

CE/RE/Wind/10690

Date: 22-04-2019

To,  
The Secretary,  
Maharashtra Electricity Regulatory Commission,  
Centre No. 1, 13<sup>th</sup> Floor,  
World Trade Centre,  
Cuff Parade, Mumbai - 400005

**Sub:** - Comments on Report submitted by MEDA on 'Study of Wind Power Density Zones of 42 Wind Power Projects Commissioned under MERC RE Tariff Regulations 2010' (Case No. 152 of 2018)

**Ref:** -

1. MERC email dated 13.03.2019
2. MEDA's Letter to MERC dated 28.02.2019 and Report on 'Study of Wind Power Density Zones of 42 Wind Power Projects Commissioned under MERC RE Tariff Regulations 2010'

Respected Sir,

This is with reference to email dated 13<sup>th</sup> March 2019 from office of Hon'ble MERC seeking MSEDCL's comments and suggestions on MEDA's Report on 'Study of Wind Power Density Zones of 42 Wind Power Projects Commissioned under MERC RE Tariff Regulations 2010' pursuant to MERC's Order in Case No. 152 of 2018 dated 09.07.2018.

In this regard, MSEDCL submits that the Order of Hon'ble MERC dated 09.07.2018, para 13 has directed MEDA to review the wind zone classification on the actual generation data submitted by MSEDCL or generators, not to study wind power density zones of 42 wind Power projects as surprisingly construed by MEDA. This difference is vital in understanding and interpreting the report. Report received has been prepared by M/s. World Institute of Sustainable Energy (WISE) and it seems that MEDA has just forwarded it along with its enclosed letter without offering to any comments. MSEDCL is of the view that as the report has been prepared on behalf of MEDA and as has been submitted to the Hon'ble MERC by MEDA, it must have been completely endorsed by MEDA.

The genesis of wind tariff based on wind zone classification lies in the Regulation 26 of MERC RE Tariff Regulations, 2010. The proviso 26.3 of the said Regulations further provides for amendment in the CUF by the Commission from time to time, based on the input provided by C-WET/MNRE. Thereafter the first Tariff Order with regard to Wind Tariff based on zone classification came in the year 2011.

The Hon'ble MERC notified RE Tariff Regulations, 2015, and as per the proviso 28.1 of the said Regulations, the CUF norms may be revised by the Commission through general or specific Order considering data that may become available subsequently. The proviso 28.2 and 28.3 of said Regulations empowered the State Nodal Agency (MEDA) for certification of all Wind Energy Projects as per the relevant Wind Zones. However MEDA did not initiate any study for re-determination / amendment of wind zones until MSEDCL filed the Petition before the Hon'ble MERC. Even prior to MERC's Order in Case No. 152 of 2018 dated 09.07.2018, the Hon'ble Commission way back in Case No. 180 of 2013 dated 12<sup>th</sup> March, 2014 had directed MEDA as under:

*"31. The Commission directs MEDA to undertake a detailed study to re-assess the realistic Capacity Utilisation Factor (CUF) for Wind power projects in the State with the help of reputed technical institutes within six months from the date of this Order."*

However, MEDA did not undertake any study or analysis until the Hon'ble Commission's recent directives in 2018, thereby delaying the required wind zone re-classification and adversely affecting crores of electricity consumers in the State of Maharashtra. Even after the directives of the Hon'ble Commission dated 09.07.2018, MEDA took almost 9 month for completing such analysis /study, but on totally different pressure than directed by MERC.

MSEDCL honestly feels that MEDA should have prepared report based on their own research, expertise and using internal resources instead of getting it prepared by a consultancy firm i.e. M/s World Institute of Sustainable Energy (WISE) as the report has huge consumer's concerns and M/s WISE's other clients may be companies influenced with this 'analysis' creating a direct conflict of interest. It may be of interest to find out the details of the top management of M/s WISE and its clients. It is also not clear whether MEDA has taken a "Disclosure" from M/s World Institute of Sustainable Energy (WISE) before entrusting the said assignment.

One of the most alarming observations in WISE's report is that conclusions have been provided in an indefinite manner by using words such as 'may be', 'may have', etc, especially at issues which have a huge impact on the common consumers of State of Maharashtra. However the same report has also given firm dispensation in the interest of wind power developers. It is further submitted that MEDA has confused and obfuscated its views in the report, clearly deviating from the objective that was set by the Hon'ble Commission in its order to re-classify the wind zones based on facts and actual figures of generation.

It appears that the report is biased and with pre-decided mindset to justify the higher Tariff by twisting and obfuscating facts and figures using conjectures all over the report instead of providing any analysis and a detailed study.

MSEDCL further submits that as per the provision of Regulations 28.1 of RE Tariff Regulations, 2015, the Commission may amend the RE Tariff Regulations by changing the methodology to decide the Tariff based on the actual CUF and not for the Wind Zone specific Tariff (at specified Wind Power Density range). It is not proposed to adopt new methodology for tariff determination, but rather to use the existing Regulation which MERC has thoughtfully provided for reviewing of the Tariff based on actual generation. Hence, it is prayed that, the Commission shall determine the Tariff based on the actual CUF. The MEDA has also stated that the regulation is silent on the period of review of CUF for revision of CUF norm/zone but it does not mean that the 'classification' should not be renewed after three (3) years. MEDA is raising such unnecessary issues and doubts even when the Hon'ble MERC has explicitly decided to have a look into it and accordingly issued its directives to MEDA.

The report has tried to justify the tenure of EPA of Maharashtra compared with other states by citing vague reasons. MSEDCL has executed EPAs with wind power generators for a period of 13 years as per MERC RE Tariff Regulations 2015 and in accordance to Tariff Orders and not for a period of 25 years as specified by MEDA in its report. It is very unfortunate that MEDA being the state nodal agency of Maharashtra does not know such basic parameters of the Tariff. It is therefore evident that MEDA had left the entire task of report writing to its consultant without actually vetting the contents of its report and has simply submitted the same as it is to the Hon'ble Commission.

Considering the significance of certain key points of the 'report', MSEDCL has briefly provided few comments herein under in order to ensure addressing of the same by the Hon'ble MERC:

**A. CUF:**

MSEDCL shall be allowed to reclassify WTGs in the state to the appropriate wind zones whose Average CUF is more than 20% on the basis of actual generation.

**B. Data:**

1. MEDA's conclusions in its report are based on the WPD data including generation data at the time of issuance of RE Tariff Regulations, 2010 and are not based on the latest data used for analysis. It seems that this way, MEDA is simply trying to misguide the Hon'ble Commission by using inappropriate data.
2. There is substantial scientific evidence from NIWE Website which proves that, multiple sites in the State of Maharashtra have good potential for zone II/III category. The CUF obtained in r/o 42 wind mills is proof of same. However, as per MEDA classification, out of the total no. Wind mills having EPA with MSEDCL, the projects identified under Zone II category are negligible and the details of same are as follows:

Zone	I	II	III	IV
No. of Wind Mills	1641	15	--	--

3. From above facts, it is substantially clear that, MEDA has contradicted its own procedure by classifying almost all wind mills under Zone I.
4. Further there are 0 (zero) wind mills under Zone III and IV category. Hence the question of paying higher tariff for non-achieving of CUF as per zone classification does not arise for these categories. In fact 99% of wind mills are availing the highest tariff and there is no scope for further compensation in view of non-achievement of CUF.
5. There are six wind farms where even MEDA or its consultant founds CUF more than 20 % for the last 3 years. Hence it is requested to re-classify / amend the Wind Zone immediately according to the actual CUF for the projects in these 6 wind farms. Benefits from such dispensation shall be passed on to the consumers as suggested by MERC to MEDA.

**C. Technology, WPD and CUF:**

1. The Generators having CUF more than 20% are getting undue advantage due to increased hub height and technology advancement as they are generating electricity higher than the CUF specified for their wind zone. These wind generators are selling such higher generation to MSEDCL at the highest available Tariff due to wrong classification of their wind zones.
2. It is MSEDCL's suggestion that:
  - a. While notifying the Regulations, the Commission has provided the maximum CUF for the Wind Zone. Therefore, it is expected from any wind generator to generate electricity up to 20 % CUF individually for Wind Zone I and not the '20%' as very wrongly submitted by MEDA.
  - b. MSEDCL has executed EPAs with wind generators for procurement of wind power considering the CUF of such wind zones (i.e. upto 20% CUF for Wind Zone - I). Therefore considering the average of CUFs of the WTGs in the wind mast area to arrive at the CUF for the entire Wind Zone is not appropriate.
  - c. Had it been correct method then single Tariff could have been fixed for entire Maharashtra assuming an average CUF for the entire state instead of zoning. This would lead to grave error in the methodology and will severely burden the consumers of Maharashtra.
  - d. Dispensation of taking average of the particular wind mast area and showing it below 20% limit has to be rejected by the Commission, as some wind generators are taking undue advantage of such higher Tariff and increasing the burden on the electricity consumers of Maharashtra.
3. The Report states that Wind Generators have installed their Turbines after the notification of RE Tariff Regulations 2010 with the wind turbine technology having 80 mtr hub heights whereas the regulations specified for zone wise CUF at 50 mtr hub height. It is submitted that such generators and MEDA should have approached the Commission for determination of tariff for their wind projects at 80 mtr hub

height. These generators knowingly kept the issue silent for their own interests and charged exorbitant tariffs. It is to be noted that the Zone wise tariff were introduced in Maharashtra so as to enable development of wind power projects at least favourable sites i.e. the sites with lower CUF by providing higher tariff. However, such benefit of higher tariff was wrongly availed by WTGs by projecting their wind power project sites as unfavorable despite the project site being favourable and also by deploying technologically advanced WTGs of higher hub heights thereby actually achieving higher CUF and thus selling higher generation to MSEDCL at exorbitantly high rates. Hence, it is evident that the WTGs filled their coffers by developing favourable wind projects achieving higher CUF but registering the same under Zone I @ 20% CUF and taking advantage of the higher tariff.

4. It can be seen that it is a fraudulent practice on the part of such wind generators as they are generating higher energy i.e. achieving higher CUF due to higher hub height and simultaneously also taking advantage of higher Tariff (determined for low CUF) and thereby taking undue advantage of the Regulations. The benefits from higher hub height should be passed on to the consumers of Maharashtra by reclassifying such generators to corresponding CUF Zone.
5. In this report, MEDA has accepted that the some generators had installed wind power projects using advanced technology of 80 Mtr hub heights and hence took advantage of higher generation. It had MEDA apprised the Hon'ble Commission at the right time regarding such technological advancement and increased hub height, the wind power generators could not have taken undue benefit of higher generation along with higher Tariff of Zone I. Also, such benefit could have been shared with the consumers of Maharashtra. The zoning based on WPD has its own lacunae such as location advantages, technology advantages, therefore, CUF based Tariff determination will balance the interest of both parties.
6. In the report, MEDA has stated that the capital cost increases with increase in hub height and the rotor diameter along with the increase in logistics costs due to setting up of projects at complex terrain than installation at flat terrain. In this regard it is to submit that the statement of MEDA is not justified with documentary evidences. The Commission must have fixed the Tariff considering the detailed Capital expenditure for the projects submitted by MEDA. It seems that now MEDA is simply obfuscating this issue under the name of technology/terrain instead of passing on such benefits to the consumers of Maharashtra and is trying to justify the higher CUF for Zone I by virtue of this report which is grave misuse of the provisions of the MERC RE Tariff Regulations.

It is quite alarming to know that 99% of the wind power projects installed under the MERC RE Tariff Regulations, 2010 having EPA with MSEDCL have been registered under Zone I i.e. the zone with lowest CUF of 20%. This clearly implies that such WTGs have taken undue advantage of the wind zone classification framework in Maharashtra by registering, their technologically advanced WTGs achieving higher CUF, with MEDA under Zone I which is for the wind project sites with CUF of less than or equal to 20%.

Whereas in fact such WTGs should have been registered under Zone II/III/IV as per the actual CUF of such projects owing to their technological advancements. It is pertinent to note that, in the recent tenders floated by MSEDCL for procurement of 500 MW wind power through reserves bidding the tariff discovered are Rs. 2.72-2.74 and out of these 500 MW, 350 MW is prepared to be installed in Maharashtra and these developers have identified the sites located at Dist. Aurangabad and Osmanabad in the state of Maharashtra and CUF declared is 35% and 37%. These sites proposed to be chosen by the developers falls in Wind Zone I as per present classification.

Due to this malpractice of WTGs of registering under Zone I with lower CUF rather than under Zone II/III/IV with higher CUF; MSEDCL's consumers have suffered an additional financial burden of INR 245 Crores in FY 2017-18 as at least half of the WTGs are generating power continuously at CUF higher than their classified zone and supplied power to MSEDCL at the higher tariff of Zone I. For FY 2017-18 based on the actual data, it is found that, out of the total 1140 WTGs / locations classified under zone I; the 283 WTGs / locations having installed capacity of 552 MW has achieved CUF pertaining to wind zone II; the 166 WTGs / locations having installed capacity of 390 MW has achieved CUF pertaining to wind zone III; and the 137 WTGs / locations having installed capacity of 89 MW has achieved CUF of wind zone IV. The above data was already submitted to MEDA vide email dated 06 November 2018.

The detailed comments / suggestions of MSEDCL are enclosed herewith as **Annexure A**. It is kindly requested that the same may please be taken on record and be considered by the Hon'ble Commission. It is further submitted that this Hon'ble Commission may graciously be pleased to dismiss the report submitted by MEDA. MEDA has miserably failed to perform its function being a "Nodal Agency" in a free and fair manner. MSEDCL prays and requests the Hon'ble Commission to check the technical expertise of MEDA to conjecture as "Nodal Agency". MEDA has constantly blocked the present issue for more than 5 years on account of its inactions and now has submitted a report which is not as per the direction of MERC bringing extraneous reasons, logic to further obfuscate the issue and delay or stop the reclassification of wind zones.

Thanking You,

Yours Faithfully



Chief Engineer (Renewable Energy)

Enclosure: Details Comments(Annexure-A)

## **MSEDCL's Comments on MEDA's Report on Wind Zone Classifications**

MSEDCL's comments and observations on various sections of the report are as given below:

### **1.1 Analysis of Samples selected by MSEDCL:**

#### **MEDA's Observations:**

1. MSEDCL shortlisted a sample of 42 wind projects (205 MW) out of 340 wind projects commissioned under RE Tariff Regulations, 2010 and assigned Zone as per Wind Power Density at 50 Mtr Hub height.
2. The sample selected by MSEDCL is not a complete sample and is only 8.66% of the total projects commissioned under RE Tariff Regulations, 2010. (Total Installed Capacity under RE Tariff Regulations 2010 is 2373.35 MW).

#### **MSEDCL's Comments:**

MSEDCL submits that the Hon'ble Commission vide Order in Case No. 152 of 2018 dated 9<sup>th</sup> July 2018 has given specific mandate to MEDA to review the wind zone classification of instant 42 wind generators and all such wind generators at end of every financial year based on actual generation data submitted by MSEDCL / generator. Further, the 42 wind generators have been shortlisted based on the actual generation which has been consistently higher for two/three years than the generation corresponding to the CUF (upper limit) for such wind zones. Therefore MSEDCL is of the view that the observations of MEDA are not relevant to the mandate given by the Hon'ble Commission and are contrary to the order of Hon'ble MERC creating confusion and may be avoided for further confusion.

### **1.2 Requirement of analysis of CUF and Wind Power Density on Wind Farm basis.**

#### **MEDA's Observations:**

1. CUF and wind power density of selected 42 wind turbines has to be analysed for every wind mast and all the wind turbines which are referring the same mast. Shortlisted 42 wind power projects are spreads across 4 districts and 14 Wind mast.
2. Out of 14, one wind mast is owned by NIWE and rest 13 wind masts by private developers. Hence, complete wind data of only one wind masts is available for analysis.

#### **MSEDCL's Comments:**

1. The Commission has directed MEDA to review the wind zone classification at the end of financial year based on the actual generation data submitted by MSEDCL/Generator and not on the basis of data from one wind mast of NIWE or remaining mast of private.
2. As mentioned in the report, details of only 1 (one) wind mast are available with MEDA out of the total 14 wind masts, which is not acceptable as MEDA being the state nodal

agency for development of renewable energy in Maharashtra ought to have complete details of all the wind masts in the State whether owned by private developers or NIWE. MSEDCL is of the view that MEDA could have sought the data of wind masts from the private developers in order to carry out a detailed analysis of CUF and Wind Power Density using data of all the 14 wind masts in the vicinity of the 42 shortlisted wind power projects. Further, access of wind mast data from the private developers would not have been difficult for MEDA as according to the procedure formulated by MEDA, 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 and MEDA will issue a letter in respect of classification of the wind power project into appropriate wind zone class. We feel that being the Nodal Agency, MEDA has all the powers and responsibilities to take data and hence it is misleading.

3. As submitted by MEDA in its report that the data of wind masts of private developers is not available with them, then it raises question as to how MEDA categorized the wind power projects under various categories at the time of according its approval to such projects based on such incomplete data.
4. MSEDCL further submits that the Private developers have kept their wind mast data in secrecy and have been used only for their own interests. Therefore, even if the Private Developers share their data now instead of sharing the same earlier on annual / real time basis at the end of each year, the reliability of such data is questionable at this point of time.
5. It is pertinent to note that, the "Schedule" enclosed with 2010 Regulations i.e. the C-WET Map has identified wind generation locations in Maharashtra and has marked locations which have density of 250-300 (W/m<sup>2</sup>) in blue colour. Hence even the 2010 C-WET map Schedule at 50 mtr hub height had identified the wind site locations in the districts of Dhule, Nandurbar, Pune and Satara as sites with wind power density between 250-300 (W/m<sup>2</sup>) i.e. corresponding CUF of 23%.
6. MSEDCL further submits that the details of wind monitoring stations as on 31.05.2018 across India including Maharashtra that are installed by NIWE/MNRE/MEDA/Private Developers is available on NIWE website. As per the "List of Wind monitoring stations" as available on NIWE website, 15 stations out of the total 140 stations in Maharashtra have measured Wind Power Density of more than 250 W/m<sup>2</sup> at 50 mtr. hub height. These 140 stations are spread all across Maharashtra however the 15 stations where the WPD is more than 250 W/m<sup>2</sup> are predominantly located in the districts where majority of the wind mills are installed i.e. in Satara, Sangli, Kolhapur, Dhule, Nadurbar, Nasik and Ahmednagar. Since the shortlisted 42 wind power projects are also located in the above mentioned districts, the wind power density (WPD) at the said projects is also more than 25 W/m<sup>2</sup>, therefore the CUF of these projects is 23%.

### 1.3 Analysis of CUF data on Wind Farm basis:

#### **MEDA's Observations:**

Out of fourteen nos. , six Wind farms Average CUF is above 20 % due to following reasons:

- i. Wind Zones wrongly determined as Zone I instead of Zone II/III/IV
- ii. Higher generation due to deployment of higher hub Height than 50 mtr.
- iii. Advantages of Best locations, elevation, lower array loss.
- iv. Improved wind profile/pattern than the assessment year when wind mast's data was referred for measurement.

#### **MSEDCL's Comments:**

MSEDCL submits that being the state nodal agency of Maharashtra, MEDA should try to provide firm conclusions and statements instead of using terminologies like "may / may be" etc. In its report MEDA has mentioned that for some projects the generation has been higher i.e. the average CUF has been higher than 20% may be due to any of the four listed reasons, such conclusion is not acceptable. Such non-committal conclusions even in the face of unambiguous data seem to be done with a design to keep entire exercise in legal dispute.

MSEDCL further submits that as one of the reasons for higher generation in these 6 wind farms, MEDA has stated and therefore has itself accepted that the wind zones of the said wind farms have been wrongly determined as Zone I instead of Zone II/III/IV.

MEDA has stated in its report that the higher generation may be due to deployment of high hub height wind turbines than that of 50 mts. Since all the wind power projects operating in Maharashtra take MEDA's approval prior to development of the projects and MEDA provides a Commissioning Certificate to all the wind power generators upon successful commissioning, MEDA must have been provided with details and technologies of the wind turbine(s) installed by such generators. Therefore, MEDA's claim that the higher generation may be due to deployment of high hub height wind turbines than that of 50 mts and if it is so then MEDA should have, at the time of commissioning of such wind projects, brought to the notice of the Hon'ble MERC for re-determination of tariff in light of higher CUF instead of burdening the consumers of Maharashtra and enriching the Wind Energy Generators.

Moreover, MEDA has stated in its report that another reason for higher generation than generation corresponding to CUF of 20% may be due to improvement in wind profile / pattern in the year when CUF was assessed as compared to that of the wind profile when wind masts data was referred for measurement. This seems to be a completely factually wrong reason as the generation for the shortlisted 42 projects has been higher than the generation corresponding to 20% CUF continuously over a period of 3/2 years and not just over for a single year.

Therefore it seems in spite of hard evidence in front of its eyes; MEDA does not want to accept that and continue to facilitate higher gains to the Wind Power Generators.

## 1.4 Analysis of Technology deployed in wind power projects

### **MEDA's Observations:**

Increased generation may also due to the following reasons.

- i. Wind Turbines installed with hub height higher than 50 Mtr and varies from 60.6 mtr to 95 mtr.
- ii. Rotor diameter is varying from 59 mtr to 100 mtr.
- iii. All the wind turbines under 42 wind projects have hub height more than 60 mtr, whereas CUF specified in the regulation is assessed at 50 mtr.

### **MSEDCL's Comments:**

1. MSEDCL submits that being the state nodal agency of Maharashtra, MEDA should provide firm conclusions and statements instead of using terminologies like "may / may be" etc. in its report. The observations made by MEDA in its report are totally theoretical, incorrect and are not practical as they have not been determined based on actual data.
2. As stated in MEDA's report, Wind Power Generators have installed wind turbines with hub heights higher than 50 mtrs which was considered in the MERC RE Tariff Regulations 2010 for determination of wind zones and CUF. Therefore, as per MEDA's observations and reasoning in the report, MEDA should have approached the Hon'ble Commission for re-determination of Tariff by factoring the additional capital cost for WTG of 80m hub height instead of WTG of 50m hub height along with the higher CUF for such WTGs. However MEDA did not do the same. Further, MEDA or the Wind Power Generators did not have any free license to improve technology unilaterally and have tariff determined by considering technology under 'Feed - in Tariff' thus causing loss to consumers of Maharashtra.
3. Further, it has been observed by MEDA in its report that there is difference in the elevation of wind masts and the WTG. The WPD were measured at 50 mtr height and the same was made applicable for the wind turbines having higher hub heights for determination of wind zones. In the report, an analysis has been carried out by theoretically extrapolating wind speed and WPD at greater hub heights and the revised WPD at hub height were compared with wind zones specified in the MERC RE Tariff Regulation 2010. As the extrapolation is completely theoretical, it cannot be relied upon and as was directed by the Hon'ble Commission to MEDA, the latter was to conduct a detailed study based on actual generation data. Clearly, MEDA has failed to do so and has simply provided hypothetical and theoretical results.
4. It is to be noted that all Wind Turbines under study of MEDA and as part of the present 'report' are of hub height more than 50 mtr and have been installed after the notification of the Regulations.
5. It is pertinent to note that, as per the Regulation and as per the objective of the study, the issue is of wind zone reclassification and is not about the technology that has been employed by the Wind Power Generators and it will be against the Regulations to state

that the Generators achieved greater CUF because of better technology and therefore the WPGs have been correctly categorized in Wind Zone I. Further, in the report MEDA has itself stated that the wind mills are located in the districts of Pune and Dhule are achieving CUF higher than that stipulated for Wind Zone 1. Since, the Regulation of this Hon'ble Commission itself provides for renewal of wind zone classification on the basis of actual generation and CUF, in the interest of consumers at large, thus MEDA should have reviewed the wind zone classification on its own long time ago. When the distribution company is trying to assist this Hon'ble Commission to safeguard the interest of the consumers, MEDA is raising baseless issues and trying to justify the existing zoning with illogical reasons which is absolutely beyond the mandates of the study.

### **1.5 Analysis as per NIWE's 50 mtr Wind Power Density (WPD) map**

#### **MEDA's Observations:**

1. From the 50 mtr WPD Map published by NIWE (used to verify WPD), it is observed that all 14 wind masts falls under the WPD up to 250 watts / sq.mtr (Zone-I) except the mast located at Chakala in district Nandurbar (250 to 300 watts/s- Zone II) .
2. As per the 50 mtr WPD map of NIWE it is observed that location Chakla falls under the Wind Zone II. However, for the same location the extrapolated WPD from NIWE's mast is 323 i.e. within Wind Zone III. So there is in-consistency in NIWE's extrapolated WPD in the list of potential sites and that of GIS arc map.

#### **MSEDCL's Comments:**

1. MEDA has itself accepted in its report that there have been inconsistencies in determining the wind power density, therefore it is not prudent to rely on such Wind power density map while determining the wind zone for any generator and objective of Commission's direction was not to verify wind zone on the basis of WPD but on the basis of actual generation.
2. MSEDCL submits with respect to the analysis presented in MEDA's report as per NIWE's 50 mtr WPD map at each wind project location, the authenticity of the WPD map is questionable since if NIWE has WPD data for only one wind mast out of the 14 wind masts in the area where the shortlisted 42 projects are located, then how is it possible to have a WPD map for all the locations. Therefore, the WPD map cannot be relied upon.
3. It is submitted that if WPD is measured/extrapolated at hub height and for that the WPD zones are determined as per the RE Regulations, 2010 then it can be observed that out of the total 205.7 MW commissioned in Zone 1 about 120.9 MW of installations fall under Zone II and III. Therefore, it is requested that at least the Hon'ble Commission should revise the wind zone for these 120.9 MW immediately.

## 1.6 Analysis of extrapolated WPD at hub height

### **MEDA's Observations:**

1. There is elevation difference at wind mast and WTG Location.
2. WPD was measured at 50 mtrs hub height and made applicable for higher hub height, which add error in deciding WPD.
3. Out of 205.7 MW commissioned in Zone I about 120.9 MW of installations will fall under Zone II and III.
4. Wind projects (13.6 MW) whose hub height is below the mast elevation are considered in Wind Zone 1.
5. In such complex terrain, some may have getting advantages of high elevation and may yield more generation or a vice versa.
6. Some of WTGs will get advantage of location and will generate more than WPG's which are affected by high array loss within the same wind farm.
7. If the CUF has to be assessed for each turbine location then high generating WTGs will fetch low Tariff and low generating WTGs will fetch high Tariff. Hence issue needs to be analyzed holistically in generic Tariff determination process or project specific Tariff for all the turbines has to be assessed.

### **MSEDCL's Comments:**

1. MSEDCL submits that in its report MEDA has simply provided an analysis that has been carried out by theoretically extrapolating the wind speed and WPD at hub height higher than 50 mts instead of analyzing the wind speed and WPD on the basis of actual data. It is further submitted that MEDA's observations in its report are completely theoretical which cannot be accepted at all for analysis purposes, as the results have not been derived from actual generation data. Also, MEDA has not provided any mathematical equations and details used for the purpose of extrapolation.
2. It is further submitted by MSEDCL that MEDA has provided a very generalized statement in its report to analyse the issue holistically regarding generic Tariff determination process instead of providing any firm recommendation/statements on the basis of their analysis of the data as per the direction of the Hon'ble Commission. It's a seems an attempt to justify overcharging by the Wind Power Generators at the cost of the consumers of Maharashtra.
3. Also, it seems that MEDA has not referred the data of all the wind masts in the state of Maharashtra that is available with NIWE regarding extrapolation of wind power density for 50 mtr hub height.
4. It is further submitted that even if there is further scope for analyzing the actual data of generation of the shortlisted and all the other wind power generators, considering the observations of MEDA regarding 120.9 MW of installations which should fall under zone II and III, the Hon'ble Commission should direct for immediate revision of wind zones of such projects.

## 1.7 Analysis of theoretical CUF of Wind Farm with Wind Atlas Analysis and Application Program (WAsP)

### MEDA's Observations:

1. For privately wind mast data, NIWE is in agreement with developers hence, data is not available in public domain. Data of the wind mast owned by NIWE (institution of GoI), made freely available by NIWE. Hence only one wind mast data used for analysis.
2. Generation gain observed in WAsP analysis and also as per actual data because of elevation.

### MSEDCL's Comments:

Based on the observations of MEDA in its report, it is implied that the actual generation data are correct and accordingly the wind zones of the said WTGs shall be revised on the basis of actual CUF data available with MSEDCL. As per the list of wind monitoring stations with MAWS & MAWPD (MNRE as on 31.01.2019) that is available on NIWE website, out of the total 140 wind mast sites, 15 wind masts have WPD of more than 250 W/sq.mtr. Further, out of the total 46 wind masts owned by private developers, 16 wind masts have WPD of more than 250 W/sq. mtr. Therefore, MSEDCL submits that it would have been more appropriate if MEDA had used such data that is already available in the public domain.

## 1.8 Review of Sample wind projects data on field

### MEDA's Observations:

1. Out of 14, 6 wind farms have average CUF higher than 20%, out of which two with highest CUF were selected for study which have 17 out of 42 projects.
2. The latitude and longitude of WTG locations and wind mast matched exactly. There is variation observed in elevation of some of the wind Turbine.
3. Shortlisted turbines had location advantage and may have generated at more CUF e.g. valley in front and back of the wind turbine which has least array loss and best wind or the wind turbines located in the first row of wind farm.
4. Hub height and rotor diameter were verified with available name plates.
5. Arial Distances verified and are in permissible limit of 10 kms.

### MSEDCL's Comments:

It is submitted that one the one hand MEDA is clearly indicating in its report that 6 wind farms are actually generating energy at a CUF higher than 20%. While on the other hand, MEDA in its report has concluded by using statements such as 'may have generated at

higher CUF'. This is not at all acceptable and MEDA should have given a firm opinion in its report after analyzing actual data.

Further, while concluding in the report, MEDA has provided reasons such as elevation difference, location advantages, etc. instead of providing conclusive statements that are based on actual generation data.

Moreover, the justifications given by MEDA in its report for higher CUF are irrelevant, since the Commission had clearly directed MEDA to carry out the study based on actual generation data and resultant CUF. In any case elevation differences, location advantage should result into appropriate zone classification and not as Zone 1. Moreover, the Procedure (c) & (d) adopted by MERC in the year 2011 for zone classification encourage specific wind Turbine Generator wise zoning. Same principle shall be applied here and the advantage of so called elevation difference, location advantage should be passed onto the consumers of Maharashtra and technological advantage shall be shared between consumers and the Wind Power Generators and as directed by the Hon'ble MERC in point 13 of its Order dated 09.07.2018, MSEDCL will submit a separate petition for sharing the advantage of technological advancements.

## **2.1 Analysis of CUF of projects commissioned during FY 2010-11 to FY 2014-15**

### **MEDA's Observations:**

1. During control period of MERC RE Tariff Regulation 2010, wind projects having cumulative capacity of 2373.35 MW are commissioned in Maharashtra, out of which, 1918 MW commissioned for sale to MSEDCL under PPA at MERC determined tariff.
2. Only two districts, Pune (21.6 %) and Nandurbar (22.58%) are having more than 20% average CUF and Five districts have average CUF of less than 20%. However, there are some of the sites within these districts which are generating at higher CUF and some sites are generating at lower CUF.
3. Out of 1918 MW, only 602.7 MW (31%) projects are generating above 20% benchmark and rest 1315.3 MW (69%) are generating below benchmark of 20 % CUF.

### **MSEDCL's Comments:**

The submission of MEDA that, the WTG having installed capacity of only 602.7 MW are generating above 20% CUF shows the casual approach of MEDA. It is to state that a wrong classification of even 602 MW will lead to financial burden of around eighty crores per annum on the common consumers of state of Maharashtra.

Since MEDA has agreed in its report that 602.7 MW projects are generating energy at a CUF of more than 20%, the Commission in first instance shall allow MSEDCL to amend the wind zones for these projects with immediate effect and for remaining districts, where some projects (31%) are achieving higher CUF, their wind zones should be re-classified as per Procedure (c) & (d) of MEDA (2011) which encourage Wind Turbine Generator wise zoning.

As MEDA has agreed that 602.7 MW projects are generating more than 20% CUF, the Commission shall allow MSEDCL to amend the wind zone for these projects with immediate effect.

## **2.2 Frequency and period of Generation data review for redetermination of CUF**

### **MEDA's Observations:**

1. The provision to re-determine the Tariff as per actual CUF is specified in Regulation 28.1 of MERC RE Tariff Regulations, 2010, however, these Regulations are silent on the period of review.
2. MSEDCL proposed to revise the CUF on the actual generation/CUF data of first three years.
3. Average CUF is dependent on the annual wind pattern which is unknown and subject to change year on year. Hence, in some project the annual CUF has been seen to be increased after three years and in some projects it was decreased after three years.
4. The wind project is bound to degrade year on year and annual degradation factor was not considered by most of the Commissions.
5. The Tariff is calculated for 13 years of PPA period by considering 20 % CUF for Zone I.
6. Even some projects are showing CUF higher than 20%, it will not last for the entire PPA Period, hence considering the data of initial 3 years will not be appropriate

### **MSEDCL's Comments:**

1. MSEDCL submits that as claimed by MEDA in its report that it was MSEDCL's proposal to revise the CUF on the actual generation/CUF data of first three years is completely wrong as it was in fact the Order of this Hon'ble Commission in which it directed MEDA to reclassify the wind zones after 3 years of commissioning. Such suggestion is deliberate and clear defiance of the Hon'ble MERC's directive.
2. It is submitted that the observation of MEDA in its report that the CUF higher than 20% will not last for the entire PPA period is only a conjecture and is denying what is visible to the eyes and conjecture for future while completely neglecting the interests of Maharashtra's consumers.
3. It is further submitted that MEDA in its report has stated that wind power projects are bound to degrade year on year and the annual degradation factor was not considered by most of the Commissions is completely beyond the Terms of Reference (ToR) given

to MEDA for present study and seems a mischievous ploy to safeguard unnecessary enrichment of Wind Power Generators.

### 2.3 Analysis of State average CUF of projects commissioned in the state

#### MEDA's Observations:

1. Considering the rated average CUF of all projects commissioned under MERC RE Tariff Regulations, 2010 is 18.86 % (<20% i.e. ceiling for Zone -1 )
2. Hence there is no excess payment for any generation more than 20% of it is seen at macro level. However, RE Tariff Regulations, 2010 specified Wind Power Density, zone wise Tariff instead of having a common generic state average CUF Tariff.
3. MERC RE Tariff Regulations, 2010 has the provision to re-determine the Tariff as per actual CUF.
4. Actual CUF achieved by some of projects which is more than 20% needs to be assessed along with project specific techno-commercial parameters considered in the Regulations and that with commissioned projects.

#### MSEDCL's Comments:

1. It is submitted that attainment of 20% CUF is not a benchmark, but rather the generator can generate up to 20% as clearly observed by MERC in its latest Order passed on 09.07.2018 and hence the generated units are expected to be less than or equal to 20%.
2. MEDA in its report has stated that MERC RE Tariff Regulations, 2010 specified Wind Power Density, zone wise Tariff instead of having a common generic state average CUF Tariff. However, individual Wind Turbine Generator wise zone was envisaged in Procedure (c) & (d) of MEDA, 2011.
3. MEDA suggestion in its report implies that some generators should be allowed to earn more revenue through higher generation because other generators are not able to do so and therefore the total would average out, thus ensuring that the wind generators in total do not earn higher than the stipulated revenue. If this the philosophy of argument by MEDA then why not have only 1 (one) zone for the entire state and the Hon'ble Commission would have determined a single generic Tariff for entire Maharashtra instead of forming different zones and different zone – wise Tariffs.

### 2.4 Analysis of life time cost of wind power to DISCOM across the State

#### MEDA's Observations:

1. As the entire project located in Maharashtra falls under Zone I i.e. 20 % CUF, the Tariff is higher than the other states where the state average CUF is more than 20%.

2. NPV of first 13 years of cashflow is highest in Maharashtra than that of other states, this benefits the wind investors in early pre-payment of date and also reduces their risk.
3. DISCOM of Maharashtra is paying higher Tariff for first 13 years, the Tariff for the period between 14 year to 25 year will be low as compared to other states and hence, they are being benefited with lower cost of procurement of wind power.
4. Hence overall cost to DISCOM over 25 years project life is comparable with other states and is win win situation in Maharashtra for investors and DISCOM/consumers.

#### **MSEDCL's Comments:**

1. From this observation in the report, it seems that MEDA does not even know that the EPAs executed between MSEDCL and the Wind Power Generators are executed for a period of 13 years and thereafter the Wind Power Generators can sell anywhere and now are also selling to third parties through open access. These considerations regarding the capital cost and the tenure of the EPAs are under the purview of the Hon'ble Commission. However, after 13 years these Wind Power Generators, who would have recovered 100 % of their capital cost which would be ultimately paid by the consumers of the Maharashtra, would opt for sale of power from their wind power projects in the market through open access. This would be against the interest of the consumers of Maharashtra as the benefit of low tariff of these wind power projects after 13 years would not be shared with them but would instead be retained by the wind power generators themselves. This is also clear from MEDA's observations in its report that in the initial 13 years, DISCOM pays higher tariff and thereafter it shall pay lower tariff for the balance life of the project. If the same observation is accepted by the Hon'ble Commission, then MERC should make it compulsory for all generators to sell power for remaining 12 years at O&M cost only to DISCOM post expiry of the 13 years EPA with the DISCOM. This request was made by MSEDCL (first right to refusal) in its petition dated 06.07.2018 with case no. 264 of 2018, however the same was not agreed upon by the Hon'ble MERC.
2. MSEDCL submits that MEDA has wrongly concluded that although Maharashtra DISCOM is paying higher tariff for first thirteen (13) years, their tariffs for the balance 12 years i.e. up to 25<sup>th</sup> year of the project are low as compared to the other states and hence MSEDCL is benefitting from lower costs of procurement from such wind power projects. In fact, these wind generators are selling power from their projects through Open Access after completion of their EPAs with MSEDCL and since the EPAs are of 13 years tenure, how is it possible for MSEDCL to benefit from the low cost wind power of such projects after 13 years.
3. It is beyond imagination that despite being the state nodal agency of Maharashtra, MEDA is unaware of the period / tenure for which the Wind Power Generators execute EPAs with MSEDCL under the 'Feed-in Tariff' regime.

## 2.5 Generic vs Project specific approach for wind project Tariff Determination:

### **MEDA's Observations:**

1. Under generic tariff approach, the developers are at the liberty to select and deploy technology with lesser cost or with better operational parameters to minimise the risks and maximise the returns.
2. In the present case, some of the wind projects will be generating at CUF above benchmark due to better technology/operation and maintenance/resources. If the benchmark parameters are to be revised for selected 42 projects then the demand may come from the projects which are performing below benchmark parameters to reconsider the parameters and increase the tariff.
3. This will lead to unending process and may not promote the best technology or benefit the efforts in optimizing the O&M.
4. It is difficult to apportion the incremental cost of better technology, increased cost of installation and commissioning at best strategic locations or the incremental cost of effective O&M which is yielding more generation.
5. Hence, after analyzing the statistics, at the macro level the overall CUF of wind projects commissioned during the control period is less than 20% and hence it is cannot be the case of undue benefit to developers and investors.

### **MSEDCL's Comments:**

1. It seems that MEDA is not able to say conclusively in its report that higher CUF is only due to technological advancement. It is camouflaging knowingly by clubbing it into better resources / O&M etc. Also, the Wind Power Generators are themselves responsible for the O&M of their projects. Would better O&M and resources result in to higher CUF? If yes then MEDA should provide such details proving such theories. Also, the benefit of such higher CUF should be passed on to the consumers of Maharashtra.
2. MSEDCL humbly submits that the promotion of technology should not at all be at the cost of unreasonable burden on the consumers of Maharashtra.
3. It is pertinent to note that, as per the Regulation the issue here is of reclassification of wind zone irrespective of the technology i.e. it will be against the Regulations to state that the Generators achieved greater CUF (more than 20%) because of better technology and hence they are rightly classified in Wind Zone I.
4. MEDA has itself stated in its report that the wind mills located in the districts of Pune and Dhule are getting more CUF. The regulation of this Hon'ble Commission's provides for renewal of zone classification as per CUF and the same should have been done by MEDA on its own much before the directives of the Hon'ble Commission, in the interest of consumers at large. Moreover, when the distribution company is trying to assist this Hon'ble Commission for safeguarding the interest of the consumers, MEDA is raising baseless issues and is trying to justify the existing zone classification with illogical reasons that are absolutely beyond the mandate of the study as per the Hon'ble Commission.

5. It is further submitted that even if the entire wind firm is generating more than 20% CUF, the focus should be on generation of each individual generator instead of generation of the entire wind farm as the latter is not owned by the one person. This clearly shows that MEDA has prepared a report results into favor to private wind generators instead of working towards ensuring passing on the benefit to consumers and also safeguarding the interests of the consumers of Maharashtra.
6. MERC while fixing Tariff did not expect or presume that the average CUF of all generators across the entire zone would be less than 20 %, as then it would be better to fix single Tariff for entire Maharashtra assuming an average CUF for the entire state. However, since the same will not be correct, hence zone wise CUF and tariff have been determined by the Hon'ble Commission.
7. The observations of MEDA seem to be going against the philosophy of wind zone classification as its purpose is to compensate generators in less windy areas and not to provide higher tariff to some generators.

## **2.6 Details of Financial Burden on MSEDCL's consumers due to higher tariff for projects in Zone I:**

MSEDCL submits below a detailed computation of the unnecessary burden on MSEDCL and eventually on the consumers of Maharashtra due to sale of electricity by wind power generators in Wind Zone I at high tariff despite achieving a CUF of more than the classified wind zone.

For FY 2017-18 based on the actual data, it is found that, out of the total 1140 WTGs / locations classified under zone I; the 283 WTGs / locations having installed capacity of 552 MW has achieved CUF pertaining to wind zone II; the 166 WTGs / locations having installed capacity of 390 MW has achieved CUF pertaining to wind zone III; and the 137 WTGs / locations having installed capacity of 89 MW has achieved CUF of wind zone IV. The above data was already submitted to MEDA.