No.: N/198/16

BEFORE THE KARNATAKA ELECTRICITY REGULATORY COMMISSION, BENGALURU

Dated : 30th January, 2018

Present:

Shri M.K. Shankaralinge Gowda	..	Chairman
Shri H.D. Arun Kumar	..	Member
Shri D.B. Manival Raju	..	Member

OP No. 97 of 2016

BETWEEN:

Manchukonda Agrotech Private Limited,
Registered Office at Settipalem,
Miryalguda-508217,
Telangana. … **PETITIONER**

[Petitioner is represented by M/s Srinivas & Badri Counsels, Advocates]

AND:

Gulbarga Electricity Supply Company Limited,
Station Main Road,
Kalaburgi-585102,
Karnataka. … **RESPONDENT**

[Respondent is represented by Induslaw, Advocates]

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ORDERS

1) This Petition is filed by the Petitioner under Section 62(1) (a) of the Electricity Act, 2003, read with Regulation 9 of the KERC (Procurement of Energy from Renewable Sources) Regulations, 2011 praying, in substance:

(a) To fix a project specific tariff of Rs.5.95 per unit for its biomass based Co-generation power plant; and,

(b) To pass such other Order as the Commission may deem fit and proper in the interest of justice and equity.

2) The facts of the case necessary for the disposal of the Petition may be summarised as follows:

(a) The Petitioner- the Rice Mill owner, after obtaining sanction from the State Govt., installed a Rice husk based Co-generation power plant of 5 MW gross capacity and 4MW exportable capacity at Raichur Growth Centre, Industrial Area, Raichur and commissioned it on 18.11.2016.

(b) As permitted by the State Government, the Petitioner entered into a Power Purchase Agreement (PPA) dated 25.10.2016 with the Respondent, agreeing to supply energy for a period of 20 years from the Commercial Operation Date at the generic tariff, determined in the Order dated 01.01.2015, with fixed cost at Rs.2.02 per unit and variable cost as stated therein.

(c) The PPA submitted to the Commission for its approval was returned, directing the Petitioner to file a petition seeking for determination of project specific tariff, as no generic tariff was fixed for Bio-mass (Rice husk) based Co-generation plant.

(d) The Commission, in its order dated 01.01.2015, has determined the generic tariff in respect of mini-hydel, Bagasse based Co-generation and Rankine Cycle based biomass Renewable Energy projects commissioned during the period from 01.01.2015 to 31.03.2018, but no tariff was determined for Bio-mass (Rice husk) based Co-generation projects.

(e) The Petitioner has urged that the tariff may be determined for its rice husk based Co-generation plant based on the following parameters:

i) *Project cost*:
The total cost for the Petitioner's 5MW plant is Rs.27.55 crores, i.e. Rs.5.51 crores/MW.

ii) *Plant Load Factor*:
PLF should be taken at 65% as rice husk (biomass fuel for the plant) is available only for eight months in a year.

iii) *Depreciation*:
Straight line method for calculation of depreciation on machinery.

iv) Operation and Maintenance (O&M) expenses:
Aggregate Annual O&M cost at Rs.40 lakhs/MW/year, consisting of employee cost at Rs.20 lakhs/MW/year, cost of wear and tear and maintenance at Rs.10 lakhs/MW, cost of spares and consumables at Rs.5 lakhs/MW and contingency and miscellaneous expenses of Rs.5 Lakhs/MW.

v) *O&M cost annual escalation*:
With retail inflation rate being 6%, the annual escalation should be 8%.

vi) *Loan tenure and interest rate*:

The Petitioner has availed loan from the State Bank of Hyderabad at an interest rate of 13% per annum with a loan tenure of seven and half years.

vii) *Specific Fuel Consumption (SFC)*:

SFC of 1.7 kgs/unit.

viii) *Fuel cost*:

Approximate cost of one tonne of rice husk including transportation charges is Rs.3200/-, and therefore the variable cost should be Rs.5.44/unit.

3) Upon issuance of notice, the Respondent appeared through its counsel and filed its objections, which may be summed up as follows:

(a) The Petition being a tariff petition is liable to be dismissed for non-joinder of parties as no tariff can be determined without hearing all the necessary stakeholders.

(b) The project of the Petitioner is not similar to Rankine cycle based project and hence the tariff applicable to Rankine cycle project cannot be applied for the Petitioner's project.

(c) At no point of time, the tariff can be greater than that agreed by the parties, under the PPA.

4) Considering the Petitioner's prayer for an interim tariff till the disposal of its petition, the Petitioner was ordered to be paid by the Respondent an

interim tariff of Rs.3.47 per unit towards the energy supplied by the Petitioner, pending final disposal of the petition. Further, as a part of the tariff determination exercise in respect of the Petitioner's project, public consultation process was initiated by requiring the Petitioner to publish the abridged version of the Petition on 06.07.2017 in one English newspaper (Deccan Herald) and two Kannada Newspapers (Vijaya Karnataka and Samyukta Karnataka) inviting comments and objections from interested persons. No comments or objections were received in this regard. Further, a public hearing in the matter was held on 14.09.2017, where only the Counsel for Petitioner was present and was directed to furnish additional information and documents necessary for tariff determination.

5) We have heard the learned counsel for the Petitioner and considered the submissions made by the Petitioner and the Respondent and perused the material placed on record and we proceed to determine the tariff in respect of the Petitioner's project, considering each of the parameters involved, as follows. Here itself we note that, though the Petitioner has filed this petition seeking project specific tariff after commissioning of its plant, it has not furnished the complete details of the actual expenditure incurred in respect of the parameters relevant for tariff determination, despite being directed to do so. Further, the Petitioner has not produced copies of the Generic Tariff Order of the Commission of any other State for rice husk based Co-generation power plant and therefore the copies of the Generic Tariff Orders of the State

Commissions for bio-mass based power plants, produced by the Petitioner are not much helpful to it.

(a) *Capital Cost:*

(i) The Petitioner claims the total capital cost of 5 MW plant to be Rs.27.55 crores which works out to Rs.5.51 crores/MW. However, in the letter dated 30.06.2012 of the Karnataka Renewable Energy Development Limited produced as Annexure-A, communicating that it has no objections to the Petitioner's proposal to set up the plant, the capital cost is mentioned as Rs.24.70 Crores and as per the DPR produced by the Petitioner, the capital cost for the 4.5 MW power plant is Rs.19.54 Crores i.e.Rs.4.34 Crores/MW. To substantiate its claim of capital cost being Rs.5.51 crores/MW the Petitioner has filed a statement of project cost and copies of certain invoices/bills. We note that as per such statement, the net capital cost is Rs.25.31 Crores. Further, the Petitioner in its additional submission has stated that Rs.36 lakhs out of the boiler cost is to be attributed to the process heat. Thus, out of Rs.25.31 Crores after deducting Rs.0.36 Crores, the net capital cost would be Rs.24.95 Crores, which works out to Rs.4.99 Crores per MW. Considering that the capital cost approved for the bagasse based co-generation plants is Rs.4.75 Crores per MW, the Petitioner's Plant cost of Rs.4.99 Crores per MW is found reasonable.

(ii) Accordingly, we decide to adopt a capital cost of Rs.5.00 Crores per MW [after rounding off].

(b) Plant Load Factor:

(i) The Petitioner claims the PLF to be 65%, on the ground that rice husk is available for only 8 months in a year, considering two crops of paddy in a year. We note that the Petitioner in the DPR submitted to the GESCOM, along with the PPA, indicated the PLF at 70% in the first year and 80% from second year onwards. Similarly, the DPR submitted along with the petition indicates generation of 349.9 lakh units from the installed capacity of 4500 KW, which makes the PLF at 89%. We note that the data of generation from the plant for three months, from November, 2016 to January, 2017, produced showing the PLF from 0%-65%, cannot be relied upon for adopting the PLF for determining the tariff for the entire life of the project, as the plant would not have attained stabilisation in such a short period of operation. Further, the actual PLF cannot vary considerably from that assumed in the DPR, as it would affect the financial viability of the project.

(ii) The Commission in its Generic Tariff Order dated 01.01.2015 has adopted a PLF of 75% for the biomass plants based on Rankine cycle. Further, the CERC, in the CERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2012, for biomass plants, has considered a

PLF of 70% during the first year after stabilization period, and 80% from the second year onwards.

(iii) In view of the above, we decide to adopt a PLF of 75% for the purpose of the tariff determination.

(c) Auxiliary consumption:

(i) The Petitioner has declared an auxiliary consumption of 13.57% based on the data of January, 2017. However, for the purpose of determining the tariff for the life of the project, a single month's data cannot be relied upon. Further, as per the copy of the DPR produced by the Petitioner, the power plant's auxiliary consumption is 10%.

(ii) The Commission in its Generic Tariff Order dated 01.01.2015 has adopted an auxiliary consumption of 10% for biomass plant based on Rankine cycle.

(iii) We, therefore, decide to adopt auxiliary consumption of 10%.

(d) Specific Fuel Consumption (SFC):

(i) The Petitioner in the Petition had stated the SFC to be 1.7 kg/unit, but in the additional data for the month of January, 2017, submitted subsequently, declares it to be 1.49/unit. Further, in response to the queries raised during the public hearing, the

Petitioner in the working sheet submitted shows a Station Heat Rate of 4776 kcal/unit, GCV of 3100 kcal/kg and worked out the SFC at 1.54 kg/kwhr.

(ii) We note that the SHR claimed 4776 kcal/unit is high. For Rankine cycle based biomass power plants, the Commission in its Order dated 01.01.2015 has considered a SHR of 4000 kcal/unit, irrespective of the type of boiler used. Further, we note that the CERC in its CERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2012 for Rankine cycle based biomass power projects has considered, a SHR of 4063 kcal/unit for AFBC based boilers. Therefore, we decide to adopt the SHR of 4000 kcal/unit.

(iii) Further, the Petitioner in its response to the queries raised during public hearing, has claimed GCV of Rice husk at 3100 kCal/kg. However, in the copy of the DPR submitted, the GCV is considered at 3200 kcal/kg. The Commission notes that as per the literature available the GCV of rice husk varies from 3000 to 3100 kcal/kg. Therefore, the Commission decides to adopt the GCV at 3100 kcal/kg.

(iv) Considering the SHR of 4000 kcal/unit and the GCV of 3100 kcal/kg, we approve the SFC at 1.29 kg/unit.

(e) *Fuel Cost:*

(i) The Petitioner has claimed the fuel cost to be Rs.3200/ tonne, submitting copies of certain fuel purchase invoices. The Commission notes that the proposal to set up the rice husk based co-generation plant by the Petitioner was to optimally utilise the rice husk that becomes available while operating its 36 TPH rice mill, as an effective way of disposal of such rice husk. The copy of the DPR submitted by the Petitioner clearly indicates that the entire rice husk required for power generation would be generated internally, from the 36 TPH rice mill, and that, as against the requirement of fuel of 168.71 tonnes per day, the rice mill would generate 172.80 tonnes/day of rice husk. Thus, the proposed Co-generation Project envisaged the use of the rice husk generated as by-product of the rice mill operation without any requirement of purchase of the fuel from an external source. Therefore, we may assume that any such purchase would be minimal to meet temporary short fall. We may note here that biomass based Co-generation power plants are promoted so that the biomass produced from any manufacturing or processing activity is disposed of by the unit concerned in an environmental friendly manner to generate much needed power and also to reduce reliance on environmentally harmful fossil fuel based power plants. Thus, any procurement of the rice husk from external sources, by the Petitioner, would be minimal and therefore, the price paid for it cannot be reckoned for the purpose of tariff determination of its plant.

(ii) However, we do note that, even considering that the entire rice husk required by the Petitioner's plant is generated internally, a reasonable economic value has to be attributed to such rice husk that could have been otherwise disposed of, by the Petitioner, for a price. The Petitioner has not provided the details of transportation cost of rice husk procured from others, despite being directed to do so. In Order to arrive at the approximate price of the rice husk at the Petitioner's mill point, we need to exclude the profit margin / mark up and transportation charges reckoned by the sellers in their sale price. Further, it is common knowledge that during offseason the sale prices of the rice husk would go up due to mismatch in demand and supply. The Petitioner's power plant being a co-generation power plant would be operating during season and therefore the rice husk available from its own rice mill cannot be valued at off-season price. In the circumstances, we are of the considered view that for the by-product, the rice husk of the Petitioner's own rice mill, assuming a cost of Rs.1200/tonne would be reasonable. Therefore, the Commission approves the fuel cost at Rs.1200/tonne (without transportation cost), in the base year with an annual escalation of 5.72%.

(f) *Debt : Equity ratio:*

(i) The Petitioner claims to have raised a loan of Rs.12.50 Crores, as against the power plant's capital cost of Rs.25.31 crores**.**

(ii) However, in line with the approach adopted by the Commission for all RE projects, we approve a debt: equity ratio of 70:30.

(g) *Interest on term loan and loan tenure:*

(i) The Petitioner has claimed interest rate of 13% for term loan by furnishing loan account statements of the SBI, Hyderabad dated 01.08.2017 and 05.09.2017. We note that, as per the statements produced, the interest rate is 12.25%.

(ii) We note that, in the recent past, the interest rates have come down substantially. With effect from 01.04.2017, the IREDA has revised the interest rates varying from 9.80% to 11% [average works out to 10.51%] for wind projects, for Grade-1 to Grade-4 projects, with a reduction of 25, 20 and 15 base points for grades 1 to 3, respectively, with the external grading. Similarly, the PFC has revised the rate of interest from 01.06.2017, which varies from 9.60% to 10.0% for State Sector and 9.75% to 11.00% for private sector with rating IR-1 to IR-5, respectively. Further, the CERC has approved an interest rate of 10.66% while determining tariff for RE projects for FY18. The Petitioner should, therefore, swap its current loan, taking advantage of the prevailing lower interest rates.

(iii) Accordingly, we approve an interest rate on term loan of 12.25% for the first year and at 11% for the subsequent years with the loan tenure, considered as eight years.

(h) *Interest on Working Capital (IWC):*

The Petitioner has not disclosed the IWC it has actually incurred or assumed in its tariff calculation. Hence, following the approach adopted for RE projects, we consider it reasonable to approve IWC at 12.50% [i.e., 150 basis points above the normative interest rate on term loan], with the working capital being taken as two months' receivables.

(j) *Depreciation:*

(i) The Petitioner has sought for adoption of straight line method for allowing the depreciation. We note that, out of the total capital cost, the depreciable asset cost is about 90%, as per the DPR furnished. Therefore, we consider 90% of the approved capital cost as the cost of depreciable assets and after allowing a salvage value of 10%, the remaining cost is depreciated over the life of the project. Since, we have considered the debt tenure as eight (8) years to cover the debt servicing at 70% of capital cost, we decide to consider the depreciation rate at 8.75% of the capital cost for the first eight years and spreading the remaining depreciation amount over the remaining useful life of the Petitioner's plant.

(k) *RoE:*

While the Petitioner has not specified the RoE sought, it can be inferred that it is claimed at 16% as allowed to all other RE projects. We decide to continue the same rate and allow a RoE of 16% in the Petitioner's case too.

(l) *O & M Expenses:*

(i) The Petitioner has claimed O & M expenses at Rs.40 lakhs/MW, with annual escalation of 8%, by submitting a copy of the offer of one ENMAS O& M Services P. Ltd. Since the offer does not indicate the actual cost incurred by the Petitioner, we had directed the Petitioner to submit documentary proof towards actual O&M cost and the Petitioner submitted statement indicating the O&M cost from November, 2016 to August 2017, which varies from Rs.16.55 lakhs to Rs.17.85 lakhs per month and the average cost working out to Rs.17.31 lakhs/month.

(ii) We note that the Petitioner has not furnished any audited accounts to substantiate its claim of O&M expenses. It can be inferred that the Petitioner's co-generation plant being an integral part of the rice mill, certain O&M expenses are common to both the plants. Therefore, we are of the view that the O&M cost of the Petitioner's co-generation plant cannot be higher than that of a Rankine cycle based bio-mass power plant. In the Commission's Order dated 01.01.2015, for the Rankine cycle based bio-mass power plants, Rs.30 lakhs/MW is approved as the O&M cost, which works out to 5% of the capital cost. Therefore, we consider it reasonable to allow 5% of the capital cost as the allowable O&M expenses for the first year, with an annual escalation of 5.72% for the subsequent years.

(iii) Accordingly, we approve O&M expenses at 5% of the capital cost for the first year, with an annual escalation of 5.72% for the subsequent years.

(m) *Tax on income:*

The Petitioner has not made any specific claim in respect of tax on income. In line with our existing policy, the Income Tax on RoE shall be claimed by the Petitioner as per actuals as a pass through and shall be computed on the allowable RoE at the tax rate applicable to the relevant assessment year.

(n) *Summary of parameters approved:*

The parameters approved are as follows:

Parameter	Petitioner's claim	Approved by the Commission
Capital cost-Rs/MW	5.51	5.00
Plant load factor- %	65	75
Depreciation	SLM	At 8.75% of Capital cost (CC) for first 8 years and the remaining depreciable amount spread over the life of the project (20 years).
O & M Expenses	Rs.40 lakhs/MW with 8% annual Escalation	5% of CC with 5.72% annual escalation.
Interest rate and loan tenure	13% with tenure of 7 and1/2 years	12.25% in the first year and 11% for next seven years, with loan tenure of eight years
Specific Fuel Consumption-kg/unit	1.70	1.29
Fuel cost-Rs./tonne	Rs.3200	Rs.1200
IWC	-	12.50% on two months' receivables.
RoE -%	-	16%
Tax	-	Pass through as per actuals.

(p) *Tariff:*

(i) Considering the above parameters, the levelised Fixed Cost would be Rs.1.90/unit for the life of the project. As the variable cost, i.e., cost of fuel of the Petitioner's rice husk based power plant varies from year to year and it would not be reasonable to determine it for the life of the project, we deem it appropriate to fix it for five years and review it later. Accordingly, the Variable Cost (VC) for the five-year period from the FY 2017 onwards would be as follows:

Year	**VC Rs./unit**
2016-17	1.72
2017-18	1.82
2018-19	1.92
2019-20	2.03
2020-21	2.15

6) For the foregoing reasons, we pass the following:

ORDER

(1) The tariff for the Petitioner's rice husk fuel based cogeneration power plant is determined as under:

(a) *Fixed cost levelised for the life of the project*:
Rs.1.90 (Rupee One and Paise Ninety) only per unit; and,

(b) *Variable Cost*:
Rs.1.72 (Rupee One and Paise Seventy Two) only per unit for FY17, escalated by 5.72% (Five Point Seven Two Percent) for subsequent years, upto FY21, and thereafter, as may be determined by the Commission;

(2) The PPA dated 25.10.2016, executed by the parties, is approved subject to incorporation of the tariff, as mentioned above; and,

(3) The Respondent shall settle the dues for the energy supplied by the Petitioner's project from 18.11.2016, the date of commercial operation till the date of this Order, considering the tariff determined as above and the Interim tariff fixed at Rs.3.47 (Rupees Three and Paise Forty Seven) only per unit, within 6 (six) weeks from the date of this Order and, in default, the Respondent shall pay interest at the rate of 9% (nine percent) per annum, from the date of default till the date of payment.

Sd/-	Sd/-	Sd/-
(M.K. SHANKARALINGE GOWDA)	(H.D. ARUN KUMAR)	(D.B. MANIVAL RAJU)
CHAIRMAN	MEMBER	MEMBER