

**Before the
MAHARASHTRA ELECTRICITY REGULATORY COMMISSION
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Case No. 41 of 2017

In the matter of

**Petition of Maharashtra State Electricity Distribution Co. Ltd. for revision in Wind
Zone classification of Wind Energy Projects with consistently higher generation**

Coram

Shri. Azeez M. Khan, Member

Shri. Deepak Lad, Member

Maharashtra State Electricity Distribution Company Ltd.Petitioner

V/s

Maharashtra Energy Development Agency Respondent

Appearance

For Petitioner : Smt. Deepa Chawan (Adv.)

: Shri. Sanjay Rajput

For Respondent : Shri Manoj Pise

For Authorized Consumer Representative : Dr. Ashok Pendse, TBIA

ORDER

Date: 03 April, 2018

1. Maharashtra State Electricity Distribution Co. Ltd. (MSEDCL) has filed a Petition on 4 March, 2017, citing Regulations 79, 80 and 81 of the MERC (Terms and Conditions for Determination of Renewable Energy (RE) Tariff) Regulations) ('RE Tariff Regulations'), 2015 seeking revision in the Wind Zone Class assigned by Maharashtra Energy Development Agency (MEDA) to Wind Energy Projects with consistently higher actual generation in the last 3 years.

2. MSEDCL's prayers are as follows:

- a) *“Admit the present Petition as per the provisions of the Regulation 79, 80 & 81 of MERC (RE Tariff) Regulations, 2015.*
- b) *Revise Wind Zone classification of 42 generators.*
- c) *Devise a procedure to adopt 80 m. hub height (or more) data for Wind power density measurement, to link up actual generation data with Wind Zone classification.*
- d) *To issue directives to MEDA to review the Wind Zone classification of 42 Wind generators & revise them as per the actual generation.*
- e) *To issue direction to MEDA to adopt the methodology suggested by MSEDCL till the procedure to adopt 80 m hub height creation is finalized by MEDA....”*

3. The Petition states as follows:

- a) In the RE Tariff Regulations, 2010, the Commission had specified the norms for determination of tariff of electricity generated from various RE Sources. The Commission also specified the Capacity Utilization Factor (CUF) of various sources, including Wind:

“26: Capacity Utilisation Factor

26.1 Capacity Utilisation Factor (CUF) norms for the Control Period shall be as follows:

<i>Wind Zone</i>	<i>Annual Mean Wind Power Density (W/m²)</i>	<i>CUF</i>
<i>Zone 1</i>	<i>200-250</i>	<i>20%</i>
<i>Zone 2</i>	<i>250-300</i>	<i>23%</i>
<i>Zone 3</i>	<i>300-400</i>	<i>27%</i>
<i>Zone 4</i>	<i>> 400</i>	<i>30%</i>

26.2 The annual mean Wind power density specified in Regulation 26.1 above shall be measured at 50 metre hub-height.

26.3 For the purpose of classification of Wind energy project into particular Wind Zone class, the State-wise Wind power density map prepared by the Centre for Wind Energy Technology (C-WET) and enclosed as Schedule to these Regulations, shall be considered.

Provided that the Commission may by notification in official gazette, amend the schedule from time to time, based on the input provided by C-WET/MNRE.”

- b) Based on these tariff determination norms, the Commission determined the Generic Tariff for Wind Energy in suo-motu proceedings each year from FY 2010-11 to FY 2015-16 by issuing separate RE Tariff Orders. The Commission issued its first

Generic RE Tariff Order on 14 July, 2010 in Case No. 20 of 2010. Regarding Wind Zone classification, the Commission ruled as under:

“Commission’s Ruling

Regulation 26.3 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 specifies that the State-wise Wind power density map prepared by Centre for Wind Energy Technology (C-WET) shall form the basis of classification of Wind energy project into particular Wind Zone class. In view of operational concerns expressed by the Wind Energy developers and MSEDCL, the Commission directs Maharashtra Energy Development Agency (“MEDA”) to devise suitable procedures for operationalising the same in consultation with C-WET/Wind Energy developers and distribution licensees within two months from issuance of this Order and also publish such information on its website on regular basis.”

c) However, the Commission proceeded to determine the Zone-wise levelised tariff for Wind Power Projects which were expected to be commissioned in FY 2010-11. For determination of tariff, the Commission considered the expected annual generation from the Projects based on the CUF mentioned in the RE Tariff Regulations, 2010.

d) In its Generic RE Tariff Order dated 29 April, 2011 in Case No. 39 of 2011 for FY 2011-12, the Commission ruled as under:

“3.11. INTERIM MECHANISM FOR WIND TARIFF DETERMINATION

As regards operationalisation of a Wind Zone based tariff, the Commission in its generic RE Tariff Order for FY 2010-11 (Case No. 20 of 2010 dated July 14, 2010) had directed the State Nodal Agency, MEDA to devise suitable procedures in consultation with C-WET/Wind Energy developers and distribution licensees within two months from issuance of the Generic RE tariff Order for first year of the Control Period and also directed MEDA to publish such information on its website on regular basis. However, it is understood that development of such procedures is at an advanced stage of finalization.

Pending finalisation of such procedure and in order to remove the difficulty being faced in classifying Wind power projects under appropriate Wind Zone and execution of EPAs between the Wind energy producers and DISCOMS, the Commission in pursuance of the provisions of “Removal of Difficulty” under Regulation 77.1 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 has decided to allow an interim mechanism wherein a uniform tariff irrespective of Wind Zone shall be applicable for Wind energy purchase by distribution licensees under preferential tariff route. The uniform tariff shall be equivalent to that determined considering the parameters pertaining to Wind Zone 2 as is specified under the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010. The applicable tariff under Wind Zone 2 has been specified under section 3.12 of

this Order. The Interim Tariff applicable for the Wind power projects in the State of Maharashtra commissioned during FY 2010-11 shall be the tariff determined for Wind Zone 2 as specified in section 3.11 of the Suo-Motu Generic RE Tariff Order for FY 2010-11 (Case No. 20 of 2010 dated July 14, 2010). The Interim Tariff applicable for the Wind power projects in the State of Maharashtra commissioned during FY 2011-12 shall be the tariff determined for Wind Zone 2 as specified in section 3.12 of this Order.

However, this interim mechanism shall be in force only till the time of finalisation of the procedure for operationalisation of Zone-wise tariff in the State by MEDA. Once the procedures are finalised, the Zone wise tariff, as determined through the yearly Suo-Motu Generic Tariff Order for projects commissioned after notification of MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, shall be applicable with retrospective effect. The adjustments for over-recovery or under-recovery, as the case may be, in tariff owing to Wind power projects falling under Wind Zones other than Wind Zone 2 shall be carried out between the distribution licensee and Wind energy developers provided Wind energy developers submit necessary certification supporting the respective Wind Zone under which their projects qualify.”

e) MSEDCL implemented the above Order and the payments to Wind Generators were made as per Wind Zone 2 tariff. From FY 2012-13, MEDA devised a procedure for classification of Wind Power Projects into a particular Wind Zone class as per the Commissions' directives. Payment is being made to the Wind Generators as per Wind Zone class certified by MEDA. However, in FY 2013-14 it was observed that some Wind Power Projects are getting generation at a CUF which was more than the corresponding Wind Zone class allotted by MEDA. Accordingly, MSEDCL raised the issue of mismatch between the Wind Zone-wise classification approved by MEDA and the actual (higher) generation of electricity from the Wind Power Projects on annual basis before the Commission and MEDA. It was also pointed out that most of the Wind Power Projects which are commissioned in the recent past have a hub height in the range of 80 to 110 metres. Higher hub height of Wind turbines allows greater utilisation of wind energy due to the greater wind potential available at higher heights and larger rotor diameter. However, most of the Wind Power Projects were still getting classified in Wind Zone 1, with CUF less than 20-22% which was the minimum CUF, as MEDA had continued with the Wind Zone classification based on historical data of Wind Power Density (WPD) measurement at 50 meter hub height.

f) CUF is one of the important parameters considered by the Commission for determination of Wind tariff, which ensures recovery of costs in 13 years under the Energy Purchase Agreements (EPAs). Lower CUF indicated lower annual generation and consequently led to determination of higher tariff, and higher CUF implied lower tariff.

g) The Commission in its RE Generic Tariff Order dated 7 July, 2014 in Case No. 100 of 2014 for FY 2014-15 has observed that:

“The Commission observes that CERC while issuing the RE Tariff Regulations, 2012 has revised zone-wise classification and respective CUF based on 80m hub height highlighting that there is no merit in contentions that WPD Zones should be defined at 50m when most of the wind turbines being installed in India are having hub heights of about 80m. Further, the Commission notes that CERC while formulating its RE Tariff Regulations, 2012 has observed that some of the stakeholders including manufacturers of wind turbine are also in agreement with considering 80 m hub height against 50m hub height turbines.

The Commission is of the view that while promoting the wind power generation through preferential tariff and other Regulatory measures, the benefit of advancement in the technology and improvement in the performance thereof should also be passed onto the utilities/consumers. In this context, the Commission notes the submission made by MSEDCL that there is need to review the Wind Zone classification based on the actual generation by wind power project at the end of the financial year.”

h) The Commission has recognised that the CUF to be specified against the revised Zone-wise classification and higher hub height needs to be established through study of actual CUF data, for which purpose MEDA has been directed to submit a report of Project-wise CUF norms of Wind Projects in the State. That report would be taken into consideration to arrive at the CUF norms to be specified against the revised Zone-wise classification at higher hub height, and the result of such analysis would be considered by the Commission for arriving at the appropriate CUF norms for future years for further determination of Zone-wise tariff.

i) These directives show that the Commission had itself intended to specify CUF against revised Zone-wise classification. Accordingly, higher hub heights need to be established on actual analysis of data collected from the Wind Projects, which MEDA is obliged to provide within a reasonable time.

j) MEDA is still conducting its study in the subject matter in coordination with National Institute of Wind Energy (NIWE), and hence has continued its old procedure of classification of Wind Power Projects into Wind Zone classes on the basis of historical WPD measured at 50 m. hub height. Despite the above directives, MEDA has not yet completed this exercise and is admittedly still continuing with 50 m. hub height due to which some of the Wind Projects get benefit of higher Wind tariff and are being given unjust enrichment.

k) The RE Tariff Regulations, 2015 were notified on 10 November 2015. The minor changes in the CUF norms (as compared to RE Tariff Regulations, 2010) are as under:

“28. Capacity Utilisation Factor

28.1 The CUF norms for wind Energy Projects for the Review Period shall be as follows for the purpose of tariff determination:

<i>Wind Zone</i>	<i>Annual Mean wind Power Density (W/m²)</i>	<i>CUF</i>
<i>Zone 1</i>	<i>≤ 250</i>	<i>22%</i>
<i>Zone 2</i>	<i>> 250 ≤ 300</i>	<i>25%</i>
<i>Zone 3</i>	<i>> 300 ≤ 400</i>	<i>30%</i>
<i>Zone 4</i>	<i>> 400</i>	<i>32%</i>

Provided that these CUF norms may be revised by the Commission through general or specific Order considering data that may become available subsequently.

28.2 The annual mean wind power density specified in Regulation 28.1 shall be measured at 80 meter hub height, and State Nodal Agency shall certify the Wind Zone relevant to the proposed wind Energy Project.

28.3 For the purpose of classification of a Wind Energy Project in a particular Wind Zone class, the State Nodal Agency shall refer to the Wind power density map prepared by the National Institute for Wind Energy.”

l) After the RE Tariff Regulations, 2015 came into effect, MEDA undertook a public hearing in the matter of classification of Wind Power Projects into Wind Zone Class and invited comments of all stake holders. It was observed that the proposed classification of Wind Power Projects was again based on the historical data of Cre measured at 50 meter hub height. MSEDCL submitted its comments to MEDA on 12 August, 2016 and requested it to adhere to the procedure prescribed under RE Tariff Regulations, 2015 on the basis of 80 meter hub height. It was further requested to adopt a single Zone tariff similar to other States, and to consider factual generation data of 3 years and classify the Wind Power Projects on the basis of average CUF achieved during the initial 3 years.

m) MEDA conducted the public hearing on 18 and 19 August, 2016. Although MSEDCL's comments were placed on record, their cognizance was not taken during the process of classification of Wind Power Projects, and Wind Zone classification letters were issued by MEDA to various Wind Generators. In fact, vide letters in August and November, 2016, MEDA mentioned that it had proceeded on the basis of the old procedure as per the specific approval sought from the Commission.

n) The matter was again referred to MEDA vide letter dated 25 November, 2016 reiterating that the criterion of 80 meter hub height needs to be followed when the Wind Power Projects are having a hub height more than 80 meter, in order to pass on the benefits of technological advancement and enhanced efficiency at higher heights

to Utilities/consumers. Further, the Wind Zone classification needs to be reviewed for the first 3 years on the basis of actual CUF/generation and the Wind Zone needs to be linked with actual CUF for the balance tenure of EPAs.

o) Issues involved:

(i) Scrutiny of Wind generation data from field offices reveals that greater hub height has resulted in enhanced efficiency of Wind Turbine Generators and enhanced generation with better CUF.

(ii) Need for review of previous Wind Zone classification in line with actual generation.

MSEDCL has carried out data analysis of actual Wind generation vis-a-vis CUF as per Wind Zone allotted by MEDA in respect of new Wind Power Projects commissioned after FY 2010-11, i.e. Projects to which Wind Zone-wise tariff is made applicable by the Commission.

Observations:

(i) Generation data of 340 Wind Power Projects was analysed for FY2013-14, FY 2014-15 and FY 2015-16. Out of 340 Projects Wind Zone -1 has been allotted to 328 Projects and Wind Zone -2 has been allotted to 12 Projects by MEDA.

(ii) Out of 328 Projects of Wind Zone-1, 42 Wind Projects are getting higher generation with CUF consistently more than 20%. Out of these 42, 30 Projects are getting higher generation with CUF more than 20% for consecutive three years and 12 Projects for consecutive two years.

(iii) Out of above 42 Projects, higher CUF implies that 19 Wind Projects (CUF greater than 20%) should have been classified under Wind Zone -2. 22 Wind Projects (CUF greater than 23%) should have been classified under Wind Zone -3 and 1 Wind Project (CUF greater than 27%) should have been classified under Wind Zone -4.

(iv) The Wind Zone classification done by MEDA directly determines which tariff is applicable to the Wind Project and thus has huge financial implications on long term basis as long as the Project's life span of 25 years. Considering the tariff determination of FY 2013-14, the tariff difference between Wind Zone -1 tariff of Rs. 5.81/unit to tariff of Rs.3.88 /unit for Wind Zone 4 is as large as Rs. 1.93 / unit.

(v) Thus, Wind Generators are getting unduly benefitted twice: in terms of enhanced generation and in terms of highest tariff at the same time, whereas

the financial burden is passed on to consumers. Considering the actual data, the financial implications for the 3 years under consideration amounts to Rs. 139 crore

p) In view of the above, the Wind Zone classification needs to be reviewed at the end of each financial year based on the actual generation submitted by the Generator. If the generation is more than Wind Zone 1 CUF, its Wind Zone classification needs to be changed accordingly and the account should be reconciled. The relevant Wind Zone tariff needs to be made applicable for the next financial year. If the generation is within the range of the classified Wind Zone, the same Wind Zone needs to be considered for next financial year.

q) Such annual verification needs to be carried out for the first three years from the date of commissioning and the correct Wind Zone Classification based on average CUF needs to be made applicable for the remaining tenure of EPA so that benefits of better efficiency can be passed on to the consumers.

r) Revision in classification of Wind Zone will not affect the cost recovery of Wind Generators at all as they will get the Commission determined tariff in accordance with their CUF, but it will certainly provide relief to common consumers through reduction of power purchase cost. Therefore, in the meantime, at least for the above 42 Wind Generators, Wind Zone classification may be reviewed and revised immediately.

s) Accordingly, MSEDCL had suggested to MEDA vide letter dated 19 December, 2016 to consider the analysis carried out by MSEDCL and revise the Wind Zone classification of 42 Wind Generators immediately.

t) Meanwhile, MSEDCL has received a copy of letter dated 18 January, 2017 written by MEDA requesting opinion of NIWE on the request made by MSEDCL for review of the Wind Zone classification of the 42 Wind Generators as well as procedure suggested by MSEDCL for classification of Wind Zones. MEDA has neither given its views/ comments on the MSEDCL suggestions nor proposed any other suitable methodology.

u) Regulatory Provisions:

The RE Tariff Regulations, 2015 empower the Commission to relax or to issue orders to amend the regulatory provisions as below:

“79. Power to Relax

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

80. Issue of Order and Practice Directions

Subject to the provisions of the Act, the Commission may from time to time issue Orders and Practice Directions with regard to the implementation of these Regulations.

81. Power to Amend

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

4. Vide its Reply dated 20 May, 2017, MEDA has stated that:

a) On revising Wind Zone classification of 42 Generators, MSEDCL has raised the issue of the actual (higher) generation of electricity from the Wind Power Projects on annual basis for which MEDA has issued Zone I letters to 328 Wind Generators. MSEDCL has carried out data analysis of actual Wind generation vis-à-vis CUF as per Wind Zone I allotted by MEDA to 42 out of 328 Wind Generators and found them getting higher generation with CUF consistently more than 20%. However, for the remaining 286 Wind Generators, actual generation data is not made available by MSEDCL. The balance 80% Wind Generators' generation data needs to be evaluated with respect to the actual CUF and may need to be co-related it with the WPD at 80 meter hub height. Also, generation less than the estimated CUF may be co-related for averaging the CUF for compensating the overall generation loss in similar cases, if any. In view of the issues raised by MSEDCL regarding the Wind Zone allotted on the basis of WPD and actual generation, MEDA has requested NIWE, Chennai to give its technical opinion on the points raised by MSEDCL.

b) On the issue of devising a procedure to adopt 80 meter hub height (or more) data for WPD measurement, to link up actual generation data with Wind Zone classification and direction to MEDA to adopt the methodology suggested by MSEDCL till the procedure to adopt 80 meter hub height is finalized by MEDA: as per directives of the Commission, MEDA has finalized the procedure for classification of Wind Power Projects into Wind Zone classes in consultation with all stake-holders, including NIWE. The Commission has given approval to this procedure. MEDA has issued Wind Zone class letters to eligible Wind Power Projects as per the set procedure.

The Commission through its RE Tariff Regulations, 2010 fixed the hub height for measurement of WPD at 50 meter and norms for CUF through various Orders. The Commission subsequently, through the Tariff Regulations, 2015 notified on 10 November, 2015, has modified the hub height for measurement of WPD to 80 meters.

In its letter dated 9 February, 2016, the Office of the Commission stated as follows:

“In this regard, I am directed to inform that in line with Regulation 26.2 of MERC (Terms and Conditions for determination of RE Tariff) Regulations,

2010 and the Commission's ruling in Case No. 100 of 2014, MEDA shall certify the Annual Mean Wind Power Density (WPD in W/m^2) to be measured at 50 meter hub height for classification of Wind Power Projects into the Wind Zone class, commissioned during FY 2014-15 and the extended period up to 9 November, 2015.

Thereafter, i.e. from 10 November, 2015 onwards, certification of WPD shall be governed as per Regulation 28.2 of MERC (Terms and Conditions for Determination of Renewable Energy Tariff) Regulations, 2015."

The provisions of RE Tariff Regulations, 2015 are as follows:

"28.2 The annual mean wind power density specified in Regulation 28.1 shall be measured at 80 meter hub height, and State Nodal Agency shall certify the Wind Zone relevant to the proposed wind Energy Project.

28.3 For the purpose of classification of a wind Energy Project in a particular Wind Zone class, the State Nodal Agency shall refer to the wind power density map prepared by the National Institute for wind Energy."

The Tariff shall be valid for a Tariff Period of 13 years from the Commercial Operation Date (COD). The classification of Wind Power Projects into Wind Zone class is done on the basis of the above directives issued by the Commission.

c) Regarding directives to MEDA to review the Wind Zone classification of 42 Wind Generators and revise them as per the actual generation, regarding the Zone allotted on the basis of WPD and actual generation, MEDA has requested NIWE, Chennai to give its technical opinion on the points raised by MSEDCL.

d) In view of the above:

i) MEDA will follow up with NIWE for its opinion regarding the issues raised by MSEDCL on Zone allotment on the basis of WPD and actual generation.

ii) The opinion of NIWE would reduce the difficulty on the above to some extent.

iii) It is necessary to take into consideration the balance 286 Wind Generators' actual generation data for the above.

5. The proceedings at the hearing held on 8 June, 2017 are summarized as follows:

a) MSEDCL stated that:

(i) Regulation 26 of the RE Tariff Regulations, 2010 provides that the CUF and the annual mean WPD be measured at 50 metre hub-height. The Commission in its first Generic RE Tariff Order dated 14 July, 2010 in Case No. 20 of 2010 had directed MEDA to devise suitable procedures for classification of Wind Power Projects into particular Wind Zone classes in consultation with C-WET/Wind

Energy Developers and Distribution Licensees. Subsequently, from FY 2012-13, MEDA devised a procedure for this. In FY 2013, it was observed that some Wind Power Projects were getting higher actual CUF than the corresponding Wind Zone classification done by MEDA. MSEDCL also pointed out to MEDA that the hub height of 80 to 110 m is being considered by Wind Power Projects in the recent past. However, MEDA continued with the procedure of Wind Zone classification based on historical data of WPD measurement at 50 meter hub height. The RE Tariff Regulations, 2015 have also considered the annual mean WPD measured at 80 meter height.

(ii) MSEDCL has analysed the actual generation data of 340 Wind Power Projects for FY 2013-14 to 2015-16. Out of these 340 Projects, 328 fall under Wind Zone -1 and 12 under Wind Zone -2. Out of the 328 Projects, 42 Projects are getting consistently much higher CUF than 20%. These 42 Wind Projects should have been classified as: 19 Projects under Wind Zone -2; 22 under Wind Zone -3 and 1 under Wind Zone -4.

(iii) In the light of the above analysis carried out for 42 Wind Projects, MSEDCL has suggested to MEDA that the Wind Zone classification needs to be reviewed at the end of the financial year based on the actual generation submitted by the Generator and the account should be reconciled. The relevant Wind Zone tariff needs to be made applicable for the next financial year.

- b) The Commission asked MSEDCL why generation data of only 42 out of 328 Wind Projects was analysed and sent to MEDA, and whether it has analysed the data for the remaining 286 Wind Projects. MSEDCL stated that generation data of 328 Projects had been analysed but, out of these, only 42 Projects are getting CUF consistently much higher than 20%. Hence, reclassification of Wind Zones in respect of these 42 Projects is sought from MEDA and generation data has been sent to it. The Commission asked whether all these 42 Projects are located in the same cluster or area and how it has segregated only 42 Projects out of 328. MSEDCL replied that out of 42 Projects, 38 are located in Satara District.
- c) The Commission asked MEDA about the action taken on the generation data of 42 Projects furnished by MSEDCL. MEDA stated that it has not received such generation data from MSEDCL. The Commission observed, however, that the written submission from MEDA dated 20 May, 2017 mentioned receipt of generation data of 42 Projects from MSEDCL, and regretted MEDA's unpreparedness at the hearing. At MEDA's request, the Commission allowed it 10 days for filing its detailed response.
- d) The Commission observed that there is need for better coordination between MSEDCL and MEDA on such issues. MSEDCL should provide the remaining data of 328 Wind Generators to MEDA so that it could take it up with NIWE.

e) Dr Ashok Pendse, on behalf of Thane-Belapur Industries Association (TBIA), an Authorised Consumer Representative, stated that MSEDCL is seeking revision of Wind Zone classification of 42 out of 328 Wind Generators under Zone-1 because the actual CUF is higher than the allotted CUF. However, in case the remaining 286 Generators are getting lower CUF (less than 20%), he asked whether such Generators would be compensated by MSEDCL assuming the deemed generation as per the Wind Zone classification.

6. Following the hearing, vide its letter dated 29 August, 2017 MEDA submitted the following correspondence between it and NIWE:, with its observations:

a) MEDA's letter dated 18 January, 2017 to NIWE: MSEDCL has raised the issue of the actual (higher) Generation of electricity from Wind Projects on annual basis for which MEDA has issued Zone-I letters to 328 Wind Generators. MSEDCL has carried out data analysis of actual Wind generation vis-a vis CUF as per Wind Zone –I allotted by MEDA to 42 out of 328 Wind Generators and found them getting higher generation with CUF consistently more than 20%. Hence, MEDA sought technical opinion of NIWE on the issues raised by MSEDCL.

b) MEDA's letter dated 30 June, 2017 to NIWE: MEDA forwarded the generation data and other details of 328 Wind Projects to NIWE as given by MSEDCL vide its e-mail dated 22 June, 2016 and sought technical opinion from NIWE.

c) MEDA's reminder dated 9 August, 2017 to NIWE seeking its technical opinion.

d) NIWE's reply letter dated 10 August, 2017 to MEDA (with its technical opinion):

(i) The Wind Zone classification procedure is carried out by considering only a static hub height, i.e. 50 or 80 meter height. As the actual hub height of the Wind turbines are varying from this static height, the actual generation at some sites may depict deviation from the Wind Zone fixed.

(ii) By considering the above procedure, comparing the actual CUF results with the fixed Wind Zone is inappropriate because the actual generation /CUF depends on many parameters, namely hub height, rotor diameter, turbine performance, grid availability, etc. However, the Wind Zone fixing concept is based only on Wind climate at a static height of 50 or 80 meters.

(iii) In the same Wind Zone, different turbines may yield different generation /CUF, mainly based on the technology /performance of the turbine. If the actual CUF is used as a tool to decide Wind Zone, then such procedure

should be examined thoroughly so that the credit to the better performing turbine is not denied.

(iv) Considering all these points, the adoption of the appropriate procedure for fixation of Wind Zone; whether based on actual generation /CUF or numerical at a static height (50 or 80 meter), or a combined procedure, is the deciding factor in this issue. That is a policy matter on which NIWE does not have any locus standi.

7. The proceedings at the hearing held on 12 September, 2017 are summarized as follows:

a) MSEDCL stated that:

(i) The Commission had directed MSEDCL to provide data of the remaining 328 Wind Generators to MEDA for technical opinion from NIWE.

(ii) Accordingly, on 22 June, 2017 MSEDCL had submitted data of the remaining 328 Generators to MEDA. It appears that MEDA has received a technical opinion from NIWE vide its letter dated 18 August, 2017. MSEDCL, unaware of this development, scheduled a meeting with MEDA on 31 August, 2017 in which MSEDCL came to know that MEDA has forwarded NIWE's technical opinion to the Commission.

b) With respect to the assignment of assessment of the realistic CUF of Wind Energy Projects, the Commission asked MEDA the reasons for the delay of 2 years in seeking information from MSEDCL. MEDA stated that NIWE, vide its letter dated 21 December, 2015, had sought various details of the Wind Generators such as location, capacity, generation details, grid connectivity, machine availability, and SCADA details for each Wind turbine installed in Maharashtra. Vide its letter dated 15 July, 2017; MEDA has sought these details from MSEDCL. The present status is that MEDA has received the technical opinion from NIWE.

c) MSEDCL stated that NIWE, in its letter dated 10 August, 2017, has suggested that the deciding factors for adoption of the appropriate procedure for fixation of Wind Zone are as follows:

(i) based on actual generation /CUF, or

(ii) based on numerical at a static height (50m or 80 m) , or

(iii) based on a combination of the above.

NIWE has not ruled out revision of procedure for fixation of Wind Zones. MEDA has also forwarded NIWE's technical opinion to the Commission as it is.

d) The Commission observed that, with respect to the actual CUF and generation availability of a Wind Generator vis-a vis MSEDCL's contracted capacity in MW with such Generator, MSEDCL is frequently changing its stand as per its convenience, as observed in the present proceedings vis-a vis the separate

Renewable Purchase Obligation (RPO) compliance verification proceedings. The Commission also observed that MSEDCL seeks to change the entire matrix of determination of Generic Tariff and the Zoning concept.

- e) In this context, the Commission asked MSEDCL what the basic norms and principles for Wind Zone classification of a Wind Generator were. Representative of MSEDCL stated that he is not fully aware of the actual Wind Zone classification process. The Commission regretted MSEDCL's unpreparedness at the hearing. It observed that, without knowing the basic norms for Wind Zone classification, MSEDCL could not argue for revision of the present procedure for fixation of Wind Zones for a Wind Generator.
- f) MEDA stated that NIWE's technical opinion may be considered as MEDA's view. The Commission asked MEDA to make its submission stating the site and operational difficulties in MSEDCL's proposal for revision in Wind Zone classification, within two weeks.
- g) Dr. Ashok Pendse, on behalf of TBIA, reiterated his earlier submission. MSEDCL is seeking revision of Wind Zone classification of 42 out of 328 Wind Generators in Zone-1 because their actual CUF is higher than the allotted CUF. He asked whether, in case the remaining 286 Generators are getting lower CUF (less than 20%), they would be compensated by MSEDCL assuming the deemed generation as per the Wind Zone classification. The Commission asked MSEDCL for its response within two weeks.

8. In its submission dated 13 October, 2017, MEDA stated as follows:

- a) The procedure for classification of Wind Power Projects into Wind Zone classes had been done in consultation with NIWE, MSEDCL and all other Distribution Licensees, and Wind Project Developers.
- b) The Commission has given approval for its implementation on 12 September, 2011 and, accordingly, MEDA issued Wind Zone classification letters to Developers.
- c) As per MSEDCL's representation dated 19 December, 2016 for reclassification of Wind Zones, MEDA sought opinion from NIWE vide letter dated 18 January, 2017.
- d) NIWE submitted its technical opinion on 10 August, 2017, which is also with the Commission.
- e) As per the Commission's directives in letter dated 9 February, 2016, MEDA certified Wind Zone Class by considering Annual Mean WPD at 50 meter hub height up to 9 November, 2015. From 10 November, 2015, MEDA is certifying WPD

considering 80 meter hub height as per Regulation 28.2 of RE Tariff Regulations, 2015.

f) As per NIWE's letter 18 August, 2017, if the actual CUF is used as a tool to decide the Wind Zone, then such procedure should be examined thoroughly so that credit to the better-performing turbines is not denied. NIWE's letter also clarifies that CUF is also the function of Wind pattern, and variation in both directions in Wind pattern is a common phenomenon. Also, in case of Wind turbine-based procedure, each turbine should have an individual meter for determining its CUF.

g) Revision of procedure for classification of Wind Power Projects into Wind Zone class is a policy matter. MSEDCL may come with its suggestion for future Wind Power Projects.

9. In its further submission dated 1 November, 2017, MSEDCL stated that:

a) As per the Commission's RE Tariff Regulations, 2010 and 2015, Wind Generators up to 20% CUF fall under Wind Zone 1 and are considered for payment under Wind Zone 1. The Generators above CUF of 20% and upto 22% are considered in Wind Zone 2.

b) In connection with the Wind Zone-wise tariff of Wind generation, the Wind Projects are classified into different Wind Zones by MEDA on the basis of WPD data and not on the performance of an individual Wind Turbine Generator, its manufacturer or technology used, etc. Else, allotment of Wind Zone to Wind Project which is on the machine to machine basis which will not be practically possible. Thus, most of the Projects are classified under Wind Zone 1. MSEDCL has never requested a zoning methodology.

c) However, it is observed that Wind Projects are able to generate energy at higher CUF due to technology advancement, larger rotor diameter, and higher hub height with class C / class III machines specially designed for low Wind areas. Thus, Wind Generators are getting higher CUF of Wind Zone 2 (or 3 in some areas) and at the same time enjoying the highest tariff of Wind Zone 1.

d) The windy states like Gujarat, Karnataka, Andhra Pradesh and Tamil Nadu having large wind energy potential have determined only a single tariff. Uttarakhand has a Zone-wise tariff. In Uttarakhand, annual mean WPD upto 200 w/m² falls in Wind Zone 1. Hence, MSEDCL requested the Commission not to consider Zone-wise tariffs for Wind Power Projects in Maharashtra but determine a single tariff for all Zones.

e) In view of the above, MEDA may be directed to review the Wind Zone classification at the end of financial year based on the actual generation submitted by the Generators. If the generation is more than Wind Zone 1 CUF, Wind Zone classification may be changed accordingly and the account should be reconciled.

f) Annual verification needs to be carried out for the first three years only from the date of commissioning and the correct Wind Zone classification based on average CUF needs to be decided, which will be applicable for the remaining tenure of EPA so that benefits of better efficiency can be passed on to consumers.

g) In case of Wind Generators giving a lower CUF than that determined by the Commission and Wind Zone classified by MEDA, it is sheer inefficiency of the Wind Generators. Also, it is the responsibility of Wind Generators/ manufacturers to generate electricity within the Zone classified by MEDA to avail benefit of preferential tariff as determined by the Commission. As per the Regulations, CUF 20% falls under Zone 1 category and the question of compensation to Wind Generators below 20% CUF does not arise.

h) MSEDCL may be allowed to revise the tariff of all these Generators by conducting reverse competitive bidding for determination of tariff, so that tariff arrived will be technology based tariff and will be beneficial to consumers.

i) MEDA did not raise any objection to the stand of MSEDCL regarding its prayers.

j) As the Wind Zone classification has been decided by the Commission, necessary re-classifications under the removal of difficulties clause of the Regulations may be decided by the Commission.

10. The proceedings at the hearing held on 7 November, 2017 are summarized as follows:

a) MSEDCL stated that the Wind Zone classification for the Wind Projects is done by MEDA entirely on the basis of Wind density data, but now it is necessary to consider other factors such as technological advancement, large rotor diameter, hub height, etc. which govern higher CUF. Wind Generators who are achieving higher CUF in particular Wind Zones are enjoying the higher tariff of that lower CUF Zone as per the present zoning concept. The tariff should be based on Zone classification based on actual generation and CUF submitted by Generators at the end of the financial year, for which MSEDCL had earlier submitted data of 42 such Generators out of 328.

b) The Commission again observed that MSEDCL had not addressed its basic questions regarding the Wind Zone classification process, nor has it indicated how the process is unscientific. The Commission asked MSEDCL for any criteria /principles/ manner which it feels necessary for Wind Zone classification of Generators, apart from stating that the actual CUF achieved by a Generator should be the basis of tariff, which implies that zoning be done away with entirely. The Commission observed that, without understanding the basic norms for Wind Zone classification and its purpose, MSEDCL cannot argue for revision of the present procedure.

c) The Commission also asked MSEDCL what the intervals at which zoning should be re-assessed, and whether any scientific study has been done for better results which may be considered for revision of the Wind Zone classification. MSEDCL did not respond.

d) The Commission observed that MSEDCL is seeking revision of Wind Zone classification of Wind Generators in Zone-1 as the actual CUF of some of the Generators is higher than the CUF assigned to that Zone. The higher tariff incentivises them to upgrade the technology, efficiency of machines, etc. At the same time, in its submissions in the RPO compliance verification and other matters, MSEDCL has been claiming that Wind Generators have been achieving lower CUF. In its submission dated 1 November, 2017, MSEDCL has also stated that Wind Generators who achieve lower CUF are inefficient and hence should not get the higher tariff of that Zone. These are all contradictory stands.

e) In response to a query of the Commission, MEDA stated that, as per the statistical data of the past three years, the average generation of Wind Generators is almost constant, i.e. 1.5 MUs to 2 MUs, inspite of changing weather conditions. Also, no major change is observed in the weather pattern since FY 2012-13 in which the Wind Zone classification was carried out. Moreover, the average Plant Load Factor (PLF) remained about 16% over the years. Hence, as of now, re-assessment and revision of Wind Zone classification has not been considered necessary.

f) Dr. Ashok Pendse, on behalf of TBIA his earlier submissions, and stated that MSEDCL is seeking revision of Wind Zone classification of a few Wind Generators from Zone -1 but silent on compensating other Generators in higher CUF Zones who have achieved lower CUF. The opinion of NIWE on the time interval to be considered for revision of Wind Zone may be taken into consideration.

Commission's Analysis and Ruling

- 11. MSEDCL has stated that, out of 340 Wind Power Projects in Maharashtra, 328 are in Wind Zone 1. Of these 328 Projects in Wind Zone 1, actual generation data for the 3 years from FY 2013-14 to 2015-16 shows that 42 Projects achieved a CUF consistently higher than 20%, which is the defining limit for Zone 1 (which has a higher Tariff). Considering the higher CUF achieved by them, 19 of these Projects should be categorized in Wind Zone 2, 22 in Wind Zone 3 and one in Wind Zone 4 and, therefore, be eligible only for the lower Tariffs applicable to those Wind Zone classes. On this basis, MSEDCL has proposed a modification in the manner in which Projects are categorized into different Wind Zone Classes, depending on their performance in the initial years. MSEDCL has also stated that, while the present Wind Zone classification is based on WPD, other factors such as technological improvements, large rotor diameter, higher hub heights, etc., which contribute to higher CUF, also now need to be considered.**

12. The Commission notes as follows:

- 1) The RE Tariff Regulations, 2010 introduced the determination of Generic Tariffs for Wind Projects depending on the Wind Zone class of their location, with which different CUF levels were associated.**
- 2) 4 Wind Zone classes have been identified based on Annual Mean WPD, with Wind Zone 1 having the lowest WPD and correspondingly lower CUF than other Zones.**
- 3) This Wind Zone classification considered the State wind density maps prepared by the Centre for Wind Energy Technology (C-WET) (subsequently renamed NIWE) from time to time.**
- 4) Considering the less advantageous characteristics of Wind Zone 1, the Wind Projects in this class have been provided a higher Tariff, with progressively lower Tariffs for the Projects in Wind Zones 2 to 4 which are better placed in terms of WPD. This distinction would encourage harnessing of the wind energy potential in the State to a greater degree than would otherwise be the case.**
- 5) The CUF norms associated with each Wind Zone have been based on a broad assessment of the status and improvements in available, cost-effective technologies and equipment in the wind energy sector in India from time to time.**
- 6) The CUF in relation to the Wind Zone classification on the basis of the Annual Mean WPD has also been taking into account increases in hub height, from 50 m. in the RE Tariff Regulations, 2010 to 80 m. under the current Regulations of 2015.**
- 7) Progressive increases have also been stipulated by the Commission from time to time in the normative CUF associated with each Wind Zone class - for instance, from 20% in 2010 to 22% at present for Wind Zone 1 (Annual Mean WPD of 200-250 W/m²) considering technological advances and other factors.**
- 8) As the Commission has observed in its RE Tariff Order in Case No. 10 of 2012, the WPD-based approach for determination of Wind Zone-specific Tariffs recognises the combination of wind velocity and power curve of the machines which takes into account harnessing of available wind power potential in the most optimal manner.**

- 9) This basic framework for Wind Energy Projects has been followed, since the Regulations of 2010, in the RE Tariff Orders of the Commission, and now in the present RE Tariff Regulations, 2015.

MSEDCL's proposals and its observations have to be tested against this background, context, principles and rationale.

13. In order to operationalise this framework for the Generic Tariff determination for Wind Energy Projects, MEDA submitted the proposed procedure for assignment of Wind Zone class to the respective Generators, which the Commission approved on 12 September, 2011. As MEDA has stated in these proceedings, that procedure was proposed after consultation with NIWE (then C-WET), MSEDCL and other Distribution Licensees, and Wind Project Developers. The procedure (also available on MEDA's website) is as follows:

a. "The value of annual mean Wind Power Density (WPD) of the Windy sites declared by Centre for Wind Energy Technology (C-WET) under Ministry of New and Renewable Energy (MNRE) or Maharashtra Energy Development Agency (MEDA) programme; or the value of the annual mean WPD of the private Windy site data vetted by C-WET, shall form the basis for the classification of Wind power projects into Wind Zone class.

b. The effective area for each Windy site declared by C-WET under MNRE or MEDA programme, and for the private Windy site data vetted by C-WET, shall be 10 km radial distance from the location of the Wind mast, which will be the reference point. The annual mean WPD at the Wind mast shall be considered to be the annual mean WPD for the effective area of that Windy site. This annual mean WPD will be made applicable for the Wind power projects falling within such effective area.

c. If a Wind power project falls within the effective areas of two different Wind masts having different values of annual mean WPD, then the annual mean WPD of the nearest Wind mast shall be considered for that project. MEDA may advise the developer/investor, if found necessary in such a case, to approach C-WET to obtain project specific annual WPD report from C-WET.

d. i) Within the effective area, if 50% or more than 50% of WTG location co-ordinates of a Wind power project are falling above or below 60m elevation difference with reference to the mean sea level of the Wind mast, then either MEDA can advise the developer/investor to approach C-WET to obtain project specific annual mean WPD report from C-WET; or the developer/investor can request MEDA for permission to approach C-WET to obtain project specific annual mean WPD report from C-WET. MEDA may allow developer/investor to approach C-WET only in those cases which fall under this criterion.

ii) The classification of such Wind power projects into Wind Zone class will be done on the basis of the project specific annual mean WPD issued by C-WET, a copy of which will be marked by C-WET to MEDA.

iii) C-WET will lay down appropriate methodology for the issuance of the project specific annual mean WPD.

e. The developer/investor is required to optimize all technical parameters for maximum generation from the Wind power project classified as per this procedure. The feasibility of the project will be the responsibility of the developer / investor. C-WET and / or MEDA shall not be responsible in any way for the feasibility of the project, and/ or for the non achievement of PLF by any or all WTGs in the project area. C-WET and / or MEDA will not entertain any complaint in this regard.

f. The developer/investor who intends to sign Energy Purchase Agreement with the distribution licensee should submit application in the prescribed format to MEDA for Wind Zone classification. After due processing and enquiry, MEDA will issue a letter in respect of classification of the Wind power project under consideration, into appropriate Wind Zone class. The letter will be issued to the developer/investor, with a copy marked to the concerned distribution licensee. Meanwhile, the developer/investor shall also submit an undertaking to MEDA, prescribed in this regard for obtaining clearances.

g. This procedure may be reviewed by MEDA, keeping in view the difficulties in implementation. MEDA reserves the right to make appropriate changes, if and when required.”

14. With regard to revision in the Wind Zone classes, the last RE Tariff Order dated 28 April, 2017 in Case No. 33 of 2017 recorded the following submissions of MSEDCL:

*“1.7. Revised Wind Zoning for promotion of efficiency in Wind Generation
Comments/Suggestions*

MSEDCL stated that, as compared to last financial year, the proposed Generic Tariff rates are slightly lower, but the reduction is not sufficient to make the power procurement viable for supply of electricity to consumers at a reasonable rate. The RE rates in Maharashtra are not only higher than the rates of conventional power purchase by MSEDCL but also among the highest in India. It is not in the interest of MSEDCL’s consumers to procure RE power at such high rates. For Wind Energy, it is the highest tariff to lowest efficiency. Efficient use of the available potential needs to be promoted. There is a need for a more scientific and logical approach to establish the correct Wind Zone to promote only efficient Generators. Hence, the Wind Energy Tariff needs to be determined based on realistic data to avoid profiteering by Developers and to benefit consumers. The high Tariffs given for RE may be reviewed.”

The Commission concluded as follows:

“Commission’s Ruling

The Commission determines the Generic Tariff for RE technologies considering the parameters specified in the RE Tariff Regulations which have been notified after due public consultation. It is not appropriate to compare the RE Tariff

rates with the rates of conventional power. The EA, 2003 and Tariff Policy, 2016 enjoin the promotion of RE resources. Moreover, the Generic Tariff specified for RE technologies is a levelised tariff over the entire Tariff period, whereas the rates of fossil-fuel based conventional power are subject to periodic revision as per the MYT Regulations or the adjustments allowed in the Power Purchase Agreements entered into through competitive bidding, as the case may be.

The Commission also notes that the Generic Tariff for Wind Energy in Maharashtra is not the highest in the country. Moreover, the Tariff takes into account the prevalent Wind regime and the Commission has determined Zone-wise Tariffs. Wind Tariff for Rajasthan are higher than Maharashtra.

As regards the actual Capacity Utilisation Factor (CUF) for Wind power generation in the State, the Commission in its Order dated 12 March, 2014 in Case No. 180 of 2013 had asked the Maharashtra Energy Development Agency (MEDA) for a detailed study to re-assess the realistic CUF of Wind Energy Projects. MEDA has informed the Commission that it is working on the study with the National Institute of Wind Energy (NIWE), and is coordinating with the concerned agencies for the data required by NIWE.

It would not be appropriate to revise the Wind zoning in the absence of supporting data. The Commission may review the classification of Wind Zones and CUF norms considering the outcome of the study being undertaken by MEDA with NIWE.

In any event, the present proceedings are for determination of the Generic Tariff for RE technologies considering the parameters specified in the RE Tariff Regulations, which have been notified after due public consultation.”

15. The outcome of that study is awaited. However, at the hearing on 7 November, 2017, MEDA stated that data of the last 3 years shows that the average generation of Wind Projects has remained almost constant, i.e. 1.5 MUs to 2 MUs, irrespective of weather conditions. The average PLF has also remained at around 16% over this period. Moreover, there has been no major change in the weather pattern since FY 2012-13 when the Wind Zone classification was done. In MEDA's opinion, therefore, re-assessment and revision of the Wind Zone classification is not necessary as of now.
16. MEDA has also submitted NIWE's opinion dated 10 August, 2017 with regard to Wind Zone classification in the context of MSEDCL's finding that 42 Generators in Wind Zone 1 achieved a higher CUF, and its consequent proposal. NIWE has pointed out that:
 - (i) The Wind Zone classification procedure is carried out considering only a static hub height, i.e. 50 m or 80 m. height. As the actual hub height of the wind turbines may vary, the actual generation at some sites may show deviation from the Wind Zone fixed.

(ii) Considering the above procedure, comparing the actual CUF results with the fixed Wind Zone is inappropriate because the actual generation / CUF depends on several parameters, namely hub height, rotor diameter, turbine performance, grid availability, etc., but the Wind Zone concept is based only on wind climate at a static height of 50 m or 80 m.

(iii) In the same Wind Zone, different turbines may yield different generation /CUF, mainly because of differences in the technology /performance of the turbines. Using the actual CUF to decide the Wind Zone needs to be examined thoroughly so that credit to the better performing turbines is not denied.

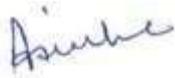
17. MSEDCL proposes that the actual CUF achieved by a Project should be the basis of its Wind Zone classification and corresponding Tariff. That would amount to doing away entirely with such zoning and Tariff determination on that basis, and its encouragement to efficiency improvements; and, in effect, tantamount to determination of Tariff Project-wise. As the Commission has pointed out during these proceedings, MSEDCL has not shown how the present Wind Zone classification rationale, principles, framework and process, set out at paras. 12 and 13 above, are unscientific or ill-founded. By the very nature of Wind Zone classification and the differing profiles of Generators, it is not expected nor at all likely that the performance of all Projects at all locations in a particular Wind Class would be uniform. The fact that 42 (i.e. 13%) of the Projects at Wind Zone 1 locations have a higher CUF does not militate against or negate this framework or its rationale, as NIWE has also pointed out.
18. MSEDCL has also taken contradictory and inconsistent stands: while Projects which achieve a higher CUF would be given the lower Tariff of a higher Wind Zone class, Projects in higher Wind Zone locations who have achieved a lower CUF would not be entitled to the higher Tariff applicable to the lower Wind Zone class. While it has focused on the 13% of Projects in Wind Zone 1 with a higher actual CUF, the Commission notes that, in order to justify its shortfalls in RPO compliance, MSEDCL has been consistently claiming that Wind Generators in general have been achieving a lower CUF than contracted. MSEDCL has also cited approvingly the alternative of a single, uniform Generic Tariff for all Wind Projects. In other words, it would then have no objection to that Tariff being applied even to Projects which achieve a higher CUF than was considered for the determination of the uniform Tariff.
19. With regard to MSEDCL's reference to competitive bidding, the Commission notes that it has separately dealt with its proposal for procurement through competitive bidding from Wind Generators without EPAs with MSEDCL or whose EPA period is over. The Central Govt. has also issued Competitive Bidding Guidelines for procurement of Wind Energy.

20. In view of the foregoing, the Commission finds no merit in MSEDCL's contentions.

The Petition of Maharashtra State Electricity Distribution Co. Ltd. in Case No.41 of 2017 stands disposed of accordingly.

**Sd/-
(Deepak Lad)
Member**

**Sd/-
(Azeez M. Khan)
Member**


**(Ashwani Kumar Sinha)
Secretary**

