

**KARNATAKA ELECTRICITY REGULATORY COMMISSION**  
**No. 16, C-1, Millers Tank Bund Road, Yellappa Garden, Bed Area, Vasanth Nagar,**  
**Bengaluru, Karnataka 560052**

**Notification**

**No. S/03/1/560 dated 06.08.2024**

**KERC (Implementation of Peer to Peer Solar Energy Transaction) Regulations, 2024**

**PREAMBLE:**

1. In terms of KERC (Implementation of Solar Rooftop Photovoltaic) Regulations, 2016 and the Orders of the Commission issued in this regard, the Commission has recognised the SRPTV projects under self-investment by the Consumers and has allowed Net or Gross metering arrangement for injection of energy to the ESCOM's grid, at the Commission determined tariff payable to the prosumers.
2. In order to accelerate the capacity addition in SRPTV, the Commission, vide its Order dated 9<sup>th</sup> December, 2019 has decided to recognise third party investment in SRTPV projects on consumers' rooftops, under various business models, allowing sale of energy under net/ gross metering at the Commission determined tariff by executing power purchase agreements.
3. The above SRTPV arrangements recognise only the sale of energy between consumers and the distribution utility. However, of late a new concept of sale of energy between consumers to consumers has emerged. The sale of surplus power by the consumer/ prosumer to another consumer at an agreed tariff is known as Peer to Peer (P2P) solar energy transactions, through Blockchain based platform, which is gaining popularity. The concept is seen as a promising innovation in the energy sector for Decentralization, Renewable Energy Integration, Efficiency and Flexibility, Empowering Prosumers, Cost Savings, Grid Resilience, Environmental Impact, Innovation in Technology, Community Engagement and Regulatory Evolution. The P2P concept would help in recovery of investment much faster as compared with the existing arrangements.



4. The objective of framing the Regulations is to promote rooftop solar, efficient utilization of existing assets and to implement innovative technologies by facilitating transactions of rooftop solar energy through blockchain/any other technology based P2P platform besides ensuring reasonable returns on the investments.
5. The P2P solar transactions offer various benefits, the success of which depends on regulatory support, technological advancements, and widespread adoption within communities. As the energy sector evolves, P2P transactions are likely to play a significant role in shaping the future of sustainable energy systems.
6. Hence, the Commission has decided to issue draft Karnataka Electricity Regulatory Commission (Implementation of Peer to Peer Solar Energy Transaction through block chain based platform) Regulations, 2024.
7. As required under Sub Section (3) of Section 181 of Electricity Act 2003, the draft Regulations were notified in the official gazette on 17.01.2024 to elicit objections/suggestions/comments from the interested persons and stakeholders. The Commission has also conducted a public hearing on 28.03.2024, to elicit the views of the public and stakeholders on the draft Karnataka Electricity Regulatory Commission (Implementation of Peer to Peer Solar Energy Transaction through block chain based platform) Regulations, 2024, issued by the Commission. The Commission has considered the views/comments/suggestions received from the stakeholders.
8. As per Section 181 read with Sections 61, 62 and 66 of the Electricity Act 2003, the Karnataka Electricity Regulatory Commission (Commission) is mandated to specify the principles for the said Regulations. Therefore, in exercise of the powers conferred on it under Section 86(1) read with Sections 181, 61, 62 of the Act, and all the powers enabling it in this behalf, the Commission hereby makes the Regulations, namely Karnataka Electricity Regulatory Commission (Implementation of Peer to Peer Solar Energy Transaction) Regulations, 2024.

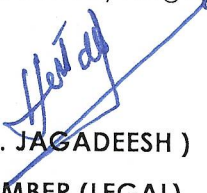


### Order

After considering the views/ objections/comments/ suggestions of the stakeholders on the draft regulations, the Commission hereby approves the Karnataka Electricity Regulatory Commission (Implementation of Peer to Peer Solar Energy Transaction) Regulations, 2024.



(P. RAVI KUMAR)  
CHAIRMAN



( H.K. JAGADEESH )  
MEMBER (LEGAL)



(JAWAID AKHTAR)  
MEMBER

**KARNATAKA ELECTRICITY REGULATORY COMMISSION**

**No. 16 C-1, Miller Tank Bed Area, Vasanth Nagar, Bengaluru- 560 052**

**No: KERC/S/03/1/561**

**Date: 06.08.2024**

**NOTIFICATION**

In exercise of powers conferred under section 181 of the Electricity Act, 2003 (herein after referred to as the Act) read with section 61 thereof and all other powers enabling it in this behalf, and after previous publication, the Karnataka Electricity Regulatory Commission hereby makes the following regulations, namely:

**1. Short Title and Commencement-**

- (1) These Regulations may be called the KERC (Implementation of Peer to Peer Solar Energy Transaction), Regulations, 2024.
- (2) These Regulations shall come into effect from the date of their publication in the Official Gazette.
- (3) These Regulations shall be applicable to all the Distribution Licensees and the Eligible Consumers in the State of Karnataka.
- (4) These Regulations shall be read along with the KERC (Implementation of Solar Rooftop Photovoltaic Power Plants) Regulations, 2016 and all the other Orders on Solar energy, issued by this Commission from time to time.

**2. Definitions and Interpretations-**

- (1) In these Regulations, unless the context otherwise requires –
  - a) Actual Injection: in a time block means the actual electricity injected by the Prosumer, measured by the energy meters at specified point of injection;
  - b) Actual Transaction: means actual exchange of energy (kWh) between a Prosumer and a Consumer as measured at a specified point of drawal for a quantum of energy (kWh) for any time block during a day;



- c) Any other Technology: means any technology or methodology that can be used to record all transactions' data for enabling Peer-to-Peer Transactions.
- d) Blockchain: Blockchain is a digitally distributed, decentralized, public immutable ledger that exists across a network for recording transactions.
- e) Energy Drawal or Actual drawal: in a time block means the electricity drawn by a consumer measured by the Energy meter.
- f) Intraday Transaction: means the submission of schedule for generation of the same day.
- g) N<sup>th</sup> Month: The Month in which Distribution Licensee raises the bill of P2P participants for energy transacted on P2P platform.
- h) N<sup>th</sup> day: Day on which energy is transacted on P2P platform.
- i) Participant: Means a prosumer or a consumer who has registered himself with the Distribution Licensee and Service Provider to sell or buy rooftop solar energy through P2P platform provided by the Service Provider.
- j) P2P Consumer: A person who is a consumer of Distribution Licensee and is registered with the Service Provider to buy solar energy through P2P platform from a P2P prosumer.
- k) P2P Prosumer: a person who is a prosumer/consumer of Distribution Licensee and is registered with the Service Provider to sell solar energy generated through his rooftop solar unit on P2P platform.
- l) P2P Platform: Peer to Peer Platform means blockchain/any other technology based electronic platform provided by the Service Provider on which P2P Prosumers can sell his solar energy to P2P Consumers at a price mutually agreed by them on P2P Platform.
- m) P2P transaction: Peer to Peer transaction means transaction of energy among P2P participants through P2P platform provided by the Service Provider.
- n) Scheduled Transaction: means schedule for transaction for exchange of energy (kWh) between a Prosumer and a Consumer, from a specified point of injection to a specified point of drawal for a quantum of energy (kWh) for any time block during a month;
- o) Scheduled injection: for a time block or any period means the schedule of injection in MW or MWh by a Prosumer.

- p) Service Provider: An agency who registers itself with Distribution Licensees to provide P2P solar energy transaction services on blockchain/any other technology based P2P Platform.
  - q) Transaction Charge: Fees charged by Service Provider for P2P solar energy transaction on P2P platform, as determined by the Commission from time to time.
  - r) Transaction Price: Mutually agreed price between P2P Prosumers and P2P Consumers, for energy transacted on P2P platform.
- (2) Words and expressions used in these Regulations not specifically defined herein above, but defined in the Act and Rules or any other Regulations made thereunder, shall have the meaning assigned to them in the Act and Rules or Regulations.

**3. Eligibility:**

These Regulations shall apply to the Registered domestic consumers and SRTPV domestic Prosumers having net metering or gross metering arrangement, who opt to transact energy among themselves through online Platform of Service Provider(s). This includes multiple consumers and prosumers engaging in P2P transactions of energy.

For example, if Consumer A, Consumer B, and Consumer C, along with Prosumer X and Prosumer Y, choose to participate in energy transactions, they can do so using the specified online P2P platform. Consumer A might purchase excess energy generated by Prosumer X and Prosumer Y, while Consumer B and Consumer C could also purchase surplus energy with Prosumer Y, all facilitated through the platform.

**4. General Principles:**

The distribution licensee shall provide gross metering or net-metering arrangement to the eligible consumers in its area of supply, as decided by the Commission from time to time on non-discriminatory and first come first served basis for facilitating transaction of rooftop solar energy through blockchain/any other technology based Peer to Peer platform, as detailed below:

- a) For preferential exchange of energy, prosumers have the option to select consumers and offer them a percentage of their excess energy at a specific price, or any other mutually negotiated rate. This arrangement will be carried out before any other transactions occur, allowing prosumers to choose their preferred recipient.
- b) For the dynamic energy exchange, prosumers and consumers interact directly through P2P platform, setting their own prices. The finalized price/the cleared price can be the highest price being offered by the buyer, the lowest price being offered by the seller, an average of buyer-seller price.

An illustration:

1. Highest Price Offered by the Buyer:

Suppose a consumer is willing to pay up to Rs.4 per kWh. The prosumer is offering his excess energy for sale at Rs.3.90 per kWh. The cleared price would be Rs.4 per kWh, which is the highest price the buyer is willing to pay.

2. Lowest Price Offered by the Seller:

A prosumer is willing to sell his excess energy for Rs.6 per kWh. The consumer is looking to purchase energy at Rs.8 per kWh. The cleared price would be Rs.6 per kWh, which is the lowest price the seller is willing to accept.

3. Average of Buyer-Seller Prices:

A buyer offers to pay Rs.9 per kWh. The seller is asking for Rs.7 per kWh. The cleared price could be the average of these two prices:  $(Rs.9 + Rs.7) / 2 = Rs.8$  per kWh.

- c) Whenever there is no excess energy available in a P2P network, then the consumer's energy needs will be met by distribution licensee. Similarly, if no buyer is available for the P2P then it will be deemed to be sold back to distribution licensee as per Power Purchase Agreement executed between distribution licensee and the Consumer, for the fixed and guaranteed price.

Provided that the Consumer shall install the grid connected SRTPV Plants of the installed capacity, as specified under KERC (Implementation of Solar



Rooftop Photovoltaic Power Plants) Regulations, 2016, Karnataka Electricity Grid Code / Karnataka Electricity Distribution Code and the Central Electricity Authority (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013 as amended from time to time and Orders of the Commission issued from time to time in this behalf.

**5. Conditions for P2P participants, Service Provider, Distribution Licensee for Implementation of Peer to Peer Solar Energy Transaction through blockchain/any other technology based platform:**

**a) P2P participants:**

i. For participating in Peer to Peer transaction, an eligible consumer/prosumer having rooftop solar plant proposed to be installed/installed in his premises under KERC (Implementation of Solar Rooftop Photovoltaic Power Plants) Regulations, 2016 in the area of supply of a distribution licensee, shall be allowed to install SRTPV plant either net metering or gross metering with the installed capacity as may be specified by the Commission in its Regulations/Orders from time to time.

Provided that the time of the day(ToD) compliant Energy meter or Smart meter is installed in such consumer's/prosumer's premises.

- ii. P2P participants shall not indulge in anti-competitive practices, such as price fixing or market sharing or gaming to create negative impact in the financial interest of a licensee.
- iii. It has to be ensured that participating into P2P exchange does not compromise aspects of electrical safety.
- iv. Data privacy and cyber security shall be maintained by Distribution Licensee and Service Provider.

**b) Service Provider:**

- i. The registered Service provider who has been registered with the distribution licensee shall provide P2P solar energy transaction services on Blockchain/ Any Other Technology based P2P platform.
- ii. Service Provider shall create awareness and train P2P participants and Distribution Licensee officials regarding functioning of P2P platform.
- iii. Service Provider shall ensure that the systems installed by it for facilitating P2P exchange do not disrupt Distribution Licensee's system.



- iv. Service Provider shall ensure that there is seamless settlement between P2P partners.
- v. Service Provider shall ensure that its cloud & communication facility is flexible to accommodate any operational or regulatory change.
- vi. If a meter is installed by the Service Provider in series with Distribution Licensee's meter and this meter becomes defective, then it shall be incumbent upon the Service Provider to replace its meter within 24 hours.

**c) Distribution Licensee:**

- i. Distribution Licensee shall work with the Service Provider to integrate their systems.
- ii. To ensure that metering is in order, if a defect emerges in the Distribution Licensee's meter of a P2P participant, the Distribution Licensee shall replace the meter as per provisions of Electricity Supply Code/Conditions of Supply.
- iii. If the distribution system is under outage, then no penal imposition will be made on either P2P Prosumer or P2P Consumer for the failure to transact as per committed transaction. However, KERC (Rights of Consumers Relating to Supply of Electricity, Standards of Performance and allied matters Regulations, 2022 shall be applicable for P2P Consumer.

**6. Procedure for Implementation & Reporting -**

- (1) Every Distribution Licensee shall adopt a transparent and uniform procedure for enabling an Eligible Consumer, on first come first served basis for the transaction duly indicating time frame for each of the activities involved in such process.
- (2) Any P2P participant who wants to participate shall register himself with his respective Distribution Licensee, who in turn shall communicate it to the Service Provider.
- (3) Within 15 days of submission of registration, Officers from Distribution Licensee and Service Provider shall jointly check the compatibility of P2P participants' system for readiness for P2P exchange.
- (4) In case of rejection of request, Distribution Licensee and/ or Service Provider shall convey reasons for the same to the applicant, in writing.
- (5) To avail the P2P services, a P2P Prosumer / Consumer shall have to install at his own cost post-paid smart meter in his premises. The cost of any additional hardware/software beyond meter shall be borne by the Service Provider.

- (6) In case of acceptance of Distribution Licensee and Service Provider, the P2P participant shall be registered on P2P platform within 15 days after the activity is carried out in accordance with the procedure as detailed above.
- (7) Upon receiving an application for P2P transactions when the cumulative capacity exceeds 100 MW, distribution licensee shall advise the prosumer/consumer to submit the following:
  - a. For day ahead transactions, P2P participants shall submit their schedule for the energy to be transacted on P2P platform on nth day, by 17:00 hours of (n-1)<sup>th</sup> day. No deviation in schedule shall be allowed beyond this time.
  - b. For intraday transactions, P2P participants shall submit their schedule for the energy to be transacted on P2P platform at least four-time blocks before the commencement of schedule. No deviation in schedule shall be allowed beyond this point.

**7. Metering System -**

To participate on P2P platform, P2P Prosumer / Consumer shall have to install post-paid smart meter/time of the day(ToD) compliant energy meter as per the Standards specified by the CEA. The Service Provider shall utilise the data of Distribution Licensee's meters through MDM to capture P2P transactions for the purposes of billing and also to reconcile the schedule transactions with the actual transactions on P2P platform.

**8. Energy accounting and settlement -**

- a) Billing cycle of P2P Platform shall be in sync with the billing cycle of Distribution Licensee. Distribution Licensee and Service Provider may mutually decide the modalities of settlement if the billing cycles differ.
- b) The Service Provider shall fetch time block-wise meter data for each day for both P2P Prosumer and P2P Consumer for actual energy generated and consumed respectively.
- c) Distribution Licensee shall generate the bills of P2P participants on the mutually agreed transaction price as agreed between P2P prosumers and P2P consumers for energy transacted on P2P platform and as per KERC retail supply tariff Order issued from time to time.

- d) The bill shall be raised for total demand (P2P transaction + purchase from Distribution Licensee) by the Distribution Licensee as per the provisions of Tariff Order and Supply Code.
- e) The payment made by P2P Consumers shall be settled proportionately towards the energy transacted by them on P2P platform, Service Provider transaction charge, energy supplied by Distribution Licensee and Green Energy Open Access charges.  
Provided that Green Energy Open Access charges shall not be levied, when the prosumer and consumer are connected to the same distribution transformer or same substation.
- f) Green Energy Open Access charges shall be collected by the Distribution Licensee. The Charges shall be as per applicable KERC tariff Order and KERC (Terms and Conditions for Green Energy Open Access) Regulations, 2022 and its Amendments issued from time to time.
- g) In case there is an under or over injections of energy by P2P Prosumers, or under or over drawal of energy by P2P Consumers, leading to imbalance in drawal and injection, the charges required to be adjusted as detailed below:
- i. Under Injection by P2P Prosumer: The Prosumer is required to make a payment equivalent to the difference between energy charges as per the rate schedule and the mutually agreed price on the P2P platform.
  - ii. Over Injection of Energy by the Prosumer: Settlement of excess energy is to be done based on the gross/net-meter/net-feed arrangement of the Prosumer.
  - iii. Energy Adjustment in the Absence of consumers: If no consumer is available to the Prosumer, the energy injected by him on a given day shall be adjusted based on the gross/net-meter arrangement with the Distribution Licensee.
  - iv. Underdrawal of Energy by P2P Consumer: The P2P Consumer must make full payment for the quantum of energy pledged on the P2P platform to the P2P Prosumer/s.



- v. Overdrawal of Energy by P2P Consumer: No penal charges are applicable, but settlement shall be done first towards the energy transacted on the P2P platform and then towards the energy supplied by Distribution Licensee. In the event of the total demand (P2P transaction + purchase from Distribution Licensee) exceeds the contracted demand, penalty shall be imposed as per the provisions of the Tariff Order or Condition of Supply.
  
- h) Fees charged by the Service Provider as Transaction charges for P2P solar energy transactions on the P2P platform shall be as specified by the Commission from time to time. Until the transaction charges are determined by the Commission, the service provider shall charge a fee of 14 paise per unit as transaction charges. Once the charges are determined, the new rates will take effect from the date of the Commission's Order.
  
- i) Service Provider transaction charges shall be paid to Service Provider by Distribution Licensee after settlement with P2P participants.
  
- j) The P2P Consumer shall have to clear all the dues for the energy transacted on P2P platform as per due date. P2P participant shall be deactivated from P2P platform, if the dues are not paid.
  
- k) In the event of default in payment for energy supplied by Distribution Licensee, appropriate action shall be taken as per Conditions of Supply.

**9. Power to remove difficulties:**

- (1) The Commission may from time to time issue such directions and orders as considered appropriate for the implementation of these Regulations.
- (2) The Commission may by general or special order, for reasons to be recorded in writing, and after giving an opportunity of hearing to the parties likely to be affected, may relax any of the provisions of these Regulations on its own motion or on an application made before it by any stakeholder.
- (3) The Commission may from time to time, add, vary, alter, suspend, modify, amend or repeal any provisions of these Regulations.



**10. Redressal Mechanism:**

The provisions of the Karnataka Electricity Regulatory Commission (Consumer Grievance Redressal Forum and Ombudsman) Regulations as amended from time to time shall apply mutatis mutandis to all kinds of grievances arise out of these Regulations, except to the disputes as specified under sec 86(f) of the Electricity Act, 2003.

**By Order of the Commission**



**SECRETARY**

**Karnataka Electricity Regulatory Commission  
Bengaluru**