

**Uttar Pradesh Electricity Regulatory Commission,
Lucknow**

In the matter of Uttar Pradesh Electricity Regulatory Commission (Rooftop Solar PV Grid Interactive Systems Gross / Net Metering) Regulations, 2019

Date: 02.11.2018

STATEMENT OF REASONS

Background:

The Electricity Act, 2003 and the Regulations framed thereunder envisage promotion of Renewable Sources of energy generation and consumption. The Government of India has pronounced the National Electricity Policy, Tariff Policy etc. which also envisage generation and consumption of energy from the Renewable Energy Sources including the Solar energy in the country. As a part of the same, the installation of Rooftop Solar Projects is being encouraged at the consumers' place. This also facilitates utilization of idle space available with Rooftop owners to enable reduction in the distribution loss, and reduce the dependency on fossil fuel-based generation.

The Commission, to promote the use of Green Energy by the consumers, in exercise of powers conferred under Section 61, 66, 86(1)e and 181 of the EA, 2003 and all other enabling power in this behalf, notified UPERC (Rooftop Solar PV Grid Interactive Systems Gross / Net Metering) Regulations 2015 vide Notification No. **UPERC/Secretary/RSPVRegulations/2015/2150** on dated 20.03.2015. The Regulations enable all the consumers in the State of UP to install rooftop solar system in their premises under Net Metering or Gross Metering mechanism. The consumers are eligible to set up Rooftop Solar Power Plants of capacity upto 100% of their Contracted demand/Sanctioned Load. Further, it is provided that the installed capacity shall not be less than 1kW. It was also provided that only 15% of the capacity of the Distribution Transformer (DT) could be installed which was later increased to 25% vide Order dated 29.06.2016.

The Commission received a number of Petitions seeking permission to install Rooftop Solar system of above 1 MW capacity under net metering system arguing that clause 3.3 of the Regulations is limiting maximum capacity to 1 MW. Considering these representations, the Commission on case to case basis allowed the installation of more than 1 MW Solar rooftop.

Over the period, taking cognizance of issues raised by several stakeholders in the implementation of RSPV Regulations, it was felt by the Commission to review the aforementioned Regulations to further facilitate the rooftop solar system in the State of UP.

Accordingly, the Commission issued a Concept Paper to frame issues for amendments in Regulations. The Concept Paper along with public notice was hosted on the Commission's website and Public Notice in this regard was issued vide Notification No. UPERC/Secy/JD(G)/2018/ dated 20th August, 2018 for inviting comments and suggestions from the stakeholders upto 21.09.2018. Considering all the comments and suggestions, the Commission has revisited the provisions of RSPV Regulations, 2015 and proposes a draft of new Regulations, which shall repeal the existing Regulations once the new Regulations are finalised. Statement of Reasons that captures the comments received from Stakeholders along with analysis and decision of the Commission on the same are as follows:

VIEWS OF THE STAKEHOLDERS AND ANALYSIS AND DECISION OF THE COMMISSION ON IMPORTANT ISSUES

I. PV system capacity limitation:

Commission's Proposal: To allow the maximum installed capacity of RSPV system upto 2 MWp.

Comments:

- 1. UPPCL:** The installation of Rooftop Solar Projects is being encouraged by the Government and the Commission at the consumers' place so that it will result in reduction in the distribution loss, utilization of idle space available with small Rooftop owners and reduce the dependency on fossil fuel-based generation. **Proposed increase in RSPV system capacity from 1 MWp to 2 MWp will be benefiting only the big consumers – who are cross subsidising consumers and paying higher tariff vis-à-vis average cost of supply, thus increasing the financial losses of the UP Discoms.** Under the existing provisions, these consumers are not required to pay cross subsidy surcharge for the consumption they are netting off against the generation from RSPV plant. **Therefore, it is requested to the Hon'ble Commission to keep the PV system capacity upper limit to 1 MWp only as per existing UPERC RSPV Regulation, 2015.**
- 2. Amplus:** In recent time, the Commission has provided permission for rooftop Solar Plant over and above 1 MWp but limited to contract demand, on case to case basis. **So, maximum capacity of rooftop project under net metering should be allowed to 100% of the contract demand (KVA) or sanctioned load (KW).** To keep promoting the rooftop solar, state commissions of Bihar and Odisha have recently removed the maximum capacity cap of 1 MWp and extended the capacity of the plant up to sanctioned load of the consumer. We welcome the initiative taken by the Commission to increase the maximum limit, **however to keep the approval**

process modest, Commission should allow rooftop Solar Plant up to the sanction load based on feasibility check.

3. NPCL

- i) The proposed PV system capacity limitation should be in MWp.
- ii) If a consumer applies for higher PV system capacity (i.e. more than 2 MWp) and Discom has no objection for installation of higher PV system capacity, **the Regulations should provide authority to the Discom for allowing the installation of PV system of more than 2 MWp up to the contracted load of the consumer.** In such cases, the Discom shall initiate for approval of the Commission.

Analysis and Decision of Commission:

The aforementioned proposal of the Commission to allow capacity upto 2 MW is in consideration to the following:

1. **Demand Supply gap**-The state experienced energy deficit during FY 2017-18 of (-)1.5% which is more than double the all-India average of (-)0.7%. To improve this demand supply Gap in the State, the Commission proposes to encourage the installation of Roof top Solar PV.
2. **High AT&C Losses**- The utilities in the State have very high AT&C losses of around 37.92%. A push to RSPV installation in the State will help the Discoms in reducing their AT&C losses and improve their financial health.
3. **MNRE suggestion**- MNRE vide its letter dated 18.07.2018 has made few suggestions with respect to Rooftop solar Regulations. In regard to rooftop PV system installation capacity, it has proposed to increase the limit to 2 MWp. The state government also vide its Solar Policy 2017 has set a target to install 4,300 MW rooftop solar projects, by 2022.
4. **Renewable Purchase Obligation (RPO)**- Ministry of Power in its Order regarding trajectory of Solar and Non- solar RPO, has increased the Solar RPO target from 6.75% in 2018-19 to 7.25% in 2019-20, 8.75% in 2020-21 and 10.50% in 2021-20. To achieve this target, the Solar installations in the State have to be encouraged.

Hence, taking into consideration Demand- supply gap, high AT&C losses and DISCOM's short fall in meeting solar RPO targets in the state, the Commission finds it appropriate to allow upto 2 MWp rooftop solar PV plant under these

Regulations.

II. Distribution transformer capacity:

Commission's Proposal: RSPV Regulations, 2015 provided the total rooftop solar PV installation capacity connected to a DT upto 15% consumer DT capacity, which was later increased to 25% vide Commission's order dated 29.06.2016. UPERC propose to further increase this% of DT capacity from 25% to 50%.

Comments:

- 1. UPPCL:** The proposed amendment, if approved, **will create technical difficulty for the distribution licensees in designing its network** and catering to the demand of its consumers as the network is designed by taking into consideration the forecast of load/demand. It will create a situation of net export which will raise the issues of safety since existing network does not have the capacity to evacuate the excess energy. This will also lead to the Residential consumers installing Solar PV Power Plant not for captive consumption but for commercial consideration.
- 2. Amplus:** Limiting the rooftop plant capacity by Distribution Transformer is not decisive. Acknowledging it, other states of India like Karnataka, Kerala, Odisha have increased the limit on DT capacity up to 80%. Further, consent of setting up rooftop project in the state is going through a feasibility check process. **So, we request the Commission that the capacity cap on rooftop Solar Plant should be increased up to 80 % of the DT rating.**
- 3. NPCL:** If the Discom has no objection for higher limit the Discom with mutual agreement with the consumer **may allow the installation of the RSPV plant of more than 50% of the DT capacity of the Discom** subject to the other conditions provided in the RSPV Regulations.

Analysis and Decision of Commission:

<p>Although, UPPCL on behalf of the State Discoms has opposed the increase in limit of available DT capacity for rooftop solar PV from 25% to 50% but they have not given any substantive reason. On the other hand, Amplus and NPCL have supported for increase in available DT capacity. The Commission finds that theoretically such generation would help in decongesting the local distribution by supplying additional power at consumption side which would also reduce the system losses as the consumption would be on local level only, hence, rooftop solar power should be encouraged by increasing the available DT capacity. Therefore, the Commission opines that for further promotion the restriction on DT</p>
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capacity should be done away with.

III. Cost of augmentation of distribution network:

Commission's Proposal: UPERC proposed that consumers should not bear the cost of augmentation of available system capacity in case it is required to provide the net metering or gross metering connection.

Comments:

1. **UPPCL:** The proposed amendment, if approved, will burden all the consumers with the cost of augmentation of the distribution network for an individual consumer. Although this will be allowed in the ARR of the Discoms, it is humbly submitted that **either the entire cost of augmentation or some portion (which can be fixed per kVA) should be recovered from the Consumer installing the RSPV system.**
2. **NPCL: Concerned consumer should bear the cost of argumentation of distribution network,** else, the burden of such cost would be borne by other consumers who don't get any direct benefit.

Analysis and Decision of Commission:

The utilities have unanimously opposed the cost on them for augmentation of system for rooftop solar PV, if required. But, the Commission opines that it would not be justified if the burden of such additional cost is put on consumer alone. Hence, the Commission has proposed that for upto total 10 kWp solar rooftop installation the consumer would not pay any system upgradation charges whereas, above this the consumer will pay at the rate of Rs 1000 per kWp as cost of augmentation of system. e.g. a consumer willing to install a 15 kWp RSPV plant shall be paying Rs 5,000 (5×1000) as RSPV cost to the utility.

IV. Settlement of Solar Energy (Banking of solar power)

Commission's Proposal: UPERC proposed not to introduce any new provision for the Settlement (Banking) of solar power at the end of settlement period in addition to the existing provisions in the Regulations.

Comments

1. **UPPCL:**UPPCL agrees with the Commission's approach and requests to continue with carryforward of the excess injected electricity credits and may be utilized to net electricity injected or consumed in future billing periods but within the settlement period.
2. **Amplus:** According to the present energy accounting and settlement procedure, industries/ Commercial properties having less consumption in daytime block could not avail the advantage of exported energy on the subsequent months. **Commission should remove same time slot adjustment for the exported energy in the subsequent month**, total exported energy should be net off against total consumption for the subsequent month, so that beneficiaries can avail the benefit of total generated energy against their consumption.
3. **NPCL:** No Comments

Analysis and Decision of Commission:

The Commission opines to keep the existing provisions and not to have any separate/additional provision for Settlement (Banking) of solar power.

V. Freedom of choosing between CAPEX and RESCO model:

Commission's Proposal: UPERC proposeno change in the existing model which already provides freedom of choosing between CAPEX and RESCO model to a consumer.

Comments:

1. **UPPCL:** No comments
2. **Amplus:** No comments
3. **NPCL:** No comments

Analysis and Decision of Commission:

The Commission would like to continue with the existing provisions of the Regulations.

SOPs

1. Timelines for Site Verification/ technical feasibility and Issuance of letter of approval/Termination

UPERC Proposal: MNRE has suggested to change the total number of days for the entire activity to 15 days.

Comments:

UPPCL: State of UP is a large state and managing all the activities of Site Verification/ technical feasibility and Issuance of letter of approval/ agreement signing will not be possible within 15 days. **It is suggested to continue with the existing timelines as per the existing regulations.**

NPCL: 15 working days will be reckoned from the date of submission of application form complete in all respect along with complete required documents as per the applicable Regulations and Indian standards.

2. Submission of Application of Subsidy

UPERC Proposal: Zero date for the subsidy process should be from the date of LOA from Discom.

NPCL Comments: Zero date for the subsidy process should be from the date of net metering agreement with the Discom and not from the date of LOA from Discom

3. Execution of net metering and Installation of rooftop Solar system

UPERC Proposal: The net metering arrangement shall be executed before the installation of rooftop solar system.

NPCL Comments: In this regard it is submitted that rooftop solar system should be installed by the consumer before the execution of net metering arrangement

4. Billing Process

UPERC Proposal: Billing process should be 30 working days after synchronization with the Grid.

NPCL Comments: Billing process should be as per the respective billing cycle of the consumer after the synchronisation of the rooftop solar system with the grid.

Analysis and Decision of Commission:

The Commission to continue with the existing provisions of the Regulations in respect of above SOPs.



Other Comments

1. Payment of electricity credits in gross Metering:

UPERC Regulations: Vide Order dtd. 23.08.2017 the Commission decided to keep tariff under gross metering arrangement at APPC of previous FY for every year. For ex. For FY 2018-19 APPC of FY 2017-18 shall be applicable.

UPPCL Comment:

It is humbly submitted that UP Discoms have already tied up power purchase capacity to meet the electricity demand. For buying power from RSPV plants, UP Discoms have to back down the plants, from where it has already contracted the power and pay capacity charge to the generators. The Discoms save only energy / variable charge from long term sources it has tied up while buying power from RSPV Plants. **Therefore, it is requested to allow settlement tariff under gross metering arrangement at Average Variable Power Purchase Cost (AVPPC) of previous FY for every year.** For ex. For FY 2018-19 AVPPC of FY 2017-18 shall be applicable.

It is suggested that for **large consumers, who are cross subsidizing other consumer categories, only gross metering should be allowed**, and the settlement tariff under gross metering arrangement shall be at Average Variable Power Purchase Cost (AVPPC) of previous FY for every year.

It is further submitted that for all cross-subsidising consumer categories, where tariff is more than Average Cost of Supply, if net metering is continued, **the hon'ble Commission may introduce levy Cross Subsidy Surcharge and Additional Surcharge on the energy generated and consumed by these consumers under net metering** arrangement to offset the revenue loss and fixed cost of long term PPA incurred by the Discoms. **For the electricity credit, which remain unadjusted at the end of settlement period under the net metering arrangement**, it is submitted that in line with practice followed in state of Punjab, Bihar, **there should neither be any payment nor it should be carried for next settlement period.**

Analysis and Decision of Commission:

Over the years Renewable Energy sector has not only grown in size but it has further matured resulting in reduction in capital cost as well as tariff. As a matter of fact, the latest bidding conducted by SDA, the discovered tariff was well below APPC. Therefore, the Commission finds it appropriate to revisit the existing provision of

tariff under gross metering arrangement. It is proposed that tariff under gross metering would be the weighted average tariff of Competitive Bidding adopted by the Commission in last Financial Year. e.g. For FY 2018-19 weighted average tariff of projects discovered through Competitive Bidding in FY 2017-18 and adopted by the Commission shall be applicable. if in any year no bidding is done then the rate of last bidding shall be applicable.

However, under net metering for settlement at the end of FY, the tariff would remain at Rs 2/unit.

Some Comments by Amplus

2. Metering:

UPERC Regulations: The check metre shall be installed after the inverter of the Solar rooftop system”

Comments: Metering shall be done by using either a single phase or three phase net meter depending upon requirement at the **interconnection point** as confirmed by the Discom in Clause 9.7 of the UPERC RSPV Regulation 2015 referred “The check metre shall be installed after the inverter of the Solar rooftop system”. Often this create ambiguity between solar meter and main check meter for metering division and consumer/ developer as there are no mandatory provision to install solar meter after inverter to measure the Solar generation. As per the provision in the Grid code of UPERC main metre is installed along with one check meter. So, we suggest the Commission should modify this accordingly **“The Check meter shall be installed along with Main Meter after the inverter of the Solar rooftop system”**.

Analysis and Decision of Commission:

The Commission to continue with the existing provisions of the Regulations.

3. Online application

MNRE in its concept note for grid connected rooftop solar division (sustainable rooftop implementation for solar transfiguration of India) has proposed following responsibilities for expeditious implementation of rooftop solar projects.

- a. Create an RTS cell at each division level headed by Executive Engineer and the respective sub divisional officer shall act as Nodal Officer for implementation of RTS project in its operation area.
- b. Develop dedicated online portal for grid connected RTS projects

Discoms are still following on offline procedure for net metering application when state like Rajasthan, Punjab, Haryana have implemented online application procedure for net metering application. **So, we suggest that the commission should direct state Discoms to adopt online application for net metering application of rooftop solar system.**

Analysis and Decision of Commission:

UPNEDA, the State Development Agency (SDA) has already come up with an online process in this regard.

4. Implementation of virtual and group net metering scheme:

The commission should implement and frame the guideline for virtual and group net metering scheme. This will boost the residential and housing societies to put investment and set up their own solar power plant and consume that energy in different location under the same Discom area.

Analysis and Decision of Commission:

So far as group net metering is concerned, the Commission vide its Order dated 23.08.2017 has made the enabling provisions. However, it opines not to introduce virtual net metering in the state as of now.

Some comments by NPCL

- 5. Standard formats:** Standard formats for application should be prepared by UPNEDA and approved by the Commission which should be available on website of UPNEDA and used by the consumers across the state of Uttar Pradesh.

As SDA has already come up with online system for RSPV, the process already stands standardised.

- 6. Standardization of technical specification:** Technical specification for rooftop solar system up to 25 KW should be standardized as the consumer who is installing lower capacity rooftop solar system do not have required technical expertise and standardization will help him to a great extent.

RSPV Regulations already provided for technical standards which shall be updated accordingly.

7. To ensure the quality of the power through SPV system, the following provisions can also be added in the RSPV regulations:

- The smart inverters which are to be used for the SPV system should have inverter test certificate of IEC 62109 as per IS 16221, 2016 Part 1 & IS 16221 Part 2, 2015 & IEC 62116 as per IS 16169, 2014 as per CEA (Measures relating to safety and Electric Supply) Regulations, 2010 & CEA (Technical standard for connectivity of distribution generation resources) Regulations, 2010 and smart inverter should also comply with the latest BIS Gazette 13th July, 2018.
- Multistage inverters for maintaining the power factor reactive power as well as limiting the harmonics injection to grid when designed, set and tuned properly are to be used.

These multistage inverters are designed with inductance (L), capacitance (C) circuitry and with the harmonic filter circuitry with combination of resistance (R) inductance (L) and capacitance (C) for maintaining the reactive power and harmonics control at the SPV end respectively.

- In case consumer wants to use the power generated by the SPV at the time of grid failure, he has to install an automatic switching system to isolate the system from Grid to prevent back feed to the grid and at the same time use the power internally using the SPV.

RSPV Regulations already provided for technical standards which shall be updated accordingly.

8. **Remote Communication:** The company hereby proposes that data concerning generation capacity above 50 KWp should be remotely captured and monitored by the Discom at the control room on real time. The communication system should be installed by the concerned consumers and cost of the same should also be borne by them.

Analysis and Decision of Commission:

RSPV Regulations already provided for technical standards which shall be updated accordingly.

9. Application Fee and Registration fee for above 1 MW capacity RSPV plants:

The Commission opines that for every MW above 1 MW, Application fee and Registration fee shall be prorated. e.g. above 1 MWp and upto 2 MWp plant, the applicable fee shall be same as that for 2 MWp plant and so on.

Way forward: Block Chain

In addition to above, to provide flexibility to rooftop solar power prosumer, taking a progressive view, the Commission is proposing provision of mutual sale and purchase of electricity through peer-to-peer transaction in a secured and reliable way with proper accounting and billing mechanism implemented with the help Block chain technology. Provided that for such arrangement prior approval of the Commission shall be required. To further take up development of peer-to-peer transaction of electricity generated through renewable sources, the Commission directs that UPPCL and UPNEDA shall put up a proposal jointly.