

Discussion Paper on “Revision of Generic Tariff for Wind Power Projects and mandatory procurement of wind Power through Bidding”

1. The Commission mandated under the Electricity Act, 2003 to promote generation of electricity from renewable sources of energy has been determining periodically their generic tariff based on normative financial and operational parameters. To create a stable environment for investment in such projects, the generic tariff is fixed for all projects commissioned during a control period. Accordingly, the Commission, vide its Order dated 24th February, 2015 has determined the generic tariff for wind power projects, wherein a levelized tariff of Rs.4.50/unit has been determined for the life of the projects, namely 25-years. The said Order was made applicable to all new wind power projects which are entering or have entered into power purchase agreements during the five year control period commencing from 10.10.2013. i.e. upto 09.10.2018.
2. Meanwhile, the new Tariff Policy dated 28.01.2016, envisages future procurement of renewable energy (except from waste to energy plants) only through competitive bidding, as per its notified bidding framework. Pursuant to the same, the Central Government, has issued the Draft Bidding Guidelines.
3. Further, the CERC, which was hitherto determining annually the Generic Tariff for wind projects, has not determined the same for the FY18, in line with its amended Regulations, wherein it has decided to determine only project

specific tariff for wind projects, keeping in view the provisions envisaged in the Tariff Policy,2016.

4. The GERC, in its Order dated 30.08.2016, has revised the wind power tariff (net of AAD of 53 paise/unit) to Rs.4.19/unit from the earlier tariff of Rs. 4.23/unit [2012 Order]. Further, the GERC has given an option to the DISCOMs to buy wind power through competitive bidding, with such wind tariff rate determined as the ceiling price.
5. The APERC has also reduced the wind power tariff from the existing Rs.4.70/unit [2012 Order] to Rs.4.25/unit, in its Order dated 26.03.2016. However, the AP Distribution Licensees, keeping in view the tariff quoted under SECI bidding being lower than the generic tariff, have proposed to buy wind power through competitive bidding. As reported, in the bids called by the SECI for procurement of 1000 MW wind power, the lowest tariff quoted is Rs. 3.46/unit.
6. The above facts and developments indicate that in the recent years the wind tariffs have come down significantly due to increased plant efficiency by adoption of technically improved and higher hub-height Wind Turbine Generators (WTG) and also due to reduction in the capital costs of the wind projects resulting from economies of scale. Thus, the current tariff determined by this Commission at Rs.4.50/unit is considerably higher and therefore, there is a need for mid-term tariff revision to ensure that, the consumers get the benefit of lower cost of wind power generation and there is an incentive to adopt efficient and improved technology in wind power projects.

7. The midterm revision of term is also necessitated by other factors. The Commission in order to promote generation of electricity from renewable sources, has also been mandated to impose renewable purchase obligation (RPO). While fixing such RPO, the Commission needs to consider apart from the guidelines of the MNRE, Government of India, the generation capacity created in the State, the grid stability, the financial health of the distribution licensees and the interest of consumers who cannot be asked to bear beyond a reasonable amount, the additional tariff on account of renewable sources, which are generally higher than conventional sources. The Wind power generation potential in the State is estimated to be 15783.22 MW and the cumulative capacity created as on 31.03.2017 is 3798.66 MW. Out of this, the State's distribution licensees have contracted to procure 2787.10 MW. The non-solar RPO fixed is mostly met through procurement from wind power. The available capacity indicates that the distribution licensees in the State as a whole would be able to comfortably meet their RPO for the FY18 and the FY19, which are 10.48 % and 11.54% respectively.

8. Therefore, keeping in view the new Tariff Policy,2016, the wind power generation capacity created in the State so far and the contracted procurement of wind power by the distribution licensees to meet their RPOs and general demand, the Commission proposes that all future wind power purchase by the distribution licensees should be only through competitive bidding and the licensees should follow the bidding guidelines as may be finally notified by the Central Government. Further,

the Commission proposes that the ESCOMs should seek its approval, before adopting the tariff as discovered under bid. However, to have a benchmark tariff for calling such bids, the Commission proposes to determine the tariff afresh for wind power projects based on the following parameters:

- a) Capital cost including evacuation system cost.
- b) CUF, Capacity Utilization Factor,
- c) Debt Equity Ratio,
- d) Interest on term loan,
- e) Depreciation,
- f) Return on equity,
- g) Operation and maintenance charges,
- h) Interest on working capital,
- i) Auxiliary consumption.

9. The Commission proposes to deal with each of the above parameters as follows:

a) Capital cost including evacuation system cost:

The Commission has approved a normative capital cost of Rs.6.00 Crs/MW in its order dated 24.02.2015. The normative Capital Cost approved by SERCs of rich wind potential States is indicated below:

State	Order Dated	Rs. Crs./MW
Tamil Nadu	31.03.2016	6.20
Andhra Pradesh	26.03.2016	6.01
Gujarat	30.08.2016	6.15

The Commission notes that the capital costs in the above States were determined in the year 2016 and that subsequently in the bids called by SECI in the year 2017, there has been a drastic reduction in the actual capital cost (a major component of tariff) as reflected in the wind tariff quoted by the bidders. Based on the parameters approved in 24.02.2015 Order of this Commission, the capital cost of a wind power project quoting a tariff of Rs.3.46/-unit (quoted in SECI bid) works out to about Rs.4.50 Crores/MW. However, it is likely that factors other than capital cost may have also brought down the estimated generation cost. Taking the reduction in project cost on account of such other factors to be 10%, **the Commission proposes to adopt a capital cost of Rs.4.80 Crs. /MW, which includes the cost of evacuation also.**

b) **CUF, Capacity Utilization Factor:**

The other SERCs for the purpose of tariff determination, have considered the following CUF:

State	Order Dated	% CUF
Tamil Nadu	31.03.2016	27.15
Andhra Pradesh	26.03.2016	23.50
Gujarat	30.08.2016	24.50

The Commission in its Order dated 24.02.2015, for the reasons stated in that Order has adopted a CUF of 26%. **The Commission proposes to adopt the same CUF of 26%.**

c) Debt Equity Ratio:

The Commission in all its earlier Orders has considered debt-equity ratio of 70:30. The SERCs mentioned earlier have also considered the same ratio. **The Commission proposes to continue the debt equity ratio of 70:30.**

d) Interest on term loan and loan tenure:

The other SERCs for the purpose of tariff determination, have considered the following interest rates for the term-loan:

State	Order Dated	% interest
Tamil Nadu	31.03.2016	13.00
Andhra Pradesh	26.03.2016	12.76
Gujarat	30.08.2016	11.80

The Commission in its Order dated 24.02.2015, had adopted interest rate of 12.50%. However, in the recent Solar Tariff Order issued by the Commission on 12.04.2017, the Commission has considered 11% as interest rate on term loan keeping in view the prevailing Marginal Cost of fund based Lending Rates (MCLR). The Commission is of the view that, the investors presently can avail Capital loans at competitive interest rates which are less than the rates considered earlier. **Therefore, the Commission proposes to adopt interest rate on term loan at 11%.**

Further, the Commission proposes to adopt a loan tenure of 12 years for the purpose of tariff determination.

e) Depreciation

The other SERCs, for the purpose of tariff determination, have considered the following depreciation rates:

State	Order Dated	% depreciation
Tamil Nadu	31.03.2016	3.60% per annum
Andhra Pradesh	26.03.2016	7% (for the first 10 years) 1.33% (from 11 to 25 years)
Gujarat	30.08.2016	7% (for the first 10 years) 1.33% (from 11 to 25 years)

The Commission in its Order dated 24.02.2015, had adopted depreciation rate of 5.83% for the first 12 years and 1.20% for the next 13 years. However, in the recent Solar Tariff Order issued by the Commission on 12.04.2017, the Commission has considered depreciation rate of 5.83% for the first 12 years

and 1.54% for the remaining 13 years on the capital cost of the plant excluding land cost. **Therefore, the Commission proposes to adopt depreciation rate at 5.83% for the first 12 years and 1.54% for the remaining 13 years.**

f) Return on equity

The Commission has adopted 16% as RoE in its order dated 24.02.2015. The RoE adopted by the SERCs of rich wind potential States is indicated below:

State	Order Dated	% RoE
Tamil Nadu	31.03.2016	20% (pre-tax) per annum without linking it to MAT and IT
Andhra Pradesh	26.03.2016	16%
Gujarat	30.08.2016	14%

The Commission in its earlier Orders has considered RoE of 16% and proposes to adopt the same.

g) Operation and maintenance charges

The other SERCs for the purpose of tariff determination, have considered the following O & M Expenses:

State	Order Dated	O& M expense-
Tamil Nadu	31.03.2016	1.1% on 85% of Capital investment and 0.22% on 15% of the Capital investment with an escalation of 5% i.e. 6.00 Lakhs/MW
Andhra Pradesh	26.03.2016	Rs.9.06 lakhs/MW with 5.72% escalation per annum
Gujarat	30.08.2016	Rs.9.90 lakhs/MW with 5.72% escalation per annum

The Commission in its Order dated 24.02.2015, had adopted O & M expenses at Rs. 9.51 lakhs/MW with 5.72% per annum. Considering the inflation rate of 5.72%, the current O & M expenses works out to Rs. 10.62 Lakhs/MW. Keeping in view the O & M expenses considered by the other SERCs, **the Commission proposes to adopt an O & M Expense of Rs.10 lakhs/MW for the base year, with an annual escalation at 5.72%.**

h) Interest on working capital:

The other SERCs for the purpose of tariff determination, have considered the following interest rate for working capital:

State	Order Dated	Interest rates
Tamil Nadu	31.03.2016	13.50%
Andhra Pradesh	26.03.2016	13.26%
Gujarat	30.08.2016	11.80

The Commission in its Order dated 24.02.2015, had adopted interest rate for working capital of 13.00%. However, in the recent Solar Tariff Order issued by the Commission on 12.04.2017, the Commission has considered 12% as interest rate on working capital. **Therefore, the Commission proposes to consider interest rate on working capital at 12%.**

Further, for the purpose of tariff determination, as done in the earlier Order, the Commission proposes to consider two months' receivables as the working capital.

i) Auxiliary Consumption:

The Commission in its earlier Order has considered an auxiliary consumption of 0.5% and proposes to continue the same.

j) The summary of the existing and the proposed parameters is indicated below:

Parameter Cr.	Existing as per Order dated 24.02.2015	Proposed
Capital Cost-Rs.MW	6.00	4.80
Debt: Equity ratio	70:30	70:30
CUF in %	26	26
Interest on term loan in %	12.50	11.00
Tenure of loan-Yrs.	12	12
Working Capital [WC]	Two-Months' receivables	Two-Months' receivables
interest on WC in %	13.00	12.00
Depreciation in %	5.83% for first 12 years and afterwards 1.20% for 13 years	5.83% for first 12 years and afterwards 1.54% for 13 years
RoE	16	16
O & M Expenses-Rs. Lakhs/MW	9.51	10.00
O & M escalation per annum	5.72%	5.72%
Auxiliary Consumption	0.5%	0.5%
Discount factor in %	13.55	12.50
Tariff in Rs/unit	4.50	3.61

10. **Applicability of revised tariff:** It is proposed to make the above revised tariff applicable to all wind projects, commissioned after 01.09.2017, for which PPAs are entered into after the date issue of this order. For projects which have entered into PPA prior to the date of issue of this Order, the tariff as per the

Commission's Order dated 24.02.2015 would be applicable, provided the projects are commissioned within the time stipulated in those PPAs, failing which the revised tariff would be applicable.

11. **Tenure of PPA:** The existing term of the PPA in respect of a Wind Power Project is synchronized with the life of the plant i.e., 25-years. However, the Commission proposes to reduce the tenure of the PPA to 20 years, with an option for the developer to extend it for another five years with the consent of the ESCOM and approval of the Commission.

12. The Commission, hereby, invites comments/views/suggestions from Stakeholders and interested persons on the above proposal, with a request to submit the objections/ comments/ suggestion to the Commission on or before 15.06.2017 to:

The Secretary,

Karnataka Electricity Regulatory Commission

7th Floor, Mahalaxmi Chambers,

No.9/2, M.G. Road, Bangalore-560 001.

Approved by the Commission

SECRETARY

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