

Guidelines for Implementation of Net Metering Rooftop Solar PV Grid Interactive Systems

I Introduction:

These guidelines are issued as per Regulation for connectivity with the Grid and sale of electricity from the Roof- top Solar Photovoltaic System, viz., Telangana State Electricity Regulatory Commission (Net Metering Rooftop Solar PV Grid Interactive Systems) Regulation, 2016 [Regulation No.6] which came into force from the date of its notification in the Telangana Official Gazette on 23.11.2016 and these guidelines are also effective from 23.11.2016.

II Eligibility of consumer and project capacity:

- a) Eligible Consumer is a consumer of electricity in the area of supply of the DISCOM, who uses or proposes to use a Rooftop Solar PV System, which can be self-owned or a third party owned to offset a part or all of the consumer's own electrical requirement including a consumer catering to a common load such as common services in a Housing Society.
- b) The land will be Own or be in legal possession of the premises including the rooftop or terrace or elevated areas on land, building or infrastructure or part or combination thereof on which the Rooftop Solar PV System is proposed to be installed.
- c) An Eligible Consumer shall be in three phase service, a single phase consumer is also eligible for net metering upto 5 KW.
- d) The maximum Rooftop Solar PV System capacity to be installed at any Eligible Consumer's premises shall be as under:

Sl No.	Type of Consumer	Maximum allowable Rooftop Solar PV System capacity to be installed
1	Residential and Government	100 % of the consumer's sanctioned load
2	Industrial, Commercial and Other Consumers	80 % of the consumer's sanctioned load

(Note: Rooftop Solar PV System installed capacity shall not be less than 1 kWp and shall not exceed 1 MWp)

- e) Consume the entire electricity generated from the Rooftop Solar PV System at the same premises wherein it is installed and generating the solar power.
- f) An Eligible Consumer may install or enhance the capacity of, or upgrade the Rooftop Solar PV Systems at different locations within the same premises that the total capacity of such Systems within the same premises shall not exceed the individual capacity limits mentioned at Para II.(d) above.
- g) An Eligible Consumer intending to install a Rooftop Solar PV System having capacity in excess of 75 kW and up to 1 MW can connect to 11 kV or 33 kV feeder from which the feeder of an Eligible Consumer is availing of supply of power.

III Procedure for Application, Registration and approval:

An Eligible Consumer who proposes to install a Rooftop Solar PV System has to follow the below procedure

- a) Solar Net Metering Rooftop Application form (**Annexure I**) is available in the Discom website www.tsnpdcl.in, the same to be downloaded and filled application to be submitted at the respective division office.
- b) The necessary documents to be enclosed along with application form are as given below:
 - i) Copy of latest Electricity Bill.
 - ii) Demand Draft drawn with applicable fee in favour of the local Divisional engineer /(Operations).
 - iii) 2 No's Self-addressed Rs.5/- Stamped envelopes.

c) Applicable fee:

System size	Applicable fee per connection
For all LT consumers	Rs.2,500/-
For all HT consumers	Rs.15,000/-

- d) The application shall be registered at the division office and acknowledge the receipt of the application with a unique registration number for further reference.

Further process after successful submission of application:

- a) The nodal point of contact for the Solar Net Metering programme shall be the local Divisional Engineer (Operations).
- b) The Submitted Solar Net Metering Rooftop Application by consumer at the division office will be forwarded to Assistant Divisional Engineer (ADE)/(Operation) if the consumer is under LT Category, Or to Divisional Engineer (DE)/(Operation) shall process the application if the consumer is under HT Category.
- c) The concerned ADE (Operation) Or DE (Operation) shall provide a written notice that they have received all the documents required for the interconnection point or furnish the deficiencies in the application within seven (7) working days.
- d) The concerned ADE (Operation) Or DE (Operation) shall assess (refer point number IV for capacity limits of DTR, 11 kV and 33 kV feeder in this guidelines) the feasibility of interconnection point and the relevant distribution transformer capacity and/or relevant 11 kV/33 kV feeder capacity (in case of HT consumer) and communicate the feasibility (**Annexure-II(a) for HT and II(b) for LT**) to the Eligible Consumer within Twenty One (21) working days from the receipt of proper application. Any application not acted up within Twenty One (21) working days from the date of receipt shall be deemed to have been approved.
- e) The feasibility so communicated shall be valid for a period of four (4) months, unless extended by the concerned ADE (Operation) Or DE (Operation) for a reasonable cause. The extended validity period of feasibility shall not exceed a period of Ten (10) months including the extended time from the date of first feasibility communication.
- f) While communicating any deficiencies in the feasibility for the connection of Rooftop Solar PV System, the concerned ADE (Operation) Or DE (Operation) shall communicate to the Eligible Consumer

deficiencies if any (**Annexure-II(c) for HT and II(d) for LT**):

- i) Particulars of deficiencies with reference to interconnection of the proposed Rooftop Solar PV System with the Distribution System;
 - ii) Cost estimate for removal of such deficiencies including augmentation of the transformer/distribution system, if required.
- g)** The Eligible Consumer shall pay the estimated amount within Fifteen (15) days of receipt of such communication. If the estimated amount is not paid by the Eligible Consumer within Fifteen (15) days from the date of receipt of such communication to the Eligible Consumer, the **application shall stand cancelled and the application fee shall be forfeited.**
- h)** If approval cannot be granted due to inadequate Distribution Transformer capacity or 11 kV / 33 kV Feeder capacity (in case of HT consumer), the application may be considered, in chronological order of seniority and if the consumer so opts, after such capacity becomes available.
- i)** On receipt of the estimate amount, the concerned ADE (Operation) Or DE (Operation), shall promptly remove the deficiencies in the distribution system including augmentation of the transformer/distribution network within Fifteen (15) days. Provided the augmentation of the system shall be in accordance with the time period specified in the Standards of Performance (SoP) notified by the Commission from time to time, if the period exceeds Fifteen (15) days as provided above.
- j)** On removal of such deficiencies including augmentation of distribution transformer/distribution network, the concerned ADE (Operation) Or DE (Operation) shall immediately convey the approval for interconnection of the proposed Rooftop Solar PV System to the Eligible Consumer. A copy of such approval shall also be forwarded to the State Nodal Agency (TNREDCL) and the Chief Electrical Inspector for necessary action at their end.
- k)** The Net metering connection agreement (**Annexure-III**) as devised shall be executed by the Eligible Consumer with the DISCOM within Fifteen (15) days of receipt of the technical feasibility approval.
- l)** Feasibility study and inspection shall be the responsibility of ADE (Operation) in case of LT services and DE (Operation) in case of HT services.

IV Capacity limits of Distribution Transformer, 11 kV and 33 kV Feeder level:

- i) The concerned ADE (Operation) Or DE (Operation) shall ensure the following capacity limits before issue of technical feasibility for Net metering arrangement to an Eligible Consumer:

Sl No	Consumer Voltage level	DTR/ 11 kV or 33 kV	Maximum allowable cumulative capacity of all the Rooftop	Maximum allowable cumulative capacity in kW/MW
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		feeder	Solar PV Systems permitted of its rated capacity/max load	
1	Low Tension (LT)	DTR	50 %	50% of existing DTR capacity x 0.9 pf
2	High Tension (11 kV / 33 kV)	11 kV or 33 kV feeder	50 %	1.125 MW (11 kV)
				4.5 MW (33 kV)

- ii) the Net Metering connectivity exceeding 50% of such rated capacity may allow upon consideration of a detailed load study carried out duly taking prior approval from Chief General Manager/Commercial.

V Synchronization with the Distribution Network/Grid: Standards and Safety:

- a) The Eligible Consumer shall submit work completion report as mentioned in **Annexure-IV** and shall make a request for inspection. The concerned ADE (Operation) for LT services or concerned DE (Operation) for HT services shall inspect the system within 10 working days and provide approval. In absence of the response within the stipulated time, it shall be considered **as deemed inspection approval**.
- b) The ADE (Operation) & ADE (Meters) for LT services Or DE (Operation) & DE (Meters & Protection) for HT services shall ensure while the inspection that the inter-connection of the Rooftop Solar PV System with its Network conforms to the specifications, standards and other provisions specified by the Central Electricity Authority (CEA) in (Technical Standard for Connectivity of the Distributed Generation Resources) Regulations, 2013, the CEA (Measures relating to Safety and Electric Supply), Regulations, 2010 and the State Grid Code, Provided that a variation in the rated capacity of the system within a range of five percent (5%) shall be allowed.
- c) A Solar Rooftop PV system should qualify the technical requirements for the grid interconnection with the network of the DISCOM and it shall be separately grounded / earthed.
- d) Provided that an Eligible Consumer may use his Rooftop Solar PV System in Island mode for his own consumption only.
- e) The connectivity levels at which a Rooftop PV Solar System shall be connected with the grid are as specified below:

Sl. No.	Connected load of Eligible Consumer	Connectivity level
1.	Upto 5 kW	240 V - Single phase
2.	Above 5 kW and upto 75 kW	415 V - Three phase
3.	Above 75 kW / kVA	High Tension (HT)

- f) High Tension (HT) (11 kV and 33 kV) Eligible Consumers may install and connect the Rooftop Solar PV System at their LT Bus Bar System and the Net Meter shall be installed on the HT side of Interconnection Point where the present metering cubicle is existing.
- g) Eligible Consumer intending to install a Rooftop Solar PV System having the capacity in excess of 75 kW shall insure the Rooftop Solar PV

System and obtain the certificate from the Chief Electrical Inspector to the Government (CEIG). The Rooftop Solar PV System having capacity up to 75 KW shall be inspected, tested and self certified by the Eligible Consumer with regard to the safety and protection.

- h) Eligible Consumer shall be responsible for safe operation, maintenance and rectification of defect of its system up to the interconnection point beyond which the responsibility of safe operation, maintenance and rectification of any defect in the system including the net meter shall rest with the DISCOM.
- i) The Eligible Consumer shall be solely responsible for any accident to human being or animals (fatal/non-fatal/departmental/ non-departmental) that may occur due to back feeding from the Rooftop Solar PV System when the grid supply is off. The DISCOM reserves the right to disconnect the consumer's installation at any time to prevent any accident or damage to men and material. The DISCOM shall not be responsible to pay any ex-gratia on account of fatal accidents or non-fatal accidents occurring on account of the Rooftop Solar PV System in the premises of the Eligible Consumer.
- j) The tests shall be done as per the standards stated in this sub-para and in accordance with the Discom's standards of the Commission to ensure the quality of power generated from the Rooftop Solar PV Systems:
 - i) DC Power Injection: Photovoltaic system should not inject DC power more than 0.5% of full rated output at the interconnection point or 1% of rated inverter output current into distribution system under any operating conditions duly complying
 - IEC 61727, 2nd Ed. (2004)
 - CEA's (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013
 - ii) Harmonic Injection:- CEA's (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013:
 - IEEE 519 (2014), "Recommended practice and requirements for harmonic control in electric power systems
 - iii) Flicker: Operation of Photovoltaic system shouldn't cause voltage flicker in excess of the limits stated in the relevant sections of
 - IEC 61000 series
 - iv) Power Factor: While the output of the inverter is greater than 50%, a lagging power factor of greater than 0.9 should operate duly complying
 - IEC 61215. 2nd Ed, (2005-04)
 - IEC 61646. 2nd Ed, (2008-05)
 - IEC 62108. 1st Ed, (2007-12)
 - IEC 61730-1, Ed. 1.2 (2013-03)
 - IEC 61730-2, Ed. 1.1 (2012-11)
- k) Any alternate source of supply shall be restricted to the consumer's network and the consumer shall be responsible to take adequate safety measures to prevent battery power or diesel generator power or back-up power extending to the distribution licensee's LT / HT grid on failure of the distribution licensee's grid supply. **Safety measures may include isolation of net metering arrangement from the grid**

- l) The Discom shall have the right to disconnect the Rooftop Solar PV System of an Eligible Consumer from its system at any time on the following situations / conditions:
 - i) Emergencies or maintenance requirement of the distribution electric system;
 - ii) Hazardous conditions existing on the distribution system due to operation of the Rooftop Solar PV System or the protective equipment as determined by the Discom/ TSTRANSCO / State Load Dispatch Centre (SLDC);
 - iii) Adverse electrical effects, such as power quality problems, on the electrical equipment of other consumers of the distribution caused by the Rooftop Solar PV System as determined by the Discom.
- m) The Rooftop Solar PV System should be capable of detecting an unintended island condition and must have an anti-islanding protection to prevent any unfavourable conditions including failure of supply. IEC 61727, 2nd Ed. (2004) & IEC 62116, 2nd Ed. (2014-02) shall be followed to test the island prevention measure for the grid connected photovoltaic inverters.
- n) Every Rooftop Solar PV System shall be equipped with the automatic synchronization device, provided that the Rooftop Solar PV System using the inverter shall not be required to have a separate synchronization device, if the same is inherently built into the inverter.
- o) The Rooftop Solar PV System operating in parallel with the electricity system shall be equipped with the following protective functions to sense the abnormal conditions on the electricity system and cause the Rooftop Solar PV System to be automatically disconnected from the electricity system or to prevent the Rooftop Solar PV System from being connected inappropriately to the electricity system;
 - i) Over and under voltage trip functions if voltage reaches above 110% or below 80% respectively with a clearing time upto two (2) seconds;
 - ii) Over and under frequency trip functions, if frequency reaches 50.3 Hz or below 49.2 Hz with a clearing time upto 0.2 seconds;
 - iii) The Rooftop Solar PV System shall cease to energize the circuit to which it is connected in case of any fault in the circuit;
 - iv) A voltage and frequency sensing and time delay function to prevent the Rooftop Solar PV System from energizing a de-energized circuit and to prevent the Rooftop Solar PV System from reconnecting with the electricity system unless voltage and frequency is within the prescribed limits and are stable for at least sixty (60) seconds; and
 - v) A function to prevent the Rooftop Solar PV System from contributing to the formation of an unintended island and ceases to energize the electricity system within two (2) seconds of the formation of an unintended island.
- p) The equipment of the Rooftop Solar PV System shall meet the following safety requirements:

- i) Circuit Breakers or other interrupting equipment shall be suitable for their intended application with the capability of interrupting the maximum available fault current expected at their location,
 - ii) The Rooftop Solar PV System and the associated equipment shall be so designed that the failure of any single device or component shall not potentially compromise the safety and reliability of the electricity system and
 - iii) Paralleling device of the Rooftop Solar PV System shall be capable of withstanding 220% of the nominal voltage at the interconnection point.
- q) Every time the Rooftop Solar PV System of the Eligible Consumer is synchronized with the distribution system, it shall not cause the voltage fluctuation greater than $\pm 5\%$ at the point of inter connection.
- r) After considering the maintenance and the safety procedures, the concerned Assistant Divisional Engineer(Operations) Or Divisional Engineer(Operations) may require an Eligible Consumer of a Rooftop Solar PV System to provide a manually operated isolating switch between the Rooftop Solar PV System and the electricity system, which shall meet following requirements:
- i) Allow visible verification that separation has been accomplished;
 - ii) Include indications to clearly show open and closed positions;
 - iii) Be capable of being reached quickly and conveniently twenty four (24) hours a day by the DISCOM personnel without requiring the clearance from the Eligible Consumer;
 - iv) Be capable of being locked in the open position;
 - v) May not be rated for load break and may not have a feature of over-current protection; and
 - vi) Be located at a height of at least 2.44 meter above the ground level.
- s) Prior to synchronization of the Rooftop Solar PV System for the first time with the distribution system, the Eligible Consumer and the concerned Assistant Divisional Engineer (Operations) & Assistant Divisional Engineer (Meter) for LT Services and Divisional Engineer (Operations) & Divisional Engineer (Meter & Protection) for HT services shall agree on the protection features and the control mechanism.
- t) The power conditioning unit shall have the features of filtering out harmonics and other distortions before injecting the energy into the distribution system. The Total Voltage Harmonic Distortion (THD) shall be within the limits specified in the Indian Electricity Grid Code (IEGC). The technical standards, power quality standards and inverter standards shall be followed by Eligible Consumer in line with the standards as specified by the CEA from time to time.

VI Net Metering arrangement

- a) A single bi-directional meter shall be installed for recording of export and import energy. This bi-directional meter should have the following characteristics:

- i) The rated capacity of Bi-Directional meter should be according to the sanctioned load / contracted demand of the consumer with the DISCOM.
 - ii) Separate registers for export and import with the Meter Reading Instrument (MRI) downloading facility.
 - iii) kVAr, kWh, kVA , kVAh measuring registers for capacity above 10 kW.
 - iv) Advanced Metering Infrastructure (AMI) facility with RS232 (or higher) communication port.
 - v) Class 1 accuracy meters for Rooftop Solar PV Systems up to 10 kW, 0.5 accuracy class meters for Rooftop Solar PV Systems above 10 kW and 0.2 class accuracy meters for High Tension (HT) systems (56 kW and above).
 - vi) Meters should be certified by the Bureau of Indian Standards (BIS).
 - vii) Current Transformer (CT) functionality meters for the Rooftop Solar PV Systems above 56 kW.
- b) Providing of Net Meter in the premises of the Eligible Consumer is the responsibility of DISCOM.
 - c) Provided that where the Eligible Consumer is within the ambit of Time-of-Day (ToD) Tariff, the Net Meter installed shall be capable of recording ToD consumption and generation.
 - d) Provided further that an Eligible Consumer may opt to procure, at his cost, after testing the Net Meter is to be installed.
 - e) The Net Meter and the Solar Generation Meter shall be installed at such locations in the premises of the Eligible Consumer as would enable easy access to the departmental personnel for meter reading.
 - f) If everything is found in line with the guidelines, the concerned officials should synchronize the Solar Rooftop PV System to the grid and sign the Synchronization report/Test report (**Annexure-V(a) for HT services Or Annexure-V(b) for LT services**) and forward the Synchronization report/Test report to the concerned Circle Office Or Electricity Revenue Office for billing purpose.

VII Energy Accounting and Settlement

- a) The accounting of electricity exported and imported by the Eligible Consumer shall become effective from the date of connectivity of the Rooftop Solar PV System with the distribution Network.
- b) For each Billing Period, the following parameters shall show separately:-
 - i) The quantum of electricity Units exported by the Eligible Consumer;
 - ii) The quantum of electricity Units imported by the Eligible Consumer;
 - iii) The net quantum of electricity Units billed for payment by the Eligible Consumer;
 - iv) The net quantum of electricity Units carried over to the next Billing Period; and

- v) Provided that if the quantum of electricity exported exceeds the quantum imported during the Billing Period, the excess quantum shall be carried forward to the next Billing Period as credited Units of electricity and the Eligible Consumer shall get a monthly minimum bill;
 - vi) Provided further that if the quantum of electricity Units imported by the Eligible Consumer during any Billing Period exceeds the quantum exported, then invoice shall raise for the net electricity consumption after adjusting the credited Units of electricity
 - vii) There shall be no deemed generation charges payable to the Eligible Consumer or the third party owner of the PV solar rooftop system
 - viii) The billing period and the due date of the bills shall be the same as that of the Eligible Consumer in whose premises the solar system has been installed.
- c) The unadjusted net credited Units of electricity shall be settled twice in a year viz., in June and December. The net export units credited for the six month period shall be settled at its average cost of power purchase as approved by the Commission for that year or at a rate as notified by the Commission from time to time. The sum so arrived shall be either adjusted in the next month electricity bill or deposited in the bank account of the Eligible Consumer furnished at the time of filing of the application.
 - d) Provided that at the beginning of each of the Settlement Period, the cumulative quantum of injected electricity carried forward shall be re-set to zero.
 - e) Where an Eligible Consumer is within the ambit of Time of Day (ToD) tariff, the electricity consumption in any time block, i.e. peak hours, off-peak hours, etc., shall be first compensated with the quantum of electricity injected in the same time block. Any excess injection over and above the consumption in any other time block in a Billing Cycle shall be accounted as if the excess injection had occurred during off-peak hours.
 - f) The Eligible Consumer shall have recourse, in case of any dispute regarding the billing.
 - g) In case the applicable tariff provides for billing on kVAh basis, the net drawl or injection of energy shall also be measured in kVAh.
 - h) When an Eligible Consumer cancels the Net metering Agreement entered into with the DISCOM after giving a month's notice, then, unused electricity credits shall be paid at a rate of Rs 0.50/kWh by the DISCOM or at a rate as notified by the Commission from time to time and ceases to be an Eligible Consumer thereafter.

VIII Applicability of other charges and incentives:

- a) The Rooftop Solar PV System under the net metering arrangement, whether self-owned or third party owned installed on the Eligible Consumer's premises, shall be exempted from Transmission Charge Transmission Loss, Wheeling Charge, Wheeling Loss, Cross Subsidy Surcharge and Additional Surcharge.

- b) All incentives or subsidy provided by the Government of India through the Ministry of New and Renewable Energy (MNRE) under the National Solar Mission or other schemes and any incentive or subsidy provided by the Government of Telangana state from time to time shall belong to the Eligible Consumer or on authorization of the Eligible Consumer to the vendor of the Rooftop Solar PV system and can be claimed after installation of the Rooftop Solar PV power net metering arrangement from the State Nodal Agency.
- c) An Eligible Consumer or a vendor of the Rooftop Solar PV system on authorization from an Eligible Consumer shall produce the latest net metering bills for two months raised by a DISCOM for the release of the subsidy or incentive. These bills shall be counter signed by the concerned Divisional Engineer (Operation) and the District Manager of the State Nodal Agency (TNREDCL). The Nodal Agency shall make the payment of subsidy or incentive within thirty (30) working days of the receipt of claim of subsidy/incentive.

IX Inspection by DISCOM Officials:

- a) The Discom Officials on inspection at the time of according permission to install the net metering arrangement or at any time thereafter, finds that, the Eligible Consumer has installed equipment not confirming to the standards published by the International Electro-Technical Commission (IEC) or Bureau of Indian Standards (BIS) as a part of the net metering arrangement in the consumer's premises, the vendor of the equipment shall be blacklisted and the same shall be notified to the MNRE and the State Nodal Agency. Further, the Discom Officials reserves the right to withdraw the permission to the net metering arrangement and cancel the net metering agreement with the Eligible Consumer after giving an opportunity in writing.
- b) The Eligible Consumer shall install any additional equipment or additional Solar panels after obtaining prior permission in writing from the DISCOM, failing which, the Discom Officials may cancel the Net Metering Agreement after giving an opportunity in writing.

X Sharing of Clean Development Mechanism (CDM) benefits

The Eligible Consumer shall retain the entire proceeds of CDM benefits in the first year after the date of commercial operation of the generating station. In the second year, the share of the Distribution Licensees shall be 10% which shall be progressively increased by 10% every year till it reaches 50%, where after, the proceeds shall be shared in equal proportion by the Eligible Consumer and the DISCOM.

XI Restriction and Control (R&C) Measures

In the event of the DISCOM being directed to impose Restriction and Control (R&C) measures under section 23 of the Act, the Discom Officials shall not refuse injecting of solar power generated from a Rooftop Solar PV System installed by the residential and the government consumers.

XII Energy Accounting during Meter defects

In case of failure of the meter recording export of energy, the meter shall be replaced within fifteen (15) days of the notice of the failure. The number of units to be billed during the period in which the meter ceased to function or became defective, shall be determined by taking the average of the electricity

exported during the preceding three (3) billing cycles to the billing cycle in which the said meter ceased to function or became defective provided that the condition with regard to export of electricity during the said three (3) billing cycles was not different from that which prevailed during the period in which the Meter ceased to function or became defective.

XIII Compensation

In case of failure of the net metering arrangement, compensation shall be payable as per the provisions of the Telangana State Electricity Regulatory Commission (Licensees' Standards of Performance) Regulation, 2016 as amended from time to time.

CGM/IPC&RAC

ANNEXURE-I



Northern Power Distribution Company of Telangana Limited

Application Form for connectivity with the Grid and sale of electricity from the Roof- top Solar Photo Voltaic System

(in terms of Regulation No.06 of 2016, Dt:16.11.2016, Net Metering Rooftop Solar PV Grid Interactive Systems, w.e.f. 23.11.2016)

Affix recent Passport Size Photo of the Applicant

For Office Use:
 Reg. No.: _____
 Date : _____
 Application fee details:
 DD No.: _____
 Date : _____
 Bank : _____

**To,
 The _____

 (Designated Officer)**

1	Name of the applicant	
2	Applicant full Address for correspondence	H. No.:
		Street Name:
		Village Name:
		Mandal Name:
		District Name:
	Pin Code :	
3	Phone/Mobile No.	
4	Email ID	
Site details where the Rooftop Solar PV System is to be established		
5	Address of the site for installation	H. No.:
		Street Name:
		Village Name:
		Mandal Name:
		District Name:
	Pin Code :	
6	Service No./Unique Service No.	/
7	Category	

8	Connected Load(Existing)	_____ kVA/_____ kW
9	If Non-Domestic, Specify type of building (Shop/Industry/ Govt./Educational/others (specify))	
10	Proposed Capacity under this policy	_____ kW
11	Average monthly consumption of electricity	_____ Units
Bank Account Details for Settlement (optional)		
12	Account holder name	
13	Account Number	
14	Bank Name / Branch	/
15	IFSC Code	

Declaration

I hereby declare that the information furnished above is true to the best of my knowledge and belief. If found false, DISCOM has every right to reject/cancel the application. Further, I hereby agree with the specifications, terms and conditions stipulated by DISCOM in line with Hon'ble TSERC Regulation 6 of 2016 for the selection and installation of Rooftop Solar PV System.

Place :
Date:

Signature :
Name :

CHECK LIST:

1. Copy of latest electricity bill (Yes/No)
2. Demand Draft drawn in favour of the local Divisional Engineer / (Operation) as per the connection (Yes/No)

System Size	Applicable fee per connection
For all LT consumers	Rs.2,500/-
For all HT consumers (11 kV and 33 kV Level and or Installed capacity > 56 kW)	Rs.15,000/-

3. Two (2) Number Self addressed Rs. 5/- Stamped envelopes (Yes/No)
4. Copy of Bank Pass book covering details of account holder (Yes/No)

(Note: This application should be submitted at the respective Division office and please obtain the Acknowledgement and preserve it for future correspondence)

ANNEXURE-II(a)



Northern Power Distribution Company of Telangana Limited

Office of the
Divisional Engineer,
Operation, DISCOM

Lr.No:DE/Op/_____/DISCOM/F:SolarRoofTop/Doc.No: /D.No:_____ Dt: xx.xx.xxxx

Sir,

Sub:- Electricity – DISCOM – Operation – Division - Installation of _____ kWp capacity Rooftop Solar PV System _____(Name) , situated at S.C.No: _____, Distribution _____, _____(M), _____(Dist) - Approval – Reg.

Ref:- Your application No: _____ Dt:_____ _*****_

With reference to your application for installation of Rooftop Solar PV System of _____ kWp on your rooftop/premise proposed under net metering at address H.No./Flat No./Plot No. _____, village _____, _____(M), _____(Dist) is inspected by the undersigned on _____ and found technically feasible.

Hence feasibility is approved vide Solar Roof - Top (SRT)No: _____/ Dt:_____, which is valid for a period of (4 months)_____

You are further requested to approach this office with relevant documents (particulars of Solar PV modules, Grid Tie Inverter, Protective system) after completion of installation of Rooftop Solar PV System.

Divisional Engineer,
Operation, DISCOM

To

(Consumer Name and Address)

ANNEXURE-II(b)



Northern Power Distribution Company of Telangana Limited

Office of the
Asst. Divisional Engineer,
Operation, DISCOM

Lr.No:ADE/Op/____/DISCOM/F:SolarRoofTop/Doc.No: /D.No: _____ Dt: xx.xx.xxxx

Sir,

Sub:- Electricity – DISCOM – Operation – Sub.Division – Installation of _____
kWp capacity Rooftop Solar PV System
_____(Name) , situated at S.C.No: _____,
Distribution _____, _____(M), _____(Dist) -
Approval – Reg.

Ref:- Your application No: _____ Dt:_____

With reference to your application for installation of Rooftop Solar PV System of _____ kWp on your rooftop/premise proposed under net metering at address H.No./Flat No./Plot No. _____, village _____, _____(M), _____(Dist) is inspected by the undersigned on _____ and found technically feasible.

Hence feasibility is approved vide Solar Roof - Top (SRT)No: _____/
Dt:_____, which is valid for a period of (4 months)_____

You are further requested to approach this office with relevant documents (particulars of Solar PV modules, Grid Tie Inverter, Protective system) after completion of installation of Rooftop Solar PV System.

Assistant Divisional Engineer,
Operation, DISCOM

To
(Consumer Name and Address)

ANNEXURE-II(c)



Northern Power Distribution Company of Telangana Limited

Office of the
Divisional Engineer,
Operation, DISCOM

Lr.No:DE/Op/_____/DISCOM/F:SolarRoofTop/Doc.No: /D.No:_____ Dt: xx.xx.xxxx

Sir,

Sub:- Electricity – DISCOM – Operation –Division - Installation of _____ kWp capacity Rooftop Solar PV System _____(Name) , situated at S.C.No: _____, Distribution _____, _____(M), _____(Dist) – Feasibility Intimation – Reg.

Ref:- Your application No: _____ Dt: _____

With reference to your application for installation of Rooftop Solar PV System of _____ kWp capacity on your rooftop/premises proposed under net metering at address H.No./Flat No./Plot No. _____, village _____, _____(M), _____(Dist) is inspected by the undersigned on _____ and found technically feasible subject to the conditions mentioned below.

- i. The proposed Solar Rooftop under net meter for service number _____, connected to the 11 kV/33 kV _____feeder with feeder code _____, with maximum load permitted _____, is to be enhanced as the maximum allowable cumulative capacity of all the Rooftop Solar PV Systems on this feeder is reached to the 50 % of maximum load permitted.
- ii. The cost of estimate for the above work amounts to Rs. _____/-.

You are requested to pay aforesaid estimate amount of Rs. _____/- within 15 days from the date of receipt of this feasibility, otherwise the feasibility approval is deemed to be terminated without any notice.

Divisional Engineer,
Operation, DISCOM

To
(Consumer Name and Address)

ANNEXURE-II(d)



Northern Power Distribution Company of Telangana Limited

Office of the
Asst. Divisional Engineer,
Operation, DISCOM

Lr.No:ADE/Op/ /DISCOM/F:SolarRoofTop/Doc.No: /D.No: Dt: xx.xx.xxxx

Sir,

Sub:- Electricity – DISCOM – Operation –Sub.Division. - Installation of _____
kWp capacity Rooftop Solar PV System
_____(Name) , situated at S.C.No: _____,
Distribution _____, _____(M), _____(Dist) –
Feasibility Intimation – Reg.

Ref:- Your application No: _____ Dt:_____

With reference to your application for installation of Rooftop Solar PV System of _____ kWp capacity on your rooftop/premises proposed under net metering at address H.No./Flat No./Plot No. _____, village _____, _____(M), _____(Dist) is inspected by the undersigned on _____ and found technically feasible subject to the conditions mentioned below.

- i. The proposed Solar Rooftop under net meter for service number_____, connected to the DTR _____ kVA, with DTR Structure code _____, is to be enhanced as the capacity of _____ kVA , as the maximum allowable cumulative capacity of all the Rooftop Solar PV Systems on this DTR is reached to the 50 % of its rated capacity.
- ii. The cost of estimate for enhancement of this DTR works out to Rs. _____/-.

You are requested to pay aforesaid estimate amount of Rs._____-/- within 15 days from the date of receipt of this intimation, otherwise the feasibility approval is deemed to be terminated without any notice.

Assistant Divisional Engineer,
Operation, DISCOM

To
(Consumer Name and Address)

ANNEXURE-III

(on non-judicial stamp paper worth Rs.200/-)

Net Metering Connection Agreement

This Agreement executed and entered on this _____(day) of _____(month)_____(year), between M/s / Mr. / Mrs. _____ S/o / D/o / W/o. _____ which means their/ his/its /theirs, successors as FIRST PARTY herein after called as “Eligible Consumer” and the Northern Power Distribution Company of Telangana Limited, a DISCOM incorporated under the provisions of Companies Act 1956 (which means its authorized representatives assigns, executors and its successors) as SECOND PARTY, herein after called the “DISCOM”).

Whereas, the Eligible Consumer has applied to the DSICOM for approval of a Net Metering arrangement at Sy.No./D.No_____, Street_____, _____ (V),_____ (M) having electrical Service Connection No._____ under TSERC (Net Metering Rooftop Solar PV Grid Interactive System) Regulation No. 06 of 2016, dated 16.11.2016, which is effective from the date of its notification in the official gazette i.e., 23.11.2016.

And whereas, DISCOM agrees to provide grid connectivity to the Eligible Consumer for injection of electricity generated from the Rooftop Solar PV System of capacity _____ kilowatts into the grid of DISCOM at _____ (Voltage level), as per conditions of this agreement.

Any modification/ amendment in the Regulation made shall be applicable and corresponding amendment(s) shall be effective to this agreement from time to time.

Both the parties hereby agree to as follows:

1. Governing Provisions

We hereby undertake to comply with all the requirements of the Electricity Act, 2003, the Rules and Regulations framed there under, provisions of the tariffs, applicable Charges and the General Terms and Conditions of Supply approved by the Telangana State Electricity Regulatory Commission herein after called as “Commission” from time to time and agree not to dispute the same.

2. Net metering facility

- i) Eligible Consumer will generate solar power for self consumption and feed excess power into the grid of DISCOM.
- ii) In the premises of Eligible Consumer, a meter will be installed by DISCOM having the feature of recording both the import and export values, besides complying with other parameters notified in CEA metering regulations and TRANSCO/DISCOM procedures for arriving net energy for the billing period.

3. Safety

- 3.1 The Eligible Consumer shall be responsible for safe operation, maintenance and rectification of defects in system up to the interconnection point beyond which the responsibility of safe operation, maintenance and rectification of any defect in the system including the net meter shall rest with the DISCOM.
- 3.2 The Eligible Consumer shall be solely responsible for any accident to human being or animals (fatal / non-fatal / departmental / non-departmental) that may occur due to back feeding from the Rooftop Solar PV System when the grid supply is off. The DISCOM reserves the right to disconnect the consumer's installation at any time to prevent any accident or damage to men and material. The DISCOM shall not be responsible to pay any ex-gratia on account of fatal accidents or non-fatal accidents occurring on account of the Rooftop Solar PV System in the premises of the eligible consumer.
- 3.3 The Eligible Developer shall strictly adhere to the standards specified by CEA/MNRE and installations of electrical equipment must comply with Indian Electricity rules, 1956 and also to follow power quality measures as per International or Indian standards and/or other such measures provided in Clause 8 of TSERC (Net Metering Rooftop Solar PV Grid Interactive System) Regulation No. 06 of 2016 and any modification/ amendment to the regulation from time to time.

4. Access and Disconnection

- 4.1 The DISCOM's personnel may enter the Eligible Consumer's premises to inspect the Eligible Consumer's protective devices and read or test the meter at any time.
- 4.2 The DISCOM shall have the right to disconnect the Rooftop Solar PV System of an eligible consumer from its system at any time on the following situations / conditions:
 - (i). Emergencies or maintenance requirement of DISCOM's electric system;
 - (ii). Hazardous conditions existing on the DISCOM's system due to operation of the Rooftop Solar PV System or the protective equipment, as determined by the DISCOM /TRANSCO / State Load Dispatch Centre (SLDC);
 - (iii). Adverse electrical effects, such as power quality problems, on the electrical equipment of other consumers of the DISCOM caused by the Rooftop Solar PV System as determined by the DISCOM.

5. Clearances and Approvals

- 5.1 The Solar power produced shall be injected in to the grid of DISCOM only after obtaining prior approval from competent authority of DISCOM and meeting all the requirements of departmental standards, viz., protection switchgear, metering, feasibility approval etc.

- 5.2 The Eligible Consumer shall not commence parallel operation of the net metering facility until the Eligible Consumer has received approval to operate from the competent authority of DISCOM.
- 5.3 The Eligible Consumer shall insure and get the statutory approvals for more than 75KW from appropriate safety authority (CEIG) of the connected electrical equipment and solar panels before plant energization. Solar PV System having capacity up to 75 KW shall be inspected, tested and self certified by the eligible consumer with regard to the safety and protection.
- 5.4 The Eligible Consumer shall install any additional equipment or additional Solar panels after obtaining prior permission in writing from the DISCOM, failing which, the DISCOM may cancel the Net Metering Agreement after giving an opportunity in writing

6. Date of enforceability of the Agreement

This agreement will be in a force for a period of 25 years from the date of connection of the Rooftop Solar PV system with the Grid, after meeting all the requirements by the Eligible Consumer under the conditions of this Agreement and in accordance with the Regulation No.6 of 2016 and its future amendments, if any

7. Settlement of energy charges

The accounting of electricity exported and imported by the Eligible Consumer shall become effective from the date of connectivity of the Roof-top Solar PV System with the distribution grid of the DISCOM.

- 7.1 if the quantum of electricity exported exceeds the quantum imported during the Billing Period, the excess quantum shall be carried forward to the next Billing Period as credited Units of electricity and the eligible consumer shall get a monthly minimum bill; if the quantum of electricity Units imported by the Eligible Consumer during any Billing Period exceeds the quantum exported, the DISCOM shall raise its invoice for the net electricity consumption after adjusting the credited Units of electricity as per applicable retail supply tariff decided by regulatory commission to the concerned DISCOM
- 7.2 The unadjusted net credited Units of electricity shall be settled by the DISCOM twice in a year viz., in June and December. The net export units credited for the six month period shall be settled at its average cost of power purchase as approved by the Commission for that year or as mentioned in clause no.10.3 of TSERC (Net Metering Rooftop Solar PV Grid Interactive System) Regulation No. 06 of 2016 and any modification/ amendment to the regulation from time to time. The sum so arrived shall be either adjusted in the next month electricity bill or deposited in the bank account of the eligible consumer furnished to the DISCOM at the time of filing of the application. Provided that at the beginning of each of the Settlement Period, the cumulative quantum of injected electricity carried forward shall be re-set to zero.
- 7.3 The payment for excess units injected into grid will be made effective from the date of connectivity with the grid till the validity of this agreement.

- 7.4 In case the applicable tariff provides for billing on kVAh basis, the net drawl or injection of energy shall also be measured in kVAh.
- 7.5 When an eligible consumer cancels the Net metering Agreement entered into with the DISCOM after giving a month's notice, then, unused electricity credits shall be paid at a rate of Rs 0.50/kWh by the DISCOM or at a rate as notified by the Commission from time to time and ceases to be an eligible consumer thereafter.

8. Metering Arrangement

The installation of meters including CTs & PTs, wherever applicable, shall be carried out as per the departmental procedures in vogue with prior permission of DISCOMs. The Eligible Consumer shall bear the entire cost of CTs & PTs including its accessories. The DISCOM will provide the Net Meter at the Eligible Consumer premises as per Clause 9.2 of TSERC (Net Metering Rooftop Solar PV Grid Interactive System) Regulation No. 06 of 2016 and any modification/ amendment to the regulation from time to time

9. Standards for Solar panels

- 9.1 The Solar PV panels proposed to be installed shall meet the requirements of Indian as well as IEC standards and also to follow power quality measures as per International or Indian standards and/or other such measures provided in Clause 8 of TSERC (Net Metering Rooftop Solar PV Grid Interactive System) Regulation No. 06 of 2016 and any modification/ amendment to the regulation from time to time. Further, the documentary evidence proving the prescribed standards has to be furnished by Eligible Consumer to the competent authority of DISCOM before commencing the plant into operation.
- 9.2 The DISCOM on inspection at the time of according of permission to install the net metering arrangement or at any time thereafter, finds that, the eligible consumer has installed equipment not confirming to the standards published by the International Electro-technical Commission (IEC) or Bureau of Indian Standards (BIS) as a part of the net metering arrangement in the consumer's premises, the vendor of the equipment shall be blacklisted
- 9.3 Further, the DISCOM reserves the right to withdraw the permission to the net metering arrangement and cancel the net metering agreement with the eligible consumer after giving an opportunity in writing.

10. Interruption or Reduction of delivery

The DISCOM shall not be obligated to accept and may require Eligible Consumer to interrupt or reduce deliveries when necessary in order to construct, install, repair, replace, remove, investigate, or inspect any of its equipment or part of its system; or if it reasonably determines that curtailment, interruption, or reduction is necessary because of emergencies, forced outages or compliance with prudent electrical practices. Whenever possible, the DISCOM shall give the Eligible

Consumer reasonable notice of the possibility that interruption or reduction of deliveries may be required.

11. Obligation of Consumer to pay all charges levied by DISCOM

11.1 The Eligible Consumer shall abide by the rules and shall pay the Maximum Demand Charges, energy charges, surcharges and other charges, if any, to the DISCOM in accordance with the notified Tariff besides the applicability of the General Terms and Conditions of Supply prescribed by the TSERC from time to time.

11.2 The Eligible Consumer shall pay the minimum charges every month as prescribed in retail supply Tariff and as per General Terms and Conditions of supply, even if no electricity is consumed for any reason whatsoever and also if the charges for electricity actually consumed are less than the minimum charges.

12. Theft of electricity or un authorised use of electricity

Eligible Consumer, found indulging in theft of electricity or unauthorized use of electricity shall pay the penal/additional charges as may be levied by the DISCOM besides disconnection of supply as per the provisions of IE Act 2003 and General Terms and Conditions of supply.

13. Termination of the Agreement

13.1 In case the LT/HT Agreement for Supply of an Eligible Consumer gets terminated then the Net Metering Connection Agreement deems to be terminated.

13.2 The agreement will be terminated only after its completion period until all the safety standards are adhered to. The DISCOM has the right to terminate the agreement on breaching of any of the rules agreed upon with one month notice. If Eligible Consumer intends to pre close or terminate the agreement, Eligible Consumer may do so with 1 (one) month prior notice.

14. Dispute Resolution

The Eligible Consumer shall have recourse, in case of any dispute with the DISCOM regarding the billing, to the mechanism specified in sub-Sections (5) to (7) of Section 42 of the Act for the redressal of grievances.

Signature of Eligible Consumer

Date:

Witness

Signature:

Name & Address:

Date:

Competent Authority from Discom

(with stamp)

Date:

Witness

Signature:

Name & Address:

Date:

ANNEXURE-IV

**Work Completion Report for Synchronization of Rooftop Solar PV System
(To be submitted by Eligible Consumer/Applicant)**

A	Applicant/Consumer Details	
1	Net Meter Registration Number	
2	Registration Date	
3	Name of the applicant	
4	Service Number	
5	Category	
6	Load in kW	
B	Vendor of the Rooftop Solar PV System Details:	
1	Name of Vendor	
	Address:	
2	Door.No.	
3	Street	
4	City/Village	
5	Mandal	
6	Pin Code	
7	Phone	
8	Mobile	
9	Email ID	
C	Solar PV Module Details:	
1	Make	
2	Serial number	
3	Type of module	
4	Capacity of each module	
5	Number of modules	
6	Total capacity	
D	Grid Tie Inverter / Connector	
1	Make	
2	Serial number	
3	Capacity	
4	Input voltage	
5	Output voltage	
6	If grid supply fails, no return supply to the grid (Yes or No)	
E	Details of protective system available (Commission shall be done only on availability of the above)	
F	CEIG Approval Ref Number (Rooftop Solar PV System having the capacity in excess of 75 kW)	

Encl.:- Connected SPV generator Single line diagram, CEIG Approval copy

Vendor Signature(with Stamp)

**Eligible Consumer
Signature**

ANNEXURE – V (a)

HT NET METER Solar Rooftop PV system Synchronization Report/Test Report

A	Applicant Details	
1	Net Meter Registration Number	
2	Registration Date	
3	Name of the applicant	
4	Service Number	
5	Category	
6	Load	
7	Distribution/Section	
8	Address	
9	Mobile No	

CEIG Approval Ref No: _____

Solar Rooftop PV system Connection details:

Sl No.	Date	Inter Connection Point (LT Bus/HT Bus)	Existing Solar Capacity if any	Now Commissioned Capacity	Total Capacity
1.					

PV Modules Details:

Sl No.	Make	Serial Number	Type of Module	No. of modules	Capacity of each Module	Total capacity
1.						
2.						

Details of protective system available :

(Commissioning shall be done only on availability of the protective equipment)

Old Meter details:

Meter Make	Serial No.	Class	Capacity	MF	Final Readings on Dt: _____
					_____ kWh, _____ kVAh

New Meter details:

Meter Make	Serial No.	Class	Capacity	MF	Initial Readings on Dt: _____	
					Import	Export
					_____ kWh, _____ kVAh	_____ kWh, _____ kVAh

C E R T I F I C A T E

It is certified that there is no return voltage from the inverter to the meter when incoming grid supply is switched off.

It is further certified that the protective equipment is installed and functioning as prescribed.

The above Solar Rooftop PV system was synchronized as per DISCOM guidelines and the performance of the above plant is satisfactory. The date of synchronization of the plant is _____.

**Vendor Signature
(with stamp)**

Eligible Consumer DE/M&P _____ DE/Op _____

ANNEXURE-V(b)

LT NET METER Solar Rooftop PV system Synchronization Report /Test Report

A	<u>Applicant Details</u>	
1	Net Meter Registration Number	
2	Registration Date	
3	Name of the applicant	
4	Service Number	
5	Category	
6	Load	
7	Distribution/Section	
8	Pole number	
9	Address	
10	Mobile No	
B	<u>Old Meter Details</u>	
1	Meter make	
2	Serial number	
3	Capacity	
4	MF	
5	Final reading	
	i) kWh	
	ii) kVAh	
6	Date of replacement	
C	<u>New Net Meter Details</u>	
1	Meter make	
2	Serial number	
3	Capacity	
4	Meter constant	
5	Initial reading (Tri vector parameters)	
	i) Import (kWh/kVAh)	_____ kWh, _____ kVAh
	ii) Export (kWh/kVAh)	_____ kWh, _____ kVAh
D	<u>Details of protective system available</u> (Commissioning shall be done only on availability of the protective equipment)	

C E R T I F I C A T E

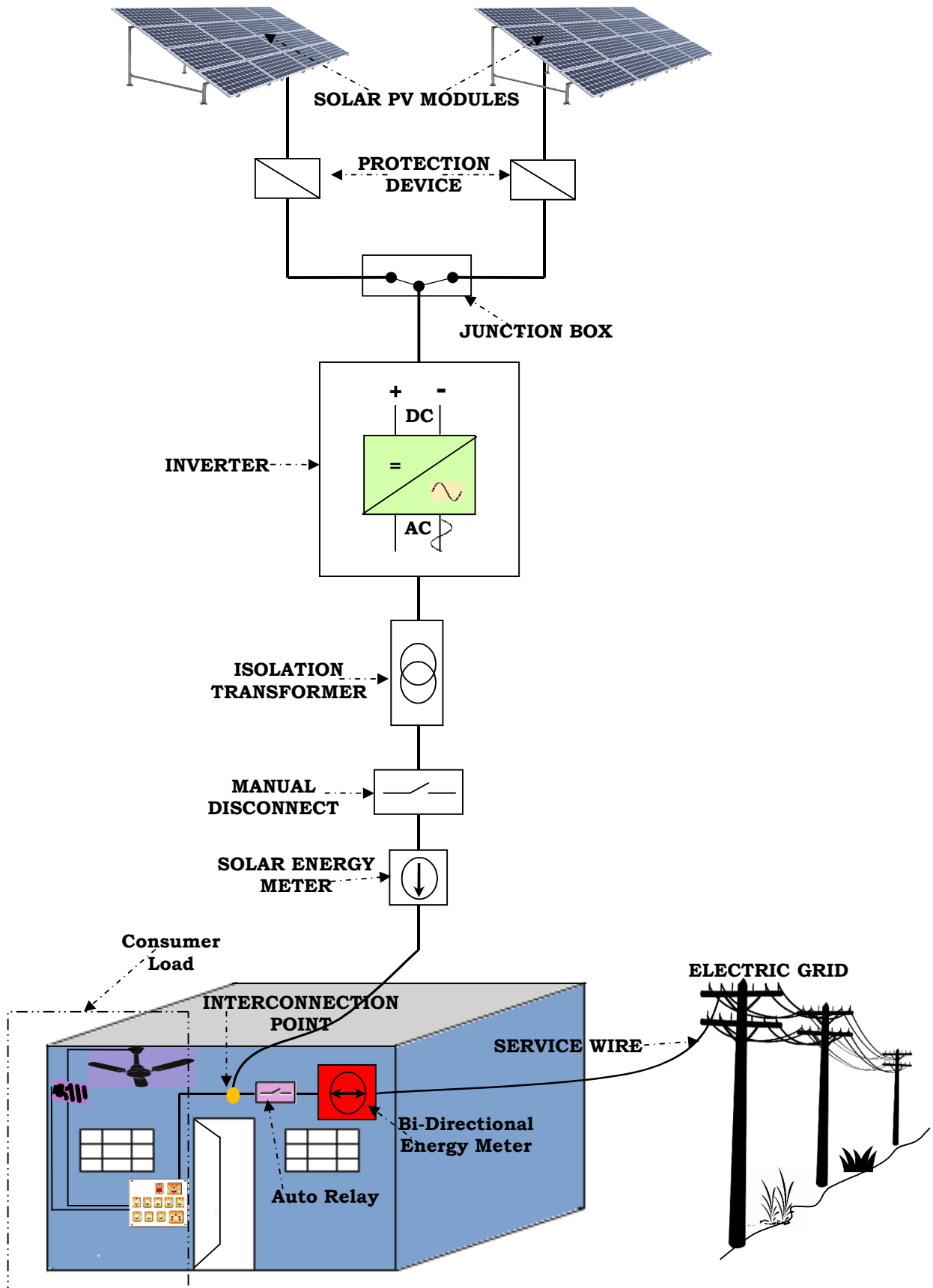
It is certified that there is no return voltage from the inverter to the meter when incoming grid supply is switched off.

It is further certified that the protective equipment is installed and functioning as prescribed. The above Solar Rooftop PV system was synchronized as per DISCOM guidelines and the performance of the above plant is satisfactory. The date of synchronization of the plant is _____.

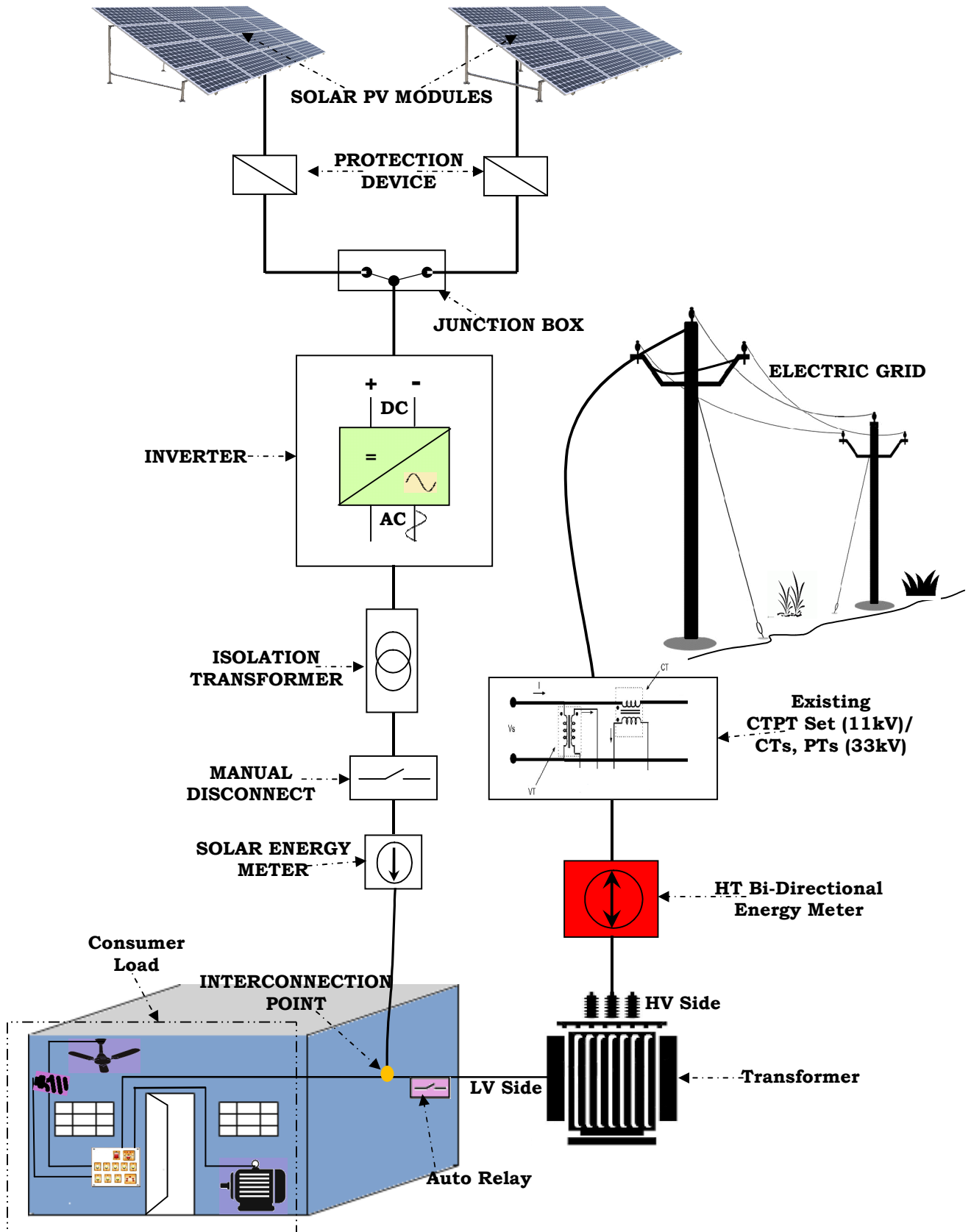
**Vendor Signature
(with stamp)**

Eligible Consumer ADE/M&P _____ ADE/Op _____

Solar Rooftop PV system LT Net metering Schematic Diagram



Solar Rooftop PV system HT Net metering Schematic Diagram



**Example for Solar Rooftop PV system Net metering
Energy Accounting and Settlement**

Month	Import Units (a)	Export Units (b)	Net Units (c=a-b)	Credited Units (d)	Credible units (e) (if (c+d)<0 then e=c+d otherwise e=0)	Billed Units (f) (if (c+d)>0 then f=c+d otherwise f=0)	Payment of CC Charges
Jan	150	125	25	0	0	25	Pays for consumed units*
Feb	123	145	-22	0	-22	0	Pays Minimum Charges
Mar	111	155	-44	-22	-66	0	Pays Minimum Charges
Apr	175	100	75	-66	0	9	Pays for consumed units*
May	175	185	-10	0	-10	0	Pays Minimum Charges
Jun	152	183	-31	-10	-41	0	Pays Minimum Charges

For unadjusted net credited 41 Units in the month of June, shall be settled at its average cost of power purchase as approved by the Commission for that year.

*Minimum Charges payable by the consumer even if no electricity is actually consumed for any reason whatsoever and also when the charges for the quantum of electricity consumed are less than the minimum charges specified by the Commission.

Note:-

- a) The sum arrived during settlement after **June** and **December** months shall be either adjusted in the next month electricity bill or deposited in the bank account of the Eligible Consumer furnished at the time of filing of the application.
- b) An Eligible Consumer is within the ambit of Time of Day (ToD) tariff, the electricity consumption in any time block, i.e. peak hours, off-peak hours, etc., shall be first compensated with the quantum of electricity injected in the same time block. Any excess injection over and above the consumption in any other time block in a Billing Cycle shall be accounted as if the excess injection had occurred during off-peak hours.