

**Before the Karnataka Electricity Regulatory Commission
Bangalore**

Dated 24th February, 2015

Present:

- | | |
|------------------------------|------------|
| 1. Sri M.R.Sreenivasa Murthy | - Chairman |
| 2. Sri H.D.Arun Kumar | - Member |
| 3. Sri D.B.Manival Raju | - Member |

In the matter of determination of tariff for Wind Power Projects

Preamble:

1. In exercise of its powers under sections 61, 62 and 86 of the Electricity Act, 2003, read with the KERC(Procurement of Energy from Renewable Sources) Regulations, 2011, this Commission had issued orders on 10th October, 2013 in OP Nos.19, 36 & 43/2012 approving the tariff for Wind Energy at Rs.4.20/kWh. The said order was made applicable for power purchase agreements signed during the period of five years from the date of the order. Aggrieved by the above orders of the Commission, M/s Gutta Seema Wind Energy Co. Pvt. Ltd., M/s Indian Wind Power Association and M/s Indian Wind Turbine Manufacturers Association had filed appeal Nos. 82/2014, 11/2014 and 49/2014 respectively before the Hon'ble Appellate Tribunal for Electricity (ATE) on various grounds. The Hon'ble ATE, in its order dated 25th November, 2014 has allowed the appeals in part and remanded the matter to this Commission for redetermination of tariff with the following directions.

- i) To re-determine tariff on levellised basis for the useful life of the project / the entire period of PPA using a discount factor.*
- ii) To reconsider the capacity utilization factor (CUF) after considering any scientific study or supporting data available for the State from*

C-WET or any other reliable data or based on actual wind energy generation data available with the distribution licensees for the existing wind generators for different areas of the State and the Regulations and object and reasons of the Regulations of the Central Commission.

- iii) To follow the Central Commission Regulations for depreciation for the period beyond 10 years while determining levellised tariff for the life of the project/ PPA period.*
- iv) To reconsider O & M expenses and to give proper reasoning if a value different from that adopted by the Central Commission is being considered.*
- v) To reconsider the issue and decide capital cost indexation mechanism for determining the capital cost for the control period or alternatively to carry out the exercise every year to determine the capital cost for the following year keeping in view the prevailing prices.*
- vi) To clarify interconnection point at which tariff determination takes effect.*

2. In the above context, the Commission issued notices to the parties in appeal before the Hon'ble ATE and also a notice in newspapers on 19th December, 2014 for conducting a public hearing. A public hearing in the matter was held in the Court Hall of the Commission on 7th January, 2015. The names of participants who made their submissions before the Commission during the public hearing are listed in the Annexure to this order.

3. In the light of the directions of the Hon'ble ATE in its order dated 25th November, 2014 and after considering the comments / views/ suggestions submitted by the stakeholders and other interested persons during the public hearing, the Commission makes the following analysis on the issues to be decided in the present case:

a) Levelized tariff

4. During the public hearing, Sri Sridhar Prabhu, Counsel appearing for M/s Gutta Seema Wind Energy Co. Pvt. Ltd. (GWECPL), has submitted that, as per the judgement of the Hon'ble ATE in Appeal No.82/2014 dated 25th November, 2014, the tariff should be determined on a levelised basis by applying a discount factor for the time value of money. Sri Vishal Gupta, Counsel appearing on behalf of M/s. Indian Wind Power Association (IWPA) and M/s. Indian Wind Turbine Manufacturers Association (IWTMA) has submitted that, since the Hon'ble ATE has directed to adopt levelised tariff for the life of the plant / term of PPA, the Commission is required to choose an option between working out the tariff for the life of the plant or for the term of the PPA. He suggested to fix a levelised tariff after calculating the costs of the project for twenty five years (life of wind generation projects) out of which the levelised costs of twenty years may be taken for determining the tariff for the term of the PPA. In the alternative, the tariff may be determined for 25 years (useful life of projects). Further, he agreed with the concept of applying a discount factor based on the weighted average cost of capital. He also suggested that, as per the provisions of the Section 86(1)(e) of the Electricity Act, 2003, the Commission is required to determine tariff for renewable sources of energy that would attract investments in the State and the tariff should be comparable with the tariffs determined by other SERCs.

5. Sri Thiruvengadam, counsel appearing on behalf of ESCOMs supported adoption of levelized tariff for 25 years as the same takes into account the time value of money.

6. The Commission had in its earlier orders adopted the method of determining average costs for the first ten years of the project with the resultant tariff being applied for the remaining ten years of the power

purchase agreements. For the purpose of adopting the method of determining levelised tariff, the Commission needs to adopt a discount factor reflecting the time value of money. The Commission considers it appropriate to adopt the weighted average cost of the capital based on a normative debt equity ratio of 70:30 as the discount factor. The written submissions made on behalf of M/s. IWPA and IWTMA have also indicated their view in support of adopting the above approach to arrive at the discount factor.

7. The rate of interest of term loans considered in the Commission's order of 10.10.2013 at 12.3 % and the return on equity at 16 % have not been disputed by any of the parties. However, the Commission in its recent orders on Generic Tariff for other renewable sources issued on 1.1.2015 adopted the current rate of interest on term loan at 12.5 %. Applying the same rate and based on the weighted average of the rate of interest and return on equity, the discount factor to be adopted for 25 years works out to 13.55 %.

8. On the issue of the duration of levelised tariff as to whether it should be for the useful life of the plant (25 years) or for the term of the PPA (20 years), the Commission agrees with the stakeholders' view that the tariff may be levelised for 25 years and implemented for a term of PPA of 20 years. This approach provides for spreading the costs of the project over 25 years with an option to the generator to either continue with the PPA for the next five years or opt for open access, for third party sales.

The Commission therefore decides to adopt levelized tariff for the useful life of the plant i.e., 25 years with a discount factor of 13.55 % per annum.

b) Capacity Utilisation Factor (CUF):

9. On behalf of IWPA and IWMTA, Sri Vishal Gupta has submitted that as per the data furnished by the National Institute of Wind Energy (NIWE), formerly C-WET, the Capacity Utilisation Factor (CUF) assessed on the basis of data from the wind monitoring stations in eight major wind potential districts of Karnataka ranges from 25% to 32% at a hub height of 50 meters. The following table is furnished by him in the written submissions to the Commission:

| Details as per C-WET | | | | |
|-------------------------------|--------------------------|-------------------------|--------------------------------|--------------|
| Major Wind Potential District | Mast Height Measured (M) | Wind Mast Elevation (M) | WPD Extrapolate/Measured at 50 | CUF Assessed |
| 1 Chitradurga | 20-80 | 1132-599 | 632-131 | 32%-20 % |
| 2 Chickmagalur | 20 | 1830 | 581 | 32% |
| 3 Bellary | 25 | 10260-849 | 286-284 | 25% |
| 4 Belgaum | 20-25 | 923-730 | 336-283 | 30%-25% |
| 5 Gadag | 25 | 976-786 | 652-423 | 32% |
| 6 Koppal | 20 | 722-709 | 335-270 | 30%-25% |
| 7 Bagalkot | 20 | 619 | 259 | 25% |
| 8 Dharwar | 20 | 705 | 268 | 25% |

10. It is further submitted on behalf of M/s. IWPA and IWMTA that in the eight potential districts mentioned above, the total installed capacity during the last several years has been only 2,041.01 MW as against 8,132.97 MW capacity allotted for wind projects. It is further stated that all the potential wind sites in the State of Karnataka which were assessed at CUF ranging from 25 % to 30 % are exhausted and most of the remaining sites cannot be utilised as they are identified as forest areas, wild life sanctuaries, etc. As per details furnished by IWPA, the District wise capacity allocated, commissioned and balance to be commissioned in seven districts of the State are as follows:

Figures in MW

| Sl. No | Name of the District | Avg CUF | Capacity allocated | Capacity Cancelled | Capacity Commissioned | Capacity yet to be Commissioned |
|--------|----------------------|--------------|--------------------|--------------------|-----------------------|---------------------------------|
| 1 | Chitradurga | 23.64 | 1508.66 | 130.22 | 524.56 | 853.88 |
| 2 | Bellary | 24.39 | 588.50 | 31.35 | 153.70 | 403.45 |
| 3 | Davangere | 26.38 | 1064.95 | 56.80 | 298.10 | 710.05 |
| 4 | Belgaum | 21.15 | 1912.25 | 297.95 | 300.60 | 1313.70 |
| 5 | Gadag | 21.13 | 1110.78 | 38.13 | 560.11 | 512.54 |
| 6 | Tumkur | 20.95 | 441.00 | 255.60 | 60.80 | 124.60 |
| 7 | Haveri | 18.31 | 369.23 | 0.00 | 204.00 | 165.23 |
| | TOTAL | 22.28 | 6995.37 | 810.05 | 2101.87 | 4083.45 |

11. Sri Vishal Gupta has also submitted a statement relating to generation recorded during the last four years in 30 pooling stations with an attached capacity of 1,554 MW which has yielded a combined CUF of 22.36 %. This statement however does not include a break up of wind projects according to the year of commissioning and the hub height even though these two factors can significantly influence the CUF of the projects in view of the different level of technology adopted in the projects established at different points of time and the higher wind potential known to exist with increased hub heights. According to the written submissions made by the above parties, the future availability of potential wind project sites may have an average CUF between to 22 % and 24% as per a study of NIWE quoted by them. In view of the above data, it is prayed by them that the CUF for determination of tariff in the present case should be fixed at 22.28 %. Sri Vishal Gupta agreed that while determining the average CUF for the State, the CUF values of below a certain level may be excluded as installation of generating units in locations with very low CUF is not feasible at the present juncture.

12. Sri Sridhar Prabhu has suggested adoption of CUF based on data to be obtained from distribution companies and other sources as per the directions of the Hon'ble ATE.

13. M/s Green Infra in their letter received on 7.1.2015 have requested to assume a CUF of 22%. The Wind Independent Power Producers Association (WIPPA) has requested to adopt a CUF of 21% to 22%.

14. Sri G.S.Kannur, appearing on behalf of KREDL, has submitted the details of CUF in respect of new wind power projects with hub heights ranging from 50 to 95 meters allocated by KREDL for the period FY12 to FY15. The CUF values indicated by promoters in these cases range from 24.25% to 37.20%. He has informed that this CUF data is based on the submissions of project developers in their detailed project reports (DPR) furnished to KREDL for allocation of the projects. As per the data submitted on behalf of KREDL, the district wise range of CUF of these proposed projects is as follows:

| Name of the District | No. of projects | Range of CUF |
|-----------------------------|------------------------|---------------------|
| Raichur | 3 | 29.28 to 35.80 |
| Koppal | 1 | 26.62 |
| Gadag | 3 | 24.25 to 34.00 |
| Chitradurga | 4 | 31.05 to 37.20 |
| Haveri & Dharwad | 2 | 24.25 |
| Davanagere & Bellary | 3 | 24.25 to 31.50 |
| Belgaum | 6 | 25.80 to 31.50 |
| Yadgir | 1 | 27.97 |
| Tumkur | 1 | 27.90 |
| Bijapur | 4 | 25.10 to 31.00 |

15. The CUF indicated by promoters at 55 mts. hub height plants averages 24.25% while at 80-95 mts. hub height plants indicate CUF in the range of 26.62% to 37.20%. As seen from the above data, with higher hub heights, the CUF recorded is generally more than 26%. Further, KREDL has submitted that the actual installed capacity commissioned in the State as

on June, 2014 is 2501.49 MW out of the allocated capacity of 10454.83 MW and the estimated potential of 22374 MW in the State. The balance capacity to be commissioned out of the allotments made is 7953.34 MW.

16. The Commission has perused the data regarding the wind power potential published by NIWE on its website, as also the data on the performance of wind power plants established during the last 3 – 4 years submitted by various distribution utilities.

National Institute for Wind Energy:

17. The Commission notes that the National Institute for Wind Energy (NIWE) has indicated different wind zones in the State based on Wind Power Density (WPD). This data is available for 50 meter hub heights. According to the data published on their website, the following districts have sites with wind generation potential as indicated:

- 1) Bagalkot CUF ranging between 20 and 25 %
- 2) Belgaum CUF 20 to 30 %
- 3) Bellary CUF 20 to 25 %
- 4) Bijapur CUF 20 to 22 %
- 5) Chitradurga CUF between 20 to 32 %
- 6) Dharwar CUF 20 to 25 %
- 7) Gadag CUF 20 to 32 %
- 8) Koppal CUF 20 to 30 %
- 9) Chickmagalur CUF 32 %

The remaining districts in the State like Bidar, Bangalore Urban, Chikkaballapur, Hassan, Tumkur and Uttara Kannada have wind sites indicating a potential of about 20 % CUF.

Generation data for FY12-14 from ESCOMs:

18. The tariff now being determined by the Commission will relate to the projects recently established and to be established in the future with the control period starting in October, 2013. The Commission has therefore

examined the actual generation data from the wind power plants (WPPs) established in the recent past of 3 – 4 years having PPAs with different ESCOMs.

19. The data submitted by Bangalore Electricity Supply Company Limited (BESCOM) of the recently established units having PPAs with it relates to eleven units, ten of which were established in the year 2011. These units are located in the districts of Chitradurga (1), Gadag (3), Davangere (5) and Belgaum (2). Except one unit in Gadag district which has a hub height of 55 mtrs., all the others have a hub height of over 80 mtrs. The average CUF achieved by them during 2012-13 was 24.84 % and during 2013-14, 24.47 %.

20. The data submitted by Hubli Electricity Supply Company Limited (HESCOM) relates to twenty one units all of which have a hub height of 56 mtrs. or below except for one unit. These units are located in the districts of Haveri (16), Belgaum (3) and Gadag (2). The average CUF of these units works out to 21.03 % in 2013-14.

21. The data relating to 13 units established in the year 2011-12 has been submitted by Gulbarga Electricity Supply Company Limited (GESCOM). These units are located in Bellary district (7), Raichur district (1) and Koppal district (5). Their average CUF in 2011-12 is 26.34 % and that in 2013-14 is 28.64 %. The hub heights of these plants are not indicated in the data furnished.

22. Mangalore Electricity Supply Company Limited (MESCOM) has submitted data of 10 units established in 2011-12, all of which are located in Shimoga district. They have hub heights ranging between 53 mtrs. and 80

mtrs. The average CUF achieved by them is 27.27 % in 2013 and 26.86 % in 2014.

23. Chamundeshwari Electricity Supply Corporation Limited (CESC) has submitted data relating to 10 units established in 2011-12, all of which are located in Hassan district. The CUF achieved by these units is 19.84 % in 2011-12 and 19.61 % in 2012-13. All the 10 units in this case are of hub height of 80 mtrs.

24. As has already been pointed out, the Commission has to determine a viable tariff for the wind energy generating units established / to be established during the control period of five years commencing from 10th October 2013. It is well known that with the advancement of technology and infrastructure facilities, the present trend in the industry is to install generating units with hub heights of 80 mtrs. and above to ensure better performance in view of the higher wind power density at higher elevations. The data relating to the performance of generating units attached to thirty pooling stations relied upon by IWPA and IWTMA shows the performance of units established over a period of more than 15 years and includes units incorporating technology at different stages of improvement during these years. Further, the average hub height of these units is closer to 50 mtrs. which was the general standard prevailing till about 2010. The units to be established in the future as confirmed by the data submitted by KREDL generally incorporate more productive technology and have hub heights of 80 mtrs. and above. Viewed from this point, the data relating to CUF of recently established plants submitted by ESCOMs is a better indicator of the performance of units to be established during the control period. The average CUF of the recently established units having PPAs with ESCOMs in the northern districts of Bellary, Gadag, Koppal, Raichur and Gulbarga as

also the southern districts of Chitradurga and Shimoga is generally above 26%, whereas the southern districts of Hassan, Bangalore, etc., have a CUF of 22 % and below.

25. The Commission is aware that, the wind energy generation units so far established in the State are all concentrated in the districts which have a high wind power density as indicated by the potential assessed by NIWE. We have also noted the submission made on behalf of IWPA and IWTMA that very low CUF values indicated for certain parts of the State need not be considered as it may not be feasible to establish wind energy units in such areas. Further, the Commission is also aware of the high cost of power generation for units that may be established in low CUF areas which will necessitate fixing of a high tariff to make such units viable. This would in turn impact on the consumer tariff in the State, passing on the burden to the consumers.

26. The Commission has noted that the cost of wind energy as claimed by the Indian Wind Power Association itself is about Rs.3 and 4 per kwh. In this respect, the Commission has noted the letter dated 15.7.2014 from the Chairman of Indian Wind Power Association addressed to the Hon'ble Finance Minister, Government of India, wherein the Chairman, IWPA has made the following statement :

“Wind energy at Rs.3 to 4 per kwh is much cheaper than the power purchased from the grid. Cheap wind energy enables MSME sector in India to produce goods at a much competitive cost enabling exports that compete with Chinese manufacturers and earn precious foreign exchange” (Reference Page-3 of Issue 7, Volume II – Windpro Magazine published by Indian Wind Power Association National Council, July, 2014).

27. The President of the Indian Wind Power Association had stated that “Wind Energy besides being pollution free and environmental friendly, is cheap at Rs.3 to 4 per kwh” in another letter published in the same journal in May, 2014.

28. For the cost of wind energy to be within about Rs.4.00 per kwh, it is necessary that development of wind energy is concentrated in areas with high wind power density for the present.

29. Keeping the above factors in view the Commission decides to adopt a CUF of 26% as the norm for determining tariff for the wind energy units to be established during the present control period.

c) Capital Cost

30. On the question of capital cost to be adopted, on behalf of IWPA and IWMTA, Sri Vishal Gupta has submitted that the wholesale price index for electrical machinery and steel is increasing year on year, as is evident from the data for the period 2011-14. He has suggested adoption of fixed capital cost of Rs.6.10 Crores / MW for the entire control period or to adopt a capital cost indexation mechanism as per CERC Regulations. He has further clarified that Rs.6.10 Crores/MW is the average capital cost for five years duly incorporating indexation on the base value of Rs.5.75 Crores for the first year. On the Commission’s suggestion, IWPA also has furnished information on the capital cost incurred on the following projects :

- i) M/s Acciona-Tuppadahalli Energy India Pvt. Ltd., at Rs.600.75 lakhs with hub height of 85 meters.
- ii) M/s Mytrah Vayu (Krishna) Pvt. Ltd., at Rs.596.24 lakhs with hub height of 65 meters.

31. Sri Sridhar Prabhu has suggested adoption of indexation while deciding on the amount of capital cost for each year of the control period as

per the directions of the Hon'ble ATE. He has also suggested to include cost of the line / sub-station, if any, up to the interconnection point in the capital cost. Sri Thiruvengadam, Advocate representing the ESCOMs has suggested that capital cost data as certified by cost accountants needs to be considered. He has also opined that any goodwill / premium on shares should also be taken into account.

32. As per the data furnished by KREDL during the public hearing, based on the information contained in the project reports submitted by promoters, the capital cost of plants with 55 mts hub height is about Rs.550 Lakhs/MW while the capital cost of 80-95 mts hub height plants is in the range of 628 Lakhs/ MW to 819 Lakhs /MW. It is evident from the data of the proposed plants that, higher values CUF are associated with plants of higher hub heights which are also expensive compared to plants with 50 meter hub height. However, it is to be noted that these expensive plants also provide higher energy output.

33. The Hon'ble ATE in its Order dated 25th November, 2014 has directed this Commission to consider capital cost indexation mechanism or in the alternative determine the tariff every year taking into account the prevailing capital cost of wind energy units. Further, the Hon'ble ATE has rejected the contention of the appellants on the issue of separately considering the cost of evacuation infrastructure and foreign exchange variation.

34. The Commission has examined the feasibility of indexing the capital cost for the purpose of determining tariff for the control period. It is felt that adopting the method of indexation on the basis of the prevailing rate of inflation may result in the capital cost getting unduly inflated over the control period. The Commission notes that the capital costs in respect of

same renewable energy technologies tend to decline over the years due to more efficient technologies becoming available. This phenomenon has been most marked in the case of solar energy where the capital cost per MW has declined from more than Rs.16 crores per MW in 2010 to about Rs.7 crores per MW at present, i.e., in less than five years. Even in the case of wind energy the international trend in the cost of machinery indicates a moderate decline / stagnation during the recent years. The Commission has noted this trend in the market studies discussed below:

- 1) India Infrastructure Research in its Report on “Wind Power in India 2014-15” issued in January 2015 (Page 152) has analysed the capital costs of some of the completed wind power projects in the country including Karnataka State during 2012-13, 2013-14 and 2014-15. This market analysis indicates the average capital cost for the last three years i.e., FY13-FY15 at Rs.612 Lakhs/MW with the capital cost varying from Rs.520 to Rs.706 lakhs/MW. The report also indicates that the average cost has not changed substantially in these years.
- 2) The International Renewable Agency (IRENA) in its report on “Renewable Power Generation Costs in 2014” (Page 60-64) issued in January, 2015 has observed that the global capital costs of wind power plants are on a declining trend. The report points out that with improved technology, higher hub heights and larger rotor diameter, higher energy output is evident. It is observed that the capital costs in India are fractionally higher in 2014 as compared to costs in 2010 and has broadly remained stable.

35. The Commission has also considered the submissions made on behalf of IWPA and IWTMA that an average capital cost could be adopted for the entire control period keeping the general trend of variation in the price of plant and machinery and other factors.

36. The Commission in its order dated 10th October, 2013 had considered capital cost of Rs.560 Lakhs for the entire control period. Considering the

fact that there is not much change in capital costs in the last three years, the Commission decides to reckon the annual increase in the capital cost over the control period at about three per cent instead of adopting the higher rate of general inflation. In the above context, reckoning a capital cost of Rs.560 lakhs/MW for FY14 and with an annual increase of 3% per annum, the capital cost for FY18 will be Rs.630 lakhs/MW. The average capital cost for the control period works out to Rs.595 lakhs/MW, which may be rounded off to Rs.600 lakhs/MW. Further, the Commission notes that the cost of two plants furnished by the petitioners is also around 6.00 crs/MW.

The Commission therefore decides to adopt capital cost of Rs.600 lakhs/MW in order to have a common tariff for all the projects to be commissioned during the control period.

d) O & M expenses

37. The Commission in its order dated 10th October, 2013 had adopted O & M expenses of Rs.7 lakhs/MW i.e. 1.25% of the capital cost with an annual escalation of 5%. The CERC in its Regulations has provided O & M expenses of Rs.9 lakhs / MW for the period 2012-13 to be escalated at 5.72% over the tariff period to compute the levelized tariff.

38. Sri Sridhar Prabhu, Counsel for M/s. GWECPL has requested the Commission to reconsider the O & M expenses as directed by the Hon'ble ATE and increase the same. Sri Vishal Gupta has submitted that 2% of capital cost may be allowed as O&M expenses with 5.72% escalation annually. He has requested the Commission to give reasons if the approach adopted is different from the norms as per the CERC Regulations.

39. During the public hearing, the Commission requested IWPA to furnish data of the actual O&M expenses incurred in respect of three to four wind power generators in the State for the last three years duly supported by vouchers. IWPA in its additional submissions received on 16th January, 2015 has furnished the O&M expenses incurred by various generators as follows:

- i) M/s Acciona-Tuppadahalli Energy India Pvt. Ltd., @ Rs.11.43 to Rs.11.96 lakhs / MW.
- ii) M/s Mytrah Vayu (Krishna) Pvt. Ltd., @ Rs.9.87 lakhs / MW.
- iii) M/s Sterling Agro Industries, Shimoga @ Rs.9.01 lakhs/ MW.
- iv) M/s Sterling Agro Industries, Davanagere @ Rs.9.23 lakhs /MW.

40. As seen from the above, O&M expenses vary with the type and location of the plant besides its vintage. Considering the views expressed by the stakeholders and the data furnished by IWPA, the Commission decides to adopt O&M expenses as per CERC Regulations.

Hence, the Commission decides to consider O & M expenses of Rs.9.51 lakhs / MW for the year 2013-14 to be escalated at 5.72% over the tariff period to compute the levelized tariff.

e) Depreciation

41. On depreciation, adoption of CERC Regulations as directed by the Hon'ble ATE is favoured by the counsel for GWECPL. Sri Vishal Gupta has also suggested to allow depreciation of 5.83% for first twelve years to enable debt servicing to be completed during that period.

42. The Commission in its Order dated 10th October, 2013 had considered depreciation of 5.83% for the first 10 years. The Hon'ble ATE in its order dated 25th November, 2014 has directed to adopt depreciation duly following CERC Regulations for the period beyond 10 years. Since the Commission has decided to adopt levelled tariff for the useful life of the plant instead of average tariff for 10 years, it is of the view that allowing depreciation at 5.83% / annum on capital cost during the first 12 years would enable the investor to repay the entire loan amount. The remaining capital cost after deducting the normative cost of land at 5% of capital cost and salvage value of plant at 10% of the plant cost, is spread over the balance period of the useful life of the plant.

Therefore, the Commission decides to adopt the rate of depreciation at 5.83 % p.a. during the first 12 years and 1.20 % p.a. for the next 13 years.

f) Inter connection / delivery point

43. Sri Sridhar Prabhu has requested the Commission to provide clarity on the inter-connection point as the same has financial impact on the investments to be made by the developers.

44. The Commission notes that, the interconnection point / delivery point has already been clearly defined in the Power Purchase Agreements and the Commission is of the view that there is no need to clarify the matter further.

45. Based on the above decisions of the Commission and the other parameters approved in Commission's Order dated 10th October, 2013, the following is the abstract of the parameters considered for determination of tariff:

| Particulars | Values adopted Category-B projects |
|------------------------------------|---------------------------------------|
| Capital Cost/MW- Rs. Lakhs | 600 |
| Debt: Equity Ratio | 70:30 |
| Debt-Rs. Lakhs/MW | 420 |
| Equity- Rs. Lakhs/MW | 180 |
| Debt Repayment Tenure in Yrs. | 12 |
| Interest charges on Debt | 12.50% |
| Capacity Utilisation Factor (CUF) | 26% |
| Return on Equity | 16% |
| Discount Factor | 13.55% |
| Auxiliary consumption | 0.5% |
| O & M expenses in Rs. Lakhs per MW | 9.51 |
| O & M expenses' Escalation p.a. | 5.72% |
| Working Capital | 2 months receivables |
| Interest on Working Capital | 13.00% |
| Depreciation for first 12 years | 5.83% |
| Depreciation for next 13 years | 1.20% |

46. Using the above parameters, the levelled tariff for wind energy projects works out to Rs.4.49 per kwh rounded off to Rs.4.50 per kwh, taking into account the life of the project at 25 years. The Commission therefore determines the tariff for wind energy projects, as follows :

O R D E R

47. (i) In modification of the earlier order dated 10th October, 2013, the Commission hereby redetermines the tariff for wind power projects at Rs.4.50 per kwh for projects established during the control period of five years commencing from 10th October, 2013.
- (ii) This tariff shall be applicable to all the new wind power projects entering into power purchase agreements (PPA) on or after 10.10.2013 for the control period of five years from that date.

(iii) In respect of the projects which have already entered into PPAs with ESCOMs from 10th October, 2013 and up to the date of this Order, the tariff as determined in this Order shall be applicable.

48. This order is signed, dated and issued by Karnataka Electricity Regulatory Commission on this 24th day of February, 2015.

Sd/-
(M.R. SREENIVASA MURTHY)
CHAIRMAN

Sd/-
(H.D. ARUN KUMAR)
MEMBER

Sd/-
(D.B.MANIVAL RAJU)
MEMBER

Annexure:

List of Persons who made submissions before the Commission in the Public hearing

1. Sri Sridhar Prabhu, Counsel representing Guttaseema Wind Energy Company Pvt. Ltd.,
2. Sri Vishal Gupta, Counsel for Indian Wind Power Association & Indian Wind Turbine Manufacturers Association.
3. Sri Prabhat WIPPA
4. Sri G.S.Kannur, Counsel for KREDL
5. Sri Manish Verma, InWEA
6. Sri Thiruvengadam, Counsel for ESCOMs