



ANDHRA PRADESH ELECTRICITY REGULATORY COMMISSION

4th Floor, Singareni Bhavan, Red Hills, Hyderabad 500 004

MONDAY, THE 6TH DAY OF FEBRUARY
TWO THOUSAND AND TWENTY THREE

Present

Justice C.V.Nagarjuna Reddy, Chairman

Sri P.Rajagopal Reddy, Member

Sri T.Rama Singh, Member

IN THE MATTER OF

Determination of Tariff/Power Purchase Price from 11th year to 20th year from
COD in respect of Wind Based Power Projects in OP.Nos. 27 to 34 of 2021, 42
of 2021, 52 to 58 of 2021, 61 to 62 of 2021, 70 of 2021, 105 of 2021, 114 to 115
of 2021, 21 of 2022, 31 of 2022, 37 and 38 of 2022 and 56 of 2022

Between:

Mayura Steels Private Limited (O.P.No. 27 of 2021) and 26 others
.....

.....Petitioners

AND

Transmission Corporation of Andhra Pradesh Limited (APTRANSCO)

Southern Power Distribution Company of Andhra Pradesh Limited (APSPDCL)

..... Respondents

The present petitions have been filed under 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 or higher for the sale of wind power by the petitioners to APDISCOMs/APSPDCL from 11th to 20th year from COD (Commercial Operation Date) of their respective wind power projects in terms of the Order dated 01.05.2009 passed by the Commission in O.P.Nos.6 & 7 of 2009. As per the orders of the Commission, the Petitioners published the applications for tariff fixation in one Telugu daily newspaper and one English daily newspaper having circulation in A.P. inviting comments/objections/suggestions from stakeholders within 30 days from the date of publication. The applications for fixing the tariff were also placed on the Commission's website for the information of the public.

The above petitions have come up for final hearing before the Commission on 28.09.2022 (O.P.No. 21 of 2022), 26.10.2022 (O.P.Nos.37, 38 and 56 of 2022), 02.11.2022 (O.P.Nos.27, 28, 29, 30, 31, 32, 33, 34, 42, 52, 53, 54, 55, 56, 57, 58, 61, 62, 70, 105, 114 and 115 of 2021) and 14.12.2022 (O.P.No. 31 of 2022) in the presence of Sri A.P. Reddy and Sri Challa Gunaranjan, the learned counsel for the Petitioners and Sri P. Shiva Rao, the learned standing counsel for the Respondents. The Commission after hearing the arguments of the learned counsel for the Petitioners and the Respondents, and after carefully considering the material available on record, passes the following common order:

COMMON ORDER

The case of the Petitioners is briefly as follows:

1. The 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 of Rs.3.43/-per unit for 20 years. That, however, in view of the urgent need to harness the available potential, the Commission, thereafter, decided to fix the tariff for the first 10 years at Rs.3.50/-per unit with a direction that the tariff from the 11th to the 20th year from COD would be revisited after the expiry of the first 10 years.
2. Pursuant to the Commission's said order dated 01.05.2009, the Petitioners executed Power Purchase Agreements with the erstwhile Central Power Distribution Company of Andhra Pradesh Limited (now Southern Power Distribution Company of Andhra Pradesh Limited) for setting up wind power projects having different capacities in the present State of Andhra Pradesh.
3. Since the period of the first 10 years for which the aforementioned tariff is applicable to the Petitioners is about to lapse, they filed the instant Petitions under 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 or higher for sale of wind power by them to APDISCOMs/APSPDCL (for short, the DISCOM(s)) from 11th year onwards, in terms of the aforementioned Order dated 01.05.2009.

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

A) This Commission, after duly considering all the factors/parameters then prevailing with the wind regime in the region, had already undertaken the exercise for determination of the levelized tariff of Rs.3.43/- per unit for 20 years. If this is changed/reduced midway, it would cause uncertainty which would further discourage potential investors and most importantly make the generation financially unviable. Therefore, in order to maintain a consistent approach and to permit the Petitioners to service their debts and earn a reasonable return on their investment, the levelized tariff of Rs.3.43/- per unit already determined vide the order dated 01.05.2009 or a higher tariff for the balance period of 10 years may be approved.

B) 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 the completion of 10 years. In this regard, they 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 the 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 the completion of 10 years from CoD.

C) 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 a reduction of tariff after the end of 10 years. On the contrary, it is suggestive of either maintaining the said tariff for the next 10 years as it has already been levelized for 20 years or increasing it further to provide impetus to the generators. Thus, the intent for having a review, midway, is with the

sole aim of promoting the generation of electricity from renewable sources as per the mandate of the Act.

- D) The Petitioners, therefore, prayed the Commission to approve a generic tariff of Rs.3.43/- per unit or higher for the sale of wind power by them to the DISCOMs from the 11th 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 Petitioners also filed IAs to the O.Ps praying to the Commission for allowing a tariff of Rs. 3.43/-per unit during the pendency of the O.Ps.
6. Having regard to the respective submissions of the learned counsel for the parties, the Commission disposed of the said I.As by fixing the interim tariff at the rate of Rs.2.43 per unit payable by the DISCOMs to the Petitioners for the power received after the completion of 10 years from COD pending disposal of the O.Ps.
- 7. The Respondent APSPDCL filed counters to the petitions. The averments contained in the counter are briefly as follows:**
- A) The commission in its orders dated 01.05.2009 in O.P.No.6 & 7 of 2009 clearly stated “The tariff stream with the above key element has been worked out by the commission, for arriving at Levelized cost using the discount rate at a 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. 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 would be decided by the Commission thereafter. Therefore, the tariff was loaded more in the first 10 years and the Petitioners’ 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 the front-end tariff, the tariff for the second 10 years needs to be reduced.
- B) While determining the said tariff, the useful life of the projects was taken as 20 years to spread the returns on the capital invested. But past experience clearly shows that the life of wind projects is 25 to 30 years (as in the case of Weizmann power Ltd and Nile Company). Even the CERC in its extant regulation of wind power projects stated that the project cost has to be considered for 25 years, i.e., the useful life of the project. Therefore, for the present revision of the tariff, the Commission may consider the life of the projects as 30 years and it may also take into consideration the fact that land to an extent of 5 acres per MW (land is a scarce commodity in India) is being retained by the Petitioners after the useful life of the projects.
- C) The Petitioners agreed to a tariff of Rs.3.50/- per unit for a period of 10 years from the COD and for a review of tariff payable beyond the 10th year of operation by the Commission. Hence, they cannot unilaterally claim the tariff of Rs. 3.43/- per unit for the period from the 11th year onwards.
- D) In the present scenario where the wind power in A.P. is much more than required, and as the

cost of wind power has reduced drastically across the country, it is not advisable to determine the tariff de hors the prevailing wind power tariff in the market. If the Petitioners are not agreeable to the reduced tariff equating to the market prices, they are at liberty to sell their power in the open market and the power utilities of A.P. are ready to provide all necessary assistance in that regard to them.

- E) The claim of the Petitioners for a generic tariff of Rs 3.43 per unit or above is absolutely not tenable. Another important aspect is that in the integration of this VRE power, there is a hidden cost liability on the DISCOMs in the form of adequacy cost, balancing cost and grid integration cost as recognized by the Central Electricity Authority in their report dated 01.01.2018. As per the DISCOMs' study, the liability of the said hidden cost works out to more than Rs.2/- per kWh.
- F) It is evident from the history of this Commission in the determination of tariffs for wind power projects since 1995 when the first projects were set up in the then state of Andhra Pradesh, it had determined only a single-part tariff by adopting a generalist stance and it has never undertaken a parametric wise analysis of wind projects to determine the tariffs. The cost-plus approach was incorporated only in O.P.Nos.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 the final conclusion was arrived at as follows:

"The tariff stream with the above key element has been worked out by the commission, for arriving at levelised cost using the discount rate at a 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 of 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."

From the above tariff orders based on which the Petitioners have entered into PPAs, it is clear that the Commission has rightly kept the tariff of wind projects beyond the 10th year open for review.

- G) In similar circumstances, the then APCPDCL (now TSSPDCL) in O.P.No.14 to 18 of 2006, based on the detailed calculations, 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 purchases during 11th to 20th year of operation in respect of 5 Nos. of wind power generators that were established in 1995 and completed 10 years of operation by 2005.
- H) The Petitioners' projects were commissioned about 15 years later as compared to the Petitioners in O.P.No.14 to 18 and incorporated new technologies, as evident from the fact that the average PLFs achieved by these projects range from 19% to 24% as against 24.5%

fixed by the Commission.

- I) The Commission is requested to adopt a parametric-wise approach and determine the tariff applicable for these projects beyond the 10th year of operation based on the financial liability, assets, balance sheets, O&M costs, depreciated values, ROE and remaining interest on debts, etc.
- J) The competitive bids floated by SECI in the month of February 2017 for procurement of 1,000MW of power sourced from wind projects discovered a tariff at Rs.3.46 per unit. Further, in the Phase-II competitive bidding conducted by SECI in October 2017 for procurement of wind power, a tariff of Rs.2.64 per unit was discovered and realised. In the reverse auction held by the Gujarat Government for procurement of wind power, the tariff of Rs.2.43 per unit was realised. In April 2018, SECI successfully auctioned 2 GW ISTS-connected wind projects under tranche 3 and received the lowest tariff bid at Rs.2.44 per unit. The above tariff is far cheaper than the Rs.3.43 per unit or higher sought by the Petitioners. The tariff of Rs. 3.50 per unit determined for the first ten years gave the developers an advantage of Rs.0.07 per unit.
- K) The contention of the Petitioners that the validity of the tariff for the first 10 years is only suggestive of either maintaining the said tariff for the next 10 years or increasing it for the next ten years to provide impetus to the generator is absolutely incorrect. If the same was the view of the Commission as claimed by the Petitioners, the Commission would not have kept the review of tariff open after the 10th year and would have approved the levelized tariff for 20 years at a stretch.
- L) The DISCOMs are already burdened by the high cost of procurement of wind and solar power with the must-run status additional burden. As a result, they are 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.NOs.17, 66 and 67 of 2019 seeking reduction of tariff for the PPAs entered into between 2012 and 2017, and the same are pending disposal.

8. The Petitioners submitted the following replies in their rejoinders to the counters filed by the Respondent APSPDCL.

- A) While determining a levelized tariff, this Commission didn't consider any interest on the Working Capital, which resulted in a lower tariff computation of Rs.3.43/kWh. If the interest rate for Working Capital equivalent to the interest rate on a loan @12% had been considered, then the tariff would have gone up from Rs.3.43/kWh to Rs.3.51/kWh. Hence, it is evident that the Petitioners have not taken any unjustified advantage by the tariff of Rs.3.50/kWh approved by this Commission.
- B) The Commission has never stated in its tariff order dated 01.05.2009 for wind power projects that front-loading of tariff is being provided by it. In the said order, it is nowhere stated that the tariff for the subsequent years shall be reduced. It merely stated that the tariff for the next 10

years would be determined thereafter.

- C) The tariff rates prevailing in other states, the financial condition of the DISCOMs, rates of power purchased from other generators or other modes of electricity generation, etc., and on consideration of overload of front-end tariff, the second 10-year tariff has to be reduced and the Project life of other generators, hidden cost mechanism, have no bearing whatsoever on what is being sought by the Petitioners in the present O.Ps. That, in fact, while raising such inconsequential points, the DISCOM has also intentionally chosen not to specify the variables, factors and instances which may support higher unit rates for generators such as the Petitioners.
- D) The financial position of the DISCOMs and their inability to pay monthly power purchase bills have no relevance to the issue in the present O.Ps. It is a settled law that the financial position of the party and the pendency of petitions before the Commission and SLPs before the Hon'ble Supreme Court do not entitle them to disown the contract or the obligation to pay.
- E) It is vehemently denied that there has been any reduction of power procurement tariff across the country as alleged, and no material which is relevant to the present case was placed on record so far to substantiate the same. The rationale and examples given by the DISCOM to illustrate its logic for reducing the tariff from the 11th year to the 20th year are against the wisdom of their own previous executives, who have signed various PPAs with multiple generators since 2012, having a flat rate for the entire duration of their PPAs, i.e., 20 or 25 years as applicable.
- F) When once the levelized tariff has been determined for an assumed useful life/period of the project, then the same rate should be applied for the said life/period, instead of subjecting the wind power generators to uncertainty. In accepting this discussion and in fixing the levelized tariff for future PPAs from the date of the order dated 15.11.2012, this commission established that the same tariff as determined while calculating the levelized tariff should be applied for the entire useful life/duration of the wind energy project.
- G) 'Levelized Tariff' is a means to recover the entire cost of a project during the project's lifecycle. Any downward revision of the same will severely impact the revenues of the project and make it financially and economically unviable. Therefore, the Commission ought not to review the approach for the determination of the tariff mid-stream and adopt a parametric approach (as suggested by the DISCOM) after the completion of 10 years from the COD.
- H) The Petitioners are correct in implying in their petitions that any scope for review tariff after 10 years was kept to determine whether to keep the tariff from the 11th year onward the same at the levelized tariff or to revise it upward to keep the project still viable or to provide further incentive.
- I) The Petitioners' projects were 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 contention raised by the DISCOM

that the land would be retained by the Petitioners after the useful life of the projects is completely irrelevant.

- J) The DISCOM has grossly underestimated the O & M cost, even going by the standard prescribed by the Commission's order in OP Nos. 6 & 7 of 2009. As such, the O&M cost incurred is even more in magnitude and should be considered as per the actuals. Further, the DISCOM failed to consider other peripheral recurring costs related to the project like DSM charges, HT bill charges, DIEG charges, Insurance payments, etc. The Petitioners' calculations club all these in the O&M charges. Further, the Petitioners' calculations also include the lease for land which ought to be paid in a recurring manner every year.
- K) The DISCOM has also not taken into account sudden upcoming new capital expenditure, such as the one prescribed to the Petitioner by the DISCOM for a new kind of metering yard that it wants the Petitioner to install in the project (this point was raised in O.P.No. 42 of 2021).
- L) The loan/debt component, even if it gets paid in the first 10 years, does not mean that the capital cost pertaining to the loan will be recovered in the first 10 years which has been levelized for a period of 20 years. Even after the repayment of the entire loan, it is the usual practice of various other Regulatory Commissions to approve interest on long-term loans on a normative basis. At the time of tariff determination for the Petitioners' projects (more than 10 years ago), the entire costs of the projects were 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.
- M) The DISCOM appears to have included the residual capital cost in its calculations but either forgot or intentionally omitted the said cost for the calculation of the depreciation of that residual capital cost from the 11th year to the 20th year.
- N) The DISCOM has very randomly and conveniently changed the method and mode of calculation by changing the designated useful life of the equipment to more than 20 years.
- O) The technologies do undergo change periodically between four to five years and each time the technology changes, it is not feasible to scrap the plant to install a new plant with new technology. The Petitioners have invested in the best technology (then available) and their plants cannot be compared with the latest ones. That they should not be penalized merely because there are new technologies available today at a lower cost per kWh. These being regularized tariffs/PPAs, the same ought to be as per the facts of the present projects.
- P) The CUF details placed by the DISCOM in its counters make it evident that the Petitioners have never been provided more than the normative CUF (though for many years the CUFs have been on a lower side) reducing the Petitioners' realizations.
- Q) The Petitioners have never given any benefit including the waiver on LPS payable by the DISCOM.
- R) 'Must-Run' is a statutory right provided to Wind & Solar projects. The Petitioners have been

asked to back down their power multiple times, which has caused huge losses to them. Several petitions by other wind energy developers in this regard have also been filed before the Commission against 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 projects 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 projects. This petition has been admitted by CERC vide order dated 05.02.2021 and would be heard on merits in due course of time.

- S) The DISCOM calculated a tariff of Rs 1.91/1.95 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:

The DISCOM 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 it 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 a 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.

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 APDISOCs from all generating sources. A tabulation of the 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

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

9. Commission's Analysis:

The levelized tariffs claimed by the petitioners from the 11th to the 20th year from COD and the parameters based on which these claims are made are tabulated in Annexure-I. Similarly, the levelized tariffs proposed by APSPDCL from the 11th to the 20th year from COD and the parameters based on which these proposals are made are tabulated in Annexure-II. The main contention of the learned counsel for the petitioners is the fixation of the tariff for the first 10 years by the Commission is suggestive of either maintaining the said tariff for the next 10 years as it has already been levelized for 20 years or increasing it further to provide impetus to the generators. It is not possible to accept this contention. At the time of the determination of the levelized tariff of Rs.3.50 per unit by the Commission for the first 10 years of the operation of these projects, the technology had not matured to the level as of now. However, since then, the technology has matured by leaps and bounds leading to a significant reduction of tariff to as low as Rs.2.43 per unit. Further, at the time of determination of the above tariff, there were no notified Regulations on wind tariff either by APERC or CERC to guide the Commission. Therefore, the Commission, in the absence of Regulations and also with a view to encouraging wind power which was at that time still in a nascent stage, determined a levelized tariff of Rs.3.50 per unit for the first ten years of operation but kept open the option to review the same after ten years of operation keeping in view the future changes in the wind energy scenario. Therefore, while not accepting the submissions of the learned counsel for the petitioners, it has decided to examine various parameters for fixing the tariff from the 11th year onwards. The Commission, having perused the records and after careful examination of the various contentions made by the rival parties in the written and oral submission and their claims as indicated in Annexures I & II, analyzed the key elements that influence the determination of tariff as under.

A) **Capital Cost:** The tariff now being determined is for the existing wind power projects which

were Commissioned based on the Commission's order dated 01.05.2009 and have completed 10 years of operation. The Commission, while fixing the tariff for the initial 10 years period for these projects, thoroughly examined the prevailing capital cost at that time and arrived at a figure of Rs.4.70 Crores per MW in its order dated 01.05.2009. Therefore, the Commission is inclined to continue the said capital cost of Rs.4.70 Crores/MW (including evacuation cost) for the purpose of tariff determination during the 11th to 20th year of operation.

- B) **Debt Equity Ratio:** The previous generic tariff order of the Commission dated 01.05.2009 in O.P.Nos.6 and 7 of 2009 states that the debt: equity ratio for the purpose of determination of tariff for wind energy would be 70:30 as per the normal regulatory practice followed for infrastructure projects. Therefore, the Commission is inclined to continue the debt-equity ratio of 70:30 for the determination of tariff from the 11th year to the 20th year from COD.
- C) **Return on Equity:** The Commission adopted a pre-tax Return on Equity (ROE) of 15.5% while determining the generic tariff for the wind power projects for the first 10 years vide the order dated 01.05.2009 in O.P Nos.6 and 7 of 2009. Further, the Commission, while determining the tariff of Vaayu (India) Power Corporation from the 11th to the 20th year from COD vide order dated 28.06.2022 in O.P.No. 29 of 2020, adopted the same pre ROE rate. Therefore, the Commission is inclined to continue the same rate in respect of the projects in these petitions also.
- D) **Interest cost on Debt:** The Commission has given careful thought to the matter. In the order dated 28.06.2022 in O.P.No. 29 of 2020, the Commission while determining the tariff of the wind power project of Vaayu (India) Power Corporation from the 11th to the 20th year from COD, adopted a normative interest rate of 9.23% which is 200 base points above the average MCLR (Marginal Cost of Funds based Lending Rate) of State Bank of India (one-year tenor) prevalent during the last six months as of 02.08.2020 (date of effect of revision of tariff of the said project) in accordance with the clause 14(2) (b) of CERC (Terms and Conditions for Tariff determination from RE Sources) Regulations 2020. As the effective dates for the revision of tariffs are different for different projects in these petitions, the interest rates would vary from project to project, if the above procedure is adopted. Since the Commission is inclined to determine a common generic tariff for all the projects which have completed 10 years of operation, the normative interest rate of 9.23% determined for Vaayu (India) Power Corporation in the order dated 28.06.2022 in O.P.No. 29 of 2020 is adopted for all the projects in these petitions.
- E) **Depreciation:** As against the claims of the Petitioners as tabulated in Annexure-I, the Respondent APSPDCL requested the Commission to consider a depreciation rate of 2.25% on the basis that 45% of the initial Capital Cost of Rs.4.7 Crores/MW approved by the Commission in its order dated 01.05.2009 would be depreciated by the end of 10th year to

55% of its value and that the balance value (45%) has to be spread over the next 20 years i.e. (11th -30th year) on SLM (Straight line Method) basis. The Commission carefully examined the rival stands. As per clause 15(2) of CERC Regulation dated 23.06.2020, a 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 depreciation at 4.5% was already allowed for the first 10 years, with the adoption of 5% from the 11th to 15th year by the Commission now, the average depreciation for the first 15 years works out to 4.67% as specified by the CERC. The balance depreciation of 20% is spread over 10 years i.e., from the 16th to the 25th year @ 2% since the useful life for wind power projects is considered as 25 years.

- F) **O & M Expenditure:** The Commission examined the matter. The CERC allowed the O&M expenses at an escalation rate of 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 in line with the said CERC Regulations with an escalation of 3.84% per annum from the 11th year onwards for the purpose of tariff determination.
- G) **Interest on Working Capital (IWC):** While determining the generic tariff of the projects in these petitions for the first 10 years in the order dated 01.05.2009 in OP.Nos. 6 and 7 of 2009 and the tariff of Vaayu (India) Power Corporation from the 11th to the 20th year in the order dated 28.06.2022 in O.P.No. 29 of 2020, the Commission did not consider IWC. Therefore, in order to maintain uniformity and consistency and also considering the fact that all the projects under the above said petitions are similarly placed, the Commission is not inclined to consider the IWC for projects in respect of these petitions also.
- H) **Discount Rate:** The Commission, while determining the tariff for Vaayu (India) Power Corporation from the 11th to 20th year from COD in the order dated 28.06.2022 in O.P.No. 29 of 2020, adopted a discount rate of 9.17%. Therefore, the Commission finds it appropriate to adopt the same rate for the projects in these petitions also as they are similarly placed.
- I) **Useful Life:** The Respondent APSPDCL requested the Commission to consider the useful life of Wind Power Projects as 30 years for the purpose of Tariff determination from the 11th year onwards. In support of its request, it has referred to and relied upon Wind Power Projets (Weizmann, NILE, and VGEIPL) which are expected to operate for a period of 30 years or more. Further, APSPDCL 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.

Name of the wind power developer	PPA date	COD	Date of Expiry of PPA	PPA extended up to
NILE Ltd (2 MW)	20.05.2002	30.08.1995	29.08.2015	29.08.2025
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
Weizman Phase-III (1.5 MW)	05.08.1998	26.09.1998	25.09.2018	18.08.2030
Vibrant Greentech (3 MW)	27.03.2002	31.03.1999	30.03.2019	29.03.2031
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 continuing to operate beyond 20 years from COD 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.

- J) **Capacity Utilisation Factor (CUF):** The Petitioners stated that their CUFs never achieved the normative CUF of 24.5% specified by the Commission. The Respondent APSPDCL requested the Commission to consider a CUF of 24.5% already approved in the order dated 01.05.2009 in respect of all the Petitions. The Commission carefully examined the matter. Under clause 25(1) of (the 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 range from 50 to 80 meters and most of the sites in AP fall in the wind power density ranging from 200-250 Watts/Sq.m as per NIWE (formerly C-WET) wind density map. With hub heights in the range of 50-80 meters and wind density in the range of 200-250 Watts/Sq.m, the CUF is expected to be around 23.50%. 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 specified CUF in any financial year shall be treated as inadvertent power and shall not be paid for.
- K) The tariff stream with the above key elements has been worked out by the Commission, for arriving at a levelized tariff of Rs 2.64 per unit from the 11th year to the 20th year of operation from COD. The tariff calculation sheet is enclosed as Annexure-III. The above tariff has been

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

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

- A) The tariff at Rs. 2.64/-per unit determined in this order shall be applicable from the 11th year to the 20th year from the date of commercial operation of the projects.
- B) The DISCOMS shall have the first right of refusal on Power Purchase if the projects continue to operate after the 20th year of operation from the COD. The tariff beyond the 20th year shall be as mutually agreed by both parties and consented to by the Commission.
- C) The developers shall be entitled to dispatch 100% of the available capacity without reference to the Merit Order Dispatch subject, however, to any system constraints.
- D) The developers shall abide by the orders, rules, regulations and terms and conditions as approved by the Commission from time to time.
- E) The CDM benefits shall be shared in the ratio of 90:10 between the developers and the DISCOMs.
- F) 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 Monday of 6th February 2023.

Sd/-
Thakur Rama Singh
Member

Sd/-
Justice C.V. Nagarjuna Reddy
Chairman

Sd/-
P. Rajagopal Reddy
Member

ANNEXURE-I (Claims of the Petitioners)																												
S.No.	Tariff Parameters	OP.Nos.																										
		27/2021 *	28/2021 *	29/2021 *	30/2021 *	31/2021 *	32/2021 *	33/2021 *	34/2021 *	42/2021 **	52/2021 *	53/2021 *	54/2021 *	55/2021 *	56/2021 *	57/2021 *	58/2021 *	61/2021 *	62/2021 *	70/2021 *	105/2021 *	114/2021 *	115/2021 *	21/2022 **	31/2022 **	37/2022 **	38/2022 **	56/2022 *
1	Capital Cost (Rs.Crs/MW)	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	2.585 (Residual Capital Cost)	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	3.11 (Residual Capital Cost)	6.11	5.15	5.15	4.7
2	Debt/Equity Ratio	70/30	70/30	70/30	70/30	70/30	70/30	70/30	70/30	0/100	70/30	70/30	70/30	70/30	70/30	70/30	70/30	70/30	70/30	70/30	70/30	70/30	70/30	0/100	70/30	70/30	70/30	70/30
3	Return on Equity (%)	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	9	14	14	14	15.5
4	Interest on Debt (%)	12	12	12	12	12	12	12	12	-	12	12	12	12	12	12	12	12	12	12	12	12	12	-	10.15	9.78	9.78	12
5	Depreciation (%)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	6.66	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.18	3.1			4.5
6	O&M expenses per MW (% of Capital cost) (first year)	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	17.06 lakhs in 11th year	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%	15 lakhs in 11th year	10.81 lakhs in 11th year	17 lakhs in 11th year	17 lakhs in 11th year	1.25%
7	O&M escalation per year (%)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
8	Interest on Working Capital (%)	-	-	-	-	-	-	-	-	12.325	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.5	10.5	-
9	Discount Rate (%)	13.05	13.05	13.05	13.05	13.05	13.05	13.05	13.05	15.5	13.05	13.05	13.05	13.05	13.05	13.05	13.05	13.05	13.05	13.05	13.05	13.05	13.05	15	11.31	14	14	13.05
10	Useful Life (Years)	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	25	25	20
11	Capacity Utilization Factor (%)	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	22.41	16.65	-	-	24.5
12	Levelized Tariff (Rs/kWh)	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43 or higher (5.46)	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43 or higher	3.43 or higher (4.17)	3.50 or higher (4.14)	3.50 or higher (4.14)	3.43
* Claims based on the order dated 01.05.2009 in OP.No.s. 6 and 7 of 2009																												
** Claims based on the actuals																												

ANNEXURE-II (Proposals of APSPDCL)

Parameter	In respect of all OP.Nos. except 21, 31, 37 and 38 of 2022	In respect of OP.Nos. 21, 31, 37 and 38 of 2022
Residual Capital Cost (Rs. Crs/MW) (55% of Capital Cost of Rs.4.7/MW)	2.585	2.585
Return on Equity (%)	15.5	14
Interest on Debt (%)	9.23	11
Depreciation Rate (from 11th to 20th year)	2.25	2.25
O&M per year (Rs.lakhs/MW)	8.72 (11th year)	1.25% of Capital Cost (1st year)
O & M escalation rate per year (%)	5	5
Discount Rate (%)	13.05	11.90
Interest on Working Capital (%)	12.325	SBI base rate + 350 points
CUF (%)	24.5	24.5
Useful Life (years)	30	30
Debt: Equity ratio	70:30	70:30
Levelized Tariff (Rs/kWh)	1.91	1.95

ANNEXURE - III

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	Rs.Crores
Debt(70 %)	3.29	Rs.Crores
Equity(30%)	1.41	Rs.Crores
CUF	23.5	%
O&M Cost Base (1.25% of Capital Cost)	0.059	Rs.Crores
O&M escalation per annum	3.84	%
O & M Cost for the 10th year	0.0911	Rs.Crores
ROE	15.5	%
Depreciation per annum	4.67	%
Depreciation for the first 10 yrs	2.115	Rs.Crores
Residual Value (10% of Cost)	0.47	Rs.Crores
Balance depreciable amount	2.115	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	%
Discount Rate	9.17	%

S.No	Components	Units	Year of Operation									
			11	12	13	14	15	16	17	18	19	20
1	Generation	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	Rs.Crores	0.0946	0.0982	0.1020	0.1059	0.1100	0.1142	0.1186	0.1232	0.1279	0.1328
3	Depreciation	Rs.Crores	0.2350	0.2350	0.2350	0.2350	0.2350	0.0940	0.0940	0.0940	0.0940	0.0940
4	ROE	Rs.Crores	0.2186	0.2186	0.2186	0.2186	0.2186	0.2186	0.2186	0.2186	0.2186	0.2186
5	Outstanding Loan	Rs.Crores	1.1750	0.9400	0.7050	0.4700	0.2350	0.0000	0.0000	0.0000	0.0000	0.0000
6	Interest on Loan	Rs.Crores	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)	Rs.Crores	0.6458	0.6277	0.6098	0.5920	0.5744	0.4268	0.4311	0.4357	0.4404	0.4453
8	Cost per kWh (7/1*10)	Rs.Crores	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)	Rs/kWh	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/kWh)		2.64									