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NOTIFICATION

In exercise of powers conferred under Sections 61 and 86 read with Section 181 of the Electricity Act. 2003 (36 of 2003), and all other powers enabling it in this behalf and after previous publication, the Andhra Pradesh Electricity Regulatory Commission hereby makes the following regulations, namely:

1. Short title and commencement:

1) These regulations may be called the Andhra Pradesh Electricity Regulatory Commission (Terms and Conditions for Tariff determination for upcoming Wind Energy Power Projects) Regulations, 2015.

2) These regulations shall come into force from the date of their publication in the official Gazette and, unless reviewed earlier or extended by the Commission, shall remain in force for a period of 5 years from the date of such publication.

2. Definitions and Interpretation:

1) In these regulations, unless the context otherwise requires,

a) '**Act**' means the Electricity Act, 2003 (36 of 2003);

b) '**Capital cost**' means the capital cost as defined in regulation 10;

c) '**CERC**' refers to the Central Electricity Regulatory Commission;

d) **'CERC RE Tariff Regulations'** shall mean Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2012, as amended from time to time.

e) '**Commission**' refers to the Andhra Pradesh Electricity Regulatory Commission;

f) '**Inter-connection Point**' shall mean the line isolator on outgoing feeder on HV side of the pooling sub-station; wherein the pooling sub-station shall mean the sub-station at project site of wind farm and shall constitute step-up transformer and associated switchgear and to the LV side of which, multiple (more than one) generating unit (s) (i.e., wind turbine generators) are connected;

g) '**MAT**' refers to Minimum Alternate Tax;

h) '**MNRE**' means the Ministry of New and Renewable Energy, Government of India;

i) ‘**Non-Conventional Energy**’ means the grid quality electricity generated from non-conventional energy sources;

j) ‘**Non-Conventional Energy Power Plants**’ means the power plants other than the conventional power plants generating grid quality electricity from non-conventional energy sources;

k) ‘**Non-Conventional Energy Sources**’ means non-conventional sources such as mini hydel, wind, biomass, bagasse, industrial waste, urban or municipal waste and other such sources as approved by the MNRE;

l) '**Operation and Maintenance expenses**’ or ‘**O&M expenses**' means the expenditure incurred on operation and maintenance of the project, or part thereof, and includes the expenditure on manpower, repairs, spares, consumables, insurance and overheads;

m) **'Project'** means a generating station or the evacuation system upto inter-connection point;

n) ‘**Review Period**’ means the period during which the norms for determination of tariff specified in these regulations shall remain valid;

o) ‘**Tariff period**’ means the period for which tariff is to be determined by the Commission on the basis of norms specified under these Regulations;

p) ‘**Useful Life**’ in relation to a wind energy power project shall mean 25 years from the date of commercial operation (COD);

q) **‘Year’** means a financial year.

(2) Save as aforesaid and unless repugnant to the context or if the subject-matter otherwise requires, words and expressions used in these regulations and not defined, but defined in the Act, or the Indian Electricity Grid Code / A.P. State Electricity Grid Code (APSEGC) shall have the meanings assigned to them respectively in the Act or the Indian Electricity Grid Code / A.P. State Electricity Grid Code (APSEGC) and amendments thereto.

3. Scope and extent of application:

These Regulations shall apply for all new wind energy power projects to be commissioned within Andhra Pradesh for generation and sale of electricity from such wind energy power projects to all Distribution licensees within the State of Andhra Pradesh subsequent to the date of notification of these Regulations and where tariff, for a generating station or a unit thereof based on wind energy source, is to be determined by the Commission under section 62 read with section 86 of the Act.

Chapter 1: General Principles

4. Review Period:

The Review Period under these Regulations shall be five (5) years. First year of the Review Period shall commence from the date of notification of these Regulations and shall cover upto the end of the financial year 2015-16.

Provided that the tariff determined as per these Regulations for the Wind Energy power projects commissioned during the Review Period, shall continue to be applicable for the entire duration of the Tariff Period as specified in Regulation 5 below.

5. Tariff Period:

a) The Tariff Period for Wind Energy power projects shall be equal to the useful life of the projects as specified under Regulation 2 (p).

b) Tariff period under these Regulations shall be considered from the date of commercial operation of the Wind Energy power projects.

c) Tariff determined as per these Regulations shall be applicable for Wind Energy power projects, only for the duration of the Tariff Period as stipulated under Regulation 5 (a) and (b).

6. Petition and Proceedings for determination of Tariff:

The Commission shall notify the generic preferential tariff on suo-motu basis at the beginning of each year of the Tariff Period for Wind Energy Power Projects for which norms have been specified under these Regulations.

7. Tariff Structure:

The tariff for Wind Energy power projects shall be single part tariff consisting of the following cost components:

a) Return on equity;

b) Interest on loan capital;

c) Depreciation;

d) Interest on working capital;

e) Operation and Maintenance expenses;

8. Levellized Tariff:

Levellized Tariff is calculated by carrying out levellization for 'useful life' considering the discount factor for time value of money.

The discount factor considered for this purpose is equal to the weighted average cost of capital on the basis of normative debt:equity ratio (70:30) specified under Regulation 11. Considering the normative debt:equity ratio and weighted average of the rates for interest and equity component, the discount factor is calculated. Interest rate for the loan component (i.e.70%) of Capital Cost is considered as explained under Regulation 12. For equity component (i.e. 30%) post tax Return on Equity (ROE) of 16% is considered as explained in Regulation 14.

9. Despatch principles for electricity generated from Wind Energy Power Projects:

All Wind Power Projects shall be treated as 'MUST RUN' power plants and shall not be subjected to 'Merit Order Despatch' (MOD) principles.

Provided that Wind Energy Power Generation Plants, where, the sum of generation capacity of such plants connected at the interconnection point to the transmission or distribution system is 10 MW and above and interconnection point is 33 kV and above shall be subjected to scheduling and despatch code as specified in Indian Electricity Grid Code (IEGC) – 2010 and/or A.P. State Electricity Grid Code (APSEGC) as amended from time to time.

Chapter 2: Financial Principles

10. Capital Cost and Capital Cost Indexation Mechanism:

The norms for the Capital cost shall be generally inclusive of all capital work including plant and machinery, civil work, erection and commissioning, financing and interest during construction (IDC) and evacuation infrastructure upto inter-connection point.

The capital cost indexation mechanism as prescribed in the CERC RE Tariff Regulations, 2012 is to be considered for arriving at the capital cost of the Wind Energy Power Projects for each year of the Review Period which shall be notified at the beginning of each financial year.

However, the capital cost for the base year i.e., 2015-16 shall be specified by the Commission consistent with its earlier orders dated 15-11-2012 and duly taking into account the capital indexation mechanism of CERC as prescribed in CERC RE Tariff Regulations 2012. The Commission is of the view that the capital cost determined with this escalation methodology would be closest to actual market values, as it takes dynamic indices into consideration. Therefore the Commission adopts the escalation methodology as suggested by CERC and is detailed below.

The following indexation mechanism shall be applicable for adjustments in capital cost over the five year period with the changes in Wholesale Price Index for Steel and Electrical Machinery.

$CC_{(n)} = P\&M_{(n)} * (1+F1+F2+F3)$

$P\&M_{(n)} = P\&M_{(0)} * (1+d_{(n)})$

$d_{(n)} = [a*\{(SI_{(n-1)}/SI_{(0)}) - 1\} + b*\{(EI_{(n-1)}/EI_{(0)}) - 1\}]/(a+b)$

Where,

$CC_{(n)}$ = Capital Cost for nth year

$P\&M_{(n)}$ = Plant and Machinery Cost for nth year

$P\&M_{(0)}$ = Plant and Machinery Cost for the base year, i.e. FY 15-16

Note: $P\&M_{(0)}$ is to be computed by dividing the base capital cost (for FY 15-16) by (1+F1+F2+F3)

$d_{(n)}$ = Capital Cost escalation factor for year (n) of five year period

$SI_{(n-1)}$ = Average WPI Steel Index prevalent for calendar year (n-1) of the five year period

$SI_{(0)}$ = Average WPI Steel Index prevalent for the base year (0),i.e. FY2015-16

$EI_{(n-1)}$ = Average WPI Electrical Machinery Index prevalent for calendar year (n-1) of the five year period

$EI_{(0)}$ = Average WPI Electrical and Machinery Index prevalent for the base year (0), i.e. FY 15-16

a = Constant to be determined by Commission from time to time, for weightage to Steel Index

b = Constant to be determined by Commission from time to time, for weightage to Electrical Machinery Index

F1 = Factor for Land and Civil Work

F2 = Factor for Erection and Commissioning

F3 = Factor for IDC and Financing Cost

The constants **'a'** and **'b'** and factors **'F1'**,**'F2'** and **'F3'** are specified and these would be determined by the Commission from time to time.

11. Debt Equity Ratio:

The debt equity ratio shall be **70:30**.

12. Loan and Finance Charges:

1) Loan Tenure: For the purpose of determination of tariff, loan tenure of **10 years** shall be considered.

2) Interest Rate:

(a) The loans arrived at in the manner indicated in the Regulation 11 shall be considered as gross normative loan for calculation of 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, the normative interest rate shall be considered as average State Bank of India (SBI) Base rate prevalent during the first six months of the previous year plus 300 basis points.

(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.

13. Depreciation:

(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 per annum shall be based on 'Differential Depreciation Approach' using 'straight line' method over two distinct periods comprising loan tenure and period beyond loan tenure over the useful life. The depreciation rate for the first 10 years of the Tariff Period shall be **4.50% per annum** and 3% for the remaining useful life of the project from 11th year onwards.

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

14. Return on Equity:

(1) The value base for the equity shall be 30% of the capital cost as determined under Regulation 11.

(2) The normative Return on Equity shall be **16%** with MAT/income tax as pass through.

15. Interest on Working Capital:

(1) The Working Capital requirement shall be computed as follows:

(a) Operation and 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 of spares at 15% of Operation and Maintenance expenses.

(2) Interest on Working Capital shall be at the interest rate equivalent to the average State Bank of India Base Rate prevalent during the first six months of the previous year plus 350 basis points.

16. Operation and Maintenance Expenses:

(1) 'Operation and Maintenance expenses' shall comprise repair and maintenance (R&M), establishment including employee expenses, and administrative and general expenses including insurance.

(2) Operation and Maintenance expenses shall be @1.25% of the capital cost of the project.

(3) Operation and maintenance expenses shall be determined for the Tariff Period based on normative O&M expenses specified by the Commission subsequently for the first year of the five year period.

(4) Normative O&M expenses allowed during first year of these Regulations (i.e. FY 15-16) shall be escalated at the rate of **5.72%** per annum over the five year period.

17. Rebate:

(1) For payment of bills of the generating company through letter of credit, a rebate of **2%** shall be allowed.

(2) Where payments are made other than through letter of credit within a period of one month of presentation of bills by the generating company, a rebate of **1%** shall be allowed.

18. Sharing of Clean Development Mechanism (CDM) benefits:

The proceeds of carbon credit from approved CDM project shall be shared between generating company and concerned beneficiaries in the following manner, namely-

a) 100% of the gross proceeds on account of CDM benefit to be retained by the project developer in the first year after the date of commercial operation of the generating station;

b) In the second year, the share of the beneficiaries shall be 10% which shall be progressively increased by 10% every year till it reaches 50%, where after the proceeds shall be shared in equal proportion, by the generating company and the beneficiaries.

19. Taxes and Duties:

a) Tariff determined under these regulations shall be exclusive of taxes and duties as may be levied by the Government; Provided that the taxes and duties levied by the Government shall be allowed as pass through on actual incurred basis.

b) Income tax/MAT is a pass through and is to be paid by the Distribution Licensees to the developer upon receipt of the claim from the developer. This is over and above the tariff determination made herein.

c) Electricity Duty is a pass through and is to be paid by the Distribution Licensees to the developer upon receipt of the claim from the developer. This is over and above the tariff determination made herein.

20. Subsidy or incentive by the Government:

The Commission shall take into consideration any incentive or subsidy offered by the Central or State Government, including accelerated depreciation (AD) benefit if availed by the generating company, for the Wind Energy Power Projects while determining the tariff under these Regulations.

Provided that the following principles shall be considered for ascertaining income tax benefit on account of accelerated depreciation, if availed, for the purpose of tariff determination:

a) Assessment of benefit shall be based on normative capital cost, accelerated depreciation, rate as per relevant provisions under Income Tax Act & Corporate Income Tax Rate.

b) Capitalization of Wind Energy Power Projects during second half of the fiscal year. Per unit levellized accelerated depreciation benefit has been computed considering the post-tax weighted average cost of capital as discount factor (as explained in Regulation 8).

Chapter 3: Technology specific parameters for Wind Energy Power Projects

21. Capacity Utilization Factor:

The Capacity Utilization Factor (CUF) of a wind turbine is a function of wind velocity, air density, power law index, mechanical efficiency of the machine, age of the machine, hub height and blade length.

The Commission had adopted a capacity utilization factor (CUF) of 23% for wind energy projects in Andhra Pradesh in its order dated 15th November 2012. During the process of determination of CUF, the Commission had examined the CUF adopted by CERC and other State Commissions. The Commission had noted that only low-wind density sites are presently available in the state and hence higher hub-height machines have to be considered in the context of setting up of fresh capacity in the wind power sector. The Commission had also considered the wind power density map prepared by Centre for Wind Energy Technology (C-WET)/Ministry of New & Renewable Energy. The excerpts from the order dated 15th November 2012 stating the same are as follows:

"The Commission was also directed by the ATE in appeal No.194 of 2009 to determine the CUF after considering the wind power density map prepared by the Centre for Wind Energy Technology (C-WET)/Ministry of New & Renewable Energy. To encourage efficiency and optimal selection of sites, the Commission proposes to adopt 23% as CUF. The Commission feels that with the advancement of technology, higher hub heights of 80 meters and above, larger rotor-diameter machines can be installed and CUF of 23% should be achievable. Hence, the Commission considers that a CUF of 23% will be appropriate for the purpose of determination of generic tariff for all the wind power projects that are going to enter into PPA from the date of issuance of this order till 31-03-2015. The Commission considers that the above approach will encourage optimal selection of sites and balance the interests of all the stakeholders."

It is also observed that with the advancement of technology and infrastructure facilities, the present trend in the industry is to install machines with hub heights of 80 meters and above in view of higher wind power density at higher elevations. As such the CUF of 23% is proposed to be retained for wind energy projects in Andhra Pradesh.

Chapter 4: Miscellaneous

22. Deviation from Norms:

Tariff for sale of electricity by the Wind Energy Power Project may also be determined in deviation from the norms specified in these Regulations subject to the conditions that the levallized tariff over the useful life of the project on the basis of the norms in deviation does not exceed the levallized tariff calculated on the basis of the norms specified in these Regulations.

Provided that the reasons for deviation from the norms specified under these Regulations shall be recorded in writing.

23. Power to Relax:

The Commission may by general or special order, for reasons to be recorded in writing, and after giving an opportunity of hearing to the parties likely to be affected may relax any of the provisions of these Regulations on its own motion or on an application made before it by an interested person.

24. Issue of Orders and Practice Directions:

Subject to the provisions of the Act, the AP Reforms Act, 1998 and these Regulations, the Commission may, from time to time, issue orders and practice directions in regard to the implementation of these Regulations, the procedure to be followed and other matters, which the Commission has been empowered by these Regulations to specify or direct.

25. Power to Amend:

The Commission may, at any time, vary, alter, modify or amend any provisions of these Regulations.

26. Power to Remove Difficulties:

If any difficulty arises in giving effect to the provisions of these Regulations, the Commission may, by general or specific order, make such provisions not inconsistent with the provisions of the Act, as may appear to be necessary for removing the difficulty.

Commission Secretary (I/c)

Place: Hyderabad
Date : 08-04-2015