

6/3/2020
law
[WITHOUT PREJUDICE]

Ref No: HFE/WSPL/RAPS/KK/APERC/SEC/FY20/002

4th March 2020

To,
The Secretary,
Andhra Pradesh Electricity Regulatory Commission,
11-4-660, 4th Floor, Singreni Bhavan, Red Hills,
Hyderabad- 500 004

Sub: Public notice dated 13.02.2020 regarding public hearing to be held on 10.03.2020 in respect of proposed amendment of Regulation 4 of 2017 i.e., APERC (Forecasting, Scheduling and Deviation Settlement of Solar and Wind Generation) Regulations, 2017 ("Regulations")

Ref: Our Letter Ref No: HFE/WSPL/RAPS/KK/APERC/SEC/FY20/001 dated 2nd March 2020

Kind attention: The Secretary, APERC

Dear Sir,

06/03
As you are aware that by way of our above referenced letter dated 2nd March 2020, we had highlighted that the legal and constitutional validity of the Regulations have been challenged before the Hon'ble Andhra Pradesh High Court (High Court) in terms of various writ petitions which is subject matter is sub-judice. Moreover, the High Court has:

- (i) passed interim orders to not to take any coercive steps on bank guarantees;
- (ii) admitted the aforesaid writ petitions and posted for final hearing;
- (iii) directed to continue the interim orders until then.

In light of the above and specifically keeping in view the judicial propriety involved in such a scenario where this Hon'ble Commission comes with the territorial jurisdiction of the Hon'ble High Court, it was requested that this Hon'ble Commission may be pleased to put in abeyance the entire process initiated by it and ought not conduct the present public hearing. So far, we have not received any response from this Hon'ble Commission and we reserve our legal rights in this regard under applicable law and equity.

However, without prejudice to the above and whilst reserving our legal rights to contest the same, we are submitting our comments and suggestions herein on the proposed amendments to the Regulations since it is imperative to note that the proposed amendments, if promulgated would completely decimate the financial viability of the Renewable Energy generators in the State of Andhra Pradesh.

WAANEER SOLAR PRIVATE LIMITED

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comments are set out in Enclosure -A.

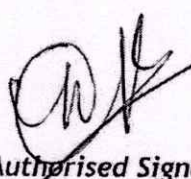
On over all basis, based on proposed amendment the DSM charges will approximately tantamount to Rs. 0.58/kWh for solar. We state that the financial implications of the proposed amendments are so prohibitive in nature that it makes it apparent that what the State Government could not achieve directly in its attempt of seeking reduction of tariff by Government Order bearing (GoRT No. 63 of 2019) (that has been quashed by the Hon'ble High Court), the same objective is being sought to be achieved indirectly by way of introducing these so called amendments by APSLDC.

Therefore, in view of the above, we humbly request that the Hon'ble Commission outrightly rejects the so-called proposed amendments.

Thanking you,

Yours sincerely

For *Waaneep Solar Private Limited*

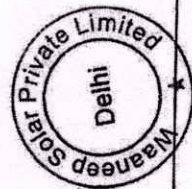

(Authorised Signatory)



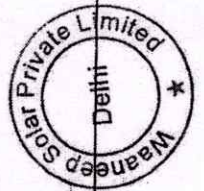
S No	Current Regulation	Amendment Proposed	Comments/Suggestions
1	Clause 2.1 (a) "Absolute Error" means the absolute value of the error in the actual injection of wind or solar generators with reference to the scheduled generation and the Available Capacity (AvC), as calculated using the following formula for each 15-minute time block.	Substitute the term 'absolute error' with 'forecast error'. Substitute the term 'Available Capacity' with 'Scheduled Generation' for calculating Forecast Error as per the following formula: Forecast Error (%) = $100 \times \frac{\text{Scheduled Generation} - \text{actual Injection}}{\text{Scheduled Generation}}$	1. Change in formula for calculating error would be against the interest of justice as it would create serious prejudice against Renewable Energy (RE) generators as their forecasting and scheduling accuracies cannot be treated at par with conventional energy generators. In the case of solar power plants, an error of 50 watt per meter square in calculating Global Horizontal Irradiance (GHI) result in an error of 10% variation in terms of power and it is pertinent to note that for solar sites, the average error in calculating GHI is 100 watt per meter square. Further, for day ahead basis, the average error in calculating wind speed is increased to more than 0.9 meter per second for wind generating plants which ultimately results in an absolute error near to 25% and for solar power plants, 100 watt per meter second is the average error in calculating GHI on day ahead basis which ultimately leads to an absolute error of 20%. 2. In case of wind power plants, an error of 0.5 meter per second in calculating/analyzing wind speed may result in 15% variation in terms of power generated and it is pertinent to note that 0.5 meter per second is the minimum error that can be recorded/achieved by any method adopted in the world for the same. Further, it is also quintessential to highlight that the average error in calculating wind speed for wind power plant is of around 0.7 meter per second. 3. Therefore, considering the present change in formula and other proposed amendments, avoiding penalties for the RE generators would become impossible without any fault or role by the RE generators and the purpose of the Regulations would be defeated.



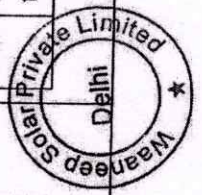
2	Clause 2.1 (j) Deviation in a time block for a seller means its total actual injection minus its total/scheduled generation.	The definition of phrase "allowable forecast error" in percentage should be considered for inclusion. Allowable forecast error = $100 \times (\text{diversity factor } 0.7 \text{ in control area in the beginning of financial year}) \times (\text{quantum of deviation limit permitted under CERCs DSM Regulation amended from time to time}) / (\text{quantum of VRE installed capacity})$	4. Forecast error represented by way of using AvC supports in encapsulating the mean absolute error or deviation from actual, in relatively rational manner throughout the seasons. Model Regulations on Forecasting, Scheduling and Deviation Settlement of Wind and Solar Generating Stations at the State level, 2015 (Model Regulations) states that "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')." 5. As we are moving towards a power system with high renewable penetration, a normalized forecast error by way of using AvC will accurately represent the uncertainty or error in the forecast affecting the power system. So, it is humbly requested to not change existing clause as the same is consistent with the Model Regulations by the Forum of Regulator (FOR) and the Central Electricity Regulatory Commission (CERC).
	1. The assumption taken into consideration by APSLDC may not be correct in every case. For instance, if two RE generators deviate in opposite directions, in that case both the RE generators end up paying deviation charges even though the impact upon the Grid owing to such deviations on the part of both the generators is zero, thereby resulting into both the RE generators furnishing penalty for such deviation which has not affected the Grid in any manner whatsoever. 2. Treating RE generators at par with conventional energy generator was never the intent of FOR and the same is evident through methodology adopted by them in the Model Regulations. If taken into consideration the proposed definition of allowable error and calculation thereto, it would be impossible for the RE generators to avoid penalties on account of deviation from the		



			schedule and would therefore, be deeply discouraging for them to operate generating plants owing to such onerous negative revenue impact. 3. RE generators are heavily dependent upon weather conditions for their plant operation & generation and accurate projection of their electricity generation and revenue cannot be ascertained. In such a scenario, reducing permissible band for deviation would totally take away the commercial viability of the projects set up by the RE generators. In this context, it is suggested that this Hon'ble Commission does not make any amendments to the definition of "deviation" and "absolute error" and its calculations.
3.	Clause 4.1 The Methodology for day-ahead scheduling of wind and solar energy generating stations which are connected to the Grid and rescheduling them on one and half-hourly basis and the methodology of handling deviations of such wind and solar energy generating stations shall be as stated hereunder and accordingly forecasting tools shall be provided by the generator concerned.	It is proposed to remove the option of rescheduling of forecast on one and half hourly basis during day of operation and strictly adhere to scheduling on day ahead basis	1. Model Regulations permit 16 intra-day revisions of scheduling per day and such revisions are permitted owing to the nature of infirm power. Considering the prevalent technology, accurate predictions of weather conditions on day ahead basis is not technically possible and the same has also been explained hereinabove and is not being repeated for the sake of brevity. State Electricity Regulatory Commissions while formulating regulations on RE Forecasting and Scheduling need to be guided by the CERC's framework and the Model Regulations and the said proposed amendment would be in direct conflict with the same. 2. Further, weather data and parameters play an important role for RE generators as plant's generation is directly related to weather conditions. Weather conditions varies from time to time on a particular given day and therefore real-time data as provided by India Meteorological Department or other service providers need to be taken into consideration and is to be incorporated by revising schedules in order to ensure grid safety and stability. In case provision for revising schedules is taken away, then the entire purpose of the Regulations, i.e., grid safety and stability, would be defeated.



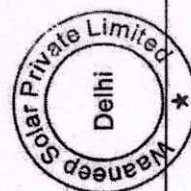
			3. Furthermore, the energy demand is expected to grow significantly in the coming times while the conventional energy sources are limited. RE sources are being built and efficiently utilized for supplementing the energy requirement of the country in a sustainable way, thereby reducing the greenhouse gas emissions in the country. Mechanism of forecasting and scheduling of RE was introduced to improve the integration of the RE power in the power grid. Therefore, there is a requirement of intraday revisions to achieve the goal of successful RE integration. The forecast accuracy improves when it is closer to the real time, i.e., forecasting is more accurate for short term than long term. Currently, in the State of Andhra Pradesh, there is a restriction of 16 intra-day revisions for wind power projects and 9 such revisions for solar power projects. It is humbly submitted that flexibility should be given for revising the schedule intra-day as many times as possible for attaining better accuracy. Removing the scheduled revision capacity will hamper the quality of forecast and lead to greater instability in the grid. Power plants based on conventional sources have the provision for multiple scheduled revisions. The same provision should also be made applicable for RE based projects.						
			1. Justification provided for the proposed amendment is very narrow since it has already been assumed that in case of deviation DISCOMs are purchasing power at high cost. However, the same is not true in every case. There are various instances when the DISCOMs are procuring power from exchange at a rate cheaper than its average pooled variable cost and thereby, in effect, the deviations on account of RE generators actually benefit the DISCOMs. Further, Rs. 2 per unit for energy deviated would be onerous on the RE generators as the functioning of the plant would become very difficult for them owing to penalties payable on account of deviations. This is because the average Power Purchase Agreement rate of RE generators comes out to be Rs. 3 kWh and such penalties may amount to more than 50% of the total						
			The levy and collection of DSM charges should be amended as shown in the table given below: <table><tr><th>S No.</th><th>Forecast Error in the 15 min. time block</th><th>Deviation charges payable to State Pool Account</th></tr><tr><td></td><td></td><td></td></tr></table>	S No.	Forecast Error in the 15 min. time block	Deviation charges payable to State Pool Account			
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				revenue of the RE generator and thereby posing negative impact upon its plant's sustainability.	
	min time block	State Pool Account (Rs / unit)	1	2	None
1	< 15%	None	< Allowable Forecast Error	At Rs. 2 per unit for the shortfall or excess injection	
2	15% - 25%	0.5	> Allowable Forecast Error		
3	25% - 35%	1.0			
4	> 35%	1.5			
2. Further, aforesaid amendment is against the CERC (Deviation Settlement Mechanism and related matters) (Second Amendment) Regulations, 2015 as CERC permits deviation band of 15% without deviation charges. Initially, during planning of RE integration with the grid, deviations on account of RE generators were taken into consideration and it was proposed to propound a balanced mechanism taking into consideration grid safety and stability and at the same time ensuring that RE generators are not put at a losing end owing to nature of infirm power and weather conditions. In this context, the exemption band of 15% was decided. As per the proposed amendments, the entire equilibrium would be disturbed with the RE generators facing the huge financial losses. 3. Further, forecasting of wind and solar power generation in India is gradually evolving with advancement of forecasting technology and participation of international players in the sector. Government of India in its various policies and the Government of Andhra Pradesh in their Wind Power Policy, 2018 and Solar Power Policy, 2018 respectively have envisaged to encourage, develop and promote solar and wind power generation. Further, the investment in RE sector has prominently contributed in the GDP of the State in various manners like generating employment opportunities, environment associated cost benefits, etc. There is the growing demand for power which must be catered in an environmentally and economically sustainable manner, which can only be met through RE. So, it is important to have a rational penalty mechanism in place to incentivize the quality of forecast by RE generators, and thereby encouraging the power developers to generate power through RE sources. 4. FOR, CERC and other states had proposed to provide incremental bands for deviation charges. The sudden imposition of stringent penalty band will					

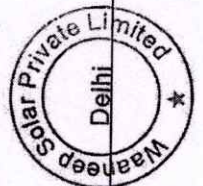


			discourage the RE generators. Further, it is quintessential to highlight that the Tamil Nadu's final regulations, i.e., a neighboring RE rich State, on forecasting and scheduling (Tamil Nadu Electricity Regulatory Commission (Forecasting, Scheduling and Deviation Settlement and Related Matters for Wind and Solar Generation) Regulations, 2019) also incentivizes the generator by capping the penalty and paying back deviation charges if the deviation charges of the entire Financial Year are greater than Rs 0.05 per unit.
5	Clause 2.1 (aa) Virtual pool means the virtual/ grouping of various pooling stations wherein the generators in such pooling stations have an option for accounting their deviational in an aggregated/ combined manner through a QCA for the purpose of availing the benefit of larger geographical area and diversity.	The 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.	1. RE and demand are both variable components in the power system and since the demand forecasting is done at the State level, it seems appropriate to do power forecasting at the State level as well. Therefore, it is humbly submitted that the aggregation of power in the form of virtual pool would be beneficial for the Grid. A large interconnected power system is beneficial because it enables aggregation of imbalances from a large geographical area and thereby ensures the grid safety. The errors are not uniformly distributed in time within a region, therefore forecasting errors for a region are smaller than for a single site. Aggregation lowers the uncertainty of power generation by reducing forecast error. GLZ's Report on Forecasting, Concept of Renewable Energy Management Centres and Grid Balancing stated that "typical accuracies for German wind power forecasts show 10-15% root mean square error of installed wind capacity for a single wind project, drop to 5-7% for day-ahead forecasts for a (regional) control area, and reduce to 4-6% for day-ahead wind forecasts for complete Germany. More importantly, with aggregation, the impact of forecast errors on individual plants is not as severe because the aggregate forecast of all plants drives the generation scheduling". 2. Report of the Expert Groups: Review of Indian Electricity Grid Code, proposes to notify a procedure for aggregation of pooling stations for the wind/solar/hybrid generating stations. In addition, Lawrence Berkeley



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			National Laboratory, USA in Statement of Reason for Forecasting, Scheduling and Imbalance Handling for Variable Renewable Energy Sources (Wind and Solar) has submitted that in the case where there is no aggregation of schedules, if two RE generators deviate in the opposite direction with no net deviation from the aggregate schedule, both the generators are expected to be penalized depending on the extent of their individual deviation even though they may not impose any additional costs on the overall system. Their research shows that the aggregate variation (in percentage terms) over multiple sites is typically lower than the variation in output on one site. Moreover, the forecasting accuracy is higher for aggregate forecast over multiple sites. Therefore, for scheduling purposes it is desirable to use the aggregate (total balancing area) level forecasts of RE generation.
6.			Additional Comments - Day ahead forecast cannot be accurate. Day ahead forecasting will make the complete project(s) unviable. - The option could be to allow IPPS to install energy storage and pass on the additional capex cost in tariff. - Without 100% storage technology, proposed stringent regulations by APSLDC cannot be met. - Plants were built on the technical standards existing during plant erection. Technological challenge is there to implement these changes with existing infrastructure to adhere to day ahead implemented schedule. - Proposed changes are not compliant with the best available scientific technology to forecast the renewable generation. On over all basis, based on proposed amendment the DSM charges will approximately tantamount to Rs. 3/ kWh for wind and Rs. 0.58/kWh for solar. Thus, such amendments are financially prohibitive and would result in decimation of renewable projects set up in Andhra Pradesh.



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