power evacuation line beyond the interconnection point to the nearest GETCO/DISCOM sub-station. The Commission in Tariff Order No 3 of 2022 for control period of FY 2020-21 to FY 2022-23 had not evolve the benchmark capital cost for the Biomass and Bagasse based Cogeneration projects, however considered to allow escalation of 4% in fixed cost component of tariff over the fixed cost allowed in the Order No 1 of 2018.

In order to arrive at the benchmark capital cost for biomass power projects in the new control period, the Commission has studied the benchmark cost considered by CERC as well as other SERCs in their tariff Orders / Regulations. The Commission noted that the CERC RE Tariff Regulations 2024 specifies the capital cost of Rs. 6.33 Cr/MW for biomass power project using water-cooled condenser and Rs. 6.85 Cr/MW for biomass power projects using Air-Cooled condenser which also includes cost towards creation of evacuation system up to the interconnection point. The Capital cost specified by other SERCs in their recent tariff Orders / Regulations is varied in the range of Rs 4.92 Cr/MW to 5.92 Cr/MW for biomass power project using water-cooled condenser and Rs 6.03 to 6.85 Cr/MW for biomass power projects using Air-Cooled condenser.

The Commission has further analysed the changes in WPI of Steel and E&M over the period from FY 2017-18 to FY 2023-24 as per data published by the Office of Economic Advisor, Ministry of Commerce and Industry, Government of India to capture the changes in the cost of Steel and E&M equipment which constitute a major part of capital cost.

After considering all the above aspects, the Commission proposes to fix benchmark capital cost of Rs 5.75 Cr/MW for Biomass Power Projects using water cooled condenser and Rs 6.11 Cr/MW for Biomass Power Projects using air cooled condenser considering their design requirements and additional features, for the control period of new Tariff order.

2.3.2. Benchmark capital cost for Bagasse based Cogeneration Project

The Commission in Tariff Order No 1 of 2018 had specified the capital cost of Rs. 4.66Cr/MW for Bagasse based Cogeneration which also includes cost towards creation of evacuation system up to the interconnection point. It was decided that GETCO/DISCOM shall be



responsible for laying the power evacuation line beyond the interconnection point to the nearest GETCO/DISCOM sub-station.

The Commission noted that the CERC RE Tariff Regulations 2024 specifies the capital cost of Rs. 5.62 Cr/MW for Bagasse based Cogeneration project. The Capital cost specified by other SERCs in their recent tariff Orders / Regulations is varied in the range of Rs 4.67 Cr/MW to 4.92 Cr/MW for Bagasse based Cogeneration project. After analysing the changes in WPI of steel and E&M over the period FY 2017-18 to FY 2023-24, the Commission proposed to fix the benchmark capital cost of Rs 5.22 Cr/MW for Bagasse based Cogeneration projects for the control period of New tariff order.

2.3.3. Power evacuation System cost:

In previous Tariff Order 01 of 2018 and Order No 03 of 2022, the Commission had considered the cost associated with erection of the transformer, associated equipment and creation of power evacuation infrastructure up to the interconnection point as part of the capital cost. GETCO/DISCOM was made responsible for laying the evacuation infrastructure beyond interconnection point. The Commission proposes to continue with the same approach during the next control period.

2.3.4. Operations and maintenance cost:

Operations and Maintenance (O&M) cost consists of the statutory charges, spares, employee cost, administrative and general expense, consumables, repairs and maintenance, and insurance expenses, etc.

In case of Biomass based power projects, the Commission in Tariff Order No 01 of 2018 had considered the O&M charges as 5% of the capital cost in the first year of project commissioning with an escalation of 5.72% per annum in subsequent years.

Whereas, in case of Bagasse based co-generation projects, the Commission had considered the O&M charges as 3% of the capital cost in the first year of project commissioning with an escalation of 5.72% per annum thereafter.



The Commission proposed to retain same O&M charges and annual escalation rate for Biomass based Power projects and Bagasse based Cogeneration during control period of new tariff order.

2.3.5. Plant Load Factor (PLF)

The Plant Load Factor (PLF) stands as a pivotal performance indicator for any power plant, reliant upon various factors including consistent and high-quality fuel supply, plant accessibility, and unimpeded off-take.

In case of Biomass based Power project, the Commission in Tariff Order No 01 of 2018 had considered PLF of 70% during 1st year of commissioning covering the stabilization period and 80% from 2nd year onwards. Whereas for Bagasse based Cogeneration Projects, based on number of days of operation of plant in state of Gujarat (180 days crushing season and 60 days in non-crushing season), a normative PLF of 60% was considered for tariff determination. The Commission noted that the CEA report on 'operating norm for biomass based power projects', September 2005 recommended PLF of 80% for recovery of the full fixed cost. In view of this, the Commission proposes to retain the normative PLF for Biomass and Bagasse based Cogeneration project tariff determination purpose as considered in Tariff Order No 01 of 2018

2.3.6. Auxiliary Consumption

The Commission in Tariff Order No 01 of 2018 had considered auxiliary consumption equal to 10% of gross generation for biomass based power projects using water-cooled and air-cooled condenser. The Commission observed that the CERC and most of the other SERCs have also specified same normative auxiliary consumption norms for biomass power project in their respective tariff orders. CEA also has recommended 10% auxiliary consumption for biomass based power projects. Similarly, in the same order for bagasse based co-generation projects the auxiliary consumption was considered equal to 8.5% of gross generation. The Commission proposes to retain same norms of Auxiliary Consumption for tariff determination purpose during control period of new tariff order.

2.3.7. Station Heat Rate (SHR)

The station heat rate of a biomass power plant based on Rankine Cycle is contingent upon



several factors, including plant capacity, design, configuration, technology employed (such as boiler type and pressure levels), operational and maintenance practices, and the quality of fuel received. The Commission in the Tariff Order No 01 of 2018 had considered SHR of 3800 kCal/kWh for biomass based power projects using water-cooled condenser and SHR of 3950 kCal/kWh was considered for Air cooled condenser by recognizing the fact that the condenser pressure in Air cooled condenser is required to be kept at high level which results in higher SHR than the water-cooled condenser. In case of bagasse based cogeneration projects, Station Heat Rate of 3600 kCal/kWh was considered by the Commission in Tariff Order No 01 of 2018. The Commission feels that revision of SHR is not necessary as it is a standard technical parameter relating to the performance of the plant. The Commission proposes to fixed the Station Rate for Biomass and Bagasse based Cogeneration project during control period of new tariff order same as considered in the Tariff Order No 01 of 2018.

2.3.8. Gross calorific value (GCV) of Fuel

In light of Hon'ble Supreme Court Judgement dated 05/07/2016 in Civil Appeal No. 1973 and 1974 of 2014 which uphold the decision of Hon'ble APTEL's Judgment dated 02/12/2013 in Appeal No. 132 and 133 of 2012, the Commission had conducted a scientific study on the availability of bio-mass and its price in the State through an independent agency - The Energy and Research Institute (TERI), New Delhi, TERI submitted its draft report on 15.05.2017 dealing with Biomass availability and Gross Calorific Value and cost of representative Biomass and Bagasse available in the state. The outcome of the study was based on elaborate consultation with various Government officials, study of the primary and secondary data and opinion of the relevant persons who are associated with the biomass industries. The Commission vide order dated 9.02.2018 after hearing the stakeholders adopted the findings of the TERI Report and declared availability of biomass in the State, weighted average GCV of 4423 Kcal/kg and weighted average cost of biomass of Rs. 3764 per tonne for tariff determination purpose. In case of Bagasse based Cogeneration projects based on TERI Report the Commission decided to consider the GCV of 2250 Kcal/kg and cost of Bagasse equal to Rs 2075 / MT for tariff determination purpose in Tariff Order No 01 of 2018.



Considering the fact that the availability of Biomass / Bagasse including the GCV of Biomass and Bagasse fuel decided by the Commission is an outcome of a scientific state specific study followed by elaborate public consultation process carried in 2018, the Commission decided to consider GCV of representative biomass and bagasse for tariff determination during control period of new tariff order as decided by Commission vide order dated 09.02.2018 and adopted in subsequent tariff Orders.

2.3.9. Cost of Fuel

The Commission notes that, the price of biomass fuel depends on various components, such as remuneration to farmers, costs related to collection and storage, transportation, loading and unloading costs, agent commission, etc. The Fuel procurement and transportation are handled by the highly unorganised sector and the prices are influenced by local factors. The Commission aims to establish reasonable tariffs by determining the cost of fuel.

As discussed in para 2.3.8 above, the Commission has decided the surplus biomass availability for each crop and representative cost for representative Biomass mix for the state for tariff determination purpose through an independent study during 2018. Similarly, the representative cost of Bagasse was ascertained for tariff determination purpose through the same study.

The Commission notes that the landed cost of Biomass and Bagasse at plant location greatly influenced by the cost of biomass/ bagasse at source, transportation cost and loading and unloading cost. To take care of these factors during the intervening period, the Commission had derived the Weighted Average growth rate considering Wholesale Price Index' of High Speed Diesel' and coking coal and Consumer Price Index of Agricultural labour during FY 2017-18 to FY 2023-24 with the help of data published by Office of Economic Adviser, Department for Promotion of Industry and Internal Trade, GoI and Consumer Price Index of Agricultural labour by Ministry of Labour Employment. After considering an additional allowance for Trading margin and other competitive use of biomass / bagasse, the Commission arrive at representative Biomass and Bagasse cost of Rs 5044 / MT and Rs 2780/MT for tariff determination purpose during first year of control period of new tariff



order. The Commission decided to escalated the Biomass and Bagasse fuel cost at the rate of 5% per annum during subsequent three years of the control period.

2.3.10. Use of Fossil Fuel

Use of Fossil fuel shall not be allowed. The Commission had discontinued the use of Fossil Fuel as a supplementary fuel in Biomass power and Bagasse based Cogeneration project since Order 03 of 2022. The Commission proposes to continue with the same provision during the Control period of new tariff order.

2.4. Financial Parameters

2.4.1. Debt-equity ratio

Tariff Policy formulated by the Ministry of Power, Govt. of India, stipulates debt-equity ratio of 70:30 for power projects. GERC Multi Year Tariff (MYT) Regulations, 2024 notified by the Commission also provide that the debt-equity ratio should be kept as 70:30. Hence, it is proposed to consider the debt-equity ratio as 70:30 for the new control period.

2.4.2. Interest on term loan and Loan tenure

The Commission has noted that the project financing interest rates are typically indicated by SBI MCLR. A reasonably sound project could avail funding at 200 basis points above the MCLR announced by State Bank of India (SBI). It is proposed to consider the interest rate on term loan as SBI MCLR rate (8.15%) plus 200 basis points which works out to 10.15 % for computation of interest on term loan and loan repayment period as 15 years for tariff determination purpose.

2.4.3. Depreciation:

GERC Multi Year Tariff (MYT) Regulations, 2024 notified by the Commission provide that depreciation rate should be calculated based on Straight Line Method. The MYT Regulations further provide that asset is to be depreciated up to 90% of its initial value (considering residual value as 10% of its initial value) over the entire asset life. To facilitate the principal loan repayment, the Commission decides to consider the depreciation rate as 4.67% per annum during the loan repayment period i.e. first 15 years; and beyond the loan tenure, the



depreciation is allowed as per 'Straight Line Method' over the remaining useful life of the plant i.e. depreciation at rate of 2% per annum from 16th to 25th year. In view of this it is proposed to consider depreciation at the rate of 4.67% per annum for the first 15 years, and 2% from 16th year to 25th year for tariff determination purpose during the control period.

2.4.4. Working capital and Interest on working capital

The Commission in its tariff orders for renewable energy projects (with fuel cost component) had considered the components of working capital as follows:

- O&M expenses for one month.
- Receivables of one month charges for sale of electricity.
- Maintenance spares at 1% of the capital cost escalated at 5% per annum.
- Fuel Cost for one month

It is proposed to continue the same approach for determination of the working capital requirement for Biomass Power and Bagasse based Cogeneration projects during the control period of new tariff order.

2.4.5. Interest on working capital

GERC MYT Regulations 2024, states that the interest on working capital is to be calculated at 250 basis points above the base rate / MCLR. In view of the above, it is proposed to consider the interest on working capital equal to the SBI MCLR plus 250 basis points, which works out as 10.65 %.

2.4.6. Return on Equity

In line with GERC Multi Year Tariff Regulations, 2014, the Commission follows the principle of allowing 15.5% RoE for generating plants plus the applicable tax payment for conventional and renewable power projects. It is proposed to consider the RoE of 15.5% and the tax payment of MAT @ 17.47 % per annum for first 10 years and corporate tax @ 34.94% (IT Rate 30% + 12% Surcharge + 4% Cess) per annum for the next 15 years as a cost for the purpose of computing the tariff during control period of new tariff order.



2.4.7. Discount rate

The discount rate has been considered by CERC and other SERCs as weighted average cost of capital (WACC). The formula for computation of WACC is given below.

WACC = Cost of Debt + Cost of Equity

Cost of Debt = $0.70 \times (\text{Rate of Interest}) \times (1 - \text{Corporate tax})$

Cost of Equity = $0.30 \times \text{Return on Equity (i.e., normative 15.5\%)}$

Interest Rate considered for the loan component (i.e., 70% of the capital cost) is 10.15 %. For the equity component (i.e., 30% of the capital cost), the rate of Return on Equity (ROE) is considered at a post-tax rate of 15.5%, as a normative factor. Further, Corporate Tax rate of 34.94% has been considered.

In view of above, the Commission proposes to consider the discount factor as 9.77% for levellized tariff calculation during the control period of new tariff order.

2.4.8. Accelerated depreciation: Following principles have been considered for ascertaining the Income Tax benefit on account of accelerated or additional depreciation for the purpose of tariff determination:

- i. The assessment of benefit shall be based on normative Capital Cost, accelerated/ additional depreciation rate as per the relevant provisions of the Income Tax Act and the Corporate Income Tax rate;
- ii. Capitalisation of Biomass and Bagasse based power projects for the full financial year;
- iii. Per-unit benefit shall be derived on levellized basis at a discounting factor equivalent to the post-tax weighted average cost of capital.

Presently, RE project developers can avail accelerated depreciation at the rate of 40% in the first year on a written-down value (WDV) basis. In addition to this 40% depreciation, the amendment in the Finance Act has allowed an additional depreciation of 20% to the power projects during first year of project commissioning. With this, Biomass power and Bagasse



based Cogeneration projects can avail 60% depreciation in the first year of commissioning. The Commission has considered above depreciation rate while calculating per unit AD benefit.

2.5. Computation of Tariff for Biomass Power

Based on the foregoing discussion, the operational and financial parameters considered by the Commission for determination of biomass based power projects tariff are provided in the table below:

Parameters	Biomass Power Projects with Water Cooled Condenser	Biomass Power Projects with Air Cooled Condenser
Project Cost and O&M		
<i>Total Project Cost (Land + Plant & Machinery + Erection Cost + Evacuation Infrastructure Cost up to Interconnection Point) (Rs. Lakh/MW)</i>	575	611
<i>Normative O&M Cost for first year</i>	5% of Capital Cost	5% of Capital Cost
<i>Escalation in O&M (per annum from 2nd year)</i>	5.72%	5.72%
Performance Parameter		
<i>PLF</i>	70% during 1 st yr and 80% from 2 nd yr onward	70% during 1 st yr and 80% from 2 nd yr onward
<i>Auxiliary Consumption</i>	10%	10%
<i>Project Life in Years</i>	25 Years	25 Years



<i>Station Heat Rate kCal/kWh</i>	3800	3950
<i>Gross Calorific Value of Biomass in kCal/kg</i>	4423	4423
<i>Cost of Fuel</i>	5044	5044
<i>Fuel Cost escalation</i>	5% per annum	5% per annum
Financial Parameter		
<i>Debt-Equity ratio</i>	70:30	70:30
<i>Loan Tenure</i>	15 years	15 years
<i>Interest on Term Loan</i>	10.15%	10.15%
<i>Interest on Working Capital</i>	10.65%	10.65%
<i>Depreciation</i>	4.67% during first 15 yrs and 2% during balance of life of project	4.67% during first 15 yrs and 2% during balance of life of project
<i>Minimum Alternate Tax</i>	17.47%	17.47%
<i>Corporate Income Tax</i>	34.94%	34.94%
<i>Return on Equity</i>	15.5%	15.5%
<i>Tariff</i>	Levellized Fixed cost component of Tariff for 25 years a) Without AD benefit – Rs 2.18/kWh b) With AD benefit – Rs 2.01/kWh	Levellized Fixed cost component of Tariff for 25 years a) Without AD benefit – Rs 2.31/kWh b) With AD benefit – Rs 2.14/kWh
	Variable Component of Tariff during • 1 st Year – Rs 4.82/kWh • 2 nd Year- Rs	Variable Component of Tariff during • 1 st Year – Rs 5.01/kWh • 2 nd Year- Rs



	5.06/kWh • 3 rd Year- Rs 5.31/kWh • 4 th Year- Rs 5.57/kWh	5.26/kWh • 3 rd Year- Rs 5.52/kWh • 4 th Year- Rs 5.79/kWh
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Note : Detail Tariff computation sheets for Biomass based Power project using Water cooled condenser and Air Cooled condenser are attached as **Exhibit A & B** with the discussion paper.

2.6. Computation of Tariff for Bagasse based Cogeneration Projects

Based on the foregoing discussion, the operational and financial parameters considered by the Commission for determination of biomass based power projects tariff are provided in the table below:

Parameters	Bagasse based Cogeneration Project
Project Cost and O&M	
<i>Total Project Cost (Land + Plant & Machinery + Erection Cost + Evacuation Infrastructure Cost up to Interconnection Point) (Rs. Lakh/MW)</i>	522
<i>Normative O&M Cost for first year</i>	3% of Capital Cost
<i>Escalation in O&M (per annum from 2nd year)</i>	5.72%
Performance Parameter	
<i>PLF</i>	60%
<i>Auxiliary Consumption</i>	8.5%
<i>Project Life in Years</i>	25 Years
<i>Station Heat Rate kCal/kWh</i>	3600



<i>Gross Calorific Value of Biomass in kCal/kg</i>	2250
<i>Cost of Fuel</i>	2780
<i>Fuel Cost escalation</i>	5% per annum
Financial Parameter	
<i>Debt-Equity ratio</i>	70:30
<i>Loan Tenure</i>	15 years
<i>Interest on Term Loan</i>	10.15%
<i>Interest on Working Capital</i>	10.65%
<i>Depreciation</i>	4.67% during first 15 yrs and 2% during balance of life of project
<i>Minimum Alternate Tax</i>	17.47%
<i>Corporate Income Tax</i>	34.94%
<i>Return on Equity</i>	15.5%
<i>Tariff</i>	Levellized Fixed cost component of Tariff for 25 years a) Without AD benefit – Rs 2.18/kWh b) With AD benefit – Rs 2.01/kWh
	Variable Component of Tariff during <ul style="list-style-type: none"> • 1st Year – Rs 4.86/kWh • 2nd Year- Rs 5.10/kWh • 3rd Year- Rs 5.36/kWh • 4th Year- Rs 5.63/kWh

Note : Detail Tariff computation sheets for Bagasse based Cogeneration project is attached as Exhibit C with the Discussion paper.

The Biomass power and Bagasse based co-generation project to be commissioned under the PPA signed during the control period of new tariff order decided in the present discussion paper shall eligible to get the above fixed component of tariff over the useful life of 25 years of the plant and yearly variable component of tariff as specified in the tariff order of the



Commission from time to time. The Biomass and Bagasse Cogeneration Projects Commissioned during the control period of previous tariff Orders of the Commission and executed PPA with the GUVNL/ DISCOM, if any, shall be eligible for yearly above variable cost component of tariff determined by the Commission in this new tariff order while they shall continue to get levelled fixed cost component of tariff as per the previous tariff orders of the Commission read with provisions of PPA executed between the parties, as applicable.

END OF CHAPTER 2



3. OTHER COMMERCIAL ISSUES

3.1. Transmission and Wheeling Charges

3.1.1. Wheeling of Power for Third Party Sale

In case of injection of the electricity at 66 KV level or above and drawl of electricity up to 66 KV level, the transmission of energy from Biomass & Bagasse Power Projects from the injection point to drawl place shall be allowed by paying transmission charges and losses determined by the Commission from time to time, as applicable to Green Energy Open Access Transaction as per GERC Green Energy Open Access Regulations, 2024 and amendments in it from time to time.

- a) In case of injection of energy at 66 KV level or above and drawl of energy below 66 KV voltage level in such case, wheeling of Power for third party sale from Biomass & Bagasse Power Projects shall be allowed on payment of transmission charges, transmission losses and wheeling charges and losses as determined by the Commission from time to time as applicable to green energy open access transaction as per GERC Green Energy Open Access Regulations, 2024 and amendments in it from time to time.
- b) In case point of injection and drawl at 11 KV or below levels lies within area of same DISCOM, the wheeling of energy from Biomass and Bagasse based Cogeneration Project shall be allowed upon payment of Wheeling Charges and Wheeling Losses of energy fed to grid, as applicable to green energy open access transaction as per GERC Green Energy Open Access Regulations, 2024 and amendments in it from time to time.
- c) The provisions related to Cross Subsidy Surcharge and Additional Surcharge shall be governed as per the MOP Rules and GERC (Terms and Conditions for Green Energy Open Access) Regulations, 2024 as amended from time to time.

3.1.2. Wheeling of power for Captive Use



- a) In case of injection of the electricity at 66 KV level or above and drawl of electricity up to 66 KV level, the transmission of energy from Biomass & Bagasse Power Projects from the injection point to drawl place shall be allowed for captive use by paying transmission charges and losses determined by the Commission from time to time, as applicable to Green Energy Open Access Transaction as per GERC Green Energy Open Access Regulations, 2024 and amendments in it from time to time.
- b) In case of injection of energy at 66 KV level or above and drawl of energy below 66 KV voltage level in such case, wheeling of Power for captive from Biomass & Bagasse Power Projects shall be allowed on payment of transmission charges, transmission losses and wheeling charges and losses as determined by the Commission from time to time as applicable to green energy open access transaction as per GERC Green Energy Open Access Regulations, 2024 and amendments in it from time to time.
- c) In case point of injection and drawl at 11 KV or below levels lies within area of same DISCOM, the wheeling of energy for captive use from Biomass and Bagasse based Cogeneration Project shall be allowed upon payment of Wheeling Charges and Wheeling Losses of energy fed to grid, as applicable to green energy open access transaction as per GERC Green Energy Open Access Regulations, 2024 and amendments in it from time to time.

Provided further that the person consuming energy generated from Biomass power or Bagasse based Cogeneration project set up for captive consumption shall require to provide the details of ownership in the captive generating plant and generation as well as consumption of energy from captive generating plant to the distribution licensee in whose area of supply, the captive consumer is situated, on annual basis, in accordance with the provisions of GERC Green Energy Open Access Regulations, 2024 to ensure that the necessary conditions stipulated in Electricity Rules, 2005 read with provisions of GERC Green Energy Open Access Regulations, 2024 is fulfilled by such captive generating plant and consumption by captive users. Failure to fulfil the aforesaid conditions, such consumption shall loose the status of captive consumption and it shall



be qualified as supply by third party by generator and the benefits granted to captive consumption shall be withdrawn for that Financial Year and it shall attract the applicability of the Cross-Subsidy Surcharge and Additional Surcharge, if any, as applicable to third party green energy open access transaction as per GERC Green Energy Open Access Regulations, 2024 and amendments in it from time to time along with delayed payment surcharge thereon.

On receiving of documents/evidence from the captive consumer by the distribution licensee, the distribution licensee shall verify the same in compliance of provisions of Act, Rules and Regulations for captive status of the generator and consumption of energy from such plant and refer the matter to the Commission in case non-compliance of captive status by the generator/captive consumer and also claim the recovery of charges payable by such consumer on account of not fulfilling of captive generating plant status by the generator or captive consumer.

The Commission shall verify the fact and take the final decision regarding continuation of the captive status of the plant and consumption of energy from such plant as captive consumption for the respective financial year.

The various provisions related to Captive Generating Plant (CGP) and consumption of energy from such plant as stipulated in the GERC Green Energy Open Access Regulations, 2024 shall be applicable for Biomass power and Bagasse based Cogeneration Project.

3.1.3. Wheeling of power to more than one locations

Biomass power and Bagasse based Cogeneration Project Developers, who desire to wheel electricity to more than one location for captive use/third-party sale, shall pay 5 paise per unit on energy fed in the grid to the concerned DISCOM in whose area power is consumed in addition to above mentioned transmission charges and losses, as applicable.

3.2. Metering Point & Interconnection Point

The Commission proposes following with regard to Metering arrangement:



- The interconnection point will be at the line isolator on outgoing feeder on HV side of generator transformer and the metering point will be at the interconnection point of the generator bus-bar with the transmission or distribution system concerned, as the case may be. The Biomass power and Bagasse based Cogeneration project shall provide energy metering and communication facility in accordance with the (a) the CEA (Installation and Operation of meters) (Amendment) Regulations 2014 and its subsequent amendments, (b) Gujarat Electricity Grid Code 2013 and its subsequent amendments (c) GERC (Terms and Conditions of Intra-State Open Access) Regulations, 2011 and its subsequent amendments, (e) GERC Green Open Access Regulations, 2024 and its subsequent amendments.
- The Biomass power and Bagasse based Cogeneration project developers shall have to provide four quadrant ABT compliant meters at the interconnection point which shall conform to the Central Electricity Authority (Installation and Operation of Meters) Regulations, 2014, as amended from time to time. GETCO/DISCOM to stipulate necessary specifications in this regard. The ABT meter shall be AMR compatible.
- The electricity generated shall be metered and readings taken jointly by The Biomass power and Bagasse based Cogeneration project developer with the representative of DISCOM and GETCO at the metering point, on weekly basis.
- The Biomass power and Bagasse based Cogeneration project shall install Remote Terminal Unit (RTU) at the sending end sub-station at their own cost for transferring the real time data to SLDC for its monitoring purpose, and in accordance with the GERC Orders from time to time.
- State Load Dispatch Centre shall certify actual injected energy and energy drawn (if any) from local DISCOM.
- Energy metering and communication facility shall be provided by the developer of The Biomass power and Bagasse based Cogeneration projects in accordance with the following Regulations/Codes/Orders and their subsequent amendments:
 - i. Central Electricity Authority (Installation and Operation of meters) Regulations 2014 and its subsequent amendments.
 - ii. Gujarat Electricity Grid Code 2013 and its subsequent amendments.



- iii. GERC (Terms and Conditions of Intra-State Open Access) Regulations, 2011 and its subsequent amendments.
- iv. GERC Distribution Code 2004 and its subsequent amendments.
- v. GERC (Terms and Conditions for Green Energy Open Access), Regulations 2024.

For the purpose of energy accounting, all The Biomass power and Bagasse based Cogeneration Project Developer shall have to provide ABT compliant (four quadrant) meters and if the power is to be wheeled to consumers' premises, then ABT cum Tariff compatible meter is to be installed at the consumers' premises also. While in case of consumer seeking open access below 1 MW, installation of Special Energy Meter capable of energy recording on 15 Minute Time Block basis at consumption end shall be allowed. GEDA, GETCO and DISCOMs shall ensure the energy accounting of Active and Reactive energy from The Biomass power and Bagasse based Cogeneration project each consumer/customer. Energy Accounting shall be done by SLDC.

3.3. Renewable Energy Certificates for Third-Party Sale and Captive Use of power generated from biomass power projects and bagasse based co-generation projects

The Commission proposes that the biomass and bagasse based co-generation projects registered in the REC mechanism, shall be governed by the CERC (REC) Regulations and its amendments from time to time to be eligible for availing RECs.

3.4. Pricing of Reactive Power

Reactive Power is required by the Biomass power and Bagasse based Cogeneration project from the grid including during requirement initial start-up and station transformers. Hence, in order to maintain grid stability, it is necessary to limit such reactive power consumption from the grid by installation of suitable compensation devices.

In order to restrain the Biomass and Bagasse based Cogeneration power projects from consuming more reactive power from the grid and to encourage them to install suitable compensation devices to limit such reactive power consumption, the Commission in the previous Order had levied reactive power charges.



The Pricing of Reactive Power for all prospective Biomass power and Bagasse based Cogeneration project shall be same as decided by the Commission in the GETCO Order from time to time read with GERC Grid Code

The above approach is proposed to be adopted for all prospective Biomass and Bagasse based Cogeneration projects.

3.5 Sharing of Clean Development Mechanism (CDM) Benefits

It is proposed that the sharing of CDM benefits or any other benefit such as carbon credit or any other benefits under Clean Development Mechanism or any other mechanism under any provision from any source providing such benefits to the Biomass power and Bagasse based Cogeneration project for which it shall qualify to receive such benefit on the energy generation from the Biomass and Bagasse based Cogeneration based power generation project shall apply to the concerned authority to avail / receive the benefit for the project. The benefits which shall be receivable or received shall be shared with the procurer of power and / or licensee as under:

- 1) 100% of the gross proceeds on account of such CDM benefit or any other benefit under Clean Energy Mechanism from any source to be retained by the project Developer in the first year after the date of commercial operation of the generating station.
- 2) In the second year, the share of the Beneficiaries like power procurer/licensee shall be 10% which shall be progressively increased by 10% every year till it reaches 50%, where after the proceeds shall be shared in equal proportion, by the Generating Company and the Beneficiaries like power procurer/licensee.”

The above approach is proposed to be adopted for all prospective Biomass and Bagasse based Cogeneration power projects.

3.6 Banking of Surplus Power & Energy Accounting

Biomass and bagasse based co-generation projects generate power with controlled supply of fuel and hence the power generated from such projects can be predicted and scheduled to maintain grid discipline. Hence, such projects are required to schedule their power as per the



provisions of ABT mechanism as amended from time to time. Accordingly, in regard to Biomass and Bagasse based Power Projects set up for captive use/ third party sale, the Commission in its earlier tariff order No 01 of 2018 and 03 of 2022 provided for allowing set off wheeled energy at the recipient unit (s) in the same 15 minute time block basis. The Commission proposes to continue the same practice for the next control period. The Commission, therefore, decides not to allow any banking facility to biomass based power projects and bagasse based co-generation projects either selling power to third party or wheeling for self-use.

3.7 Purchase of Surplus Power from Biomass Power and Bagasse based Co-generation Projects Opting for Captive Use and Third Party Sale under Open Access

Biomass power and bagasse based co-generation projects are required to schedule the power as per the provisions of ABT mechanism. In case of Biomass power and bagasse based co-generation projects set up for captive use/ third party sale, the Commission proposes that surplus power over and above the settlement of wheeled energy given in same 15 minute time block basis at the recipient unit shall be treated as per provisions under intra state ABT mechanism or any new mechanism as may be introduced by the Commission during the control period of new tariff order.

3.8 Contract Demand for Commissioning/Start-up Power

The biomass power projects selling power to distribution licensee, the start -up power and standby power would be at par with the energy charges applicable to the HT industrial consumer of similar connected load / category. Further as a promotional measure, the Commission has exempted such projects from payment of demand charges for commissioning and start-up power requirement. For the bagasse based co-generation projects, such requirement of standby power can be met from the existing power supply available for the sugar factory.



Security Deposit

The Commission proposes that the Biomass Power & Bagasse based Cogeneration project developers are required to furnish Bank Guarantee of Rs. 10 Lakh/MW as a security deposit after entering into PPA with Distribution Licensees. The Bank Guarantee shall be returned if the developer achieves commercial operation within the time period mentioned in the PPA. The Bank Guarantee shall be encashed if the project is not commissioned within the specified time period as stipulated in the PPA.

3.9 Information and Data sharing by Biomass and Bagasse based Cogeneration Project

The Project Developer shall maintain the record on (a) Daily basis, (b) Monthly basis and (c) Annual basis (Financial Year) of following information:

- 1) Opening Balance of Biomass & Bagasse fuel, if any
- 2) Opening Balance of Calorific Value of Biomass & Bagasse fuel, if any
- 3) Quantity of Biomass & Bagasse received
- 4) Calorific Value of Biomass & Bagasse received, if determined by approved laboratory
- 5) Quantity of Biomass & Bagasse utilised for generation of electricity
- 6) Calorific Value of Biomass & Bagasse fuel utilised
- 7) Gross Electricity Generation
- 8) Auxiliary consumption
- 9) Net Electricity Generation as per SEA of SLDC
- 10) Closing Balance of Quantity of Biomass & Bagasse fuel,
- 11) Closing Balance of Calorific Value of Biomass & Bagasse fuel etc.

The above information shall be provided with monthly invoices raised by the Biomass & Bagasse Developer (Supplier) to the GUVNL / DISCOM (Procurer).



Moreover, the Biomass & Bagasse Project Developer shall also upload the above data/information/details on its website duly updated on day to day basis. The Nodal Agency shall verify above aspects will processing the invoice(s) raised by the Biomass & Bagasse Project Developer. It is made clear that any electricity generated through use of any other fuel other than Biomass & Bagasse fuel shall not be allowed

The Biomass power and Bagasse based co-generation project to be commissioned under the PPA signed during the control period of new tariff order decided in the present discussion paper shall eligible to get the above fixed component of tariff over the useful life of 25 years of the plant and yearly variable component of tariff as specified in the tariff order of the Commission from time to time. The Biomass and Bagasse Cogeneration Projects Commissioned during the control period of previous tariff Orders of the Commission and executed PPA with the GUVNL/ DISCOM, if any, shall be eligible for yearly above variable cost component of tariff determined by the Commission in this new tariff order while they shall continue to get levelized fixed cost component of tariff as per the previous tariff orders of the Commission read with provisions of PPA executed between the parties, as applicable.

Stakeholders may offer their comments on or before 18.10.2024. Public hearing in this regard will held on 25.10.2024 at 11:30 AM at GERC's Office, GIFT CITY, Gandhinagar. Stakeholder either in person or through their authorized representative may remain present.

Sd/-
[Ranjeeth Kumar], IAS]
Secretary
Gujarat Electricity Regulatory Commission
Gandhinagar, Gujarat

Place: Gandhinagar

Date: 30/09/2024.



EXIBIT A: Tariff Computation Sheet for Biomass Power Projects using water cooled condenser

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Net Energy sold (lakh kWhs)	55.1 9	63.0 7	63.0 7	63.0 7	63.0 7	63.0 7	63.0 7	63.0 7	63.0 7	63.0 7	63.0 7	63.0 7	63.0 7	63.0 7	63.0 7	63.0 7	63.0 7	63.0 7	63.0 7	63.0 7	63.0 7	63.07	63.07	63.07	63.07	
Costs																										
O&M	28.7 5	30.3 9	32.1 3	33.9 7	35.9 1	37.9 7	40.1 4	42.4 4	44.8 6	47.4 3	50.1 4	53.0 1	56.0 4	59.2 5	62.6 4	66.2 2	70.0 1	74.0 1	78.2 5	82.7 2	87.4 5	92.46	97.75	103.3 4	109.2 5	
Insurance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depreciation (SLM)	26.8 3	26.8 3	26.8 3	26.8 3	26.8 3	26.8 3	26.8 3	26.8 3	26.8 3	26.8 3	26.8 3	26.8 3	26.8 3	26.8 3	26.8 3	11.5 0	11.5 0	11.5 0	11.5 0	11.5 0	11.5 0	11.50	11.50	11.50	11.50	
Advance Against Depreciation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on term loan	39.4 9	36.7 7	34.0 4	31.3 2	28.6 0	25.8 7	23.1 5	20.4 3	17.7 0	14.9 8	12.2 6	9.53	6.81	4.09	1.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working capital	6.77	7.75	8.08	8.42	8.78	9.16	9.56	9.99	10.4 3	10.9 0	11.4 4	11.9 6	12.5 0	13.0 8	13.6 9	14.2 0	14.9 0	15.6 3	16.4 0	17.2 1	18.0 6	18.96	19.89	20.88	21.92	
Return on Equity	26.7 4	26.7 4	26.7 4	26.7 4	26.7 4	26.7 4	26.7 4	26.7 4	26.7 4	26.7 4	26.7 4	26.7 4	26.7 4	26.7 4	26.7 4	26.7 4	26.7 4	26.7 4	26.7 4	26.7 4	26.7 4	26.74	26.74	26.74	26.74	
Tax on equity	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	9.34	9.34	9.34	9.34	9.34	9.34	9.34	9.34	9.34	9.34	9.34	9.34	9.34	9.34	9.34	9.34
Fuel cost	265. 73	318. 88	334. 82	351. 56	369. 14	387. 60	406. 98	427. 33	448. 69	471. 13	494. 69	519. 42	545. 39	572. 66	601. 29	631. 36	662. 93	696. 07	730. 88	767. 42	805. 79	846.0 8	888.3 8	932.8 0	979.4 4	
Total Cost (Rs lakh)	398. 98	452. 04	467. 32	483. 52	500. 68	518. 85	538. 08	558. 42	579. 94	602. 68	631. 43	656. 83	683. 66	711. 99	741. 89	759. 36	795. 41	833. 30	873. 11	914. 93	958. 89	1005. 07	1053. 60	1104. 60	1158. 19	
Fixed cost (Rs lakh)	133. 25	133. 16	132. 50	131. 96	131. 54	131. 25	131. 10	131. 09	131. 24	131. 55	136. 75	137. 41	138. 27	139. 33	140. 60	128. 00	132. 49	137. 23	142. 23	147. 51	153. 10	158.9 9	165.2 2	171.8 0	178.7 4	
Fuel cost (Rs lakh)	265. 73	318. 88	334. 82	351. 56	369. 14	387. 60	406. 98	427. 33	448. 69	471. 13	494. 69	519. 42	545. 39	572. 66	601. 29	631. 36	662. 93	696. 07	730. 88	767. 42	805. 79	846.0 8	888.3 8	932.8 0	979.4 4	
Tariff																										
Fixed tariff (Rs / kWh)	2.41	2.11	2.10	2.09	2.09	2.08	2.08	2.08	2.08	2.09	2.17	2.18	2.19	2.21	2.23	2.03	2.10	2.18	2.26	2.34	2.43	2.52	2.62	2.72	2.83	



Variable tariff (Rs / kWh)	4.82	5.06	5.31	5.57	5.85	6.15	6.45	6.78	7.11	7.47	7.84	8.24	8.65	9.08	9.53	10.01	10.51	11.04	11.59	12.17	12.78	13.41	14.09	14.79	15.53
Tariff (Rs/kWh)	7.23	7.17	7.41	7.67	7.94	8.23	8.53	8.85	9.19	9.56	10.01	10.41	10.84	11.29	11.76	12.04	12.61	13.21	13.84	14.51	15.20	15.94	16.70	17.51	18.36
Levelized Fixed Tariff Calculations																									
Discount Rate	9.77 %																								
Levelized Fixed Tariff (Rs / kWh)	2.18																								



EXHIBIT B: Tariff Computation Sheet for Biomass Power Projects using Air cooled condenser

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Net Energy sold (lakh kWhs)	55.19	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07	63.07
Costs																									
O&M	30.55	32.30	34.14	36.10	38.16	40.35	42.65	45.09	47.67	50.40	53.28	56.33	59.55	62.96	66.56	70.37	74.39	78.65	83.15	87.90	92.93	98.25	103.86	109.81	116.09
Insurance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depreciation (SLM)	28.52	28.52	28.52	28.52	28.52	28.52	28.52	28.52	28.52	28.52	28.52	28.52	28.52	28.52	28.52	12.22	12.22	12.22	12.22	12.22	12.22	12.22	12.22	12.22	12.22
Advance Against Depreciation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on term loan	41.96	39.07	36.18	33.28	30.39	27.49	24.60	21.71	18.81	15.92	13.02	10.13	7.24	4.34	1.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working capital	7.08	8.11	8.45	8.80	9.18	9.58	9.99	10.44	10.90	11.39	11.95	12.49	13.06	13.66	14.30	14.83	15.56	16.32	17.13	17.97	18.86	19.79	20.77	21.80	22.88
Return on Equity	28.41	28.41	28.41	28.41	28.41	28.41	28.41	28.41	28.41	28.41	28.41	28.41	28.41	28.41	28.41	28.41	28.41	28.41	28.41	28.41	28.41	28.41	28.41	28.41	28.41
Tax on equity	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	9.93	9.93	9.93	9.93	9.93	9.93	9.93	9.93	9.93	9.93	9.93	9.93	9.93	9.93	9.93
Fuel cost	276.22	331.47	348.04	365.44	383.71	402.90	423.04	444.20	466.41	489.73	514.21	539.92	566.92	595.26	625.03	656.28	689.09	723.55	759.73	797.71	837.60	879.48	923.45	969.62	1018.10
Total Cost (Rs lakh)	417.71	472.83	488.70	505.51	523.33	542.21	562.18	583.32	605.68	629.32	659.32	685.73	713.62	743.08	774.19	792.04	829.60	869.08	910.56	954.14	999.94	1048.07	1098.65	1151.79	1207.63
Fixed cost (Rs lakh)	141.49	141.37	140.66	140.07	139.62	139.31	139.14	139.12	139.27	139.60	145.11	145.80	146.70	147.82	149.16	135.76	140.51	145.53	150.83	156.43	162.35	168.60	175.19	182.17	189.53
Fuel cost (Rs lakh)	276.22	331.47	348.04	365.44	383.71	402.90	423.04	444.20	466.41	489.73	514.21	539.92	566.92	595.26	625.03	656.28	689.09	723.55	759.73	797.71	837.60	879.48	923.45	969.62	1018.10
Tariff																									
Fixed tariff (Rs / kWh)	2.56	2.24	2.23	2.22	2.21	2.21	2.21	2.21	2.21	2.21	2.30	2.31	2.33	2.34	2.36	2.15	2.23	2.31	2.39	2.48	2.57	2.67	2.78	2.89	3.00



Variable tariff (Rs / kWh)	5.01	5.26	5.52	5.79	6.08	6.39	6.71	7.04	7.39	7.76	8.15	8.56	8.99	9.44	9.91	10.41	10.93	11.47	12.05	12.65	13.28	13.94	14.64	15.37	16.14
Tariff (Rs/kWh)	7.57	7.50	7.75	8.01	8.30	8.60	8.91	9.25	9.60	9.98	10.45	10.87	11.31	11.78	12.27	12.56	13.15	13.78	14.44	15.13	15.85	16.62	17.42	18.26	19.15
Levelized Fixed Tariff Calculations																									
Discount Rate	9.77 %																								
Levelized Fixed Tariff (Rs / kWh)	2.31																								



EXHIBIT C: Tariff Computation Sheet for Bagasse based Cogeneration Projects

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Net Energy sold (lakh kWhs)	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	48.09	
Costs																										
O&M	15.66	16.56	17.50	18.50	19.56	20.68	21.86	23.11	24.44	25.83	27.31	28.87	30.53	32.27	34.12	36.07	38.13	40.31	42.62	45.06	47.64	50.36	53.24	56.29	59.51	
Insurance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Depreciation (SLM)	24.36	24.36	24.36	24.36	24.36	24.36	24.36	24.36	24.36	24.36	24.36	24.36	24.36	24.36	24.36	10.44	10.44	10.44	10.44	10.44	10.44	10.44	10.44	10.44	10.44	10.44
Advance Against Depreciation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Interest on term loan	35.85	33.38	30.91	28.43	25.96	23.49	21.02	18.54	16.07	13.60	11.13	8.65	6.18	3.71	1.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Interest on working capital	5.82	6.05	6.30	6.56	6.83	7.11	7.42	7.73	8.07	8.42	8.83	9.23	9.64	10.08	10.53	10.90	11.43	11.99	12.58	13.19	13.84	14.52	15.23	15.98	16.76	
Return on Equity	24.27	24.27	24.27	24.27	24.27	24.27	24.27	24.27	24.27	24.27	24.27	24.27	24.27	24.27	24.27	24.27	24.27	24.27	24.27	24.27	24.27	24.27	24.27	24.27	24.27	
Tax on equity	4.24	4.24	4.24	4.24	4.24	4.24	4.24	4.24	4.24	4.24	8.48	8.48	8.48	8.48	8.48	8.48	8.48	8.48	8.48	8.48	8.48	8.48	8.48	8.48	8.48	
Fuel cost	233.79	245.48	257.75	270.64	284.17	298.38	313.30	328.96	345.41	362.68	380.81	399.85	419.85	440.84	462.88	486.03	510.33	535.84	562.64	590.77	620.31	651.32	683.89	718.08	753.99	
Total Cost (Rs lakh)	344.00	354.34	365.33	377.01	389.40	402.54	416.47	431.23	446.86	463.41	485.20	503.73	523.31	544.01	565.89	576.19	603.09	631.34	661.03	692.21	724.97	759.39	795.55	833.54	873.45	
Fixed cost (Rs lakh)	110.21	108.86	107.58	106.37	105.23	104.16	103.17	102.27	101.45	100.73	104.39	103.87	103.46	103.17	103.00	90.17	92.76	95.50	98.39	101.44	104.67	108.07	111.66	115.46	119.46	
Fuel cost (Rs lakh)	233.79	245.48	257.75	270.64	284.17	298.38	313.30	328.96	345.41	362.68	380.81	399.85	419.85	440.84	462.88	486.03	510.33	535.84	562.64	590.77	620.31	651.32	683.89	718.08	753.99	
Tariff																										
Fixed tariff (Rs / kWh)	2.29	2.26	2.24	2.21	2.19	2.17	2.15	2.13	2.11	2.09	2.17	2.16	2.15	2.15	2.14	1.87	1.93	1.99	2.05	2.11	2.18	2.25	2.32	2.40	2.48	



Variable tariff (Rs / kWh)	4.86	5.10	5.36	5.63	5.91	6.20	6.51	6.84	7.18	7.54	7.92	8.31	8.73	9.17	9.62	10.11	10.61	11.14	11.70	12.28	12.90	13.54	14.22	14.93	15.68	
Tariff (Rs/kWh)	7.15	7.37	7.60	7.84	8.10	8.37	8.66	8.97	9.29	9.64	10.09	10.47	10.88	11.31	11.77	11.98	12.54	13.13	13.74	14.39	15.07	15.79	16.54	17.33	18.16	
Levelized Fixed Tariff Calculations																										
Discount Rate	9.77 %																									
Levelized Fixed Tariff (Rs / kWh)	2.18																									