



TELANGANA STATE ELECTRICITY REGULATORY COMMISSION
5th Floor, Singareni Bhavan, Red Hills, Lakdi-ka-pul, Hyderabad 500004

O.P. No. 21 of 2020

Dated: 28.08.2020

Present

Sri T. Sriranga Rao, Chairman

Sri M.D. Manohar Raju, Member (Technical)

Sri Bandaru Krishnaiah, Member (Finance)

In the matter of *Suo-Moto* determination of Variable Cost for the period from FY 2020-21 to FY 2023-24 for existing Biomass, Bagasse and Industrial waste based power projects in the State of Telangana, and having Power Purchase Agreements with the Distribution Licensees

ORDER

1. Section 62 of the Electricity Act, 2003 empowers the Commission to determine the tariff for supply of electricity by a generating company to a Distribution Licensee. Section 86(1)(e) of the Electricity Act, 2003 mandates the Commission to 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.
2. In exercise of powers vested in it under Sections 62(1) read with 86(1)(a), (b), & (e) of the Electricity Act, 2003, the Commission, through this Order, determines the Variable Cost for the period from FY 2020-21 to FY 2023-24 for existing Biomass, Bagasse and Industrial waste based power projects in the State of Telangana, and having Power Purchase Agreements (PPAs) with the Distribution Licensees.
3. The Commission vide its *Suo-Motu* Order dated 21.04.2020 in O. P. No. 15 of 2020, approved the norms and determined the Variable Cost for the FY 2019-20 for existing Biomass, Bagasse and Industrial waste projects in the State of Telangana and having PPAs with the Distribution Licensees, as under:

Table 1: Approved Norms and Variable Cost for FY 2019-20

| Sl. No. | Parameter | Unit | Approved for FY 2019-20 | | |
|---------|-----------------------|----------------|------------------------------|--|---------------------------------------|
| | | | Biomass based power projects | Bagasse based co-generation power projects | Industrial waste based power projects |
| 1. | Station Heat Rate | kcal/kWh | 4200 | 3600 | 4200 |
| 2. | Auxiliary Consumption | % | 10% | 9% | 10% |
| 3. | Gross Calorific Value | kcal/kg | 3100 | 2250 | 3100 |
| 4. | Fuel Price | Rs./MT | 3168 | 1788 | 3168 |
| 5. | Variable Cost | Rs./kWh | 4.77 | 3.14 | 4.77 |

4. The Commission has initiated a *Suo-Moto* proceeding for determination of Variable Cost for the period from FY 2020-21 to FY 2023-24 for existing Biomass, Bagasse and Industrial waste based power projects and accordingly issued the Public Notice dated 13.07.2020 inviting the written suggestions and comments from all the stakeholders on the proposed norms on or before 03.08.2020 by 5 pm. The Commission has received written suggestions and comments from two (2) nos. stakeholders within the stipulated time. The Commission has received written suggestions and comments from one (1) no. stakeholder after the stipulated time. The list of stakeholders who have submitted the written suggestions and comments is enclosed at Annexure 1 of the Order. The Commission has considered all the suggestions and comments received from all the stakeholders.
5. The Commission had proposed the following norms as mentioned in the Public Notice dated 13.07.2020 for the determination of Variable Cost for the period from FY 2020-21 to FY 2023-24 for existing Biomass, Bagasse and Industrial waste based power projects in the State of Telangana which are having PPAs with the Distribution Licensees:

Table 2: Proposed norms and Variable Cost for the period from FY 2020-21 to FY 2023-24 as mentioned in the Public Notice dated 13.07.2020

| Sl. No. | Parameter | Unit | Proposed | | |
|---------|-----------------------|----------|------------------------------|--|---------------------------------------|
| | | | Biomass based power projects | Bagasse based co-generation power projects | Industrial waste based power projects |
| 1 | Station Heat Rate | kcal/kWh | 4200 | 3600 | 4200 |
| 2 | Auxiliary Consumption | % | 10% | 9% | 10% |
| 3 | Gross Calorific Value | kcal/kg | 3100 | 2250 | 3100 |
| 4 | Fuel Price | | | | |

| Sl. No. | Parameter | Unit | Proposed | | |
|---------|---------------|---------|------------------------------|--|---------------------------------------|
| | | | Biomass based power projects | Bagasse based co-generation power projects | Industrial waste based power projects |
| | FY 2020-21 | Rs./MT | 3326 | 1877 | 3326 |
| | FY 2021-22 | Rs./MT | 3492 | 1971 | 3492 |
| | FY 2022-23 | Rs./MT | 3667 | 2070 | 3667 |
| | FY 2023-24 | Rs./MT | 3850 | 2174 | 3850 |
| 5 | Variable Cost | | | | |
| | FY 2020-21 | Rs./kWh | 5.0069 | 3.3002 | 5.0069 |
| | FY 2021-22 | Rs./kWh | 5.2568 | 3.4655 | 5.2568 |
| | FY 2022-23 | Rs./kWh | 5.5202 | 3.6396 | 5.5202 |
| | FY 2023-24 | Rs./kWh | 5.7957 | 3.8224 | 5.7957 |

6. The norms viz., Station Heat Rate, Auxiliary Consumption and Gross Calorific Value have been proposed at the same level of the norms specified by the Hon'ble APTEL and also considered in the determination of Variable Cost upto FY 2019-20. The Fuel Prices approved for FY 2019-20 have been considered as the base and escalated annually by the normative value of 5% to arrive at the Fuel Prices for the period from FY 2020-21 to FY 2023-24. The Variable Cost has been computed based on the proposed norms and Fuel Prices.
7. The suggestions and comments filed by the stakeholders and Commission's views thereon have been summarised issue wise as detailed below:

Issue No. 1: General

Stakeholders' submission

8. The study as per the Judgment of the Hon'ble Appellate Tribunal for Electricity (APTEL) dated 20.12.2012 in Appeal Nos. 150, 166, 172, 173 of 2011 and 9, 18, 26, 29 and 38 of 2012, has not been undertaken for the co-generation plants operating in the State. Over the years, there has been technology improvements and one such improvement is installation of air-cooled condensers, instead of water-cooled condensers, which reduces water consumption. Installation of air-cooled condensers increases Station Heat Rate (SHR). With aging of the plant, its efficiency reduces and SHR increases. These factors need to be taken into account in determination of Variable Cost.
9. The threshold Plant Load Factor (PLF) of 55% for recovery of fixed cost was determined based on the assumption that the co-generation units run for 230 days at 90% utilisation factor. However, the PLF of 55% could not be achieved in most of the years due to which the fixed cost for those years remained unrecovered. The stakeholder requested the Commission to provide suitable

compensation enabling the plants to recover the unrecovered fixed cost.

10. The PPAs provide for opening of Letter of Credit by the Distribution Licensees but that provision was kept in abeyance on the assurance of the then Transmission Corporation of Andhra Pradesh (APTransco) to meet its obligation on time. As there is considerable delay in payment of bills by the Distribution Licensees, the Commission may issue directions for opening of Letter of Credit and release of payments due.
11. The generators are receiving the payments with substantial delays resulting in frequent shutdowns. The Regulations of Central Electricity Regulatory Commission (CERC) permit a late payment surcharge at the rate of 1.50% per month for delay beyond a period of 45 days from the date of presentation of bills and hence a higher surcharge would ensure that the Distribution Licensees pay before due dates.
12. The Distribution Licensees have been raising the bills towards maintenance of line from the generating point to the substation. Such expenses were not considered in determination of the Operation and Maintenance (O&M) expenses. The Commission may allow pass through of such expenses.
13. The co-generation plants had to install 'reliable and efficient speech and data communication systems' which was not considered in determining the capital cost. Most of the PPAs are nearing completion and hence the Commission may allow compensation enabling the plants to recover this additional capital cost.

Commission's view

14. The Commission is mindful of the Judgment of the Hon'ble APTEL referred by the stakeholder. The erstwhile Andhra Pradesh Electricity Regulatory Commission (APEREC) had conducted a study in the year 2014 on the performance of the Non-Conventional Energy (NCE) power projects and determined the norms of operation for the Bagasse based co-generation power projects including the plants currently located in Telangana State. The Commission is also mindful of the Regulations/Orders issued by CERC and other State Electricity Regulatory Commissions (SERCs) with reference to determination of Variable Cost. The Commission has initiated the current proceedings for determination of Variable Cost for the period from FY 2020-21 to FY 2023-24 for existing Biomass, Bagasse and Industrial waste based power

projects and accordingly issued the Public Notice inviting the written suggestions and comments on the proposed norms from the stakeholders. The Commission has provided ample opportunity to all the stakeholders including the co-generation plants to place their views with all the relevant material before the Commission for taking a holistic view in the matter. In view of the holistic approach adopted by the Commission, the statement of the stakeholder referring to the Judgment of the Hon'ble APTEL dated 20.12.2012 is misplaced.

15. Although the stakeholder has submitted that installation of air-cooled condensers needs to be taken into account in determination of Variable Cost, the proposed norms of operation have not been substantiated based on the same. Therefore, the Commission does not find any merit in such submissions.
16. The PLF will depend on the availability of the plant and fuel and these factors cannot be treated as uncontrollable. The Commission has taken note of the PLFs submitted by the stakeholder. The stakeholder has not submitted any justification for such lower PLFs. Consistent operation at lower PLF would result in faster deterioration of the equipment. Lower PLF would result in inferior performance parameters and such inferior performance parameters cannot be the basis for tariff determination on normative basis. Hence, the aging of the plant cannot be considered as valid reason more so when the plants had been consistently underperforming.
17. As regards (i) unrecovered fixed cost due to lower PLFs, (ii) opening of Letter of Credit by the Distribution Licensees, (iii) late payment surcharge for delayed payments, (iv) line maintenance charges and (v) additional capital cost, the said issues are not the subject matter of the current proceedings and hence, the Commission does not find it prudent to express any opinion on the same.

Issue No. 2: Auxiliary Consumption for Bagasse based co-generation power projects

Stakeholders' submission

18. The average auxiliary consumption of four co-generation plants in State for FY 2015-16 to FY 2019-20 works out to 11.26%. Although the co-generation power plants and sugar units are close proximity, power consumption of co-generation plants (Boiler, Turbine, Cooling Towers and other auxiliaries) is over 10%. Sugar plant (sugarcane milling and boiling house equipment) consumes around 22 units for every ton of sugarcane crushed. Hence, the auxiliary consumption

of co-generation plant cannot be reduced on the grounds that some of its equipment are common with sugar plant.

19. The co-generation plants and biomass plants have same equipment except for the following:

Table 3: Uncommon equipment amongst Bagasse based co-generation plants and Biomass power plants

| List of uncommon equipment | Bagasse based co-generation power plants | Biomass power plants |
|---------------------------------------|---|-----------------------------------|
| Wood chipping and cutting machine | Not available | Used for cutting/chipping Biomass |
| Bagasse conveyors from Boiler to yard | Total 3 nos. Compared to Biomass plants 2 additional conveyors for conveying excess bagasse from Boiler to storage yard and conveying Bagasse from yard to Boiler | 1 no. |

20. Hence, it cannot be said that Bagasse requires less processing than Biomass and the auxiliary consumption of Bagasse based co-generation power plants may be specified as 10% on par with Biomass plants.

Commission's view

21. The Commission has taken note of the PLFs submitted by the stakeholder. The stakeholder has not submitted any justification for such lower PLF. Lower PLF would result in higher auxiliary consumption in percentage terms and such higher auxiliary consumption cannot be the basis for tariff determination on normative basis. Moreover, the auxiliary consumption of 9% has been considered in determination of Fixed Cost for 20 years as well as Variable Cost upto FY 2019-20. As the Commission is determining the norms for the existing projects in this Order, the Commission finds it appropriate to consider the auxiliary consumption norm as 9% for Bagasse based co-generation power projects for the period from FY 2020-21 to FY 2023-24.

Issue No. 3: Station Heat Rate for Bagasse based co-generation power projects

Stakeholders' submission

22. The bagasse consumption during season for power generation including process steam is in the range of 2.7-3.0 kg/kWh which translates to SHR of

6075-6750 kcal/kWh. The SHR during off-season is in the range of 4300-4400 kcal/kWh. Further, with aging of the plant, its efficiency decreases and hence, the SHR may be considered at minimum of 4200 kcal/kWh.

Commission's view

23. The SHR of 3600 kcal/kWh for Bagasse based co-generation power projects was considered in the determination of Variable Cost upto FY 2019-20. The stakeholder has neither submitted the basis for the SHR claimed as actual achievement nor the justification for the same to be higher than the normative value in the previous years. Therefore, the Commission does not find any merit in the stakeholder's submissions in this regard.

Issue No. 4: Specific fuel consumption for Bagasse based co-generation power projects

Stakeholders' submission

24. Based on the SHR of 4200 kcal/kWh and Gross Calorific Value (GCV) of 2250 kcal/kg, the specific fuel consumption works out to 1.87 kg/kWh. The average specific fuel consumption of four co-generation plants in State for FY 2015-16 to FY 2019-20 works out to 2.64 kg/kWh. Hence, the specific fuel consumption may be considered at minimum of 2.64 kg/kWh.

Commission's view

25. The Commission had considered the SHR of 3600 kcal/kWh and GCV of 2250 kcal/kg till FY 2019-20, based on which the specific fuel consumption works out to 1.60 kg/kWh in respect of Bagasse based co-generation power projects. The stakeholder has neither submitted the basis for the specific fuel consumption claimed as actual achievement nor the justification for the same to be higher than that computed based normative SHR and GCV approved for the previous years. The issue of SHR has been dealt with in the preceding paragraphs. In the absence of any specific submissions regarding the GCV, the Commission does not find any merit in the stakeholder's submissions regarding specific fuel consumption.

Issue No. 5: Fuel price for Biomass based power projects

Stakeholders' submission

26. The Biomass price has been proposed at Rs. 3326/MT for FY 2020-21 which is in line with the CERC Order dated 21.07.2020 and is on par with the price for

Andhra Pradesh. This price needs to be reviewed on the following grounds:

27. **Size of catchment area:** The Telangana State was carved out in the year 2014 and out of the then Biomass based power projects, 28 nos. projects are in residual Andhra Pradesh and 6 nos. projects are in Telangana State. The geographical area of Telangana is 1,12,007 sq. km. as against 1,62,975 sq. km. of Andhra Pradesh. The licences for Biomass units in the combined State were allotted based on biomass availability establishing the fact that Telangana region did not have enough raw material availability. Thus, the cost of fuels in Telangana is much higher as compared to Andhra Pradesh as the collection has to be made over large area for a given biomass unit viz., 18,680 sq. km. in Telangana vs 5820 sq. km. in Andhra Pradesh.
28. **Geography:** The Telangana State is part of Deccan Plateau and with Maharashtra, which is also a part of Deccan Plateau, as boundary in the North and the West. The Biomass price for Maharashtra is Rs. 3872/MT which is 16.4% higher than Telangana State. Whereas, the geography and cropping pattern of Telangana State is similar to that of Maharashtra. So, the Biomass price for Telangana State has to be considered in line with that of Maharashtra.
29. **Boundary:** The Biomass power projects in Telangana State collect the Biomass from the neighbouring States Maharashtra and Andhra Pradesh. The average of Biomass prices for Maharashtra and Andhra Pradesh works out to Rs. 3617/MT and the same may be considered by the Commission for FY 2020-21 with 5% annual escalation.

Commission's view

30. The Commission has considered the approved Biomass Price for FY 2019-20 as base Price and escalated annually by 5% to arrive at the Biomass Prices for the period from FY 2020-21 to FY 2023-24. It is pertinent to mention that the Biomass Prices proposed by the Commission are in line with the Prices specified by the CERC. The arrangement for adequate fuel at economical prices is the responsibility of the generator and the same cannot be treated as uncontrollable factor. The Fuel Price varies depending on various factors including demand and supply. The stakeholder has not submitted any supporting documents to substantiate its submissions regarding the Biomass procurement. The generator is free to choose its sources of fuel to supply

electricity to the Distribution Licensees at the tariff determined by the Commission. In light of the above, the Commission does not find any merit in stakeholder's submissions prudent enough for revising the Biomass price from that proposed in the Public Notice.

Issue No. 6: Fuel price for Bagasse based co-generation power projects

Stakeholders' submission

31. The process and cost of generation of Bagasse is more or less uniform throughout the Country. However, the Bagasse price varies from State to State. The CERC has adopted the price of Rs. 2671/MT and Rs. 1877/MT for Haryana and Telangana respectively for FY 2020-21. The Commission may take up the issue of disparity in Bagasse price and arrive at a uniform rate for Bagasse throughout the country.
32. As Bagasse is also a Biomass, it may be appropriate to link the Bagasse price to Biomass and consider the Bagasse price as Rs. 2414/MT for FY 2019-20 with annual escalation of 5%.

Commission's view

33. The stakeholder's request to arrive at a uniform rate for Bagasse throughout the country is out of context and does not require any consideration in the current proceedings.
34. The methodology proposed by the stakeholder for arriving at the fuel price for Bagasse is devoid of merits and hence not considered by the Commission.

Issue No. 7: Variable Cost

Stakeholders' submission

35. One stakeholder submitted that it has no comments on the Variable Cost determined by the Commission.

Commission's view

36. The Commission has taken note of the stakeholder's submission.

VARIABLE COST DETERMINED BY THE COMMISSION

37. Based on the above, the Commission approves the following norms and determines the Variable Cost for the period from FY 2020-21 to FY 2023-24 for existing Biomass, Bagasse and Industrial waste based power projects in the

State of Telangana which are having PPAs with the Distribution Licensees:

Table 4: Approved norms and Variable Cost for the period from FY 2020-21 to FY 2023-24

| Sl. No. | Parameter | Unit | Approved | | |
|---------|-----------------------|----------|------------------------------|--|---------------------------------------|
| | | | Biomass based power projects | Bagasse based co-generation power projects | Industrial waste based power projects |
| 1 | Station Heat Rate | kcal/kWh | 4200 | 3600 | 4200 |
| 2 | Auxiliary Consumption | % | 10% | 9% | 10% |
| 3 | Gross Calorific Value | kcal/kg | 3100 | 2250 | 3100 |
| 4 | Fuel Price | | | | |
| | FY 2020-21 | Rs./MT | 3326 | 1877 | 3326 |
| | FY 2021-22 | Rs./MT | 3492 | 1971 | 3492 |
| | FY 2022-23 | Rs./MT | 3667 | 2070 | 3667 |
| | FY 2023-24 | Rs./MT | 3850 | 2174 | 3850 |
| 5 | Variable Cost | | | | |
| | FY 2020-21 | Rs./kWh | 5.0069 | 3.3002 | 5.0069 |
| | FY 2021-22 | Rs./kWh | 5.2568 | 3.4655 | 5.2568 |
| | FY 2022-23 | Rs./kWh | 5.5202 | 3.6396 | 5.5202 |
| | FY 2023-24 | Rs./kWh | 5.7957 | 3.8224 | 5.7957 |

APPLICABILITY

38. The Commission directs the Distribution Licensees namely Southern Power Distribution Company of Telangana Limited (TSSPDCL) and Northern Power Distribution Company of Telangana Limited (TSNPDCL) to pay the above Variable Cost for the period from FY 2020-21 to FY 2023-24 for the power purchased from existing Biomass, Bagasse and Industrial waste based power projects in the State of Telangana and having PPAs with the Distribution Licensees.

This Order is corrected and signed on this 28th day of August, 2020

**Sd/-
(BANDARU KRISHNAIAH)
MEMBER**

**Sd/-
(M.D. MANOHAR RAJU)
MEMBER**

**Sd/-
(T. SRIRANGA RAO)
CHAIRMAN**

**ANNEXURE 1 – LIST OF STAKEHOLDERS WHO SUBMITTED WRITTEN
SUGGESTIONS AND COMMENTS**

| Sl. No. | Name of the Stakeholder |
|----------------|--|
| 1. | Southern Power Distribution Company of Telangana Ltd., #6-1-50, Corporate Office, Mint Compound, Hyderabad – 500 063 |
| 2. | Telangana Sugar Mills Association, Gayatri Sugars Ltd., B2, TSR Towers, Raj Bhavan Road, Somajiguda, Hyderabad – 500 082 |
| 3. | Biomass Energy Developers Association, No. 13, 4 th Floor, Maitri Arcade, 2-3-42/52, M. G. Road, Secunderabad – 500 003 |