Rajasthan Electricity Regulatory Commission

Petition No. RERC/2045/2022

To seek approval for procurement of 1200 MW power on long term basis (25 years) from solar power projects with committed power supply from Energy Storage Systems for at least six hours during the peak demand period(s) to meet energy demand of the state & meeting Renewable Purchase Obligation of the state power distribution companies; and approval of deviations from the guidelines; along with amendments; issued by Ministry of New and Renewable Energy for tariff based competitive bidding process for procurement of power from Grid Connected Wind Solar Hybrid Projects.

Coram:

Dr. B.N. Sharma, Chairman

Shri Hemant Kumar Jain, Member

Dr. Rajesh Sharma, Member

Petitioner : Rajasthan Urja Vikas Nigam Ltd

Date of hearing : 18.10.2022, 03.01.2023

Present : Ms. Parinitoo Jain, Advocate for Petitioner

Sh. Shatanu Kumar Singhal, Representative for Petitioner.

Sh. Y. K. Bolia, Stakeholder.

Sh. D. S. Agarwal for Rudraksh Energy.

Sh. V. K. Gupta, Stakeholder.

Sh. D. D. Agarwal, Stakeholder.

Sh. Simran Grover for Bask Research foundation.

Sh. Manish Tyagi for RENEW Energy.

Date of order : 23.01.2023

Order

1. Rajasthan Urja Vikas Nigam Limted (hereinafter also called as "RUVNL" or "Petitioner") is a company incorporated under Companies Act, 2013 which is engaged in procurement of Power from different sources and thereafter distributing it to the consumer through the distribution licensee as per their respective jurisdictions.

2. The Petitioner on behalf of Distribution Licensees intends to initiate a Tariff Based Competitive Bidding process for procurement of electricity from Solar power projects along with committed power supply from energy storage systems during the peak demand period (at least six hours) during the day for a period of 25 years with effect from FY 2025-26.

3. Petitioner in its petition and during hearing has mainly submitted as under:

3.1. In terms of electricity units sold, agriculture sector is the biggest consumer of electricity. Most of the agriculture load in the state operates during the daytime. Also, Government of Rajasthan (GoR) in the budget announcement for FY 2020-21 made announcement for phase wise shifting of entire agriculture load catered during night hours to the day hours. Cheapest option available for meeting the day demand is solar energy.

3.2. Energy Assessment Committee (EAC) in its 28th meeting held on 07.01.2022 after considering shifting of agriculture load from night hours to day hours, decided the following peak demand and peak deficit scenario for the period from FY 2022-23 to FY 2029-30 :

Financial Year	**Anticipated peak demand (in MW)**	**Anticipated Available Capacity (in MW)**	**Peak deficit (in MW)**
(A)	(B)	(C)	(D = C- B)
2022-23	17,757	12,847	-4,910
2023-24	18,979	13,636	-5,343
2024-25	20,284	14,886	-5,398
2025-26	21,680	14,730	-6,950
2026-27	23,172	14,673	-8,499
2027-28	24,766	14,501	-10,265

2028-29	26,470	14,328	-12,141
2029-30	28,291	14,328	-13,963

3.3. The Board of Directors, RUVNL in its 50th Meeting held on 17.05.2022, approved procurement of 1200 MW power from solar power projects with committed power supply for six hours during the peak demand period.

3.4. Energy Department, Government of Rajasthan vide Letter dated 24.06.2022 conveyed its approval for initiating bid process for procurement of 1200 MW solar power with committed supply from Energy Storage system (i.e. pump storage, battery storage or any other technology) for at least six hours during the peak demand periods i.e. 06:00 AM to 10:00 AM and 06:00 PM to 10:00 PM to meet peak electricity demand of the state and to meet Solar RPO as well. To charge the Energy Storage System for supply of power during peak hours, bidder is free to adopt technology as per its convenience. Power supply shall commence from FY 2025-26. RUVNL has decided to procure this power through tariff based competitive bidding process as envisaged under Tariff Policy and guidelines notified by Ministry of Power.

3.5. Ministry of Power, Government of India, notified revised Tariff Policy on 28.01.2016 under Section 3 of Electricity Act, 2003. This Policy contained provisions for promoting procurement of renewable energy on long term basis by power distribution companies. To keep the tariff low, policy also encourages purchase of renewable energy through competitive bidding.

3.6. Ministry of Power from time-to-time has issued guidelines for procurement of long-term power from different renewable energy sources. Various guidelines issued by MoP for procurement of power from renewable energy sources are as follows:

(i) Guidelines dated 03.08.2017 for procurement of power from Grid Connected Solar Energy Projects. These Guidelines were issued under the provisions of Section 63 of the Electricity Act, 2003 for long term procurement of electricity from grid-connected Solar PV Power

Projects, having size of 5 MW and above, through competitive bidding.

(ii) Guidelines dated 08.12.2017 for procurement of power from Grid Connected Wind Energy Projects through a transparent bidding process. These Guidelines were issued under provisions of Section 63 of the Electricity Act, 2003 for long term procurement of electricity through competitive bidding process, from grid connected Wind Power Projects having, (a) individual size of 5 MW and above at one site with minimum bid capacity of 25 MW for intra-state projects; and (b) individual size of 50 MW and above at one site with minimum bid capacity of 50 MW for inter-state projects.

(iii) Guidelines dated 14.10.2020, along with subsequent amendments, for Tariff Based Competitive Bidding Process for procurement of power from grid connected Wind Solar Hybrid projects having individual minimum size of 50 MW at one site. Solar and Wind projects may be located at same or different locations. Further, storage may be added to the hybrid project.

(iv) Guidelines dated 11.03.2022 for procurement and utilization of Battery Energy Storage Systems as part of Generation, Transmission and Distribution Assets along with ancillary service.

3.7. In terms of the GoR approval, bidder will supply solar power during the day-time (i.e. 06:00 AM to 06:00 PM) by setting up of solar power project(s) with adequate storage capacity, to supply peak power for at least 6 hours between 06:00 AM to 10:00 AM and 06:00 PM to 10:00 PM, by setting up energy storage systems i.e. pump-storage project, battery storage or any other technology. To charge the Energy Storage System for supply of power during peak hours, bidder is free to adopt technology as per its convenience.

3.8. It is evident from above that the guidelines for development of solar power projects and wind projects are not suitable for the current bid process since these guidelines do not address the issue of peak power supply from Energy Storage System (ESS). However, guidelines dated 14.10.2020 for Wind-Solar hybrid projects along with storage has provisions for supply of power from Renewable Energy Projects (solar and wind

projects) along with supply of peak power by Energy Storage System. RUVNL is using these guidelines for its proposed 1200 MW power purchase.

3.9. However the 'Wind-Solar Hybrid' guidelines mandates supply of power from wind-solar hybrid project and the rated power capacity of one resource (wind or solar) shall be at least 33% of the total contracted capacity. Extracts from the guidelines is reproduced hereunder for ready reference:

"3.1. These Guidelines are being issued under the provisions of Section 63 of the Electricity Act, 2003 for long-term procurement of electricity through competitive bidding process, by Procurer(s), from Hybrid Power Projects having individual size of 50 MW and above at one site with minimum bid capacity of 50 MW, subject to the condition that the rated power capacity of one resource (wind or solar) shall be at least 33% of the total contracted capacity.

3.2. The solar and wind projects of the hybrid project may be located at same or different locations. The minimum capacity to be injected at each injection point shall be 50 MW.

3.3. Storage may be added to the hybrid power project:

a. *to reduce the variability of output power from wind solar hybrid project;*
b. *providing higher energy output for a given capacity (bid sanctioned capacity) at delivery point, by installing additional capacity of wind and solar power in a wind solar hybrid project;*
c. *to ensure availability of firm power for a particular period."*

3.10 In terms of the approval of GoR, 1200 MW power purchase is to be done from solar energy-based power projects with peak power supply using Energy Storage System (ESS). Hence approval of Hon'ble Commission is being sought for allowing deviation from the bidding guidelines to the extent that 100% of the power purchase be allowed from Solar Projects with storage as against Wind-Solar Hybrid Project with storage. Further, as per clause 23 of the guidelines, any deviation shall be subject to the approval of the Appropriate Commission (here RERC). Clause 23 is being reproduced hereunder:

"23. DEVIATION FROM PROCESS DEFINED IN THE GUIDELINES

In case there is any deviation from these Guidelines, the same shall be subject to approval by the Appropriate Commission. The Appropriate Commission shall approve or require modification to the bid documents within a reasonable time not exceeding 60 (sixty) days."

3.11 Therefore, RUVNL has filed this petition seeking approval of this Hon'ble Commission to consider and approve procurement of 1200 MW long term power from solar power projects with committed peak power supply from energy storage system as per MNRE guidelines for procurement of power from wind-solar hybrid projects with deviations/modification as stated in earlier paras.

3.12 The Petitioner in its petition has prayed for:

(i) To take the petition on record and admit the same.

(ii) To approve the deviations taken from the guidelines notified by Ministry of Power and allow long-term procurement of 1200 MW Power from grid connected solar power projects with storage under Section 86(1)(b) of the Electricity Act, 2003.

(iii) Any other order or relief deemed just and proper in the interest of justice may kindly be passed in favour of the petitioner.

4. During the first hearing on 18.10.2022, the Commission directed that the petition may be published and comments/suggestions may be invited from stakeholders within two weeks. Subsequently, the Petitioner issued notice dated 22.10.2022 to submit comments/suggestions by the stakeholder. Last date for submission of the comments was 09.11.2022.

5. Comments/Suggestions were received from following seven stakeholders:

(i) Sh. Yevanti Kumar Bolia

(ii) M/s Rudraksh Energy

(iii) Sh. V.K. Gupta

(iv) Sh. Dharm Deo Agarwal

(v) Bask Research Foundation

(vi) The Rajasthan Solar Association

(vii) M/s ReNew Power Private Ltd

Comments/Suggestions received from the stakeholders are summarised from para 6.1 to para 6.36 in this order.

6. Comments/Suggestions received from the stakeholders are summarised as below:

6.1 Decentralized solar energy is the cheapest option to meet the day's demand. Explain the calculation of how the proposed centralized solar power plant is the cheapest option after considering efficiency, cost, transmission distribution losses and expenses etc.

6.2 Estimated peak deficit in current FY 2022-23 is 4910 MW, which may further increase to 13963 MW in FY 2029-30. Then what is the justification for the petitioner to buy only 1200 MW of solar energy with storage system.

6.3 It is to be informed that whether or not the electricity demand that will increase after the release of more than 4.88 lakh agriculture electricity connections outstanding till now, is also included in this table. If not, provide the table including that additional electrical load as well.

6.4 Even without storage and transmission system, the proposed 1200 MW solar plant will give only 200 MW average energy or for 1200 MW average electrical energy, there will be 7200 MW capacity solar plants. This needs to be explained.

6.5 Transmission loss and expenditure and very low efficiency of storage system and battery life of maximum 8 years, battery replacement cost of minimum three times in the proposed period of 25 years and its maintenance and interest etc. will also have to be added.

6.6 Details to be provided of purchase of 1200 MW with energy storage system for 6 hours out of 8 hours of peak demand period. Details of Renewable Purchase Obligation of all three Discoms may also be submitted. This envisaged tariff based bidding process through complete calculations for the purchase of this 1200 MW electricity, such as the amount of solar energy (in average per day, month or year) and its rate (Rs. per unit), storage (battery) efficiency (storing the produced solar electric energy in the battery and on converting the

DC power of the battery to AC for re-transmission (percentage of the original stored power of the available quantity), loss in transmission-distribution of this power and its expenditure (average Rs. per unit) etc.

6.7 Details of the desired deviation in the guidelines, their justification and/or its effect etc. needs to be provided.

6.8 It is to be informed that which guidelines for the development of solar power projects and wind power projects are not suitable for the ongoing bidding process and reasons thereof. Instructions may be sought in this regard from the Ministry of Power, Government of India. If already sought then provide their details.

6.9 The basic nature of the Wind-Solar Hybrid RE Projects along with storage system, as per Guidelines dated 14.10.2020 should not be changed to only solar power with storage.

6.10 Under clause 23 of the guidelines, the Commission can approve deviation from the process defined in the Guidelines but not the nature of RE project. i.e., Solar-Wind Hybrid.

6.11 Only Solar power projects , particularly during winter months (November to February) when the peak demand occurs, it may not be possible to meet the morning peak demand (from 6.00 AM to 10.00 AM). With solar-wind Hybrid project, it will be possible through wind power generation during night, when the power demand is low, morning peak with storage system can be met.

6.12 Guidelines dated 14.10.2020 at para 3.1 provide that the Hybrid Projects having individual size of 50 MW & above at one sight, subject to the condition that the rated power capacity of one resource (wind or solar) shall be at least 33% of the total capacity. With such condition, the 1200 MW RE project can have 800 MW Solar and 400 MW wind projects.

6.13 Discoms are not meeting the RPO of wind, solar and total Renewable Energy. As per the Guidelines dated 14.10.2020, Solar-Wind Hybrid projects with storage system should be considered.

6.14 Energy storage system with pumped storage, taking long gestation period(about 4-5 years), may not provide power supply during peak demand period from FY 2025-26.

6.15 How the power generated would be consumed i.e. during 06.00 AM - 10.0 AM , 06.00PM -10.0 PM and during day time when peak demand occur, due to shifting of Agriculture load in day time as mentioned in para 4 of the Petition.

6.16 A report from RUVNL regarding present status of PPA'S, proposed & new units of Solar/ Wind/ Thermal/ Biomass, which are likely to come in Production in next 10 years, whether with Committed/ Definite Supply position of peak demand be Obtained. It may help to ascertain the judgment of EAC as there is no representative of RUVNL in the Committee.

6.17 Why RUVNL is procuring only 1200 MW power for 6 hours Commitment, when we are expecting Peak demand for 8 hours. Also, when Shortage of Power mentioned is increasing year after year in next Ten years, what are the plans of Energy Department/ RUVNL/ DISCOMS to meet out the Shortages.

6.18 The petitioner plans for committed supply of 6 hours from the energy storage system during the peak demand periods of 6.00 am to 10.00 am and 6.00 pm to 10.00 pm. However, it is not clear if the petitioner is seeking 1200 MW of supply from the energy storage system or from the hybrid system. Based on the peak demand periods indicated, it seems to be the later since solar PV system shall not be able to supply the stated power during evening peak demand period.

6.19 The petitioner is vague in its plan, especially its demand from energy storage system. The SECI guidelines referred to by the petitioner suggest ESS of minimum 1 MWh capacity for every MW of contracted capacity. The petitioner's guidelines shall lead to controversy during bidding because of various possible interpretations of the guidelines. Further, it may also lead to over-sizing of the solar PV and ESS system, and under-utilization of the hybrid system and the evacuation infrastructure.

6.20 On annual average basis, in a day, a solar PV system operates for about 4.8 hours of equivalent rated capacity. In a solar PV and ESS hybrid system, in a scenario where ratio of PV capacity to ESS capacity (in MW) is less than or equal to 1, complete charging of ESS through solar PV shall not be technically feasible. Hence, provision for

external injection and trading of power shall be required to be inserted.

6.21 Proposed trading margin of 7 paise per kWh for the intermediary is very high, and the Commission may allow for a prudent trading margin only. In case there is no intermediary, the clauses on intermediary and trading margin shall be removed.

6.22 Achieving a minimum CUF of 30% for Solar and ESS hybrid system against the contracted capacity on the AC side is not feasible without significantly over-sizing the system on the DC size. The approach is non-optimal as it shall lead to over-injection and underutilization of transmission network. Consequently, if the guidelines are retained, the petitioner needs to seek amendment of performance values also.

6.23 EAC's approach for energy demand estimations is very rudimentary and may have significant shortfalls given the increasingly dynamic nature of electricity demand. The Commission may give directions to undertake exhaustive medium- and long- term demand forecasting exercise in consultation with experts and public stakeholders. This shall protect the consumers and investors against the risk of overestimation or underestimation of demand.

6.24 There is a continuous improvement and innovation in the domain of Energy Storage System (ESS). Market prices of ESS have also been falling. Given the industry landscape of energy storage, it makes less business sense to enter into a 25 years contract.

6.25 Energy storage is a flexible asset and can potentially create more value if it is not treated is a committed supply source. Hence, the petitioner plan for procurement of committed supply during peak demand hours limits the value of ESS. It is suggested that ESS is treated as a flexible resource in bid document.

6.26 It shall be prudent to arrange separate procurement of solar PV capacity and energy storage capacity, although joint bid may be invited for the same. This shall also allow the systems to be integrated and synchronised with a singular point of coupling.

6.27 Following guidelines may be adopted for the aforementioned purpose:

(i) Guidelines for procurement of power from Grid Connected Solar Energy Projects.
(ii) Guidelines for procurement and utilization of Battery Energy Storage system as part of Generation, Transmission and Distribution assets along with Ancillary service.

6.28 An analysis of the load-demand data of last 3 years for Rajasthan state and projection till 2030, provides the following insights:

(i) Rajasthan has a very flat distribution of load where the demand peaks during the day hours. The demand starts increasing around 6 am and peaks between 8 am to 10 am. Historically, 60% of the daily load demand is between 6 am to 8 pm.
(ii) Considering the year on year agriculture demand shift in the day hours, the demand during non-Solar hours, i.e., 6 pm to 6 am can be managed with existing non-RE contracted capacity (Thermal, Hydro & Nuclear).
(iii) Solar generation hours are from 7 am to 6 pm during which solar generation starts ramping up from 6 am and reaches to 40%+ PLF from 8 am onwards. Further, it starts dropping from 5 pm onwards and generates around 10% PLF till 6 pm.

6.29 The energy storage will be required to meet the demand for less/non-solar generation periods for maximum of 2 hours each during morning, i.e. 6 AM - 8 AM and evening, 6 PM - 8 PM respectively. In these timeslots, supply is supported partly by solar generation. This indicates that the storage solution can be operated for around 2 cycles per day cumulatively for 4 hours.

6.30 As per historical data, the 60% of the daily load demand happens between 6 am to 8 pm. Therefore, the tender should put compliance only for 6 am to 8 pm time-block. We recommend to introduce compliance requirement on an annual basis for the defined time period of 6 am to 8 pm. Any non-compliance to be penalized at the PPA tariff. This will ensure that the peak requirement of the state is met along with better utilization of the asset and evacuation system.

6.31 Energy Storage System (ESS) is a non-generating, high energy consuming and an expensive asset. Therefore, the optimum sizing and maximum utilization of ESS is the key to discover lower tariff. As this is a

solar only tender where the BESS (Battery ESS) can be charged once during the day with the solar-generation for discharge between 6 pm to 8 pm, for charging ESS during night period for discharge between 6 am to 8 am, the following options may be considered:

(i) State can provide excess energy during the night hours to charge the ESS. This will help in reducing the continuous requirement to ramp-up and ramp-down existing generation capacity
(ii) Power markets can also be tapped to procure the charging power required
(iii) any other self-identified bilateral PPA or ISTS connected merchant plants of the Developer/IPP

Doing so will help in reducing the oversizing of ESS and will support consumption during the low demand night periods and thereby lowering the bid tariff.

6.32 Single blended tariff may be considered for this tender, which in turn will put all the RE and ESS technologies on an equal competitive footing and also meet the required demand load profile of the State.

6.33 The solar plant and the energy storage component should be co-located with a common point of grid interconnection. This will ensure higher utilization of the evacuation infrastructure along with optimized balance of system and lower transmission losses. Also constructing both the solar and storage component within the state grid boundary will save the DISCOMs the additional GNA charges along with ISTS losses. All synergies combined should result in achieving lower bid tariff.

6.34 Provisions may be incorporated for allowing installed capacity of the project within +/- 5% of the Contracted Capacity and accordingly, grid connectivity upto 105% of the Contracted Capacity to be provided. This will increase the total solar generation to the PPA and help in reaching better compliance during 6 am to 8 pm time slot. There is precedence of same being allowed by Gujarat state for all state connected bids.

6.35 To ensure only serious players participate in the bid, stringent penalty should be put in place for non-compliance with construction timeline. We request RUVNL to limit the construction time period to 24 months

with a maximum delay extension of 6 months with PBG encashment. Any delay beyond 30 months should lead to Project termination. This will ensure the assets are constructed within the defined time period and asset is supplying power to meet the state's demand.

6.36 With additional payment security like state guarantee and payment security fund over the existing provisions should help build confidence of lender in State Tenders. This directly affects the Project financing interest rate and thereby the tariff. Alternatively, RUVNL can explore to conduct this bid via any central agency like SECI. Historically the state bids have been concluded with a premium of upto INR 0.30/ kWh when compared with the central bids.

7. Reply to observations raised by the stakeholders given by RUVNL in written submissions and during hearing is summarised as below:

7.1 Implementation of Roof Top Solar by the end users is not mandatory under the law. It depends on an individual based on his/her own interest, financial analysis and conscious decision.

7.2 In terms of the guidelines issued by the Ministry of Power/Ministry of New and Renewable Energy, the applicable tariff on resources for procurement of renewable energy power is a single part tariff i.e. Payable for the energy actually determined/supplied by the renewable energy generator. There is no obligation to pay fixed charges as in conventional power projects with bifurcated tariffs, where fixed charges are paid based on the availability of power projects and variable tariffs are paid for fixed energy.

7.3 Since the farmers were reluctant to pay 10 percent of their share in advance, the Discoms have cancelled the work orders placed under Component-C of KUSUM Scheme. For early implementation of the scheme and speedy execution of the project, Rajasthan Discoms have implemented Solar Agriculture Livelihood Yojana. A portal has been launched where interested landowners / farmers and solar power plant developers, together on RESCO system around existing 33/11 KV sub-stations of Rajasthan Discoms can arrange land for solar power plant.

7.4 In the present petition, RUVNL is seeking permission to set up 1200 MW of solar projects which would meet the day time power requirements of the State and supply energy from storage systems which would meet the demand of power during peak demand hours. The developers will be selected on the basis of the proposed minimum tariff (Rs./unit). This tariff is determined for the entire project duration of the contract. The capacity addition through distributed solar generation is very slow and such projects also consume subsidies as per the policy of the MNRE / State Government.

7.5 The Energy Assessment Committee, during its meeting held in January 2022, had envisaged a peak deficit during the financial years 2022-23 to 2029-30. The current bidding process is to meet the power shortage during day time as well as to meet the mandatory power supply during peak hours and to meet the renewable power purchase obligation of DISCOMs also planning to purchase electricity from various energy sources including available energy sources. The power demand is expected to increase further after the connections are given. The committee reviews its determination from time to time keeping in view the increase in demand and planned capacity addition. However, it is clear that the demand will increase in future and DISCOMs will have to enter into long term power contracts to meet the demand.

7.6 Under the proposed bidding process, RUVNL has the obligation of the PSU is to purchase power from the selected project developers at the quoted per unit rate for 25 years. The establishment of the project, selection of storage system, project design and its maintenance to meet the obligation of annual supply of electricity during the contract period of 25 years is entirely the domain of the developer. Rajasthan DISCOMs have considered 6.00 AM to 10.00 AM and 6.00 PM to 10.00 PM as peak demand hours based on the demand pattern and uniform availability of power during these hours. Storage supply to Discoms during the above peak hours will be available for at least six hours as per requirement.

7.7 The DISCOMs are bound to undertake renewable energy purchase as notified by the Ministry of Power and the Commission to fulfil their renewable energy purchase obligation. So far, order for renewable energy purchase obligation is only for till FY 2023-24. As per the guidelines issued by the MNRE for RPO up to FY 2029-30 on 22.07.2022 the RPO should be at least 33 percent of the total contracted

capacity. RUVNL intention is to procure solar power with storage, through a tariff based competitive bidding process.

7.8 Since, ESS is requisite to meet morning & evening peak and renewable energy along with storage is covered under Wind-Solar Hybrid Bidding guidelines, it is necessary to seek deviation from guidelines under clause 23. Also day time supply along with meeting solar RPO and morning & evening peak is our primary requirement.

7.9 RUVNL has sought deviation since entire contracted capacity is required during the day hours and/or peak hours. For this purpose, solar project with necessary storage facility is the best option. As Wind generation during this period has least generation, whereas state has its peak demand. Wind generation will largely be available during monsoon season and night hours, which are lean demand period for the state.

7.10 In order to ascertain the benefits of solar power along with storage systems, in terms of the provisions of the bidding guidelines, it has been requested to approve the solar power along with storage configuration, as it is a proven fact that solar power along with storage system can meet the day and/or peak demand of the State (as solar power is available more than 330 days in a year)

7.11 It is true that Rajasthan Discoms have not been able to meet wind, solar & total RE obligation till date. RUVNL has already signed agreement with SECI for procurement of 1200 MW power from ISTS wind power projects. RERC vide order dated 23.06.2022 has already approved procurement of this power at the discovered tariff. Projects will commence power supply from March-2023 onwards and will help Discoms to meet their wind RPO.

7.12 Further, RUVNL in petition no 1939/2021 seeking waiver of shortfall in RPO obligations has elaborated its various efforts taken to fulfil RPO obligation and genuine reasons hampering its efforts. Further details of future RE capacity addition, tentative assessment of RPO fulfilment is also available. RERC vide order dated 23.12.2021 has directed to make all out efforts to meet their total RPO backlog accumulated till date along with the respective year targets as have been given to the Discoms by the Commission up to FY 2023-24.

7.13 In view of the RERC directions and RPO trajectory notified by MoP in July 2022, RUVNL has taken initiative to initiate the bid process for

procurement of solar power with storage to meet day power requirement as well as RPOs. As mentioned above, Solar along with storage is equipped to meet Rajasthan State's day requirement from 6 AM to 6 PM and evening peak as per the estimated demand approved by EAC. Besides these, RUVNL is also planning to purchase power from Hybrid (solar & wind) power projects in future to meet the RPOs.

7.14 Energy generated from solar power project will be used to meet day power requirement and energy stored in the ESS will meet the obligation of supply of power during 6:00 AM to 10:00 AM and 6:00 PM to 10:00 PM. Developer is responsible for charging the ESS through RE power at its risk and costs.

7.15 Developer is free to choose storage technology and plan its project configuration to meet its power supply obligation for charging the storage system. Storage may be in the form of Battery Energy Storage System or Pump Storage Plant or any other form.

7.16 RUVNL has already tied 1200 MW wind power which is expected to supply 3590 MUs annually from March 2023. This energy will help Discoms to meet out the wind obligation upto FY 2025-26 in view of MoP order.

7.17 As per the terms and conditions of the Bidding Guidelines issued by MoP/MNRE, Discoms had to approach the commission seeking approval of the deviation from the guidelines. RUVNL has filed this petition seeking approval of the RERC on the deviation from the bidding guidelines as there is no specific guidelines for procurement of solar power with storage. It shall prepare the bid documents in accordance with the MNRE/MoP guidelines after due approval of the Commissions on the deviation.

7.18 As per clause 23 of the wind-solar hybrid guidelines, in case of deviation from these Guidelines, the same shall be subject to approval by "Appropriate Commission". Hence, there is a provision available for deviation in the Guidelines.

7.19 As per the provision provided in Tariff Policy 2016 and the guidelines issued by Ministry of Power, GoI, distribution licensees are required to procure solar/wind power through competitive bidding only. RUVNL is not having its own solar power plants and is procuring RE power from the solar power plants on tariff (Rs/kWh) basis.

7.20 Trading margin is applicable in case when RUVNL procures power through intermediary agency like SECI. In the present bid process, no intermediary agency is involved and hence state Discoms will save on trading margin.

7.21 CUF is calculated on the contracted capacity (AC side) of the power plant. CUF of standalone solar plant is generally in the range from 25% to 30% across all the tenders. CUF can be different with different location and technology for e.g. solar projects with tracker technology can achieve much higher CUFs. Also, installation of higher DC capacity will not result in over-injection or underutilization of transmission system as contracted capacity shall be in terms of AC capacity and Developer is not allowed to inject power more than the contracted capacity. Planning of transmission system is also on the basis of the contracted capacity of the power project. Besides, ESS system will help to save off peak generation. Hence, achieving minimum 30% CUF is not very difficult as it was 10-15 years ago.

Commission's View:

8. Commission has considered the submissions, Objections, reply, and oral arguments on behalf of the Petitioner and the Stakeholders.

9. In their submission and during hearing, the Petitioner submitted that subsequent to the announcement in the budget for FY 2020-21 by the GoR the Energy Assessment Committee (EAC) in its 28th meeting held on 07.01.2022 after considering shifting of agriculture load from night hours to day hours, decided the peak demand and peak deficit scenario for the period from FY 2022-23 to FY 2029-30. The anticipated Peak deficit shall increase from 4910 MW (2022-23) to 13936 MW (2029-30). The power deficit scenario along with proposal for procurement of solar power complemented with peak power purchase from energy storage were presented before the Board of Directors, RUVNL in its 50th meeting held on 17.05.2022. The Board approved the procurement of 1200 MW power from solar power projects with committed power supply for six hours during the peak demand period. To supply peak power for at least 6 hours, the bidder may set up energy storage system i.e. pump- storage project, battery storage or any other technology.

10. The petitioner further submitted that it can be seen from the Ministry of Power (MoP) guidelines dated 03.08.2017 for procurement of power from Grid Connected Solar Energy Projects that these guidelines are not suitable for the current requirement since it does not address the issue of peak power supply from Energy Storage System. The guidelines dated 14.10.2020 for Wind Solar Hybrid projects has provisions for power supply from Energy Storage System but these guidelines mandates that the rated power capacity of one resource (solar or wind) shall be at least 33% of the total contracted capacity. Looking to the potential & suitability of Solar power for Rajasthan and requirement of fulfilment of RPO , the Petitioner prayed for allowing deviation from the bidding guidelines dated 14.10.2020 to the extent that 100% of the power purchase be allowed from solar project.

11. The petitioner in its petition has mainly prayed for :

> Approval of the deviations taken from the guidelines notified by MoP and allow long-term procurement of 1200 MW Power from grid connected solar power projects with storage under Section 86(1)(b) of the Electricity Act, 2003.

12. The Petitioner also submitted that as per clause 23 of the guidelines dated 14.10.2020, any deviation shall be subjected to the approval of the Appropriate Commission. Clause 23 is reproduced hereunder:

> *"23. DEVIATION FROM PROCESS DEFINED IN THE GUIDELINES*
>
> *In case there is any deviation from these Guidelines, the same shall be subject to approval by the Appropriate Commission. The Appropriate Commission shall approve or require modification to the bid documents within a reasonable time not exceeding 60 (sixty) days."*

13. After careful consideration of the submissions made by the Petitioner as well as the Stakeholders, the Commission observes that the Petitioner is planning to procure 1200 MW solar power on long term basis with committed power supply from Energy Storage System for at least six hours during the peak demand periods. Further, no guidelines of Central Government are suitable for the project, if used as it is. So the Petitioner has proposed deviation in the guidelines dated 14.10.2020 which is most suitable for the project. Further, as per clause 23 of the guidelines, the Commission can approve any deviation in the guidelines.

14. The Commission also observes that addition of the storage with the solar project may reduce the variability of output power. It will also ensure availability of firm power for a particular period specifically during peak hours.

15. The Commission further observes that as per the proviso to regulation 7.2 of RERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2020 , in case the Competitive Bidding Guidelines for any particular technology are not issued by the Central Government, the Competitive Bidding Guidelines issued for the other technologies issued by the Central Government with suitable deviations approved by the Commission may be followed by Distribution Licensee for procurement of power through competitive bidding. The proviso is reproduced hereunder:

> *"7.2 The Commission shall adopt the tariff for a RE Power Project where such tariff has been determined through a transparent process of competitive bidding in accordance with the Guidelines issued by the Central Government under Section 63 of the Act:*
>
> *Provided that, in case the Competitive Bidding Guidelines for any particular technology are not issued by the Central Government, the Competitive Bidding Guidelines issued for the other technologies issued by the Central Government with suitable deviations approved by the Commission may be followed by Distribution Licensee for procurement of power through competitive bidding:*
>
> …….. "

16. The Commission further observes that MoP has issued RPO trajectory till 2029-30. In the trajectory, the total RPO target for the year 2029-30 is 43.33 % of the total consumption of electricity (in energy terms). The Commission is also in the process of making RPO Regulations for the above targets. Public notice has already been issued for the same inviting comments/suggestions. MoP has also issued trajectory for Energy Storage Obligation (ESO) till FY 2029-30. The ESO shall be calculated in energy terms as a percentage of total consumption of electricity and shall be treated as fulfilled only when at least 85% of the total energy stored in the Energy Storage System (ESS) on annual basis, is procured from renewable energy sources. The ESO to the extent of energy stored from RE sources shall be considered as a part of fulfilment of the total RPO. Further, The Rajasthan state has tremendous potential of solar power and if that potential is tapped effectively then the RPO

targets may be achieved easily that too in a cost effective manner. As regard wind RPO, the Discoms have indicated that they have tied up for 1200 MW wind power which is expected to supply 3590 MUs annually from March 2023.

17. Looking to the submission of the Discom, and provisions of bidding guidelines of MNRE dated 14.10.2022 read with provisions of RERC tariff Regulations cited above, the Commission approves the proposed deviation from the MNRE guidelines dated 14.10.2020.

18. The Commission have also noted the RPO compliance status submitted by the Discoms. The latest RPO Compliance status of Discoms received from RREC on 06.06.2022 is as follows:

Year	Total Energy Excluding Hydel Energy in MU	Wind		Biomass		HPO		Solar		Total	
		Target	Ach.	Target	Ach.	Target	Ach	Target	Ach.	Target	Ach.
	MU	%	%	%	%	%	%	%	%	%	%
2014-15	67423	6.80	5.60	0.70	0.41			1.50	0.69	9.00	6.71
2015-16	69393	7.30	6.27	0.90	0.35			2.00	0.96	10.20	7.58
2016-17	69166	7.80	7.38	1.10	0.40			2.50	1.14	11.40	8.92
2017-18	67915	8.20	7.22	1.30	0.52			4.75	2.89	14.25	10.62
2018-19	74423	8.00	7.40	0.60	0.48			4.75	4.38	13.35	12.26
2019-20	73425	8.30	7.24	0.70	0.53			6.00	5.97	15.00	13.75
2020-21	78370	8.60	6.28	0.80	0.53			7.25	6.03	16.65	12.84
2021-22	84051	8.90	6.64	0.90	0.46	0.18	0.0	8.50	7.02	18.48	14.12

19. It is observed that the Discoms have also to meet their shortfall in meeting its RPO of the earlier years, and RPO targets fixed for them for FY 2022-23 and 2023-24 are even higher. It is further noted that earlier Discoms had filed Petition No. 1979/2021 regarding RPO compliance where Commission had issued the order on 23.12.2021 in the matter directing the Discoms to make all efforts to meet their total RPO and backlog accumulated till date along with the respective year targets given to them.

20. Looking to the present shortfall in RPO, need to fulfil higher RPO in future and further need to tie up for peaking power through ESS which will also help to fulfil the proposed ESO, the Commission deems it appropriate to allow power procurement of 1200 MW from grid connected Solar power project with storage.

21. In view of the foregoing discussions, the Commission orders as under:

20.1 Long term procurement of 1200 MW power from grid connected Solar power project with storage through a transparent tariff based competitive bidding by the petitioner is allowed.

20.2 The Deviation proposed by the Petitioner in the guidelines dated 14.10.2020 of MNRE, Government of India is approved to the extent that full 1200 MW power to be procured from solar power project.

20.3 At least 85% of the total energy stored in the Energy Storage System (ESS), on annual basis, shall be taken from renewable energy sources.

20.4 The requirement of energy during peak hours shall be clearly spelt in the bidding documents.

22. Petition stands disposed of in above terms.

(Dr. Rajesh Sharma)	(Hemant Kumar Jain)	(Dr. B. N. Sharma)
Member	Member	Chairman