



TELANGANA STATE ELECTRICITY REGULATORY COMMISSION
5th Floor, Singareni Bhavan, Red Hills, Hyderabad-500 004

Order for Determination of Generic Tariff for Wind Power Plants

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TELANGANA STATE ELECTRICITY REGULATORY COMMISSION
5th Floor, Singareni Bhavan, Red Hills, Hyderabad-500 004

DATED 6th October, 2018

Present
Sri. Ismail Ali Khan, Chairman

In the matter of

In the matter of determination of levelized generic tariff for Wind Power Projects in the State of Telangana for the control period 2018-2020 (i.e. FY 2018-19 and FY 2019-20).

In exercise of the powers conferred under Sections 62, 86 (1) (a), (b) and (e) of the Electricity Act, 2003, (Act 36 of 2003), read with the Tariff Policy and Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2017, dated 17.04.2017 (hereinafter referred to as CERC Regulations 2017) the Commission hereby determines the levelized generic tariff for Wind Power Plants (WPP) in the State of Telangana.

1. Introduction

- 1.1. Telangana State Electricity Regulatory Commission (herein referred to as TSERC or Commission) was constituted by the Government of Telangana (GoTS) in terms of the provisions of Schedule XII (C) (3) of the A.P. Reorganisation Act, 2014 (Central Act, 6 of 2014), read with Section 82 of the Electricity Act, 2003 (Act, 2003) vide G. O. Ms. No.3, (Energy) (Budget) Department dated 26.07.2014.
- 1.2. The Commission has received several representations from stakeholders to determine generic tariff for wind energy produced in the state for the period beyond 31-3-2015 in view of the validity of generic tariff determined earlier being valid only up to 31-3-2015 as passed by erstwhile Andhra Pradesh Electricity Regulatory Commission (APERC) and adopted by TSERC.

- 1.3. The Commission has decided to issue a Generic Tariff Order for the control period 2018-2020.
- 1.4. Though all the latest guidelines including those notified by the Ministry of New and Renewable Energy (MNRE), National Tariff Policy, 2016, Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2017, dated 17.04.2017, all of which prescribe competitive bidding route for wind power projects. For the projects sanctioned before the notification of the bidding guidelines, the Commission is of the view that a feed in tariff that reflecting the prevailing market price is necessary for the State. Thus, to honour the projects approved by several government agencies in the erstwhile combined A.P. state and later continued by the Telangana State and in exercise of the powers conferred on it to determine tariff u/s 62 of the Act, 2003, the Commission initiated the present proceedings to issue this generic tariff order.
- 1.5. Further, the Commission has also considered the following petitions filed before the Commission in view of the directions of Honourable High Court for State of Telangana and the State of Andhra Pradesh.
- 1.6 O. P. No. 4 of 2018 has been filed by M/s. Clean Wind (Anantapur) Pvt Ltd. seeking determination of tariff for its wind project of the capacity of 31.5 MW. As the said petition was not being considered by the Commission, it approached the Hon'ble High Court for a direction for early disposal of the petition. Thereafter, the Hon'ble High Court directed the Commission to dispose of the petition expeditiously within the statutory period after filing the petition. In pursuance of the direction of the Hon'ble High Court for the State of Telangana and the State of Andhra Pradesh to pass appropriate orders as per law on the said petition regarding determination of tariff for the WPP. In order to comply with the directions of the Hon'ble High Court, the present generic exercise is undertaken by the Commission.
- 1.7 O. P. No.2 of 2018 of M/s. RSR Power Private Limited and O. P. No. 3 of 2018 of M/s. Siemens Gamesa Renewable Power Private Limited for a capacity of 20 MW each power plant.

- 1.8 The Commission had also on its file several other petitions filed by wind power developers associations and wind turbines manufacturers in the year 2015, wherein relief has been sought in respect of the tariff for wind projects, evacuation facilities and other parameters associated with wind tariff. In order to consider all those issues also, the present proceeding is initiated.
- 1.9 The determination of the tariff is being undertaken in the case of projects which are sanctioned by the state nodal agency and not commissioned up to this date, which are likely to be commissioned during the above stated control period.
- 1.10 The Commission thus decides to proceed to issue Generic Tariff Order applicable for wind power plants (WPP) in the State of Telangana. Accordingly, the discussion paper with parameters for determination of tariffs have been hosted in the website and with public notice for Public Hearing on 20th July 2018 wherein written comments, views and suggestions have been invited from the stakeholders.
- 1.11 The Commission received written submissions from various stakeholders as shown in the Annexure-I. The Commission also held a public hearing on 14.08.2018 at TSERC office, during which oral submissions were made by the stakeholders shown in Annexure-II. The Commission has considered all the written and oral submissions received in the matter.

2. Need for Feed-in tariff and legal framework:

2.1. The relevant provisions of the Act, 2003 are as below:

“Section 61: The Appropriate Commission shall, subject to the provisions of this Act, specify the terms and conditions for the determination of tariff, and in doing so, shall be guided by the following, namely: -

.....

(h) The promotion of cogeneration and generation of electricity from renewable sources of energy;

(i) The National Electricity Policy and tariff policy;

Section 62 (1): The Appropriate Commission shall determine the tariff in accordance with the provisions of this Act for –

(a) Supply of electricity by a generating company to a distribution licensee:

Section 62 (2): The Appropriate Commission may require a licensee or a generating company to furnish separate details, as may be specified in respect of generation, transmission and distribution for determination of tariff.

Section 62 (5): The Commission may require a licensee or a generating company to comply with such procedure as may be specified for calculating the expected revenues from the tariff and charges which he or it is permitted to recover.

Section 63: Notwithstanding anything contained in section 62, the Appropriate Commission shall adopt the tariff if such tariff has been determined through transparent process of bidding in accordance with the guidelines issued by the Central Government.

Section 86 (1) (e): The State Commission shall promote cogeneration and generation of electricity from renewable sources of energy by providing suitable measures for connectivity with the grid and sale of electricity to any person, and also specify, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution licensee;”

2.2. The relevant provisions of National Electricity Policy 2005 are as below:

“Section 5.2.20 Feasible potential of non-conventional energy resources, mainly small hydro, wind and bio-mass would also need to be exploited fully to create additional power generation capacity. With a view to increase the overall share of non-conventional energy sources in the electricity mix, efforts will be made to encourage private sector participation through suitable promotional measures.”

2.3. The relevant provisions of Tariff Policy, 2016 are as below:

Para 6.4 (2) States shall endeavour to procure power from renewable energy sources through competitive bidding to keep the tariff low, except from the waste to energy plants. Procurement of power by Distribution Licensee from renewable energy sources from projects above the notified capacity shall be done through competitive bidding process, from the date to be notified by the Central Government.

However, till such notification, any such procurement of power from renewable energy sources projects may be done under Section 62 of the Electricity Act, 2003.”

The spirit of the Act, 2003 is to promote competition in the power sector. With a view to maintain competitive tariff, the Tariff Policy 2016 has recommended to procure power from renewable energy sources, except waste to energy plants, through competitive bidding and the distribution licensee shall procure power from renewable energy sources above the notified capacity, through competitive bidding process, from the date to be notified by the Central Government.

- 2.4. Government of India (GoI) has issued guidelines for tariff based competitive bidding process for procurement of power from wind power projects vide resolution No. 23 / 54 / 2017 – R & R dated 08.12.2017. The MNRE competitive bidding guidelines vide a communication dated 12.01.2018, has clarified that the States / UTs can consider procuring power from solar and wind projects of less than the defined threshold prescribed (25 MW for wind, 5 MW for solar) competitive bidding guidelines through feed-in tariff to be determined by concerned State Electricity Regulatory Commissions (SERCs).

Sections 62 and 63 of the Act 2003 lay down the provisions for the distribution licensees to procure power with the tariff being determined or approved by the Commission and the State Commission is bestowed with statutory powers to determine tariff. The policies and notifications of government serve as guidelines.

- 2.5. Though bidding guidelines have been issued, the Commission is of the view that a feed-in tariff that reflects the prevailing market trend is necessary for the State for the projects already approved by the state nodal agency. Considering the powers conferred on it to determine tariff u/s 62 of the Act 2003, the Commission hereby issues the following order.

3. **Objections:**

3.1. Public notice, Public Hearing, comments / suggestions received and Commission analysis:

3.1.1 As shown in Annexure-I written comments / suggestions were received from the following entities / individuals / stakeholders:

3.1.2 Indian Wind Energy Association (InWEA), Indian Wind Turbine Manufacturers Association (IWTMA), Mytrah Energy (India) Private Limited (Mytrah), Chief Engineer (Commercial), TSPCC, Sri M. Venugopala Rao.

An analysis of the same is done by the Commission and the same is discussed in detail hereunder.

3.2. Capital Cost

Comments / suggestions

3.2.1 InWEA and Mytrah suggested the capital cost per MW to be at Rs.600 lakhs, Rs.700 lakhs respectively as against Rs. 575 lakhs proposed by the Commission.

3.2.2 InWEA mainly focussed on additional costs due to connectivity regulations of CEA, 2013 while Mytrah referred to capital costs of small projects, increase in land costs, transmission costs, etc.

Commission's view

3.2.3 The capital cost is arrived at after taking into consideration all aspects, prevailing market conditions, competitive bidding trends and costs as adopted by many other neighbouring SERCs. TNERC has approved project cost of Rs. 5.25 crores per MW (on 13.04.2018). The proposed capital cost of Rs.5.75 crores per MW allowing additional amount of Rs. 50 lakhs per MW by this Commission is also on par with Karnataka ERC which has also approved Rs.5.75 crores per MW on 16.05.2018. The additional amount of Rs. 50 lakhs per MW proposed by the Commission is to encourage the wind generation plants. The wind profile in the State of Telangana is similar to the potential available in parts of Karnataka State and hence the capital cost considered by the Commission is on the same terms as that of Karnataka.

3.3. Capacity Utilization Factor (CUF):

Comments / suggestions

3.3.1 Mytrah has stated that most of the high potential wind sites have already been exhausted and small Wind Turbine Generators (WTGs) are not available for a hub height of more than 80 Meters.

3.3.2 InWEA has stated that the annual mean wind power density for the State of Telangana ranges between 221 - 275 W / m². As per CERC Regulation, 2017, the annual mean wind power density range of 221 - 275 W / m² the CUF is considered to be 24%.

Commission's View

3.3.3 As per National Institute of Wind Energy (NIWE), Chennai, at a mast height of 100 metres, in majority wind potential areas of State of Telangana, the lowest CUF was 24% including that of Medak where the same was specified at a low mast height of only 80 metres and WPD of 230.6.

3.3.4 At a mast height of 120 metres, as per the latest / future technological developments and considering the above data of NIWE, Chennai, as furnished by one of the objectors for their Telangana project, 27.5% CUF is achievable and the Commission considers the same for determination of tariff.

3.4. O & M cost:

Comments / suggestions

3.4.1 Mytrah has stated that the O & M expenses may vary with the type and location of the plant besides its vintage. InWEA has stated that O & M costs are in the range of Rs. 9.53 lakhs to Rs.10 lakhs per MW.

Commission's View

3.4.2 The O & M expenses at the rate of Rs.6 lakhs per MW have been considered as per the latest market trend which is also marginally higher than TNERC approved rates. Even CERC has not stipulated any norms as per their order dated 28.03.2018. It only mentions that in case of project specific tariff determination it would consider O & M Expenses based on prevailing market information. Though KERC has

given Rs.10 lakhs per MW, it applies only to wind power plants below the capacity of 25 MW. The Commission considering the market conditions in respect of wind generation and this order being passed for generic tariff considers it appropriate to adopt state specific policy in so far as the applicable capacity is concerned. It is not restricted to 25 MW as is provided in the bidding guidelines as this order is in respect of those projects, which are approved plants prior to notification of bidding guidelines.

3.5. Interest on term loans

Comments / suggestions

3.5.1 InWEA has stated that based on one year SBI MCLR rate for last 6 months, the interest rate works out to 10.25% and therefore it requested for increasing the interest rate on term loan to 10.50%.

3.5.2 Mytrah presuming that the tariff order will be applicable only for small wind energy generators (WEGs) has requested for considering 12% per annum as the interest rate for long term debt and 13% for working capital.

3.5.3 IWTMA has stated that in line with the CERC Regulations, the SBI MCLR prevalent during last six months is 8.20% and thus would like to propose an interest rate of 10.20% per annum on term loans.

Commission's view

3.5.4 The Commission noticed that the latest CERC guidelines as adopted by the neighbouring SERCs that is normative interest rate of 200 basis points and 300 basis points above average SBI MCLR (one year period) prevalent during the last available six months respectively for term loan and working capital loans for the determination of tariff may be appropriate.

3.5.5 However as per the average of last six months that is 01.04.2018 to 01.09.2018 applicable as on the date of this order, the same would be 10.25% as stated by IWTMA, which is more than 10.15% per annum that was proposed earlier, in view of change of averages due to shifting of starting month of 6 months period from Jan'18 to April'18.

3.5.6 Considering the submissions of the stakeholders and also based on the analysis of the data, Commission decides to adopt a figure of 10.25% per annum for this purpose.

3.6. Interest on Working Capital:

Comments / suggestions

3.6.1 InWEA has stated that based on one year SBI MCLR rate for last 6 months, the interest rate works out to 11.25% and therefore it requested for increasing the interest rate on term loan to 11.50%.

3.6.2 Mytrah presuming that the tariff order will be applicable only for small (WEGs) has requested for considering 12% per annum as the interest rate for long term debt and 13% for working capital.

Commission's view

3.6.3 The Commission reiterates similar reasoning as has been stated by it in respect of interest on term loans, and accordingly, the interest on working capital is adopted as 11.25% per annum.

3.7. Rate of Depreciation:

Comments/suggestions

3.7.1 IWTMA has stated that the proposed rate of depreciation till repayment of the loan period is 5.28%, whereas, the period of the loan being 13 years, the depreciation being allowed during the initial period of the loan repayment is 70%. However, the proposed rate of depreciation at 5.28% is not appropriate and does not cover the loan repayment in 13 years. It is the case of IWTMA that the rate of depreciation till loan repayment period should be 5.38% and thereafter in the remaining period of plants useful life the depreciation rate should be 1.67%.

Commission's View

3.7.2 Clause 15 of the CERC Regulations, 2017 has provided for computation of depreciation in the following manner:

“(1) The value base for the purpose of depreciation shall be the Capital Cost of the asset admitted by the Commission. The Salvage value of the asset shall be considered as 10% and depreciation shall be allowed up to maximum of 90% of the Capital Cost of the asset.”

(2) Depreciation rate of 5.28% per annum for first 13 years and remaining depreciation to be spread during remaining useful life of the RE projects considering the salvage value of the project as 10% of project cost shall be considered.

(3) Depreciation shall be chargeable from the first year of commercial operation.

Provided that in case of commercial operation of the asset for part of the year depreciation shall be charged on pro rata basis.”

3.7.3 Accordingly, the Commission considers that 68.64% of the capital cost is prudent for depreciation during the loan period of 13 years and the balance of 21.36% is factored as depreciation in the remaining 12 years @1.78% per year considering a useful life of 25 years for wind power plants as per CERC Regulations, 2017.

3.7.4 Thus the depreciation rate of 5.28% is adopted for the purpose of the tariff determination in this order.

3.8. Return on Equity (RoE):

Comments/suggestions

3.8.1 IWTMA has stated that the RoE proposed in the discussion paper of the Commission is 17.56%. However, IWTMA stated that as per CERC Regulations, 2017, the RoE is stipulated as follows:

“16. Return on Equity

(1) The value base for the equity shall be 30% of the capital cost or actual equity (in case of project specific tariff determination) as determined under Regulation 13.

(2) The normative Return on Equity shall be 14%, to be grossed up by prevailing Minimum Alternate Tax (MAT) as on 1st April of previous year for the entire useful life of the project.”

Hence, the IWTMA suggests that in line with the CERC Regulations, 2017 the RoE may be fixed at 17.80%.

Commission’s View

3.8.2 The RoE as proposed at 17.56% is based on grossing up average MAT rates as on 01.04.2017 on normative rate of return on equity of 14% detailed as under.

Note: MAT rates, as on 01.04.2017, for companies having profit less than Rs.1 Cr, between Rs.1 Cr & 10 Cr and above Rs.10 Cr are 19.055%, 20.389% and 21.342% respectively, resulting in an average MAT rate of 20.26%. Accordingly, the RoE is arrived at 17.56%.

3.8.3 Similarly the MAT rates, as on 01.04.2018, for companies having profit less than Rs.1 Cr, between Rs.1 Cr & 10 Cr and above Rs.10 Cr is 19.24%, 20.59% and 21.55% respectively resulting in an average MAT rate of 20.46%. Thus normative rate of return on equity of 14% when grossed up by average MAT rate of 20.46% being the prevailing MAT rate (as on 01.04.2017) would result in a ROE of 17.60%. Accordingly, the Commission is adopted RoE of 17.60%.

3.9. Other comments / Objections which are general in nature:

3.9.1 While the Commission has considered the specific comments and suggestions as discussed herein above at clauses 3.1 to 3.8 in respect of tariff and calculations proposed by the Commission, comments and objections submitted by the CE (TSPCC) and Sri. M. Venugopala Rao are general in nature on the issue of generic tariff order per se and they are briefly discussed as under:

CE (TSPCC) submissions

3.9.2 The representative of the TSDISCOMs stated that as per the approved projections in the retail supply tariff Order for FY 2018-19, they would be meeting the non-solar RPPO purchases with 1.01% as against the specified 0.67% in the regulation. Therefore, they are under no obligation to procure power from wind power projects with generic tariff under Section 62 of the Act, 2003. Besides, the National Tariff Policy, 2016 mandates the procurement of power from renewable sources except waste to energy projects on in competitive bidding route alone.

3.9.3 They are not inclined to submit views and comments on the financial or operational parameters proposed in the discussion paper in view of the competitive bidding process mandated by National Tariff Policy 2016 and bidding guidelines issued by Ministry of Power (MoP).

3.9.4 The Commission may decide and notify the guidelines for procurement of power from wind projects under competitive bidding process.

Sri M.Venugopala Rao:

3.9.5 The purpose as well as process for determining generic tariffs by respective ERCs for purchase of non-conventional energy including from wind power projects, by the DISCOMs, is redundant and its continuation is unwarranted in view of availability of lower tariffs through transparent competitive bidding process and in the best interests of the consumers.

Commission's View:

3.9.6 The Commission is of the view that passing of this tariff order is keeping in view the need for the same as explained elsewhere in this order.

4. Applicability of this Order

4.1. This order shall come into force from the date of its issuance and notification on the website of the Commission.

4.2. The control period in respect of determination made in this order shall be from the date of its issuance and is valid up to 31.03.2020.

4.3. This order is applicable for wind projects Commissioned during the control period 2018-19 to 2019-20 which includes the generators, who have obtained approval or permission for establishment of wind generating units from the government or its agencies earlier to the competitive bidding guidelines for wind projects and are likely to commission the projects during the above said control period including the petitioners, who have filed petitions seeking determination of tariff for such wind projects and that apart to honour the directions of Hon'ble High Court for State of Telangana and the State of Andhra Pradesh.

4.4. The above tariff shall also be applicable to all such new wind power projects, which are commissioned during the control period of this order.

4.5. The period of the PPA shall be the plant life of the wind power projects that is twenty-five (25) years.

5. Determination of Tariff:

5.1. The Commission in this order is determining the tariff for wind based power projects under section 62 read with section 86 (1) (e) of the Act, 2003. Its

applicability has already been stated above. This determination is with reference to the projects likely to be commissioned during the control period in the State of Telangana.

- 5.2. The CERC Regulations, 2017 has not fixed any generic tariff for wind and solar power generation for the reason that determining generic tariff based on norms may not provide the right price signals in order to encourage investment. However, the CERC has specified financial and operational norms that would serve as norms for determination of specific tariff.
- 5.3. The Commission thought it fit and appropriate to follow the CERC financial and operational norms to the extent applicable to the State of Telangana, whilst, keeping in view the current market trends as well as benchmarking considered in the recent orders of the other ERCs that have issued generic tariff orders for WPPs.
- 5.4. Keeping in view the principles, the various parameters adopted in this tariff order for determination of the generic tariff are elaborated herein below :

5.5. Tariff Structure

The following fixed cost components as stipulated in the CERC Regulations, 2017 for single part tariff:

- (a) Return on equity;
- (b) Interest on loan capital;
- (c) Depreciation;
- (d) Interest on working capital;
- (e) Operation and maintenance expenses;

5.6. LEVELLISED TARIFF

The Levellised tariff is calculated by carrying out levellisation for “useful life” of the wind power plant considering the discount factor for time value of money. The norms considered for computation of tariff are as below.

5.7. USEFUL LIFE

The useful life in relation to a wind power project shall be in accordance with Clause 2 (1) (cc) of CERC Regulations, 2017.

“The “useful life” shall be 25 years in relation to a unit of a generating station (including evacuation system) from the date of commercial operation (COD) of such generation facility.”

5.8. CAPITAL COST:

- 5.8.1 The Commission considered the various submissions and has taken into consideration the findings of other ERCs while deciding the capital cost to be applicable to the State of Telangana.
- 5.8.2 The orders passed by SERCs of Tamil Nadu and Karnataka are discussed in the subsequent paragraphs.
- 5.8.3 The Tamil Nadu Electricity Regulatory Commission (TNERC) in its order on generic tariff for wind power and related issues dated 13.04.2018 has considered a capital cost of Rs.5.25 Crs. / MW. TNERC while arriving at the above cost in its order stated as follows:

“Capital cost

The cost of wind turbines have considerably reduced over the years from 2010. One of the reasons widely reported for lower tariffs of Rs.3.46 per unit and Rs.2.64 per unit in the auctions conducted by SECI is the significant reduction in the price of wind turbines with advanced technologies and discounts offered by the wind turbine manufacturers. The cost of wind turbine with tall wind towers and advanced technology have reportedly come down by 20% in terms of cost per MW. Stakeholders have requested to adopt capital costs ranging from Rs.5 crores to Rs.7.5 crores and have requested to factor in land costs, evacuation, operation and maintenance costs, forecasting of wind power etc.

Commission adopted a capital cost of Rs.6.2 crores per MW in the wind tariff order of 2016. With the cost of the wind turbine that makes for 70% or more for a wind power project added with other costs for installation, and considering the reduced prices of machinery, a capital cost of Rs.5.25 crores per MW is adopted. It is up to the developer to identify land, factor in various parameters that influence the performance of the plant. Based on the recommendation of MNRE, Commission in its tariff orders No.1 of 2009, order No.6 of 2012 and

order No.3 of 2016, considered 85% of the capital cost as attributable to machinery cost, 10% for civil works and 5% for land cost. Commission decides to adopt the same percentage in this order also.”

5.8.4 The Karnataka Electricity Regulatory Commission (KERC) in its order on tariff for wind power dated 16.05.2018 has considered a capital cost of Rs.5.75 Crs / MW. Para 7.1.c. of the KERC’s order stated as follows:

“The Commission, while agreeing with the views of the TNERC, notes that, the introduction of competitive bidding for procurement of power from wind projects has had the positive effect of reduction in capital costs and higher productivity through better machine efficiency and increase in hub-height across the sector. Even though the capital costs as per the DPR, which are generally higher than the actuals, are above Rs.6.00Crs./MW, the Commission considers that with prudent procurement of WTG and other accessories, it would be possible to commission a wind power project at a capital cost of Rs.5.75 Crs / MW. Thus, the Commission considers it reasonable to adopt a capital cost of Rs.5.75 Crs. / MW, including the cost of evacuation.”

5.8.5 It has been noticed by the Commission that the price discovered in the competitive bidding including the one conducted by Solar Energy Corporation of India (SECI) has shown a downward trend. It cannot be certainly said that such tariff may be able to sustain the wind power projects throughout the useful life of the plant.

5.8.6 Thus, considering the factors set out in the aforesaid orders of SERCs of Tamil Nadu and Karnataka and the current trends observed in the market in respect of tariff, the Commission considers it reasonable to adopt a capital cost of Rs.5.75 Crs / MW, including the cost of evacuation and implementation of connectivity standards of CEA.

5.9 DEBT-EQUITY RATIO:

The clause 13 (1) of the CERC Regulations, 2017 provides that the debt-equity ratio will be at 70:30, which is to be considered for determination of generic tariff. Accordingly, the debt and equity components of the normative capital cost for determination of tariff is as follows in Table - 1:

TABLE - 1

	Rs. Crs per MW
Capital Cost	5.75
Debt (70%)	4.03
Equity (30%)	1.72

5.10 RETURN ON EQUITY (RoE)

5.10.1 The clause 16 (2) of the CERC Regulations, 2017 as extracted elsewhere in this order , stipulates that the normative RoE shall be 14 %, to be grossed up by prevailing MAT as on 1st April of previous year for the entire useful life of the project.

5.10.2 Accordingly, the RoE is allowed at the rate of 17.60% after grossing up of prevailing MAT rate of 20.46% (Avg. MAT rate as on 01.04.2018).

Note: Average of MAT rate, as on 1st April 2018, for companies having profit less than Rs. 1 Cr, between Rs. 1 Cr and 10 Cr and

above Rs.10 Cr is.19.24%,20.59% and 21.55% respectively resulting in an average rate of 20.46%.

5.11 CAPACITY UTILISATION FACTOR (CUF):

5.11.1 The clause 26 of CERC Regulations, 2017 lays down the following norms for measurements at 100 meters hub height as indicated in Table - 2.

TABLE - 2

Annual Mean Wind Power Density (W/m ²)	CUF
Upto 220	22%
221-275	24%
276-330	28%
331-440	33%
> 440	35%

5.11.2 The TNERC in its order dated 13.04.2018 has considered a CUF of 29.15% due to technology advancement whereby the present machines are capable of high generation at low speeds of wind.

The KERC in its order dated 16.05.2018 has considered a CUF of 29% due to technology advancement whereby the present machines are capable of high generation at low speeds of wind.

5.11.3 The following table elucidates the wind speed potential in State of Telangana based on which the CUF as per CERC Regulations, 2017 is arrived at Table - 3.

TABLE - 3

<i>(Data Source: NIWE, Chennai)</i>				Expected CUF (%) as per CERC Norms
Sl No	District	Mast Height	WPD at Mast Height	
1	Nalgonda	100	268.65	24%
2	Rangareddy	100	239.11	24%
3	Nizamabad	100	233.26	24%
4	Medak	80	230.60	24%
5	Warangal	100	208.39	22%

The Commission notes that as per CERC Regulations, the CUF for the wind power projects in the State shall be 22% to 24%.

5.11.4 M/s. Clean Wind (Ananthpur) Private Limited has filed O. P. No. 4 of 2018 before this Commission, seeking determination of the tariff for its wind project and proposed the CUF of 27.45%.

5.11.5 The Commission after taking into consideration the submissions of the stakeholders and having analysed the data with reference to CERC Regulations, 2017, keeping in mind the advancements in technology, findings in orders of other ERCs, hereby determines the CUF of 27.5% to be applicable in the state of Telangana.

5.12 INTEREST ON LOAN

5.12.1 The clause 14(1) of the CERC Regulations, 2017 provides that the loan period of 13 years is to be considered for determination of tariff for RE projects.

5.12.2 The clause 14 (2) of the CERC Regulations, 2017 provides for computation of interest on loan as under:

- a) "The loan arrived at in the manner indicated in Regulation 13 shall be considered as gross normative loan of calculation for interest on

loan. The normative loan outstanding as on April 1st of every year shall be worked out by deducting the cumulative repayment up to March 31st of previous year from the gross normative loan.

- b) For the purpose of computation of tariff, normative interest rate of two hundred (200) basis points above the average State Bank of India MCLR (Marginal Cost Lending Rate - one-year tenor) prevalent during the last available six months shall be considered.
- c) Notwithstanding any moratorium period availed by the generating company, the repayment of loan shall be considered from the first year of commercial operation of the project and shall be equal to the annual depreciation allowed.”

5.12.3 The monthly data of MCLR for the last available six months from State Bank of India and the average MCLR is shown below in Table – 4.

TABLE - 4

beginning of the Month	1 Year Tenor MCLR Rates
April-18	8.15
May-18	8.15
June-18	8.25
July-18	8.25
Aug-18	8.25
Sep-18	8.45
Average Rate	8.25

Considering the average MCLR and in accordance with Regulation, interest rate for loan component is determined as 10.25% per annum.

5.13 INTEREST ON WORKING CAPITAL:

5.13.1 As per clause 17 of CERC Regulations, 2017 working capital requirements shall be as follows:

“The Working Capital requirement in respect of Wind energy projects, Small Hydro Power, Solar PV and Solar thermal power projects shall be computed in accordance with the following:

- a) Operation & Maintenance expenses for one month;
- b) Receivables equivalent to 2 (Two) months of energy charges for sale of electricity calculated on the normative Capacity Utilisation Factor (CUF);

c) Maintenance spare at 15% of operation and maintenance expenses.”

5.13.2 The Commission has considered the data placed before it and thus it is felt appropriate that the receivables equivalent to two months of energy charges, operation and maintenance expenses required for one month and 15% of expenses towards maintenance of spares under operation and maintenance of the project are required to be allowed. Based on the above requirement, the working capital rate of interest has been computed as an average of State Bank of India MCLR (one year period) prevalent during the last six months along with 300 basis points has been arrived at 11.25% per annum.

5.14 OPERATION AND MAINTENANCE (O&M) EXPENSES:

5.14.1 The clause 19 (3) of CERC Regulations, 2017 provides as follows:

“Normative O & M expenses allowed during first year of the Control Period (i.e. FY 2017-18) under these Regulations shall be escalated at the rate of 5.72% per annum over the Tariff Period.”

The CERC Regulation however does not specify the normative O&M Expenses for wind power projects. Thereby, the Commission decided to consider the prevalent market rates for O & M expenditure.

5.14.2 The TNERC in its order dated 13.04.2018 has adopted the principle for computing O & M expenditure as 1.1% on 85% of the capital investment and 0.22% on 15% of the capital investment and escalation factor of 5% from second year onwards. This works out to Rs.5.08 Lakhs / MW.

5.14.3 The KERC in its order dated 16.05.2018 has adopted O & M expenses at Rs.10 Lakhs / MW with escalation of 5.72% per annum.

5.14.4 The Commission has examined the submissions of the stakeholders and the orders passed by the other ERCs including the CERC Regulations, 2017. It is observed that with the advancement of technology and higher unit size of wind turbines, higher generation is made possible at a given location, it has resulted in the tariff being discovered at lower rates in the recent trends of tariff bidding. The State of Telangana is an emerging state for wind power generation investment and setting up of plants.

Therefore, considering all the above factors, the Commission decides to adopt the O & M expenses at Rs.6 lakhs / MW with escalation of 5.72% per annum.

5.15 DISCOUNT RATE:

5.15.1 As per clause 10(2) of CERC Regulations, 2017 the discount factor has been provided and it shall be equal to the post tax weighted average cost of capital based on normative debt: equity ratio (70:30).

5.15.2 The Commission considers the normative debt equity ratio and weighted average of the post-tax rates for debt and equity component based on the calculation of discount factor as below:

- a) Interest rate to be considered for loan component is 10.25%.
- b) The RoE is considered at post tax rate of 14%.
- c) Income tax rate of 29.12% that is 25% of income tax and 12% surcharge along with 4% education cess is taken into account.

However, this is not a static situation on tax front, therefore, the actuals have to be factored while arriving at this component.

5.15.3 Based on the above figures the Commission has derived discount rate under this method as $9.29\% [(10.25\% \times 0.70 \times (1 - 29.12\%))] + [(14.0\% \times 0.30)]$

6. **SUMMARY OF TARIFF COMPONENTS:**

The Commission has considered all the parameters and submissions brought before it with reference to its discussion paper and it is of the view that the submissions made in respect of certain issues do not satisfy the normative conditions nor can they be factored while determining the tariff. Therefore, the Commission has arrived at the tariff based on the normatives that are taken into consideration and discussed thoroughly in this order. Based on the discussion, the final tariff is arrived at, which is applicable in the State of Telangana for wind generation projects for the period FY 2018-2020 (FY 2018-19 and 2019-20) in terms of the applicability stated at clause 4 of this

order. Normatives parameter adopted for determination of tariff are given at Table – 5.

TABLE - 5

Tariff Component		
Capital Cost - Rs. Crs/MW		5.75
CUF		27.50%
O&M expenses/ MW		Rs. 6.00 Lakhs
Escalation on O&M		5.72%
Debt-Equity Ratio		70:30
Useful Life		25 Years
Return on Equity (pre-tax)		17.60%
Loan Tenure		13 Years
Interest on Loan		10.25%
Depreciation		5.28% for first 13 years; with remaining depreciation spread equally over the balance years of the useful life
Working Components	Capital	1-month O&M and 2 months receivables and maintenance spares @ 15% of O&M expenses
Interest on Working Capital		11.25%
Discount Factor		9.29%
Levelling (Rs./Unit)	Tariff	3.61

This order is corrected and signed on this 06th day of October, 2018.

Sd/-
(ISMAIL ALI KHAN)
CHAIRMAN

// CERTIFIED COPY //

Annexure-I

List of Entities/Individuals who have submitted suggestions / comments

1. Indian Wind Energy Association(InWEA)
2nd Floor, All India Federation of the Deaf (AIFD), Building,
12-13, Special Institutional Area, Shaheed Jeet Singh Marg,
New Delhi-110 067,
2. Indian Wind Turbine Manufacturers Association (IWTMA) Transit House: C-1,
2nd Floor, Soami Nagar, New Delhi - 110 017.
3. Mytrah Energy (India) Private Limited,
8001, Survey No.109, Q-City, Nanakramguda,
Gachibowli, Hyderabad-500032
4. Chief Engineer (Commercial),
TSPCC, VidyutSoudha,
Hyderabad-500082
5. Sri M. VenugopalaRao,
Senior Journalist & Convenor,
Centre for Power Studies,
F 203, Sri Sai Darshan Residency,
Ameerpet, Hyderabad-500016

Annexure-II

List of Individuals in attendance in public hearing held on 14th August, 2018

Sl. No.	Name of the Individual	Name of the organization represented
1	Sri. A.V. Bhargava	M/s. Indian Wind Power Association
2	Sri. Palghuna	M/s. Enercon Energy
3	Sri. M. Venugopal Rao	Stakeholder
4	Sri. Deepak chowdhury	Indus law Advocates for M/s. Gamesa,
5	Sri. S. Nagarajan Reddy	M/s. Mytrah Energy (India) Private Limited
6	Sri. Vijay Jaiswal	Director / Automotive, Industries Department of TS
7	Smt. Annapurana Devi	GM (IPC&RAC)TSNPDCL
8	Sri. K. Satish Kumar	DE / RAC, TSSPDCL
9	Sri. Shivaji Rathod	SE / RAC, TSSPDCL
10	Sri. Mallikarjun	AO / RAC, TSSPDCL
11	Sri. C. Niranjan Reddy	ADE / RAC, TSSPDCL
12	Smt. K. Neeraja	ADE / IPC, TSSPDCL
13	Smt. M.Kiranmayee	AAO / IPC, TSSPDCL
14	Sri. V. Bucchi Reddy	AAO / IPC , TSNPDCL
15	Smt. J. Ananda	

Assumption		
Capacity	1	MW
Capital Cost	575.00	lakhs/MW
Project Cost	575.00	lakhs
Debt	70%	of project cost
Equity	30%	of project cost
Debt	402.50	Lakhs
Equity	172.50	Lakhs
ROE (pre-tax)	17.60%	
CUF	27.50%	
Total units generated per year(8766 hours per year as per CERC)	2.411	MU
Project life	25	yrs
Depreciation allowed	90%	of project cost
Loan Repayment	13	yrs
Depreciation till loan repayment	5.28%	per year
Depreciation after loan repayment	1.78%	per year
O & M cost	6.00	Lakhs/MW/year
Annual Escalation rate	5.72%	
Interest on Working Capital	11.25%	
Interest on Loan	10.25%	
Discount Rate	9.29%	
Maint Spares	15.00%	of O&M cost
Wind Tariff	Without	Tax Reimbursement

Tariff Calculation

Rs Lakhs

Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Return on Equity	30.36	30.36	30.36	30.36	30.36	30.36	30.36	30.36	30.36	30.36	30.36	30.36	30.36	30.36	30.36	30.36	30.36	30.36	30.36	30.36	30.36	30.36	30.36	30.36	30.36
Tax on RoE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on Loan	40.07	36.89	33.72	30.55	27.37	24.20	21.02	17.85	14.68	11.50	8.33	5.16	1.98												
Interest on Working Capital	2.20	2.16	2.11	2.07	2.03	1.99	1.95	1.91	1.87	1.83	1.80	1.77	1.73	1.34	1.38	1.41	1.45	1.48	1.52	1.57	1.61	1.66	1.71	1.76	1.82
Depreciation	30.36	30.36	30.36	30.36	30.36	30.36	30.36	30.36	30.36	30.36	30.36	30.36	30.36	10.24	10.24	10.24	10.24	10.24	10.24	10.24	10.24	10.24	10.24	10.24	10.24
O&M Cost	6.00	6.34	6.71	7.09	7.50	7.92	8.38	8.86	9.36	9.90	10.46	11.06	11.70	12.37	13.07	13.82	14.61	15.45	16.33	17.26	18.25	19.30	20.40	21.57	22.80
Total Cost	108.99	106.11	103.26	100.43	97.62	94.83	92.07	89.34	86.63	83.96	81.32	78.71	76.14	54.30	55.04	55.83	56.65	57.53	58.45	59.43	60.46	61.55	62.71	63.93	65.22
Fixed Cost per unit	4.52	4.40	4.28	4.17	4.05	3.93	3.82	3.71	3.59	3.48	3.37	3.27	3.16	2.25	2.28	2.32	2.35	2.39	2.42	2.47	2.51	2.55	2.60	2.65	2.71
PV factor	1.00	0.92	0.84	0.77	0.70	0.64	0.59	0.54	0.49	0.45	0.41	0.38	0.34	0.32	0.29	0.26	0.24	0.22	0.20	0.19	0.17	0.15	0.14	0.13	0.12
PV tariff	4.52	4.03	3.59	3.19	2.84	2.52	2.24	1.99	1.77	1.57	1.39	1.23	1.09	0.71	0.66	0.61	0.57	0.53	0.49	0.46	0.42	0.40	0.37	0.34	0.32