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Ref No: EEIPL/APERC/FSS/001

Date: 4th March, 2020

To

The Hon'ble Secretary,
Andhra Pradesh Electricity Regulatory Commission (APERC),
11-4-660, 4th Floor, Singareni Bhavan,
Red Hills,
Hyderabad - 500 004

4/3/2020
00-PPP

Sub: Suggestions / Comments on the proposed amendments of Regulation 4 of 2017 i.e., APERC (Forecasting, Scheduling and Deviation Settlement of Solar and Wind Generation) Regulations, 2017 ("Regulations")

Dear Sir,

We are an independent power producer (Wind) with a portfolio of 129.5MW capacity (under various SPVs) projects at Dhone, Kandimallayapalle & Nelakota in Kurnool, Y S R Kadapa & Anantapuram District in Andhra Pradesh, engaged in the business of generating wind energy for sale to Discom. We have an operational capacity of 129.5MW in Andhra Pradesh, which would be severely affected by the proposals of APTransco for Forecasting, Scheduling and Deviation Settlement of Solar and Wind Generation Regulations, 2017.

Plan of action
05/03

We express our sincere gratitude to APERC for addressing the issue facing the industry in the past, which has helped the industry to make significant progress in deployment and scaling up of renewable projects across the state.

Thanking You,

Yours sincerely

For Ecoren Energy India Pvt Ltd

ECOREN ENERGY INDIA PVT. LTD.

Authorised Signatory

Andhra Pradesh Electricity Regulatory Commission * Hyderabad *
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- 4 MAR 2020

CIN No. U40108TG2013PTC087661
ECOREN ENERGY INDIA PRIVATE LIMITED
Plot No. 1202, 1215A Door No. 8-2-293/82/A/1202, S.L. Jubilee, Road No.61, Jubilee Hills, Hyderabad-500033
Ph. No. 040- 66993333 I E: info@ecorenenergy.com I www.ecorenenergy.com

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We place below, our observation and suggestions on the proposals of APTransco and request APERC to kindly take the same into account:

Amendment 1:

Present Formula: As per CERC DSM Regulation 2014 & APERC Regulation 04 of 2017

Absolute Error (%) = 100 x (Actual Injection - Scheduled Generation) / Available Capacity (AvC)

Amendment requested by APTransco

Substitute the term "Absolute Error" with "Forecast Error"

Substitute the "Available Capacity" with "Scheduled Generation" for Calculating the Forecast error as per the following Formula

Forecast Error (%) = 100 x (Scheduled Generation - Actual Injection) / Scheduled Generation

Ecoren Observations and Suggestions:

Change in formula for error would be against the interest of justice and would create serious prejudice against VRE (Variable Renewable Energy) as renewable energy is only predictable to some extent and forecasting and scheduling accuracies cannot be treated at par with conventional energy generators. For instance, in case of wind generating plant an error of 0.5 meter per second in wind speed may result in 15% variation in terms of power generated which is minimum error achieved worldwide. For day ahead basis, the average error is more than 0.9 meter per second for wind generating plants which ultimately results to an absolute error of approx. 25%. In case of solar generating plant an error of 50 watt per meter square as GHI results an error of 10% variation in terms of power generation with an average error of 100 watt per meter square as GHI which leads to an absolute error of 20%.

As per CERC DSM Regulation 2014, the Commission has used Available Capacity (AvC) as the denominator for calculating Absolute Error.

Also, as per Forum of Regulators on Model Regulation, the Central Commission, in the Statemen of Reasons (SOR) accompanying the Framework on Forecasting, Scheduling and Imbalance Handling for Variable Renewable Energy Sources (Wind and Solar), has noted that the definition of error, calculated w.r.t schedule, does not adequately address instances such as low/no generation cases, such as during low wind season, where close to zero schedules would result in high numerical errors but with no real impact on grid. Additionally, incentives to generators for better forecasting must be aligned with the objective of grid management, which is to minimize actual MW deviations from schedule. As commercial impact on generators is directly proportional to the error percentage, forecasting models will be

designed to minimize MW deviations only if the denominator is a constant (and not a variable such as 'schedule'). This will ensure that the error quantity corresponds to the physical MW impact on the grid, and the error definition holds valid in all seasons.

Therefore, considering the present change in formula and other proposed amendments, avoiding penalties for VRE Generators would be inevitable without any fault or role by VRE Generators and entire purpose of the RE Regulation would be defeated.

Suggestions:

We request Hon'ble Commission not to deviate from current Regulation No. 04 of 2017 i.e. calculate error in absolute terms and not the proposed 'forecast error', keeping it consistent with CERC DSM Regulation, 2014.

Amendment 2:

Present Regulation: As per CERC DSM Regulation 2014 & APERC Regulation 04 of 2017

Current Absolute error deviation with aero penalty is + / - 15%

Amendment requested by APTransco

'Allowable forecast error' = 100 x (diversity factor 0.7 in control area in the beginning of FY) x (Quantum of deviation limit permitted under CERCs DSM Regulation amended from time to time) / (Quantum of VRE installed capacity) or estimated + / - 5%

Ecoren Observations and Suggestions:

Assumption taken into consideration by APTransco may not be correct in evert case. In case two VRE Generators deviate in opposite direction, in that case both the VRE Generators end up paying deviation charges despite there being no impact upon state owing to deviation on the part of both the generators.

Treating VRE Generator at par with conventional energy generator was never the intent of Forum of Regulator and the same is evident through methodology adopted by them in the Model for Forecasting and Scheduling Regulations for State by Forum of Regulator, 2015.

As per Forum of Regulators, 2015, the Central Commission, while proposing the DSM amendments for solar & wind regional entities, considered simulations and analytical inputs from agencies engaged in wind forecasting. The Central Commission, in view of simulation studies as well as international research reports on observed mean absolute error (MAE), had

put forth the framework for computing deviation charges based on error, with a tolerance band of 15% initially, which shall be tightened over time as the ecosystem gains experience.

If renewable energy generators are treated at par with conventional energy generators that would seriously defeat the very target of Government of India to meet its renewable energy target since VRE Generator has a very narrow scope for mismatch with respect to their revenue requirement. VRE Generators are firmly dependent in weather conditions for accurate projection for the energy generation and revenue cannot be ascertained. In such situations, reducing permissible band for deviation would totally take away the commercial viability of VRE Generators. In this context, it is proposed that no amendment is made to the definition of Absolute Error and its calculation.

Suggestions:

We request Commission not to include any diversity factor as it is against Model Regulations on Forecasting, Scheduling & Deviation Settlement of Wind & Solar Generator by Forum Of Regulators which has suggested to have penalty +/- 15% deviation as in the current CEC DSM, 2014 and APERC DSM Regulation, 2017.

Amendment 3:

Present Regulation:

As per Forum of Regulator on Model Regulation 2015

16 revisions allowed in particular day. One revision for each time slot of one and half hours starting from 00:00 hours

As per APERC Regulation No. 04 of 2017

9 revisions allowed in particular day. One revision for each time slot of one and half hours starting from 05:30 Hours up to 19:00 hours

Amendment Requested by APTransco

It is proposed to remove the option of rescheduling of forecast on one and half hourly basis during the intra-day of operations and strictly to adhere to scheduling of day ahead basis.

Ecoren Observations and Suggestions:

As per Forum Of Regulators for Model Regulations on Forecasting, Scheduling & Deviation Settlement of Wind & Solar Generating stations permits 16 revision per day and such revision

is permitted owing to nature of infirm power. Accurate prediction of weather conditions on day ahead basis is not technically possible. With the available weather prediction technology and models, local weather changes cannot be predicted more than 1 hour in advance to the accuracy of +/- 15% especially the local cloud movements during the monsoon season in case of Solar projects.

Also, as per APERC Regulations 04 of 2017 it allowed solar power generators with 9 revision with 1 hour ahead rescheduling which is already disadvantageous to the solar and wind generating stations as the RE generators are highly dependent on weather. Removing the revision provision altogether, will ensure that RE Generators will end up paying penalty with no control over weather conditions.

State Electricity Commissions while formulating Renewable Energy forecasting and scheduling regulations needs to be guided by Forum Of Regulators framework. The Proposed amendment would be in direct conflict with the framework proposed by FOR's model regulation. Removing provisions for revision in schedule and reducing the accuracy band to 5% would entirely make projects unviable for developers to operate.

Suggestions:

We request the Hon'ble Commission to allow 16 revisions as per Forum Of Regulators framework considering the infirm nature of solar and wind power.

Amendment 4:

Present Regulation: As per CERC DSM Regulation 2014

Under Injection		Over Injection	
Absolute error	**Deviation Charges Payable**	**Absolute error**	**Deviation Charges Payable**
<=15%	At the Fixed Rate for the Shortfall energy for absolute error up to 15%	<=15%	At the Fixed Rate for excess energy up to 15%
>15% but <=25%	At the Fixed rate for the short fall energy for absolute error up to 15%+110% of the Fixed rate for balance energy beyond 15% and up to 25%	>15% but <=25%	At the Fixed rate for excess energy for absolute error up to 15% + 90% of the Fixed rate for excess energy beyond 15% and up to 25%

>25% but <=35%	At the Fixed rate for the short fall energy for absolute error up to 15%+110% of the Fixed rate for balance energy beyond 15% and up to 25%+120% of the Fixed rate for balance energy beyond 25% and up to 35%	>25% but <=35%	At the Fixed rate for the excess energy for absolute error up to 15%+90% of the Fixed rate for excess energy beyond 15% and up to 25%+80% of the Fixed rate for excess energy beyond 25% and up to 35%
>35%	At the Fixed rate for the short fall energy for absolute error up to 15%+110% of the Fixed rate for balance energy beyond 15% and up to 25%+120% of the Fixed rate for balance energy beyond 25% and up to 35%+130% of the Fixed rate for balance energy beyond 35%	>35%	At the Fixed rate for the excess energy for absolute error up to 15%+90% of the Fixed rate for excess energy beyond 15% and up to 25%+80% of the Fixed rate for excess energy beyond 25% and up to 35%+70% of fixed rate for excess energy beyond 35%

Amendment Requested by APTransco

Levy and collection of DSM charges should be amended as shown in the table given below:

Absolute Error in the 15-minute time block	Deviation Charges payable to state Poll account
<Allowable Forecast Error	None
Above allowable Forecast error	At Rs.2.00 Per unit for the shortfall or excess injection

Ecoren Observations & Suggestions:

It is Submitted that in the event of actual wind and solar generation are mostly dependent on climatic conditions and geographical conditions. The power from the renewable energies is not firm and are not predictable. It is further submitted that even the dedicated government departments using best of the forecasting technologies cannot accurately predict the phenomenon of the nature. Thus, it would be completely unfair to penalize wind/solar generator for any inaccurate forecasting, that too at lowest tolerance band of +/- 5% and at Rs.2.0 per kWh.

According to CERC DSM Regulations,2014, the penalty is based on percentage of fixed rate with each error band and not an absolute penalty value as proposed by AP Transco. The proposed absolute penalty of Rs 2 per kWh is extremely harsh and unviable.

Also, asper the Forum of Regulators ,2015, the Central Commission, while proposing the DSM Amendments for solar & wind regional entities had considered simulations and analytical inputs from the agencies engaged in wind forecasting. The Central Commissioning view of simulation studies as well as international research reports on observed mean absolute error

(MAE) had put forth the framework of computing deviation charges based on error, with a tolerance band of 155 with no deviation charge. Penalty will be levied beyond 15% deviation and will be different for different deviation bracket. Also, the penalty should not be in absolute value and should be in percentage of tariff in line with the CERC framework.

Suggestions:

We suggest Hon'ble commission to align DSM charges as per CERC DSM Regulation 2014 with deviation penalty charges in percentage basis of Tariff and with similar error bands.

Amendment 5:

Current regulation: As per Forum of Regulator on Model Regulations 2015 (Section 3.7)

It mentions that all RE generators to be treated together as a virtual Pool within the state pool/

Amendment Requested by APTransco

Definition Phrase of virtual pooling may be considered to be deleted from definition 2.1(aa) and also be deleted at clause 6.9 of Regulation 4 of 2017.

Ecoren Observations & Suggestions:

Having all the RE generators connected to Virtual Pool is advantageous in many fronts. It reduces the number of QCA sending their schedule to SLDC thus removing multiple data analysis/entries. Further, aggregation of schedule and actual generation on the state level and/or with respect to each distribution licensee would ensure that the deviation from the schedule in generation of renewable power is averaged out. This will enable the SLDC to plan their day ahead schedule more accurately, thus enhancing grid stability and security through more accurate management while parallelly helping RE generators minimize their penalties.

Hon'ble Commission followed the FOR Model Regulations and Karnataka ERC has also allowed such aggregation.

Suggestions:

We suggest Hon'ble Commission not to remove Virtual Pooling from the regulation as this helps all the stakeholders, for the above mentioned reasons.

ECOREN ENERGY INDIA PVT. LTD.