

BEFORE THE KARNATAKA ELECTRICITY REGULATORY COMMISSION AT
BENGALURU

Order dated:02.03.2023

Present:

Shri P. Ravi Kumar	Chairman
Shri H.M. Manjunatha	Member(Legal)
Shri M.D. Ravi	Member

In the matter of:

Evacuation/Utilisation of Solar Energy Generation at LT/HT Voltage and connect to their LT/HT system

ORDER

Preamble:

1. The Commission has been receiving proposals from the HT consumers for approval for availing Net Metering arrangements in respect of SRTPV plants installed on the roof top of several buildings having different capacities within the same premises and requesting for facilitating evacuation of solar energy by connecting to the LT voltage Level of each building, within the same premises, instead of injecting the solar energy at a single point. This not only saves the cost on additional infrastructure and also minimizes the loss of power as there is no need to lay cable from each SRTPV unit installed on individual buildings, to a single point. The excess energy injected to the grid shall be accounted as per KERC (Implementation of Solar Rooftop Photovoltaic Power Plants) Regulations, 2016 and the orders of the Commission issued from time to time.
2. As per Regulation 13 of KERC (Implementation of Solar Rooftop Photovoltaic Power Plants) Regulations, 2016 and other Orders of the Commission issued from time to time, the Commission had issued a discussion paper on 07.11.2022 to allow Net Metering arrangements in



respect of SRTPV plants installed on the roof top of several buildings with different capacities within the same premises, having HT connection with the distribution Licensee and to evacuate the solar energy connecting it at the LT Voltage of each building requesting all the stakeholders and interested persons to furnish their views/suggestions/comments on or before 05.12.2022.

3. In response to the said Discussion Paper issued by the Commission, various stakeholders including some of the ESCOMs have submitted their written comments/views/suggestions. The Commission has considered some of the suggestions wherever necessary.
4. The Commission held a public hearing in the matter on 30.12.2022. The stakeholders who participated in the hearing, made their oral submissions before the Commission.

The list of stakeholders who have filed their written comments/suggestions and those who made oral submissions in the public hearing is given in the Annexure-I and Annexure-II respectively, of this Order.

Stakeholders' Comments, in brief are as under:

1. SLV Solar Power Solutions have submitted that they agree with the new system adopting as per proposal shown in schematic diagram.
2. EnerMAN Technologies Private Limited has submitted that the Company provides Data Loggers and software to collect minute-wise real time data of the Solar Energy Generation from Energy Meters/Inverters with RS-485 interface and stores the data in the cloud, and shares the database in Common Data Format (CDF) as devised by Distribution Licensee.
3. Vidya Vikas Institute of Engineering & Technology has submitted that Smart meter can be used to provide two way communications between supply board and consumers, the monetary value of exported energy is deducted from the monetary value of the imported energy to arrive at the net amount to be billed. Bidirectional meter that will calculate the final bill after net metering, should be a smart prepaid meter. Evacuation of solar energy to each building in the same premises instead of single point may lead to increase in cost of investment on meters and converters.



4. Sri. Raghunandan, Karnataka Renewables Energy Association (KREA) has sought clarity for interpretation on technical requirements such as architecture requirement, single line diagram, data acquisition system (wired/non-wired/Manual) etc. The Distribution licensees have to issue operational guidelines within 90 days from the date of issue of the Commission's Order on the above requirements.
5. BESCO has submitted that:
 - a. the Meter should be either a Smart Meter or Trivector with RS232 or DLMS Compliant ports. At present BESCO is using DLMS compliant meters and hence external modems are required for communication purpose. Modems are used for communication between meter and head end system. The communication means proposed is GPRS. The signal strength of different communication service providers is not the same in an area and hence the consumers should be provided with flexibility to use/change any service provider of their choice. If static SIM with static IP address is not used, modem should be intelligent enough or should be supported with necessary software for identification and communication of dynamic IP address. Modems should be programmed / or provision should be made for programming by external agency such that they communicate to any head end system and ports should be compatible for DLMS protocol i.e., the Head End System should receive the data in DLMS format without any modification or conversion. The data (billing parameters) as requested by BESCO only should be provided by the remote monitoring service provider, in order to secure the data transmission.
 - b. The Consumers have to install solar generation meters at each of the buildings where plant is installed so that real time data acquisition is enabled. Hence, for data acquisition purposes, a modem needs to be fixed to the meter and cost of the modem has to be borne by the consumer or Smart Meter with inbuilt Modem capable of handling dynamic IP address needs to be fixed by the consumer.
 - c. Multiple Head End Systems(HES) can be installed for collection of meter data. These HES should be able to collect data from any make of

modem or meter. The HES in turn has to communicate (or transfer data) to BESCOM Meter Data Management (MDM) System for billing purpose. For transferring data from Meter to HES, a communication means is required and it is proposed that it should be GPRS and Consumers should be able to choose any network service provider for data transfer. BESCOM will maintain only MDM and HES has to be maintained by any BESCOM designated Vendor. Empanelment of Vendors for providing HES solutions would enable options for Consumers, wherein they can choose any vendor of their choice among the empanelled Vendors. Further, BESCOM has to incur expenditure for HES and for enhancing/modifying the existing billing system. It is proposed that a portion of cost towards HES may be recovered from Consumers. If the Cloud Service providers are empanelled, they should guarantee the service for 25 years i.e. the PPA period or if they are awarded, the award cost should be passed on to Solar Consumers.

6. Sri. Binu Vasudevan, Director, Kalkitech has submitted that the meters should be DLMS compliant and the interface available must be RS485 serial or TCP/IP. Meter data must be sent securely on TL1.3 channel using X.509 certificate. Meters must allow access to any HES/ Data aggregator platform, all DLMS data including meter management and meter identification. Modems must be IPV6 modems that must be able to securely transmit the data on TL1.3 channel using X.509 certificate. Modems must be able to communicate on any cellular carrier. Modems should have provisions for adding secure proxy if they do not have TLS1.3 and X.509 capability. The HES primarily is a data acquisition layer and data transformation layer that is to be hosted on a cloud and acts as a data aggregator platform. It must be cloud independent and accept any meters from the ESCOMs.
7. Sri. A.C. Eswar, KRESMA has submitted to allow synchronization of Solar Roof Top systems installed on several buildings in a single campus instead of pooling to one single point and connecting to grid. This will save crisscross of the cables from one building to another building. This also

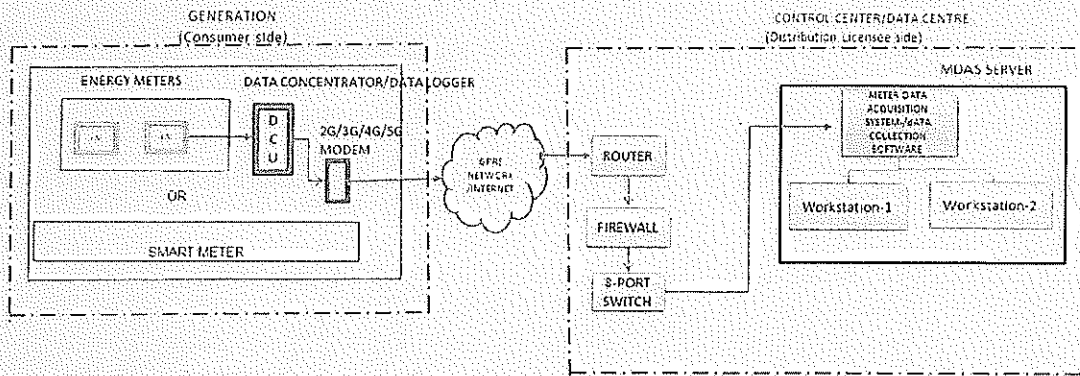
saves loss of energy from cables. To allow solar installation capacity to the extent of sanctioned load for LT connections (under LT3 and LT5) which will help customer to utilize full capacity of the solar generation to meet the connected or sanctioned load.

8. Sri. C.S. Gopinath, Karnataka Renewables Energy Association has suggested that all bidirectional meters need to be tested in the NABL (National Accreditation Board for Testing and Calibration Laboratories) accredited Lab for accuracy of the data. Also, suggested to standardize the online meter reading formats and instruct the Distribution Licensees to issue the bills in the standard formats only.
9. Sri. Seshu Prasanna, N Karnataka Renewables Energy Association has suggested to allow option to the installation consumer to choose unidirectional/bidirectional meters while availing services.
10. Sri. Paresh. N.R, ORB Energy Pvt Ltd has requested the Commission to allow the meter readings of gross generation through manual and to give the data in the dash board stating that the implementing the online system for communicating the data to net meter will add to cost.
11. Dr. Ashok Kumar Saxena, Millenium Synergy Pvt Ltd has submitted written views/Objections/ Suggestions to extend net-metering system for the next two years.
12. Sri. Lokaraj, Secretary General, FKCCI has submitted that the SRTPV installed in the same building by different floor users can also install the SRTPV for the corresponding RR Meter to be included in the above description for both LT and HT users. He has suggested to install smart meter or ABT meters by consumers. Distribution licensees should also implement the auto mailing of the bills along with Online facility with all the parameters mentioned. Detailed schematic of ABT meter should be incorporated in the order. Distribution licensees should accept all the meters which have BIS standards and meeting all the communication support which is defined. Distribution licensees also restricting on the inverter suppliers to empanel, which is not correct. If the inverters are as per BIS certification, they have to approve.

The Commission, after considering the views and submissions made by the stakeholders and in exercise of powers conferred under section 62(1)(a), read with Section 64 and 86 (1)(e) and other enabling provisions of the Electricity Act, 2003 and Regulation 13 of KERC (Implementation of Solar Rooftop Photovoltaic Power Plants) Regulations, 2016 and other Orders of the Commission issued from time to time in the matter of implementation of SRTPV plants/ units, hereby orders as follows:

ORDER

The Commission hereby allows net-metering arrangement in respect of SRTPV installed on the rooftops of the several buildings with different capacities within the same premises, having HT connection with distribution licensees and to evacuate the solar generated energy connecting to the LT voltage bus of each building. The Commission also hereby approves a detailed schematic diagram with the following specifications of the meters with defined application layer protocol and standards for metering application, telemetry application and control applications, having the following features along with the Roles and Responsibility of Consumers and Distribution Licensees:



1. Metering application: The metering system shall consist of meters, modems and Head End System(HES) /data aggregator platform for:
 - a) Obtaining data from the solar energy generation, a separate unidirectional meter to be provided duly tested, to each solar unit

installed in each of the buildings duly conforming to the applicable CEA Metering Regulations. A Bi-directional Meter shall also be installed on the HT side of the Consumer's Transformer to measure import and export energy.

- b) The meters should be Device Language Message Specification(DLMS) compliant and the interface available must be RS485 serial or Transmission Control Protocol/Internet Protocol (TCP/IP). Meter data must be sent securely and must allow access to any Head End System(HES) /data aggregator platform and should be compatible to DLMS Protocol.
- c) Modems must be able to securely transmit/ communicate the data on channel and on any cellular carrier. Also Modems should have provisions for adding secure proxy.
- d) The Head End System (HES) primarily shall have a data acquisition layer and data transformation layer that has to be hosted on a cloud and acts as a data aggregator platform. It must be cloud independent and accept any meter data from the Distribution Licensee.
- e) For metering applications, the HES must be able to read data on DLMS protocol, without any transformation or conversion. The HES or aggregator platform shall be scalable to collect a large number of solar generation data and Net meters' data from solar roof top.

2. Telemetry application:

The HES shall collect meter data from roof top solar plant on DLMS and transfer it to Distribution Licensee Billing system or generation portal in the data format as prescribed by the Distribution Licensees.

3. Control Applications:

HES must be capable of implementing the controls as defined by the Distribution Licensee over an accepted International/National protocol along with integration with inverter management system of the solar project, if required.

4. Roles and Responsibilities of the Consumer and the Distribution Licensee:

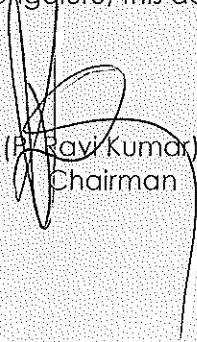
a) Roles and Responsibilities of the SRTPV consumers:

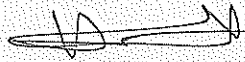
For recording the solar energy, the consumers shall have to install energy meter as prescribed above, in each of the buildings so that real-time data acquisition is enabled from the data logger deployed and organize the data in the database in a Common Data Format (CDF) as devised by the Distribution Licensee. The bi-directional meter shall be installed on the HT side of the consumer transformer.

b) Roles and Responsibilities of the Distribution Licensee:

To enhance and update its metering and billing system, in line with the requirement of its Data Centre with relevant parameters pertaining to solar energy gross generation, export, import, net units, demand etc. The distribution licensees are required to compute and furnish these details separately, in the consumer's electricity bills. Distribution licensees are required to make available online all the above details of billing data to the consumers, along with a sample bill explaining the various billing components. The Distribution Licensees shall issue operational guidelines within 30 days from the date of this Order, such as architecture, applications, single line diagram/ drawings, specifications of meters/modems etc. to be connected to its Data Centre.

This Order is signed and issued by the Karnataka Electricity Regulatory Commission at Bengaluru, this day, the 2nd day of March, 2023


(B. Ravikumar)
Chairman


(H.M. Manjunatha) 2/3/2023
Member(Legal)


(M.D. Ravi) 2/3/2023
Member

Annexure-I

List of stakeholders who have submitted written comments/views/suggestions

1	SLV Solar Power Solutions,Bengaluru.
2	EnerMan Technologies Private Limited,Bengaluru
3	Vidya Vikas Institute of Engineering & Technology,Mysuru
4	Karnataka Renewables Energy Association
5	Bangalore Electricity Supply Company Limited.
6	Sri. Binu Vasudevan, Director, Kalkitech
7	Sri. A.C. Eswar, KRESMA
8	Sri. Raghunandan, Karnataka Renewables Energy Association
9	Sri. C.S. Gopinath, Karnataka Renewables Energy Association
10	Sri. Sessa Prasanna, N Karnataka Renewables Energy Association
11	Sri. Paresh. N.R, ORB Energy Pvt. Ltd.,
12	DR. Ashok Kumar Saxena, Millenium Synergy Pvt Ltd.,
13	Sri. Lokaraj, Secretary General, FKCCI.



Annexure-II

List of persons who participated in Public Hearing on 30.12.2022

1	Sri. A.C. Eswar, KRESMA
2	Sri. Raghunandan, Karnataka Renewables Energy Association
3	Sri. C.S. Gopinath, Karnataka Renewables Energy Association
4	Sri. Sesha Prasanna, N Karnataka Renewables Energy Association
5	Sri. Paresh. N.R, ORB Energy Pvt. Ltd.,
6	Sri. Binu Vasudevan, Director, Kalkitech.
7	Sri. Lohith. M, BESCO, DGM (DSM)
8	Smt. Dhatri Joshi, BESCO, AGM (DSM)
9	DR. Ashok Kumar Saxena, Millenium Synergy Pvt Ltd.,
10	Sri. Sanjeev. B. Millenium Synergy Pvt Ltd.,
11	Sri. L.P Reddy, Krishnamadhav Energy Services.
12	Sri. Lokaraj, Secretary General, FKCCI.

