Nos.: N/38/16

BEFORE THE KARNATAKA ELECTRICITY REGULATORY COMMISSION, BENGALURU

Dated : 24th August, 2017

Present:

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

OP No.29/2016

BETWEEN:

Airsync Energy Pvt. Ltd.,
20, Uganda Park Society,
Memnagar,
Ahmedabad – 380 052. .. **PETITIONER**

[Petitioner Represented by Shri Raj Tillan, Advocate]

AND:

1) Karnataka Power Corporation Limited,
Shakthi Bhavan,
Race Course Road,
Bengaluru- 560 001.

2) Karnataka Renewable Energy Development Limited,
39, Shanthi Gruha,
Palace Road,
Bengaluru – 560 001.

3) Karnataka Power Transmission Corporation Limited,
Cauvery Bhavan,
Bengaluru – 560 009.

4) Bangalore Electricity Supply Company Limited,
K R Circle,
Bengaluru – 560 001.

5) Gulbarga Electricity Supply Company Limited,
Station Road,
Kalaburagi – 585 101.

6) Mangalore Electricity Supply Company Limited,
MESCOM Bhavana,
Kavoor Cross Road,
Bejai,
Mangaluru – 575 004.

7) Hubli Electricity Supply Company Limited,
P.B. Road, Navanagar,
Hubballi -580 029.

8) Chamundeshwari Electricity Supply Corporation Ltd.,
28, Kaveri Grameena Bank Road,
Vijayanagar 2nd stage,
Mysuru – 570 019. .. **RESPONDENTS**

*[Respondent- 2 is represented by Shri. G.S. Kannur, Advocate,
Respondents- 3, 5, 7 and 8 are represented by ALMT Legal, Advocates,
Respondents- 4 and 6 are represented by Justlaw, Advocates]*

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ORDERS

1) This Petition has been filed under Sections 62, 63, 64 and 86 of the Electricity Act, 2003 read with Regulation 21(4) of the KERC (General and Conduct of Proceedings) Regulations, 2003 seeking mainly determination of tariff of Rs.11.74 per unit for the electricity from the proposed hybrid generating system using solar and Wind power for plant life of twenty years.

2) The submissions of the Petitioner in support of its prayer may be stated as follows:

(a) That the proposed generation of power is from a hybrid generating system using solar and wind power and that the hybrid configuration is deemed to qualify as solar PV power as the primary and dominant source of power is solar PV panel. That it is basically a technology demonstration plant which is not strictly comparable with other Renewable Energy configurations and that in contrast with the static plant machinery of conventional photovoltaic plant, it is a mix of static and rotating machinery with short and long life equipment. That while the static machinery is the solar panels, power conditioning equipment like invertors, heavy duty battery as storage device and standby source and DC generators as battery chargers as well as auxiliary services drivers, the rotating machinery is in the form of synchronous generators, air blowers, wind turbines magnetic fly wheel etc. That it would be first of its type to introduce Utility grade hybrid of solar, wind and storage device Li-ion batteries. That sophisticated control panels with communication ports and SCADA system are being used in the proposed plant. That the plant is modular in construction which facilitates quick replacement of parts without long shut downs or even without any shut down, thus enhancing the Plant Load Factor (PLF) to as much as 90 +%.

(b) That as is the case with every technology there would be exponential decline in the cost of similar projects, with time and accumulation of manufacturing and operating experience. That the Petitioner is quite optimistic about the cost reduction in medium future.

(c) That the Petitioner meets the criteria set out in under the Karnataka Solar Policy 2014-21 and hence is eligible to develop solar power project in the State.

(d) That the Petitioner has the technical and financial participatory collaboration with ECO-GEN ENERGY INC located in Nevada, USA. That It jointly meets the criteria set out in the policies and has prayed the Commission to consider the Petitioner's case under 'Promotion of RE' under Section 86(1)(e) of the Electricity Act, 2003.

(e) That considering the various aspects of Demonstration Technology, the operational life of the plants as a whole be reckoned as twenty (20) years. That RE Tariff orders passed by the Commissions in the country have considered plant life as twenty-five (25) years and the Petitioner expects cost reduction and faster scaling up capacities with the gain of experience in the near future.

(f) That the yearly cost of production would vary in the life span of the plant. That the cost would reduce on financial parameters but increase on maintenance and operation and increase cost of maintenance and capital spares. That the collaboration agreement has been drawn with due diligence with a clear vision that plant cost is paid on performance, and if plant does not perform, no payment need be made and, that thus there is no fixed component in the proposed tariff.

(g) That for certainty and predictability, the estimated tariff of Rs.11.74 per unit is indicated for the project considering a life of the twenty (20) years based on the following parameters:

Sl. No	***Particulars***	***Unit***	***Rs. in Lakhs***
1	*Capital cost proforma invoice per MW*	*Rs Lakhs*	*4480.00*
1.1	*Preoperative expensive invoice cost*	*5%*	*2.24*
	Total cost of plant	***Rs Lakhs***	***4704.00***
2	*Debt Equity Ratio*		*70:30*
3	*Debt Per MW*	*Rs Lakhs*	*3293.00*
4	*Equity Per MW*	*Rs Lakhs*	*1411.00*
5	*Debt repayment tenure*	*Years*	*20.00*
6	*Interest charges on debt*	*%*	*6.00*
7	*Capacity Utilization factor (CUF)*	*%*	*85 +*
8	*Degradation factor*	*%*	*0.5*
9	*Return of Equity (RoE)*	*%*	*16.00*
10	*Discount Factor*	*%*	*9.00*
11	*Auxiliary consumption*	*%*	*2.00*
12	*O & M expenses on initial asset value*	*%*	*1.50*
13	*Escalation of O & M values*	*%*	*5.72*
14	*Interest on working capital*	*%*	*13.50*
15	*Working capital Components:*		
15.1	*Receivables*	*Months*	*2*
15.2	*O & M expenses*	*Months*	*2*
15.3	*Maintenance Spares*	*O/M %*	*15*
16	*Insurance on capital cost of assets*	*%*	*0.5*
16.1	*Other Insurance O & M*	*%*	*10.00*
17	*Depreciation for first 10 years*	*%*	*6.00*
18	*Depreciation for remaining 10 years*	*%*	*4*

3) Based on the above pleadings, the Petitioner has prayed for a levelized tariff rate of Rs.11.74 for the plant life of twenty (20) years with Income Tax and other taxes along with fluctuation in exchange rate allowed as pass through or alternatively hedging of exchange be permitted as allowable expenditure.

4) Upon admission of the Petition and issuance of Notice, the Respondents have entered their appearance through their counsel.

5) Respondent 4, expressed its willingness to enter into a PPA with the Petitioner for its proposed 10 MW plant, but at a tariff of ₹3.58 per unit purely to promote the new hybrid concept.

6) Similarly, Respondent 7, expressed its willingness to enter into a PPA with the Petitioner for its proposed 10 MW plant, but at the Average Pooled Power Purchase Cost determined by the Commission purely to promote the new hybrid concept.

7) Similarly, Respondent 5 too, expressed its willingness to purchase power from the Petitioner's proposed plant, but at the Average Pooled Power Purchase Cost determined by the Commission. It further contended that the complete technical details are not furnished by the Petitioner and that use of batteries to provide uninterrupted power is not cost effective as there are alternative cost effective options available. It also

expressed apprehensions about the integrity and reliability of the Petitioner's plant. Further, Respondents 4 & 6 referred to the CERC's Order dated 29.04.2016 in which the CERC has observed that sufficient data is not available in respect of Solar-wind hybrid technology, for determination of generic tariff. They also furnished copies of certain documents to contend that the hybrid concept currently being considered by the Centre and the States is establishment of solar and wind power plants at common locations without any new technology as in the case of the Petitioner.

8) As part of public consultations in the matter, the Commission also held a public hearing which however did not result in any fresh inputs from any stakeholders.

9) The Commission pointed out to the Petitioner that none of the Respondents had come forward to purchase the power from the Petitioner's plant at the proposed rate.

10) Subsequently, the Petitioner submitted a letter dated 10.07.2017 from the Government of Karnataka. The Government in such letter has agreed to consider the proposal of the Petitioner to set up 5 MW project and has requested the Commission to fix tariff so that one of the ESCOMs could be directed to enter into a PPA with the Petitioner.

11) The Commission notes that the Petitioner's proposed plant is a demonstration project, whose location is not known. The petitioner has not furnished any basis or break up for arriving at the capital cost of Rs.47.04 Cores/ MW, which is almost 10 times the cost of solar or wind project leading to comparatively high cost of electricity generated at Rs.11.74 per unit. The articles / papers produced by Respondents 4 and 6 relating to economic and other feasibility of hybrid solar-wind power systems are not of much use for our purpose as none of them are of recent period. Hence, there is no material available to facilitate determination of either project specific tariff or generic tariff based on normative parameters. We are aware that any new technology in power generation would not be cost effective in the initial stage and only economies of scale and improvement in technology would bring down the cost to a reasonable level over a period of time, and that we need to promote new technology by providing promotional and sustainable tariff to make that happen. At the same we need to keep in mind that in order to make any project developer to bring in efficiency and economy in its operations any tariff determined needs to be moderated to achieve these objectives especially in the case of a new technology which is not tested or proven.

12) We note that Petitioner has not furnished the detailed working sheet based on which it has sought a levelised tariff of Rs.11.74 per unit for twenty years (Plant Life), though it has indicated the parameters it seeks to be adopted for determination of such tariff. The Petitioner has in its

Petition tried to justify the assumptions made in respect of each of the parameters and most of them are justified on the basis of norms adopted by the CERC, this Commission and the Commissions of other States.

13) Our views and decisions on the assumptions on the parameters and consequential reliefs sought by the Petitioner are as follows:

(a) The Petitioner claims that the capital cost of the project is at Rs.4,480.00 Lakhs (Rupees four thousand four hundred and eighty lakhs only) based on a Proforma Invoice dated 24.03.2016 of his supplier in USA. While the break-up of such capital cost is not furnished, admittedly it includes the cost of solar panels. The Petitioner has indicated that its hybrid plant would have solar panels of 17 kW capacity per Mega Watt (MW). The Commission in its latest Order dated 12.04.2017 for determining the generic tariff for megawatt scale solar plants has adopted solar panel cost at Rs.234.89 Lakhs (Rupees Two Hundred and Thirty-Four lakhs and Eighty-Nine thousand) only per MW, as against Rs.311.965 Lakhs considered in its earlier Order dated 30.07.2015. At the revised solar panel cost, the cost of 17 kW solar panels required for the Petitioner's hybrid plant would come down by Rs.1.31 Lakhs per MW and the same is adopted by us for tariff determination. However, we decide to allow the pre-operative expenses at 5% of the reduced capital cost.

(b) The Petitioner has sought Return on Equity (RoE) of 16%, whereas as admitted by the Petitioner, the CERC and the GERC have in their recent Orders considered RoE of only 14%, which we also decide to consider.

(c) As against discount factor of 9% reckoned by the Petitioner, we decide to adopt it at 8.4% because of change in the relevant parameters.

(d) The Petitioner has claimed interest at the rate of 13.5% on working capital. In view of the current low interest rates we decide to adopt a rate of 11.25%.

(e) The Petitioner apart from claiming insurance expenses at 0.5% on capital cost of assets, has also claimed insurance expenses at 10% on O&M expenses without giving any justification for such claim and therefore, we decide to reject the insurance expenses on O&M expenses. However, insurance expenses on capital cost of assets at 0.5% is allowed.

(f) The Petitioner has claimed O&M expenses of two months and maintenance spares at 15% of the O&M expenses, in addition to two months' receivables as working capital. We do not find the claims justified. The Commission has adopted two months' receivables as the reasonable working capital for the Renewable Energy Power Projects. Therefore, adopting the same, the Commission decide to allow only two months' receivables as the working capital.

(g) The Petitioner has claimed depreciation at 6% for the first ten years and 4% for the remaining ten years without valid justification. We decide to allow depreciation at 5% of the depreciable asset cost over twenty years. Further we decide to take 95% of the capital cost as the asset cost and 90% of such asset cost for the purpose of computation of depreciation.

(h) Considering that the Petitioner's plant is a demonstration project, we decide against allowing variation of exchange rates as pass through or cost of hedging as allowable expenditure. However, Income Tax on RoE payable will be allowed as a pass through.

(j) The Petitioner has claimed various other costs like replacement of batteries etc. without quantifying such expenditure. We decide not to allow such costs.

(k) We decide to adopt other parameters as claimed by the Petitioner.

14) Considering the above parameters, the levelised tariff works out to Rs.9.38 per unit for period of twenty years. Accordingly, we pass the following:

ORDER

(a) The Commission hereby determines a tariff of `9.38 (Rupees Nine and Paise Thirty Eight) only per unit for the electricity generated by the Petitioner's plant for a period of twenty years from the date of commercial operation, which shall not be more than twelve months from the date of Power Purchase Agreement with any distribution Licensee in the state;

(b) This Order shall be effective and in force till 31st December, 2017; and,

(c) The Petition is disposed of accordingly.

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