



**ANDHRA PRADESH ELECTRICITY REGULATORY COMMISSION**

4<sup>th</sup> Floor, Singareni Bhavan, Red Hills, Hyderabad 500 004

TUESDAY, THE 28<sup>th</sup> DAY OF JUNE  
TWO THOUSAND AND TWENTY TWO

**Present**

**Justice C.V.Nagarjuna Reddy, Chairman**

**P.Rajagopal Reddy, Member**

**T.Rama Singh, Member**

IN THE MATTER OF

Determination of Tariff / Power Purchase Price from 11<sup>th</sup> year to 20<sup>th</sup> year  
from COD in respect of wind Based Power Projects

O.P.No.29 of 2020

Between:

M/s.Vaayu(India) Power Corporation Pvt.Ltd.  
Commercial Complex,H-Block,Alpha-II,Sector,Greater Noida,  
Uttar Pradesh-201308.

.....Petitioner

AND

Andhra Pradesh Southern Power Distribution Company Limited

..... Respondent

M/s. Vaayu (India) Power Corporation Private Limited filed the present petition under the section 86(1)(a), 86(1)(b) and 86(1)(e) of the Electricity Act 2003, for approval of the generic tariff at Rs. 3.43/- per unit for sale of wind power by the Petitioner to DISCOMs for all the Seven PPAs, after expiry of the 10<sup>th</sup> year period in terms of the Order dt.01.05.2009 passed by the Commission in O.P. Nos.6 & 7 of 2009.

The above petition was taken on the file of the Commission as O.P.No. 29 of 2020 on 24-08-2020. As per the orders of the Commission dt.01-09-2021,the petitioner

published the application for tariff fixation in two daily newspapers viz. Sakshi telugu and Deccan Chronicle in english having circulation in A.P. on 13-10-2021 inviting comments / objections / suggestions from stakeholders within 30 days from the date of publication. The tariff application for fixing the tariff was also placed on the Commission's website for the public information.

The above petition has come up for final hearing before the Commission on 16-03-2022 in the presence of Sri Sajan Poovayya, the learned senior counsel and Sri P.Shiva Rao, the learned standing counsel for the Discom and Sri.M.Venugopala Rao, the learned objector. After hearing the arguments of the learned counsel for both parties and learned objector, and after carefully considering the material available on record, the Commission passed the following:

### **ORDER**

#### **The case of the petitioner is briefly as follows:**

1. That this Commission vide its order dated 01.05.2009 in O.P Nos.6 and 7 of 2009, while determining the generic tariff applicable to the PPAs entered between 01.05.2009 and 14.11.2012 (in respect of wind power projects) in the state of Andhra Pradesh had arrived at a levelized fixed tariff for 20 years at Rs.3.43/-per unit and however, and in view of urgent need to harness the available potential, thereafter, the Commission decided to fix the Tariff for the first 10 years at Rs.3.50/-per unit with a direction that the tariff for the 11<sup>th</sup> to 20<sup>th</sup> year would be revisited after expiry of the first 10 years.
2. That pursuant to the Commission's said order dated 01-05-2009, the petitioner executed seven identical power purchase Agreements each dated 29-05-2010 with the erstwhile Central Power Distribution Company of Andhra Pradesh Limited (now Southern Power Distribution Company of Andhra Pradesh Limited [**APSPDCL**] for setting up a wind power generating station (Phase-I to VII) having an aggregate capacity of 50.4MW at Kondameedipalli in Kurnool district in the state of Andhra Pradesh.
3. That, since the period of first 10 years for which the aforementioned tariff is applicable to the Petitioner is about to lapse, the Petitioner filed the instant Petition under the Sections 86(1)(a), 86(1)(b) and 86(1)(e) of the Electricity Act, 2003 for approval of the generic tariff at Rs.3.43/- per unit for sale of wind power by the Petitioner to APSPDCL

(for short, the DISCOM) for all the Seven PPAs from 11<sup>th</sup> year onwards, in terms of the aforementioned Order dated 01.05.2009.

4. The petitioner sought approval of the tariff at Rs.3.43/- per unit on the following grounds:

- i) That, this Commission after duly considering all the factors/ parameters, then prevailing with the wind regime in the region, has already undertaken the exercise for determination of the levelized tariff of Rs.3.43/- per unit for 20 years, that If this is changed/reduced midway, it would cause uncertainty which would further discourage potential investors and most importantly make the generation financially unviable. That therefore, in order to maintain consistent approach and to permit the petitioner to service its debts and earn a reasonable return on its investment the already approved levelized tariff of Rs.3.43/- per unit as determined vide the order dated 01.05.2009 for the balance period of 10 years may be continued.
- ii) That the Commission vide its order dated 06.09.2014 in O.P.Nos.14 to 18 of 2006, after considering the need for consistency in tariff determination, observed that it is not desirable to review and adopt a new methodology/approach for determination of the tariff midstream, especially after completion of 10 years. The petitioner has extracted relevant portions of paras 89 & 90 of the Order dated 06.09.2014 which read as under.

*“89” As will be seen, while the Commission has issued the orders for payment of price of Rs.3.37 per unit for all old projects including the 5 projects under consideration till 31.03.2014, it has also simultaneously stated that the review of purchase price will be completed after 10 years of CoD to keep in mind possibilities of the reduction of tariff after repayment of loans. The argument of the developers that there is ambiguity in the Commission's stance cannot be fully rebutted.*

*“90” The Commission has carefully considered the following issues relating to the determination of tariff for the old projects which have completed 10 years:*

- (i) *That the Commission has never undertaken a parametric-wise analysis of wind projects to determine tariffs, Starting from the original rate of Rs. 2.25 per unit with 5% escalation. The Commission has continued its generalist stance for determination of tariffs for wind generators . As part of this approach these projects were awarded tariffs of Rs.3.37 per unit for two successive five year periods i.e from 01.04.2004 to 31.03.2009 and 01.04.2009 to 31.03.2014. It may now not be desirable for the Commission to review the approach for determination of the tariff mid-stream and adopt a parametric approach after completion of 10 years from CoD.*
- iii) That the provision for keeping the tariff valid for 10 years has to be understood in the context of the fact that the tariff, after determination, was levelized for 20 years by this Commission . The validity of the tariff for 10 years is not to be construed as suggestive towards reduction of tariff after the end of 10 years. On the contrary, it is suggestive of either maintaining the said tariff for next 10 years as it has already been levelized for 20 years or to increase it for providing impetus to the generators . Thus, the intent for having a review , midway, was with the sole aim of promoting generation of electricity from renewable sources as per the mandate of the Act.
- The petitioner therefore prayed to approve the generic tariff at Rs.3.43/- per unit for sale of wind power by the petitioner to DISCOM for all the seven PPAs from the 11<sup>th</sup> year onwards, in terms of Order dated 01.05.2009 passed by this Commission in O.P. Nos.6 and 7 of 2009.

5. The petitioner, also filed an application vide I.A No:20 of 2020 in O.P No. 29 of 2020 with the prayer to continue the generic tariff of Rs.3.43/- per unit applicable to the Petitioner's Power Purchase Agreements during the pendency of the present Petition. Sri Sajan Poovayya, the learned senior counsel for the petitioner submitted during hearing on 26-08-2020 that the period of ten years for which tariff was fixed expired on 02-08-2020 and requested for an interim rate to be fixed for the power supplied thereafter pending disposal of the O.P.

In response, Sri. P.Shiva Rao, Learned Standing Counsel for the Respondent, submitted that as the AP Discoms are taking consistent stand that the tariff is required to be reduced in view of the reduced level of tariffs prevailing country wide and also taking into consideration the fact that in cases where power purchase Agreements are under dispute, the Hon'ble High court of AP has fixed interim payment of Rs.2.43 per unit, this Commission may allow payment of interim rate of Rs.2.43 ps pending the O.P

Having regard to the respective submissions of the learned counsel for the parties, the Commission disposed of the said I.A by fixing the interim tariff at the rate of Rs.2.43 per unit payable by the AP Discoms to the petitioner for the power received after 02-08-2020 pending disposal of the O.P.

**The respondent APSPDCL filed their counter on 25-01-2021. The averments contained in the counter are briefly as follows:**

6. That the commission vide its orders dated 01.05.2009 in O.P.No.6 & 7 of 2009 clearly stated that "The tariff stream with the above key element has been worked out by the commission, for arriving at levelized cost using discount rate at weighted average cost of capital i.e. 13.05% which works out to the fixed tariff for 20 years at Rs.3.43 per unit.

7. From the above, it is clear that the levelized cost was arrived at Rs.3.43/- per unit fixed for 20 years, but to harness the wind energy potential the single part tariff of Rs.3.50/- per unit was fixed for the first 10 years and the tariff for the next 10 years period will have to be decided by the Commission thereafter. Therefore the tariff was loaded more in the first 10 years and the petitioner's request for approval of the then generic preferential tariff of Rs.3.43/- per unit without any further reduction is not tenable. Considering the overload of front end tariff, the second 10 years tariff needs to be reduced.

8. That while determining the said tariff, the useful life of the project was taken into consideration as 20 years to spread the returns on the capital cost invested. But the past experience clearly shows that the life of the projects is more than 25 to 30 years (as in case of Weizmann power Ltd and Nile Company). Even the CERC in its extant regulation of the wind power projects stated that the project cost has to be considered for the useful life of project as 25 years. Therefore during the present revision of tariff, the Commission may consider the life of the project at 30 years and it may also take in to consideration of



the fact that land i.e an extent of 5 acres per MW (land is a scarce commodity in India) is being retained by the developer after useful life of the project.

9. That the developer had agreed for the tariff of Rs.3.50/- per unit for a period of 10 years from the COD and for review of tariff payable beyond 10<sup>th</sup> year of operation by the Commission and hence the petitioner cannot unilaterally claim the tariff of Rs. 3.43/- per unit for the period from 11<sup>th</sup> year onwards.

10. That in the present scenario where the wind power in A.P. is much more than required, and across the country the cost of the wind power is reduced drastically, it is not advisable to determine the tariff de hors the prevailing wind power tariff in the market. If the developer is not agreeable to the reduced tariff equating market prices, the developers are at liberty to sell their power in open market and the power utilities of A.P are ready to provide all necessary assistance in that regard to the developer.

11. That the claim of the petitioner for approval of the generic tariff of Rs 3-43 is absolutely not tenable. Apart, another important aspect is that in integration of this VRE power there is hidden cost liability on DISCOMs in three aspects i.e. adequacy cost, balancing cost and grid integration cost as recognised by Central electricity authority also in their report dt 01.01.2018. That as per the DISCOMs' study, the liability of said hidden cost works out to more than Rs.2/- per kWh.

12. That It is evident from the history of this Commission in determination of tariff for wind power projects since 1995 when the first projects were set up in the then state of Andhra Pradesh, the Commission had determined only a single part tariff and that too incorporating a generalist stance and never undertaken a parametric wise analysis of wind projects to determine tariffs. The cost plus approach was incorporated only in O.P.No.6 & 7 of 2009, wherein certain key elements that influence the determination of tariff were considered for the first time, analysed therein considering the objection/ suggestions of various stakeholders and arrived at the final conclusion as follows:

*“The tariff stream with the above key element has been worked out by the commission, for arriving at levelised cost using discount rate at weighted average cost of capital i.e. 13.05% which works out to the fixed tariff for 20 years at Rs.3.43 per unit. However in view of the urgent need to exploit the available potential of about 2100 MW, out of which only about 100MW has been harnessed as on date,*

*the commission has decided to fix the single part tariff for the first 10 years at Rs.3.5 per unit and the tariff for the next 10 year period will be decided thereafter.”*

That, from the above tariff orders as per which the petitioner has entered PPAs, it is clear that the Commission has rightly kept the tariff of wind projects beyond 10<sup>th</sup> year “open for review”.

13. That in similar circumstances, the then APCPDCL (now TSSPDCL) in O.P.No.14 to 18 of 2006, basing on the detailed calculation had proposed a tariff of Rs.1.43 per unit (as against the tariff of Rs.3.37 per unit paid for the first 10 years) for the energy purchase during 11<sup>th</sup> to 20<sup>th</sup> year of operation in respect of 5 Nos. wind power generators established during 1995 and completed 10 years of operation by 2005.

14. That the DISCOMs crave to submit at this juncture that the developer M/s.VIPCL projects are commissioned in 2010 (i.e.) 15 years later as compared to the petitioners in O.P.No.14 to 18 and incorporated new technologies, the fact of which can be observed is due to the average PLF achieved by these 7 phases ranging from 19% to 24% as against the 24.5% fixed by the Commission, and if yearly data is considered, the PLFs exceeded 24.5%.

15. That the APDISCOMs earnestly request to take up the parametric wise approach in the present petition (as post 2015 parametric approach only is being adopted for tariff determination) bringing to book the financial liability, assets, balance sheets of the developer, O&M costs, depreciated value, ROE and remaining interest costs on debts etc and also that the above factual values are to be incorporated in arriving at the tariff applicable for projects beyond 11<sup>th</sup> year of operation.

16. That in the competitive bidding floated by SECI in the month of February 2017 for procurement of 1000MW power sourced from wind projects discovered tariff at Rs.3.46 per unit. In the Phase-II competitive bidding conducted by SECI during October 2017 for procurement of wind power, a tariff of Rs.2.64 per unit was discovered and realised and in the reverse auction held by Gujarat Government for procurement of wind power, the tariff of Rs.2.43 per unit was realised. During April 2018, SECI successfully auctioned 2 GW ISTS-connected wind projects under tranche 3 and received the lowest tariff of Rs.2.44 per unit. The said low cost of wind energy discovered is far cheaper than Rs.3.43 per unit sought by the developer in the present petition. The tariff of Rs. 3.50 per unit which was

fixed already gave the developer advantage of Rs.0.07 per unit and works out to Rs.7 Crores. (Based on PLF of 24.5% for a capacity of 50.4 MW for 10 years).

17. That the claim of the petitioner that the validity of tariff for 10 years is only suggestive of either maintaining the said tariff for the next 10 years or to increase it for providing impetus to the generator is absolutely incorrect. If the same was the opinion of the Commission as claimed by petitioner, it would not have kept the review of tariff open after 10<sup>th</sup> year and would have applied the levelised value for 20 years at a stretch.

18. That the licensees are already burdened by the high cost of procurement of wind and solar power with must run status additionally causing DISCOMs to incur huge financial losses and due to the same it is not able to pay monthly power purchase bills from August 2018 onwards. This has caused the DISCOMs to approach this Commission by way of filing O.P.NO.17, 66 and 67 of 2019 seeking reduction/amendment of tariff in the PPAs entered between 2012 and 2017, and those cases are pending disposal.

19. The APSPDCL proposed the tariff of Rs.1.91 per unit of energy purchased from the petitioner projects for the period from 11<sup>th</sup> year to 20<sup>th</sup> year of PPA by considering Residual Capital cost (RCC is 55% of the Capital Cost of Rs.4.70 Crs. after 10 years at depreciation @ 4.5%), interest on debt @ Rs.9.23%, ROE at 15.5%, CUF of 24.50%, useful life of 30 years without considering depreciation from 11<sup>th</sup> year.

**20. The petitioner filed the following rejoinder on 21-06-2021 on the Replies/ Objections filed by APSPDCL on 21.01.2021**

- i) That while determining a levelized tariff, this Commission didn't consider any interest on Working Capital which has resulted in a lower tariff computation of Rs.3.43/kWh. If an interest rate for Working Capital equivalent to interest rate on loan (@12%) is considered, then tariff would go up from Rs.3.43/kWh to Rs.3.51/kWh. Hence, it is evident that the Petitioner has not taken any unjustified advantage by tariff (Rs.3.50/kWh) approved by this Commission.
- ii) That the Petitioner's project is set up in a mix of Revenue and Private land and both the private as well as the revenue land are on lease. Therefore, the point raised by the APSPDCL that the land would be retained by the Petitioner after the useful life of the project is completely irrelevant.



- iii) That the long term project loans have tenure extending beyond 15 years. The Loan tenure for the Petitioner's projects is till FY 2031 and, currently, the principal outstanding towards the same is around Rs.126.24 Crores (*as on 31.12.2020*). That, even after repayment of the entire loan, it has been a usual practice of various other Regulatory Commissions to approve interest on long term loans on a normative basis. That, at the time of tariff determination for the Petitioner's projects (*more than 10 years ago*), the entire cost of the project was supposed to be recovered in a period of 20 years and not just 10 years and that was the sole premise/ rationale for determining a levelized tariff for the entire period of 20 years.
- iv) That the technologies do undergo change periodically between four to five years and each time when the technology changes, it is not feasible to scrap the plant to install a new plant with new technology. The Petitioner had invested in the best technology (*then available*) and its plant cannot be compared with the latest ones and should not be penalised merely because there are new technologies available today at a lower cost per kWh. This being a regularised tariff/ PPA, the same ought to be as per the facts of the present project.
- v) That the CUF details placed by APSPDCL in its replies/ objections dt. 21.01.2021 makes it evident that the Petitioner has never been provided more than the normative CUF (*though for many years the PLF has been on a lower side*) reducing the Petitioner's realisation.
- vi) That the Petitioner herein in July 2020 had to waive LPS to the tune of Rs.5.5 Crores in order to get the outstanding payments (*only till the month of January 2021*) realised from APSPDCL. The Petitioner has continued doing the same, till date, in order to get timely payment from APSPDCL while on the other hand no relief has been provided by lenders of the project and the petitioner has been servicing its debts as per terms of the loan agreement.
- vii) That 'Must-Run' is a statutory right provided to the Wind & Solar i.e. the intermittent

sources of power. The Petitioner has been asked to back down its power supply multiple times which has caused huge losses to it. Several petitions by other wind energy developers in this regard have also been filed before this Hon'ble Commission against the APTRANSCO/SLDC. It is worth noting that even 'Southern Regional Load Despatch Centre' (SRLDC – POSOCO) has filed a petition against APSLDC and APTRANSCO in CERC (Petition No. 204/MP/2020) invoking Regulation 1.5(i) read with Regulation 5.2(u) and Regulation 6.5(11) of the CERC (Indian Electricity Grid Code) Regulations, 2010 for enforcement of 'must run' status granted to solar and wind generators and Regulation 111 of the CERC (Conduct of Business) Regulations, 1999 seeking direction to State Load Dispatch Centre to act in accordance with 'Indian Electricity Grid Code' provisions while issuing backing down instructions to the solar and wind generators. This petition has been admitted by CERC *vide* order dated 05.02.2021 and would be heard on merits in due course of time.

- viii) That the APSPDCL has calculated a tariff of Rs 1.91 per kWh for the balance 10 years of the PPA period. The calculation regarding the same is full of errors and is liable to be rejected for the following reasons:

That the APSPDCL has deducted Cumulative Depreciation accrued in 10 years of the PPA from the Capital cost in order to arrive at the Net Asset Value (*to be used for tariff calculation purpose*). The methodology considered by APSPDCL is flawed as the tariff has to be calculated on the Gross Fixed Asset [**GFA**] but not on the Net Fixed Asset [**NFA**]. Denial of a large size of equity invested in projects for return on Equity [**RoE**], is neither fair nor judicious, and is against all fundamentals of tariff fixation. It is pertinent to mention herein that a similar approach which leads to reduction in the RoE has already been set aside by the Hon'ble Appellate Tribunal *vide* the Judgement dated 16.05.2006 in Appeal No.121 of 2005.

Furthermore, as per the fundamentals of tariff calculation, the value base for the purpose of depreciation shall be the capital cost of the asset admitted by this Commission. Also, as the GFA has been admitted, depreciation needs to be calculated on that amount for the rest of the PPA period.

- ix) That it is pertinent to point out here that a tariff of Rs.3.43 per kWh is also lower than the Average Power Procurement Cost of the AP DISOCMs from all generating sources. A tabulation of Average Procurement Cost of AP DISCOMs is provided below for ready reference:

FY	Rs/kWh
2016-17	4.15
2017-18	4.13
2018-19	4.44
2019-20	4.02
2020-21	4.68

- x) That if the levelized tariff of Rs.3.43/kWh (*determined for 20 years*) is being objected to by APSPDCL, the Petitioner would like to demonstrate to the Hon'ble Commission that if the generic tariff (*as determined vide Order dt. 01.05.2009*) would have been levelized for 10 years (*instead of 20 years*), while keeping all the parameters same, then the tariff which would have been determined by this Hon'ble Commission would have been Rs.4.24/kWh which makes it clear that the tariff determined by the Hon'ble Commission *vide* the Order dated 01.05.2009 in O.P Nos.6 and 7 of 2009, and levelized to Rs.3.43 (*without considering interest on working capital*) after applying the discount factor and then fixing the same at Rs.3.50 was for a full term of 20 years (*not for 10 years*).

21. As per the request of Sri M.Venugopala Rao learned objector during the public hearing on 15-12-2021, the petitioner filed the Auditor's Certificates dated 22-01-2022 on 24-01-2022 and tariff working for the petitioner's project with propotionate project specific parameters.

**22. In response to the affidavit dated 24-01-2022 of the petitioner, Sri M.Venugopal Rao learned objector made the following submissions on 08-03-2022:**

- i) The subject developer has shown in their affidavit, the average annual capacity utilisation factor achieved 24.5% during the first ten years from the COD against 22.03% determined by the Commission. The actual annual CUF claimed to have been achieved by the developer from 2011-12 to 2020-21 ranges from the lowest (17.30%) to the highest (26.65%). As such, the difference between the generation at threshold level of CUF and revenue accrued thereon and actual generation at CUF achieved and revenue that accrued to the developer needs to be examined. Based on that, the CUF needs to be revised upwards appropriately for the next ten years.
- ii) In the affidavit and data submitted, actual revenue and actual profit accrued to the developer year wise are not shown. They need to be examined based on their IT returns. If their revenues led to higher profit exceeding the CUF determined by the Commission, CUF for the next 10 years needs to be worked out. If it is full tariff for excess generation and supply, that should not be allowed and only a marginal incentive can be fixed.
- iii) Whether various parameters determined by the Commission while fixing leveled tariff have been proved to be very much liberal leading to lesser expenditure and additional profit needs to be examined and the actual expenditure incurred pertaining to parameters like O&M expenditure, scope for reduction in rate of escalation for O&M expenditure, actual interest on loan, scope for swapping of loan with a fresh loan with lesser rate of interest in view of interest rates coming down drastically, increase in useful lifespan of the project based on experience, etc. may be examined by the Commission to take the above points into consideration, among others, and take appropriate decisions for determination of tariff.
- iv) In view of the drastic reduction in tariffs for wind power projects as discovered through competitive biddings in the country, return on equity may be fixed at 14%.

**23. The respondent APSPDCL submitted the following reply to the rejoinder filed by the petitioner dt 20.04.2022.**

**a) Capital Cost:**

APERC in its Tariff order vide OP.No.6 & 7 of 2009, dated 01.05.2009 approved **Rs.4.7 Crs per MW** as the allowable Capital Cost. APERC had decided the Tariff basing on this Capital Cost even before the Wind Plants were set-up by the Generator and the same had been acceded by the Generator at the time of entering the PPA. However, the present claim of the petitioner that the actual cost incurred in setting up the plant at Rs.5.81 Crs per MW is not tenable. Hence, the Capital Cost of Rs 4.7 Cr/MW only may be considered for Calculation of Tariff applicable to the developer from 11<sup>th</sup> year to 20<sup>th</sup> year (end of PPA) of Operation.

**b) Land Details:**

The Government of Andhra Pradesh allotted land for 6 Phases out of 7 on lease basis to the Petitioner M/s Vaayu(India) Power Corporation Ltd for setting up of Wind Energy projects.

**c) Loan liability:**

The APERC in its order dated 01.05.2009 in O.P.No.6 and 7 of 2009 has considered the tenure of the loan as 10 years. Accordingly, the petitioner himself has submitted its calculations in rejoinder calculating interest on loan up to 10 years. Thus there is no liability of loan after 10 years on the project.

**d) Depreciation:**

APERC has considered the depreciation rate of 4.5% p.a in Straight Line method with residual cost of 10% of total Capital Cost and 45% of the initial Capital cost value would be depreciated by the end of 10<sup>th</sup> year. The balance value (45%) to be spread over the next 20 years i.e. (11<sup>th</sup> -30<sup>th</sup> year) on SLM basis which results in depreciation value of 2.25% p.a. and hence the same may be considered for calculation of Tariff.

Generator in its statement “Details of Proportionate Project Specific parameters for 63 wind Turbines in AP” had claimed that the depreciation (Average) rate is 7.69% for the first



10 Years as per Income Tax. Depreciation rate for wind projects on WDV basis is 15% p.a. as per Income tax Act which generator may have been following and it is requested not to consider the Generators' submission.

**e) Useful Life:**

APERC had considered the useful life of plants as 20 years in its order dated 01-05-2009, but practically Wind Power Plants(as in case of Weizmann,NILE and VGEIPL) are operating for a period of 30 years. CERC vide its Regulation "**Terms & Conditions for Tariff determination from RE Sources, 2009**" dt.16.09.2009 clearly stated that useful life of wind Energy Projects is 25 years (Clause 2(y) and hence requested to consider the useful life of Wind Power Plants as 30 years for the Purpose of Tariff determination.

**f) O & M Expenditure:**

APERC approved O & M Expenditure @ 1.25% of Project approved Capital Cost which was Rs.4.7 Crores per MW with an escalation of 5% per annum. Accordingly, the O & M Expenditure for 10<sup>th</sup> Year works out to Rs. 0.0911 Crs. Hence the 11<sup>th</sup> year O&M expenditure was taken as Rs.0.0957 Crores with escalation at 5% thereupon.

**g) Capacity utilization Factor (CUF) :**

The Generator is claiming that the average CUF realised for 50.4 MW for the first 10 years was 22.03% and however from the data submitted by the Generator itself it can be observed that CUF greater than 24.5 % had been realised for 4 years & less than 24.5 % during the rest of the Years.

The Actual Generation depends upon factors which are not in control of APDISCOM(s). The various reasons which affect the generation includes Technological Quality of wind Mills erected by the Generators, Blade Radius, Wind Speed, Air Density etc. Generator is also well aware that the actual generation will not be considered for Tariff determination. Hence CUF of 24.5% for the purpose of Tariff determination for the balance tenure also (11<sup>th</sup> to 20<sup>th</sup> year) may be considered.

By considering the above factors and calculations, APSPDCL in its rejoinder proposed a tariff of Rs.1.95 per unit of energy purchased from the petitioner projects for the period from 11th year to 20th year of PPA, though it proposed tariff of Rs.1.91 per unit initially in the counter filed by it.

**24. Commission's Analysis:** The Commission, having perused the record and after careful examination of the various contentions made in the written and oral submissions of Petitioner, Respondent and the learned objector, analysed the key elements that influence the determination of tariff hereunder.

**i) Capital Cost:** The petitioner claimed the proportionate capital cost at Rs. 5.81 Cr per MW for 63 WTG's in the state of AP by proportioning the capital cost incurred for the total number of 253 WTG set up across the country is not tenable. The respondent has stated in their reply that the Commission approved the Capital cost at Rs.4.70 Cr per MW in its tariff order vide OP.No.6 & 7 of 2009, dated 01.05.2009, that the Commission decided the tariff based on this Capital Cost even before the Wind Plants were set-up by the Generator and the same had been accepted by the Generator at the time of entering the PPA. The respondent requested to consider the Capital Cost of Rs 4.70 Cr/MW only for Calculation of Tariff applicable to the developer from 11<sup>th</sup> year to 20<sup>th</sup> year (end of PPA) of Operation. The Commission carefully examined the matter. As noted above the petitioner claimed the proportionate capital cost at Rs.5.81Cr for 63 Wind Turbine Generators commissioned in the state of Andhra Pradesh based on the proportionate cost incurred for total 253 Nos Wind Power Projects of the Company commissioned in various states i.e 64 Nos. in Gujarat, 63 Nos. in Tamil Nadu and 63 Nos in Rajasthan. The capital cost of wind power projects depends on various factors like cost of land, pre development expenses, civil work, grid connection costs, type of wind turbine, hub heights, wind speed, wind power density, technology, size and location of the wind power plant. The above factors vary from one state to another depending upon the geographical conditions. Hence, the claim of the proportionate capital cost of Rs.5.81 Crs per MW based on the capital cost incurred for commissioning of 253 WTG's across the country as mentioned above is neither tenable nor appropriate.

The tariff now being determined is for the existing Wind Power plants from the 11th year onwards after completion of 10 years of operation. The Commission while fixing tariff for the initial ten years period, thoroughly examined the prevailing capital cost at that time and arrived at the capital cost of Rs.4.70 Cr per MW vide its order dated 01-05-2009.

Therefore, the Commission is inclined to continue the existing capital cost of Rs.4.70 Cr/ MW (including evacuation cost) for the purpose of tariff determination for the 11th to 20th year of operation.

**ii) Capacity Utilisation Factor (CUF):** The petitioner claimed the average CUF realised for 50.4 MW for the first 10 years as 22.03%. The respondent stated that the developer's claim based on average basis is impermissible. However, it is observed that the CUF greater than 24.5 % had been realised for 4 years & less than 24.5 % during the rest of the 6 years as per the data submitted by the Generator itself. APSPDCL requested the Commission to consider the CUF of 24.5% already approved in the order dated 01-05-2009 for the purpose of Tariff determination from the 11<sup>th</sup> to 20<sup>th</sup> year. The Commission carefully examined the matter. Under clause 25(1) of (Terms & Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2020, framed by the CERC, a CUF of 24% for 100 meter hub-height wind power Projects having Annual Mean Wind Power Density (221-275) W/Sq.m has been stipulated. The hub-heights of the then wind power Generators commissioned in AP are ranging from 50 to 80 Meters and most of the sites in AP fall in the range of wind power density from 200-250 Watts/Sq.m as per NIWE (formerly C-WET) wind density map. With the hub heights of 50-80 mts range, and the wind density range from 200-250 Watts/Sq.m, the CUF is expected to be around 23.50%. This view is supported by the fact that for some years, the Petitioner exceeded 24.5% CUF. Therefore, the Commission is of the view that it is appropriate to adopt a CUF of 23.50% for the purpose of tariff determination from the 11th year onwards, subject however to the condition that the energy injected over and above the above specified CUF in any financial year shall be treated as inadvertent power and shall not be paid for.

**iii) O & M Expenditure:** The petitioner claimed Rs. 0.0687 Cr per MW as per auditors certificate dated 22-01-2022 with an escalation of 5% p.a from 2nd year onwards and accordingly the expenditure of Rs. 0.1116 Cr per MW is claimed towards O&M expenditure for the 11th year of operation. The respondent APSPDCL requested the commission to consider O&M Cost of 1.25% of project cost with an escalation of 5% p.a as allowed by the Commission in its wind Tariff Order in O.P. No.6 & 7 of 2009 dated 01.05.2009 for tariff determination from 11<sup>th</sup> to 20<sup>th</sup> year also. Thus the respondent conceded the expenditure of Rs 0.0957 Cr per MW for the 11th year of operation. The CERC allowed the O&M expenses with an escalation rate at 3.84% per annum vide clause 19(2) of its Regulation

dated 23-06-2020 . In the absence of its own regulations, the Commission is inclined to allow the O&M cost inline with the said CERC Regulations with an escalation of 3.84% per annum from the 11<sup>th</sup> year onwards for the purpose of tariff determination.

**iv) Depreciation:** The petitioner claimed depreciation at 7.69% as per Income Tax, whereas the respondent stated that the Commission considered the depreciation rate of 4.5% p.a in Straight Line method with residual cost of 10% of total Capital Cost in its order dt 01-05-2009, that, 45% of the initial Capital cost value would be depreciated by the end of 10<sup>th</sup> year and that the balance value (45%) has to be spread over the next 20 years i.e. (11<sup>th</sup> -30<sup>th</sup> year) on SLM basis. The respondents accordingly requested to consider the same for determination of Tariff from 11<sup>th</sup> to 20<sup>th</sup> year.

The Commission carefully examined the rival stands. As per the clause 15(2) of CERC Regulation dated 23-06-2020 , depreciation rate of 4.67% per annum shall be considered for the first 15 years and the balance depreciation shall be evenly spread during the remaining useful life of the project. The Commission is therefore inclined to follow the said Regulation and allow depreciation at 4.67% per annum for the purpose of tariff determination from the 11th year onwards. As the depreciation at 4.5% was already allowed for the first ten years, with the adoption of 5% from 11th to 15th year by the Commission now, the average depreciation for the 15th year works out to 4.67% as specified by the CERC. The balance depreciation of 20% is to be spread over 10 years i.e. from 16th to 25th year @ 2% since the useful life of 25 years is considered for the wind power projects.

**v) Return on Equity:** The petitioner claimed 15.5% as per the Commission's orders in O.P.No.6 & 7 of 2009 dated 01.05.2009, while the respondent has requested to consider ROE at 14% based on the Objections during the Public hearings on 16.3.2022. However, the Commission is inclined to adopt Return on Equity at 15.5% pre-Tax as allowed by it in O.P Nos.6 and 7 of 2009.

**vi) Interest cost on Debts:** The petitioner has claimed the interest cost on debt at 11.79% for determination of tariff from 11<sup>th</sup> year. The respondent has stated that the interest cost on debt at 12% per annum was considered in the previous order dt 01.05.2009 of the Commission. Later the respondent requested to consider the interest rate of 11% per annum in its rejoinder, though it suggested the interest rate of 9.23%

initially in the counter filed. The Commission has given careful thought to the matter. For the purpose of computation of tariff, the normative interest rate of two hundred (200) basis points above the average State Bank of India Marginal Cost of Funds based Lending Rate (MCLR) (one-year tenor) prevalent during the last available six months is considered as specified in clause 14(2) (b) of CERC (Terms and Conditions for Tariff determination from RE Sources) Regulations 2020.

The monthly data of MCLR for the last available six months as on 02.08.2020 (Date of effect of revision of tariff) from State Bank of India and the average MCLR is shown in following table:

Effective Date	One year tenor MCLR Rate
10-02-2020 to 09-03-2020	7.85 %
10-03-2020 to 09-04-2020	7.75 %
10-04-2020 to 09-05-2020	7.40 %
10-05-2020 to 09-06-2020	7.25 %
10-06-2020 to 09-07-2020	7.00 %
10-07-2020 to 09-08-2020	7.00 %
<b>Avg. for last Available 6 months</b>	<b>7.23 %</b>

Based on the above, the interest rate on the loan component works out to 9.23 %. Therefore, the Commission is of the view that it is appropriate to adopt the interest rate at 9.23 % per annum on debt and the same is accordingly allowed.

**vii) Debt Equity Ratio:** The previous generic tariff order of the Commission dated May 01, 2009, (applicable for the petitioner also) states that the debt equity ratio for the purpose of determination of tariff from wind energy would be 70:30 as per the normal regulatory practice followed for infrastructure projects. Both the petitioner and the respondent are claiming the debt equity ratio of 70:30. The Commission is also of the view that a debt equity ratio of 70:30 is appropriate to consider for the purpose of determination of tariff from 11th year to 20th year.

**viii) Useful Life:** The petitioner has claimed 20 years as useful life of the plant. The respondent has requested to consider the useful life of Wind Power Plants as 30 years for the Purpose of Tariff determination from 11th year onwards. In support of its request, it has



referred to and relied upon Wind Power Plants (Weizmann, NILE, and VGEIPL) which are expected to operate for a period of 30 years or more. Further, the Respondent submitted the following details pertaining to the extension of the PPAs of Wind Power Plants beyond 20 years of operation in support of its request to consider the useful life of the projects as 30 years:

<b>Name of the wind power developer</b>	<b>PPA date</b>	<b>COD</b>	<b>Date of Expiry of PPA</b>	<b>PPA Extended upto</b>
M/s.NILE Ltd (2 MW)	20.05.2002	30.08.1995	29.08.2015	29.08.2025
M/s.Weizman Pase-I(3MW) & Phase-II (3 MW)	07.09.1995 29.10.1995	13.09.1995 18.09.1996	13.09.2015 18.09.2016	10.12.2029 10.12.2029
M/s.Weizman Phase-III(1.5 MW)	05.08.1998	26.09.1998	25.09.2018	18.08.2030
M/s.Vibrant Greentech (3 MW)	27.03.2002	31.03.1999	30.03.2019	29.03.2031
M/s.NREDCAP (2.75 MW)	15.01.2001	31.03.2001	30.03.2021	25.03.2031

From the above, it is observed that the above plants are operating beyond 20 years and the PPAs with these plants were extended up to 30 years. Further, clause 2(y) of CERC “Terms & Conditions for Tariff determination from RE Sources, Regulation 2009” dt.16.09.2009 clearly stated that the useful life of wind Energy Projects is 25 years. Hence, The Commission considers it appropriate to take the useful life of wind Power projects as 25 years in line with the above CERC regulation.

The tariff stream with the above key elements has been worked out by the Commission, for arriving at the levelised cost using discount rate at weighted average cost of capital i.e 9.17 % which works out to a fixed tariff of Rs 2.64 per unit from 11th year to 20th year. The tariff calculation sheet is enclosed as annexure-I

The above tariff has been determined in exercise of the powers conferred on the commission under Section 62, 86 (1) (a) and 86(1)(b) of the Electricity Act 2003.

**25. The above tariff determination is subject to the following terms and conditions:**

- (i) The tariff at Rs. 2.64/-per unit determined in this order shall be applicable from 11<sup>th</sup> year to 20<sup>th</sup> Year from the date of commercial operation of the project.
- (ii) The DISCOMS shall have the first right of refusal on Power Purchase if the Plant continues to operate after the 20<sup>th</sup> year of operation from the COD. The tariff beyond 20<sup>th</sup> year shall be as mutually agreed by both the parties and consented by the Commission.
- (iii) Developer shall be entitled to dispatch 100% of the available capacity without reference to the Merit Order Dispatch subject, however, to any system constraints.
- (iv) The developer shall abide by the orders, rules, regulations and terms and conditions as approved by the Commission from time to time.
- (v) The CDM benefits shall be shared in the ratio of 90:10 between the developer and the DISCOM
- (vi) The Energy injected in any financial year over and above the specified CUF of 23.50% shall be treated as inadvertent and shall not be paid.

***This order is signed by the Andhra Pradesh Electricity Regulatory Commission on this 28th day of June 2022.***

**Sd/-  
Thakur Rama Singh  
Member**

**Sd/-  
Justice C.V. Nagarjuna Reddy  
Chairman**

**Sd/-  
P. Rajagopal Reddy  
Member**

## ANNEXURE - 1

## Tariff Calculation of Wind Power Plants from 11 th year to 20th year

## Components considered for Tariff determination

Description	Value	Units
Capacity	1	MW
Capital Cost	4.7	in Rs crores
Debt( 70 %)	3.29	70%
Equity( 30% )	1.41	30%
CUF	23.5%	
O&M Cost Base (in Crores)	0.059	1.25%
O&M esc per annum	3.84%	
O & M Cost for 10th year	0.0911	in Rs crores
ROE	15.50%	
Depreciation	4.67%	per annum
Depreciation for first 10 yrs	2.115	in Rs crores
Residual Value (10% of Cost)	0.47	in Rs crores
Balance amount to be depreciable	2.115	in Rs crores
Depreciation p.a for 11-15 yrs	0.235	in Rs Crs at 5%
Depreciation p.a for 16-25 yrs	0.094	in Rs Crs at 2%
Interest on Debt	9.23%	per annum
Discount Rate	9.17%	per annum

S.No	Components	Units	Year of Operation									
			11	12	13	14	15	16	17	18	19	20
1	Gen MU	MU	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06
	Tariff Components											
2	O&M	in Rs. Crs	0.0946	0.0982	0.1020	0.1059	0.1100	0.1142	0.1186	0.1232	0.1279	0.1328
3	Depreciation	in Rs. Crs	0.2350	0.2350	0.2350	0.2350	0.2350	0.0940	0.0940	0.0940	0.0940	0.0940
4	ROE	in Rs. Crs	0.2186	0.2186	0.2186	0.2186	0.2186	0.2186	0.2186	0.2186	0.2186	0.2186
5	Outstanding Loan	in Rs. Crs	1.1750	0.9400	0.7050	0.4700	0.2350	0.0000	0.0000	0.0000	0.0000	0.0000
6	Interest on Loan	in Rs. Crs	0.0976	0.0759	0.0542	0.0325	0.0108	0.0000	0.0000	0.0000	0.0000	0.0000
7	Total (2+3+4+6)	in Rs Crs	0.6458	0.6277	0.6098	0.5920	0.5744	0.4268	0.4311	0.4357	0.4404	0.4453
8	Cost per unit (7/1*10)	in Rs Crs	3.14	3.05	2.96	2.88	2.79	2.07	2.09	2.12	2.14	2.16
9	Year		1	2	3	4	5	6	7	8	9	10
10	Present Value Factor		1.00	0.92	0.84	0.77	0.70	0.64	0.59	0.54	0.50	0.45
11	Discounted Cost (8*10)	in Rs/unit	3.14	2.79	2.49	2.21	1.96	1.34	1.24	1.14	1.06	0.98
12	Levelised Tariff for 11- 20 yrs (Rs/unit)		2.64									