# Madhya Pradesh Policy for Net-Metered Renewable Energy Applications, 2016

## 1. PREAMBLE

**1.1** To harness the potential of renewable energy resources in the state, Government of Madhya Pradesh wishes to encourage Net - Metered renewable energy applications. In light of technological advantages unfolding in the sector and achievements made by renewable energy based power projects, green energy is being considered as an alternative to augment the current sources of generation.

**1.2** Solar energy, being the most favourable and suitable technology for decentralized and distributed generation, is expected to be the most popular option for harnessing Net - Metered Renewable Energy Applications. The state of Madhya Pradesh is endowed with high solar radiation with around 300 clear, sunny days. The state offers good sites, which have a potential of more than 5.5 kWh/$m^2$/day. "Madhya Pradesh Solar Policy, 2012" has provided a major thrust to the installation of grid-connected solar projects in the state. Further, clause 5(b), section I of the Policy brings out its intention to promote decentralised solar energy generation. Jawaharlal Nehru National Solar Mission (JNNSM) has also focussed on rooftop solar PV projects. Guidelines for "Smart City" developed by Government of India provide that at least 10% of smart city's energy requirement should be met with solar energy. In Madhya Pradesh, five cities have been identified to be converted to 'smart cities'.

**1.3** The policies followed in the country to promote solar power have registered a great success in attracting investment in this sector. Bankability of Solar Photo Voltaic (SPV) projects has substantially increased and private sector has shown huge interest in the sector. As a consequence, system costs have plummeted downwards year by year and rates of solar power are increasingly close to that from new thermal projects. Thus grid parity of solar power is being achieved.

**1.4** SPV installations have vast potential for use at decentralised load locations. Small SPV power plants can be installed on roofs or within the premises of consumers, including in agricultural forms. The power so generated could be primarily used by the consumer for his own use. The power generated, over and above the consumer's requirement, could be feasibly injected into electricity network of the DISCOM. The energy thus

exported could be adjusted against the energy purchased by the consumer from DISCOM by way of installation of Net meter. HT Consumers (11kV & above) may install and connect Renewable Energy Based Power Plant at their LT Bus Bar System, provided that the Net Meter shall be installed on the HT side of the Transformer. The consumer, after settlement of energy within the settlement period, shall pay for the net energy purchased by him from DISCOM.

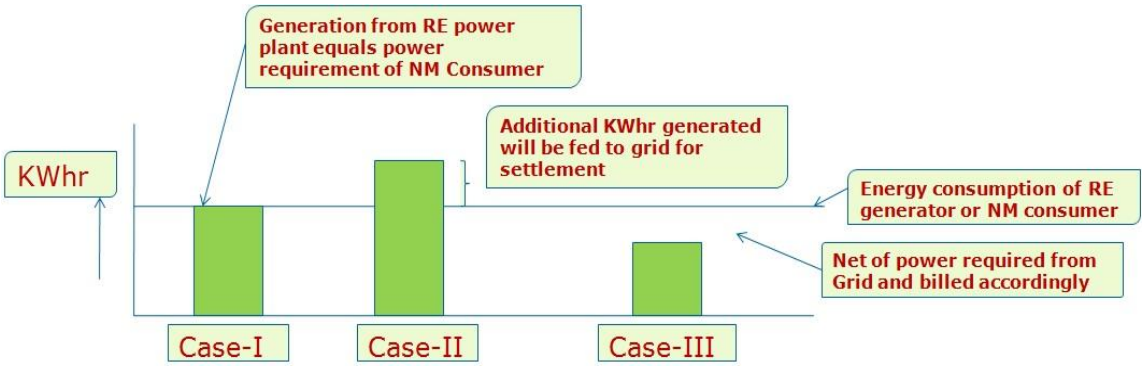
**1.5** Government of India has laid down target of capacity addition of 40,000 MWp of Grid Connected Solar Rooftop systems in the country by 2022. Out of this, Madhya Pradesh has been given a target of 2,200 MWp, which is the seventh highest amongst all the states. Year-wise target for Grid Connected Solar Rooftop systems set by MNRE, GoI is as follows:

| **Year** | **Targets (in MW)** |
|---|---|
| 2015-16 | 10 |
| 2016-17 | 265 |
| 2017-18 | 275 |
| 2018-19 | 330 |
| 2019-20 | 385 |
| 2020-21 | 440 |
| 2021-22 | 495 |

**1.6** In view of the above, New and Renewable Energy Department, Government of M.P. hereby notifies **'Madhya Pradesh Policy for Net - Metered Renewable Energy Applications, 2016'.** The policy intends to promote consumption of energy generated from renewable energy resources by individual users at decentralized locations. This would decrease the burden on conventional sources of energy. The Policy would serve to reduce the distribution losses, which are a bane for DISCOMs. It is also envisaged, through this policy, to help the community realize the importance of judicious use of electricity and involve them in the process of reducing dependence on conventionally produced electricity.

## 1.7 What is Net- Metering?

A Renewable Energy based power plant is installed on the roof, open space, walls, agriculture farm, etc., i.e., within the legal premises, of the customer to generate electricity. The power thus generated is first used in the building for captive requirement and the surplus power is fed to the grid of DISCOM. In case power requirement of the building is more than the power being generated, the extra power requirement is drawn from the grid. This system is 'Net Metering', as explained below:-




**Case-I**

In case generation of power from Renewable Energy based Power Project equals the power requirement of the Net metering consumer, there is no export or import of power from the grid. Hence, net billing units for this type of consumers will be zero.

**Case-II**

In case generation of power from Renewable Energy based Power Project is greater than the power requirement of the Net metering consumer, additional power generated can be supplied to the grid and settled against future surplus within the settlement period, as per the Regulations.

**Case-III**

In case generation of power from Renewable Energy based Power Project is less than the power requirement of the Net metering consumer, additional power required can be imported from the grid and settled at the prevailing DISCOM rate.

## 2. OBJECTIVES OF THE POLICY

a. To encourage broader community involvement and growth of decentralized Renewable Energy based Power Projects.

b. To reduce dependence on conventional sources of energy.

c. To provide impetus to growth of clean technology in the state of Madhya Pradesh.

d. To reduce distribution losses of Discoms by decentralized generation.

e. To improve tail-end grid voltages and reduce system congestion.

f. To reduce carbon emissions.

g. To help the state achieve its RPO(Renewable Purchase Obligation)

h. To develop sustainable energy solution for future and energy security of the nation.

i. To encourage job creation in the downstream Renewable Energy market segment.

j. To help the community realize the importance of judicious use of electricity and involve them in the process of reducing dependence on conventionally produced electricity.

## 3. DEFINITIONS

a. **"Billing period"** means the period for which regular electricity bills, as specified by the Commission, are prepared for different categories of consumers by the licensee;

b. **"Eligible Consumer or Consumer"** means a consumer of electricity in the area of supply of the Distribution Licensee, who uses a renewable energy system installed in the Consumer's Premises to offset part or all of his own electrical requirements, given that such systems can be self-owned or third party owned;

c. **"Financial year" or "year" or "Settlement Period"** means the period beginning from first day of April as per English calendar year and ending with the thirty first day of the March of the next year;

d. **"Generation Meter"** means a meter used for accounting of electricity generated from Renewable Energy based Power Project ;

e. **"Inter-connection Point"** means the interface of renewable energy generation facility system with the network of distribution licensee;

f. **'Installation'** means any composite electrical unit used for the purpose of generating, transforming, transmitting, converting, distributing or utilizing energy.

g. **"Net Metering Arrangement"** means an arrangement under which renewable energy system installed at eligible consumer's premises delivers surplus electricity, if any, to the Distribution Licensee after off-setting the electricity supplied by the Distribution Licensee during the applicable billing period;

h. **"Obligated Entity"** means the entity mandated under clause (e) of subsection (1) of section 86 of the Electricity Act, 2003 to fulfill the Renewable Purchase Obligation identified under Regulations;

i. **"Premises"** means any land, agricultural farm, building or structure or part thereof or combination thereof for which a separate meter or metering arrangements has been made by the licensee for measurement of net supply of electricity;

j. **"Renewable Energy based Power Project"** means the system to generate electricity from such source(s), which are recognized as renewable energy source(s) by Ministry of New and Renewable Energy (MNRE), Government of India or any other agency, as may be notified by the Government / Commission;

k. **"Renewable Energy Meter or Net Meter"** means a meter used for accounting and billing of electricity supplied to and from the consumer.

l. **"RESCO (Renewable Energy Services Company)"** means a business organization having adequate financial & technical resources and which provides energy to an Eligible Consumer from Renewable Energy Based Power Project set up in the premises of the said consumer on mutually agreed terms.

Words and expressions used in these Policy, which are not specifically defined herein but are defined in the Electricity Act 2003, shall have the meaning assigned to them in the said Act; and, if not defined in the Act, shall have the meaning assigned to them in any Act of Parliament or the State Legislature applicable to the electricity industry.

## 4. REGULATORY FRAMEWORK

**4.1.** Electricity Act, 2003 has been in force since June 2003. In accordance with the provisions of this act, any Government/ Private individual or agency is free to set up a power generation plant.

**4.2.** Madhya Pradesh Electricity Regulatory Commission (MPERC) is functioning since 1999. MPERC has issued notification for application of renewable energy resources (RES) as per net metering process, vide notification no.G-39 of 2015.

**4.3.** In case of any discrepancy between the provisions of this policy and the Act or orders or regulations of the Commission, presently or in future, the provisions of the Act and orders/regulations of the Commission shall prevail.

## 5. GUIDING PRINCIPLES OF THE POLICY

### 5.1. Operative Period:-

The policy shall become applicable from the date of its notification in the Madhya Pradesh State Gazette.

### 5.2. Applicability Of The Policy:-

The Policy shall extend to the entire State of Madhya Pradesh. It shall be applicable to all eligible consumers for Renewable Energy based Power Project installations adopting net metering mechanism. The Renewable Energy Based Power Plant shall be located in the consumer premises and in case of multi storied buildings in common facility area. The Net Metering facility shall also be applicable to such Eligible Consumers, who have installed Renewable Energy based Power Project before notification of this policy, subject to technical feasibility at Distribution Transformer / Sub-Station Level and fulfilment of laid down procedure under this policy.

### 5.3. Eligibility Criteria:-

In order to promote utilization of Renewable energy, all categories of consumers, who are consumers of electricity in the area of supply of the Distribution Licensee, and who use a renewable energy system installed in their premises to offset part or all of their electrical requirement, are considered as ‘Eligible Consumers’. Such renewable energy systems can be self-owned or third party owned. Bulk consumers, i.e., single point connection owners, can also avail the facility of Net Metering arrangement.

## 6. CAPACITY CAP:-

### 6.1. Capacity Limit at Distribution Transformer:

The cumulative capacity of all Renewable Energy based Power Projects under Net Metering Arrangements, which are connected to a particular Distribution Transformer of the Licensee, shall be as per MPERC Grid Connected Net Metering Regulations, 2015 and subsequent amendments thereof.

The Distribution Licensee shall offer the provision of Net Metering arrangement to the Eligible Consumer, who intends to install Renewable Energy based Power Project in its area of supply, on non-discriminatory and 'first come first serve' basis.

In case Renewable Energy based Power Project to be set up is beyond the limit specified in MPERC Grid Connected Net Metering Regulations, 2015, and cannot be undertaken due to infrastructure constraints, the DISCOM shall work with 'Eligible Consumer' and/or MPUVN to analyse the investment required for strengthening the infrastructure, so as to bring the relative capacity of the proposed Renewable Energy based Power Project and the concerned Distribution Transformer within the norms prescribed in the MPERC Grid Connected Net Metering Regulations, 2015. Eligible Consumer, or MPUVN on his behalf, shall present the case to MPERC and request to provide guidelines for sharing of cost of infrastructure upgradation between DISCOM and Eligible Consumer.

**6.2.** The distribution licensee shall update on yearly basis the capacity available at distribution transformer level for connecting renewable energy systems under Net Metering arrangement and shall provide information regarding the same on its website.

## 7. TECHNOLOGY:-

Renewable Energy based Power projects, with or without storage, conforming to the technical specifications specified by MPERC/MNRE/CEA, will be eligible for incentives available under this policy. Specifications for solar Photovoltaic system are at Annex – I, subject to modifications in specifications specified by MPERC/MNRE/CEA.

If an Eligible Consumer opts for connectivity with a battery back-up, the inverter shall have a separate back-up wiring to prevent the power from battery/ decentralized

generation (DG) from flowing into the grid in the absence of grid supply, and that an automatic as well as manual isolation switch shall have to be provided.

Renewable energy systems using inverter should comply with IEC 61683/IS 61683 for efficiency and Measurements, and with IEC 60068-2 (1, 2, 14, 30) / Equivalent BIS Standard for environmental testing. Inverter should supervise the grid condition continuously and, in the event of grid failure (or) under voltage (or) over voltage, Renewable energy System should be disconnected by the circuit Breaker / Auto switch provided in the inverter. Further, The Renewable Energy based Power Project shall be equipped with automatic synchronization device. However, renewable energy systems using inverter shall not be required to have a separate synchronizing device, if the same is inherently built into the inverter.

## 8. ENERGY ACCOUNTING AND COMMERCIAL ARRANGEMENTS:-

Provisions for energy accounting and commercial arrangements will confirm to MPERC Grid Connected Net Metering Regulations, 2015 and subsequent amendments thereof.

### 8.1. Provision Regarding Surplus Power:-

If there is surplus power generated after fulfilling captive consumption requirement at the end of the settlement period, the surplus power shall be compensated as per MPERC Net Metering Regulations, 2015 and amendments thereof. The unadjusted net credited units of electricity, at the end of each 'Settlement period', shall be purchased by the Distribution Licensee at its Average Pooled Cost of Power Purchase, as approved by the Commission for that year. The Distribution Licensee shall provide credit equivalent to the amount payable in the immediately succeeding Billing period, and, if any credit still remains, then in the following Billing period(s).

### 8.2. Metering Arrangement:-

Provisions for metering arrangements will confirm to MPERC Grid Connected Net Metering Regulations, 2015 and subsequent amendments thereof. The standards for Generation Meter and Net Meter are specified in Annex – II, subject to any modifications in standards by MPERC/CEA.

DISCOM or 'Eligible Consumer' or Madhya Pradesh Urja Vikas Nigam could buy bi-directional meter or Net Meter, which shall be sliding window compatible for HT

customers. The said Meters should be tested and installed by Distribution Licensee or Distribution Licensee's authorized representative at the cost of the consumer.

In case the meter becomes defective or burnt, the same shall be replaced at the cost of the consumer.

## 9. STANDARDS, OPERATION AND MAINTENANCE OF RENEWABLE ENERGY BASED POWER PROJECT

The Renewable Energy based Power Project and equipment will conform to the standards and requirements specified in the following Regulations and codes, as amended from time to time:

a. Central Electricity Authority (Technical Standards for connectivity of the Distributed Generating Resources) Regulations, 2013.

b. Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006.

c. Central Electricity Authority (Measures relating to safety and electric supply) Regulations, 2010

d. Madhya Pradesh Electricity Supply Code, 2013.

## 10. INTERCONNECTION NORMS:-

Interconnection of the renewable energy system with network of Distribution licensee shall be made as per Central Electricity Authority (Technical Standards for connectivity of the Distributed Generating Resources) Regulations, 2013, and Central Electricity Authority (Measures relating to safety and electric supply) Regulations, 2010, as amended from time to time. The technical requirement for interconnection of the renewable energy system with the network of the Distribution licensee is specified in Annex – III, subject to any modifications by MPERC/CEA.

**10.1.** Madhya Pradesh Electric Supply Code, 2013 and subsequent amendments thereto, lay down connectivity with grid as follows:-

| System Capacity | Supply Voltage |
|---|---|
| 3 Kw | 230 V, 1 PH [LT] |

| | |
|---|---|
| 112 kW | 415 V, 3 PH [LT] |
| 300 kVA | 11 kV [HT] |
| 10,000 kVA | 33 kV [HT] |

In case the Renewable Energy Based Power Plant of is being installed by an HT Consumer (11kV & above) , he may install and connect the Power Plant at his LT Bus Bar System, provided that the Net Meter is installed on HT side of the transformer. Typical Single Line Diagrams for different voltage levels for interconnection of the renewable energy system with the network of the Distribution licensee are at Annex - IV, which may be considered for installation of the systems.

**10.2.** Distribution licensee shall specify the interface/interconnection point and metering point in Eligible Consumer's premises.

**10.3.** In compliance with Rule 47 A of Indian Electricity Rules, 1956 as applicable in Madhya Pradesh, installation of Renewable Energy based Power Project up to 10 kW capacity is exempted from CEIG approval. Discoms shall inspect Renewable Energy based Power Project up to 10 kW capacity.

## 11. SAFETY OF RENEWABLE ENERGY BASED SYSTEMS

The Renewable Energy based Power Project owner 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 distribution licensee.

The Renewable Energy based Power Project owner shall be responsible for any accident to human being/ animals, whether fatal/nonfatal or departmental /non-departmental that may occur due to back feeding from the Renewable Energy based Power Project when the grid supply is off. The distribution licensee would have the right to disconnect the consumer's installation at any time in the event of such exigencies to prevent accident or damage to men and material. In such a situation, 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 flow of power from battery /diesel generator / backup extending to distribution licensee's grid.

The Renewable Energy based Power Project should be capable of detecting an unintended islanding condition. These systems must have anti-islanding protection to prevent any unfavourable conditions, including failure of supply.

In case it is determined by the Distribution Licensee that Eligible Consumer's photovoltaic system either causes damage to and/or produces adverse effects affecting other consumers or Discom's assets, Eligible Consumer will have to disconnect photovoltaic system immediately from the distribution system upon direction from the Discom and correct the problem at his own expense prior to a reconnection.

In emergency or outage situation, where there is no access to the disconnecting means, both automatic and manual, such as a switch or breaker, Discom may disconnect service to the premises of the Eligible Consumer.

## 12. MONITORING & PERFORMANCE EVALUATION:-

'Eligible Consumer' is required to install Generation Meter at the consumer's premises at his own cost, whose standards are prescribed in Annex-III.

All Renewable Energy Based Power Projects, which are given subsidy of Government of India and/or Government of MP, will be subject to monitoring and evaluation by MPUVN to measure performance of the system and to quantify electricity generated through the Renewable Energy Based Power Project under Net Metering.

## 13. THIRD PARTY OWNED SYSTEMS

### 13.1. RESCO (Renewable Energy Services Company)

Installation of Renewable Energy based Power Project under the Policy in the premises of an Eligible Consumer can be done by a RESCO on behalf of the Eligible Consumer on mutually agreed terms, including the arrangement where the Renewable Energy based Power Project is owned by the RESCO. Power generated from such Renewable Energy based Power Project would be supplied to the said consumer and it cannot be traded or sold to a third party.

The RESCO would enter into a Power Purchase Agreement with the Eligible Consumer to sell metered units of electricity at a mutually agreed price. The Eligible Consumer will effectively buy electricity from two sources: daytime power (in case of a solar system) from the RESCO, and remaining daytime plus night-time power from the

DISCOM. Further, in accordance with the agreement between the RESCO and the Eligible Consumer, the RESCO could be responsible for all O&M service through the life of the contract, implying that the Consumer does not have to pay for capital expenditure, and has to do nothing but pay the RESCO for units of electricity consumed from the Renewable Energy based power project. The RESCO model could be implemented in inter alia the following models:

a. Build Own Operate Maintain (BOOM), wherein the third party RESCO will purchase and permanently own the Renewable Energy based Power Project, and supply power to the Eligible Consumer for the lifetime of the project, and

b. Build Own Operate Transfer (BOOT), wherein the RESCO purchases and owns the Renewable Energy based Power Project upfront, but enters into a PPA with the Eligible Consumer only for a specified period of time, and, subsequently, the Consumer takes over ownership of the Renewable Energy based Power Project from the RESCO. In this model, while the O&M expenses during the life of the PPA are borne by the RESCO, later the responsibility for O&M shifts to the Consumer. In addition to the cost of metered units of electricity, the RESCO would add an Equal Monthly Instalment (EMI) payment to the amount payable per month. Effectively, the Consumer is getting an implicit 'loan' from the RESCO in order to be able to take ownership of the Renewable Energy based Power Project at an agreed time.

**13.2. Other third-party owned models**

There could be a model, wherein the investor could buy and own the Renewable Energy based Power Project, and enters into a lease contract with the Consumer, who makes a flat monthly lease payment to the investor.

On account of the provision of accelerated depreciation for investment in renewable energy, there are investors keen to invest in the area. Such an Investor can come together with a Renewable Energy based Power Project developer, who has the necessary subject matter knowledge and expertise to accurately design and install Renewable Energy based Power Project, to provide another third party owned model for consumers. Other third-part owned models can emerge, including an NBFC(Non-Banking Financial Company) consortium model, wherein mutually agreed roles could be played by firstly a Renewable Energy based Power Project developer, secondly an

investor, and thirdly an NBFC, who knows numerous small residential, commercial and industrial customers and their risks, and is comfortable to arrange financing for such parties from the Investor. These models could extend net metered renewable energy based power project with financing benefits further down the income ladder among residential, commercial and industrial consumers.

## 14. INCENTIVES :-

**14.1.** Installation of Renewable Energy based Power Project under the Policy shall be exempted from banking, wheeling charges and cross-subsidy charges, subject to MPERC Net Metering Regulations, 2015 and amendments thereof.

**14.2.** Electricity Duty and Cess shall be exempted on the renewable energy generated by the Renewable Energy based Power Project. The power thus generated shall be banked with the distribution company.

**14.3.** All Eligible Consumers can avail Central Financial Assistance from MNRE, on meeting the eligibility conditions and the procedure prescribed, as also the subsidy made available by Government of Madhya Pradesh, Department of New & Renewable Energy. MPUVN shall take necessary action for processing the request and releasing the subsidy.

**14.4.** RBI guidelines provide for bank loans up to a limit of Rs.15 Crore for the purpose of Renewable energy system. For individual households, the loan limit is Rs. 10 lakh. Further, many banks have policies to include cost of Renewable Energy installations in the loan for houses, and there is no need of hypothecation beyond the asset created under the loan. Such loans are also eligible for relief under the Income Tax Act. MPUVN shall give all necessary support for loans to Eligible Consumers being sanctioned by banks.

**14.5.** Installation of renewable energy based power project in the premises of an Eligible Consumer would not be considered under eligible Floor Area Ratio (FAR) calculation. Further, it will also entitle the consumer to additional Floor Area Ratio (FAR) for the consumer premises as notified by Urban Development & Environment Department.

## 15. TAX EXEMPTIONS:-

**15.1.** Installation of Renewable Energy based Power Project under the policy shall not be treated as “construction”, as regards there being any additional liability of property tax

for installation of Renewable Energy based Power Projects on their rooftops or premises.

**15.2.** The equipment purchased for installation of Renewable Energy based Power Project under this policy shall be exempted from VAT and entry tax, as per the exemption granted to these systems under Madhya Pradesh VAT (Amendment) Act – 2009 and subsequent amendments thereof.

**16. RPO**

**16.1.** The quantum of electricity produced from the Renewable Energy based Power Project, as measured by the generation meter under net metering arrangement by an Eligible Consumer, who is not defined as Obligated Entity, shall qualify towards compliance of Renewable Purchase Obligation (RPO) for the distribution licensee in whose area of supplies the Eligible Consumer is located.

**16.2.** Till the distribution licensees have systems in place for reading the Generation Meter for RPO, the quantity of electricity generated by a Renewable Energy based Power Project under Net Metering arrangement for the purpose of RPO would be ascertained using a normative CUF to be decided jointly by New and Renewable Energy Department and Energy Department.

**16.3.** In case the Eligible Consumer is an Obligated Entity, the quantum of electricity generated from the Renewable Energy based Power Projects under net metering arrangement, shall be counted towards meeting his RPO.

**17. CDM**

The proceeds from CDM benefits shall be retained by the Discom.

**18. EMPANELMENT OF TECHNOLOGY FACILITATORS / DEVELOPERS / AGENCIES / EQUIPMENTS**

For standardization of quality and to enable easy installation of Renewable Energy based Power Projects, MPUVN would empanel technology facilitators/ developers/ agencies, and equipments for implementing Renewable Energy based Power Projects, after thorough due diligence of documents through separate Expression of Interest. MPUVN shall invite proposals for empanelment from time to time, normally twice in a year. Interested parties can apply, along with necessary documents, for being added to

the empanelled list as technology facilitators/developers/agencies. Further, MPUVN would also lay down standards for installation, inverter, solar module and safety, and also rates, etc.

**19. REGISTRATION & PROCESSING PROCEDURE (For Eligible Consumer):-**

The Net Metering facility shall also be applicable to such Eligible Consumers, who have installed Renewable Energy based Power Project before notification of this policy, subject to technical feasibility at Distribution Transformer / Sub-Station Level ; subject to fulfilment of criteria as indicated below from point (a to f).

a. The Application Form can be collected or downloaded Application Form (as per enclosed Annex - V) from concerned distribution utility's office/website or MPUVN's office/Website.

b. Applicant or on his behalf RESCO or MPUVN or their representative will fill the application form and will submit the same to the distribution utility for general and technical screening for interconnection along with registration fee of Rs 1000.

c. On receiving the application form, utility will register the application form and will electronically issue acknowledgement receipt (as per enclosed Annex - VI) with unique registration number to applicant and MPUVN for further reference / tracking of application form on first cum first serve basis.

d. The distribution utility will exam in the request on the basis of relative capacity of the proposed renewable energy system and the distribution transformer on the basis of Para 6.1 of the policy.

e. If the interconnection is feasible, utility will issue 'approval letter' (as per enclosed Annex - VII) to the applicant for system installation.

f. The applicant after receipt of 'approval letter' shall sign the Net Metering Inter Connection Agreement and submit the same to the distribution utility. (As per enclosed Annex - VIII).

g. The applicant shall submit application for processing of subsidy in MPUVN's website. (As per enclosed Annex – IX & Annex - X).

h. The applicant or MPUVN on his behalf will identify and finalise the appropriate contactor/system installer/MPUVN empanelled vendor for solar project installation and get the plant installed and commissioned.

i. This above said approval is valid for 180 days from the date of approval letter and the renewable energy system is to be commissioned within this period. The progress of system installation shall be monitored by MPUVN authorized officer / Agency and if adequate progress is not observed MPUVN may recommend cancellation of the approval.

j. On completion of project installation, Applicant or MPUVN on his behalf will inform the utility and MPUVN through work completion report, as per enclosed Annexure - XI.

k. After completion of installation of project, utility personnel will undertake final site inspection

l. On completion of site inspection, utility will finally approve the synchronisation of solar project with the grid and issue the commissioning certificate.

m. If applicable, Subsidy shall be released to eligible consumer, subject to and following of sanction/release by concerned government authorities.

**20.** The administrative department may issue clarification and interpretation of provisions of the policy, and would also be authorized to modify the policy, based on provisions of MPERC Grid Connected Net Metering Regulations, or guidelines or directions issued by Central Government and State Government, or to streamline implementation of the program.

**Annex -I**

## Technical Specifications of Solar Photovoltaic System

| S. No. | Standards | Reference |
|---|---|---|
| 1. | IS 13779-1999 | Standards for single or poly phase electrostatic watt hour meters |
| 2. | IS 14697 | Standards for static transformer operated watt hour meters and VAR hour meters |
| 3. | IEEE 61000 | Equipment standards to control/curtail flicker |
| 4. | IEEE 519 | Standards for limitation for Total Harmonic Distortion |
| 5. | IEC 61215 | Standards for Crystalline Silicon terrestrial photovoltaic (PV) modules- Design qualification and type approval |
| 6. | IEC 61646 | Standards for thin film terrestrial photovoltaic (PV) modules-Design qualification and type approval |
| 7. | IEC 61730 | Standard for Photovoltaic (PV) module safety qualification- Part1: Requirement for construction Part 2: Requirements for testing |
| 8. | IEC 61701 | Standards for Salt mist corrosion testing for modules used in coastal corrosive atmosphere |
| 9. | IEC 60068-2(1,2,14,30) | Standards for power conditioning unit/inverters for efficiency measurement and environment tests |
| 10. | IEC 60502 | Standards for power cables with extruded insulation and their accessories for rated voltages from 1 kV(Um=1.2 kV) upto 30 Kv(Um=36 kV) |
| 11. | IEC 60227 | Standards for polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V |
| 12. | IEC 62116 | Standards for utility-inter connected photovoltaic inverters-Test procedures of islanding prevention measures. |

**Annex - II**

## Standards for Generation Meter

| S. No | Technical Parameters | Connectivity at 415 V & below voltage level | | | Connectivity above 415 V voltage level |
|---|---|---|---|---|---|
| | | Whole Current Meters | | CT Operated | CT-PT Operated |
| 1. | Applicability | Renewable energy plant capacity up-to 4 kW | Renewable energy plant capacity above 4 kW and upto 15 kW | Renewable energy Plant Capacity above 15 kW and upto 50 kW | HT/EHV supply |
| 2. | Number of phases and wires | Single Phase, 2 Wire | Three Phase, 4 Wire | Three Phase, 4 Wire | Three Phase, 4 Wire |
| 3. | Measurand (s) | kWh | kWh | kWh, kVAh, kVA, PF | kWh, kVAh, kVA, PF, Max. demand |
| 4. | Standard Voltage and frequency | 240 V, 50±5% | 3X240 V (P-N), 415 V (P-P), 50±5% | 3X240 V (P-N), 415 V (P-P) 50±5% | 3X63.5 V (P-N), 110 V (P-P) 50±5% |
| 5. | Current Rating | 10-60 | 10-60 | 1 Amp | 1 Amp |
| 6. | Accuracy class | 1.0 | 1.0 | 0.5S | 0.2S |
| 7. | Indian Standard or IEC to which conforming | IS 13779-1999 | IS 13779-1999 | IS 14697,IS 13779 | IS 14697,IS 13779 |
| 8. | Import-export feature | Forward import | Forward import | Forward Import | Forward import |
| 9. | Communication Port/ Protocol | Optical/ DLMS | Optical, RS- 232/ DLMS | Optical, RS-232/ DLMS | Optical, RS-232/ DLMS |

## Standards for Net Meter

| S. No | Technical Parameters | Connectivity at 415 V & below voltage level | | | Connectivity above 415 V voltage level |
|---|---|---|---|---|---|
| | | Whole Current Meters | | CT Operated | CT-PT Operated |
| | Applicability | Up to 5 kW Connected | Above 5 kW and upto | Above 18.65 kW and upto 50 | HT/EHV supply |

| | | | | | |
|---|---|---|---|---|---|
| | | load | 18.65 kW connected load | kVA contract demand | |
| | Number of phases and wires | Single Phase, 2 Wire | Three Phase, 4 Wire | Three Phase, 4 Wire | Three Phase, 4 Wire |
| | Measurand(s) | kWh | kWh | kWh,kVAh,kVA, PF | kWh,kVAh,kVA, PF, Max. demand |
| | Standard Voltage and frequency | 240 V, 50±5% | 3X240 V (P-N), 415 V (P-P),50±5% | 3X240 V (P-N), 415 V (P-P) 50±5% | 3X63.5 V (P-N), 110 V (P-P), 50±5% |
| | Current Rating | 10-60 | 10-60 | 1 Amp | 1 Amp |
| | Accuracy class | 1.0 | 1.0 | 0.5S | 0.5S |
| | Indian Standard or IEC to which conforming | IS 13779-1999 | IS 13779-1999 | IS 14697,IS 13779 | IS 14697,IS 13779 |
| | Import-export feature | Import & Export | Import & Export | Import & Export | Import & Export |
| | Communication Port/ Protocol | Optical/ DLMS | Optical, RS-232/ DLMS | Optical, RS-232/ DLMS | Optical, RS-232/ DLMS |

**Annex -III**

## Technical and interconnection requirements Parameters

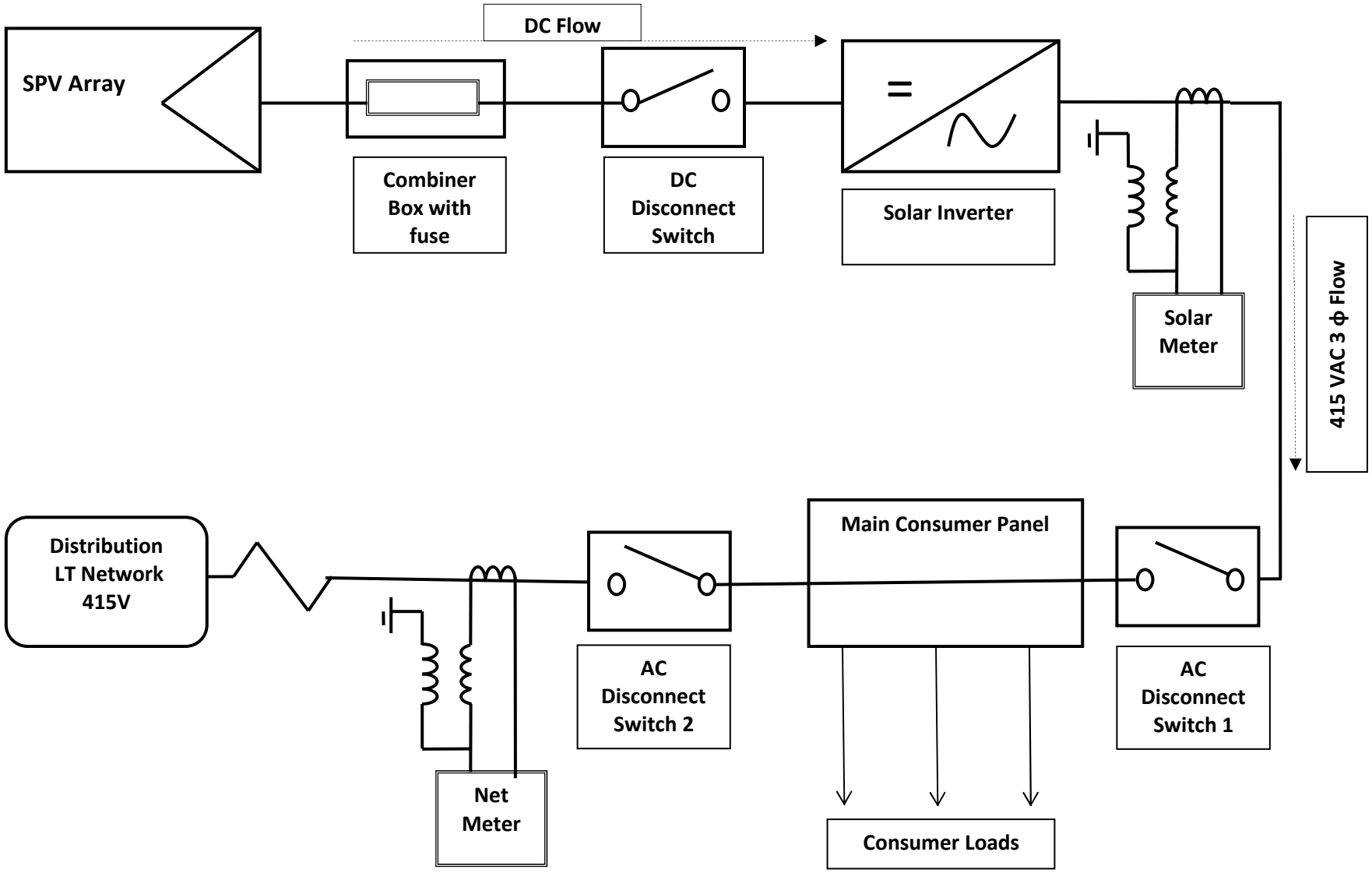
| S. No | Parameters | Reference | Requirements |
|---|---|---|---|
| 1. | **Overall conditions of service** | State Distribution / Supply Code | Compliance with the terms and conditions of supply. |
| 2. | **Overall Grid Standards** | Central Electricity Authority (Grid Standard) Regulations 2010 | Compliance with Grid Standards as regards frequency, voltage and Protection coordination. |
| 3. | **Meters** | • Central Electricity Authority (Installation & Operation of Meters) Regulations, 2006<br>• MPERC Metering Regulations as amended from time to time | Compliance with the specifications of the meters. |
| 4. | **Safety and supply** | Central Electricity Authority (Measures of Safety and Electricity Supply) Regulations, 2010 | Compliance with safety provisions for electrical installations and apparatus of voltage below and above 650 volts. |
| 5. | **Harmonic Requirements, Harmonic Current** | • IEEE 519<br>• CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013 | The Total Harmonic Distortion (THD) for voltage at the interconnection point should not exceed 5%. For the current distortion limits, the Total Demand Distortion (TDD) in terms of ratio of available short circuit current to the demand current (Isc/IL) should remain within limits specified for various harmonics for different TDD values. |
| 6. | **Synchronization** | | Renewable Energy system must be equipped with a grid frequency synchronization device. |

| | | | |
|---|---|---|---|
| | | CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013 | Every time the generating station is synchronized to the electricity system, it shall not cause voltage fluctuation greater than +/- 5% at point of inter connection. |
| 7. | **Voltage** | | The voltage-operating window should minimize nuisance tripping and should be within operating range of 80% to 110% of the nominal connected voltage. The Renewable Energy system must isolate itself from the grid within a clearing time of 2 seconds. |
| 8. | **Flicker** | | Operation of Renewable Energy system should not cause voltage flicker in excess of the limits stated in IEC 61000 standards as follows:<br>Short-term flicker (Pst): The flicker severity evaluated over a short period of time (10 minutes) should be <=1.<br><br>Long-term flicker (Plt): The flicker severity evaluated over a long period of time (typically 2 hours) should be <=0.65. |
| 9. | **Frequency** | | There should be over and under frequency trip functions with a clearing time of 0.2 seconds, when the Distribution system frequency deviates outside the specified Conditions (50.5 Hz on upper side and 47.5 Hz on lower side). |
| 10. | **DC injection** | | Renewable Energy should |

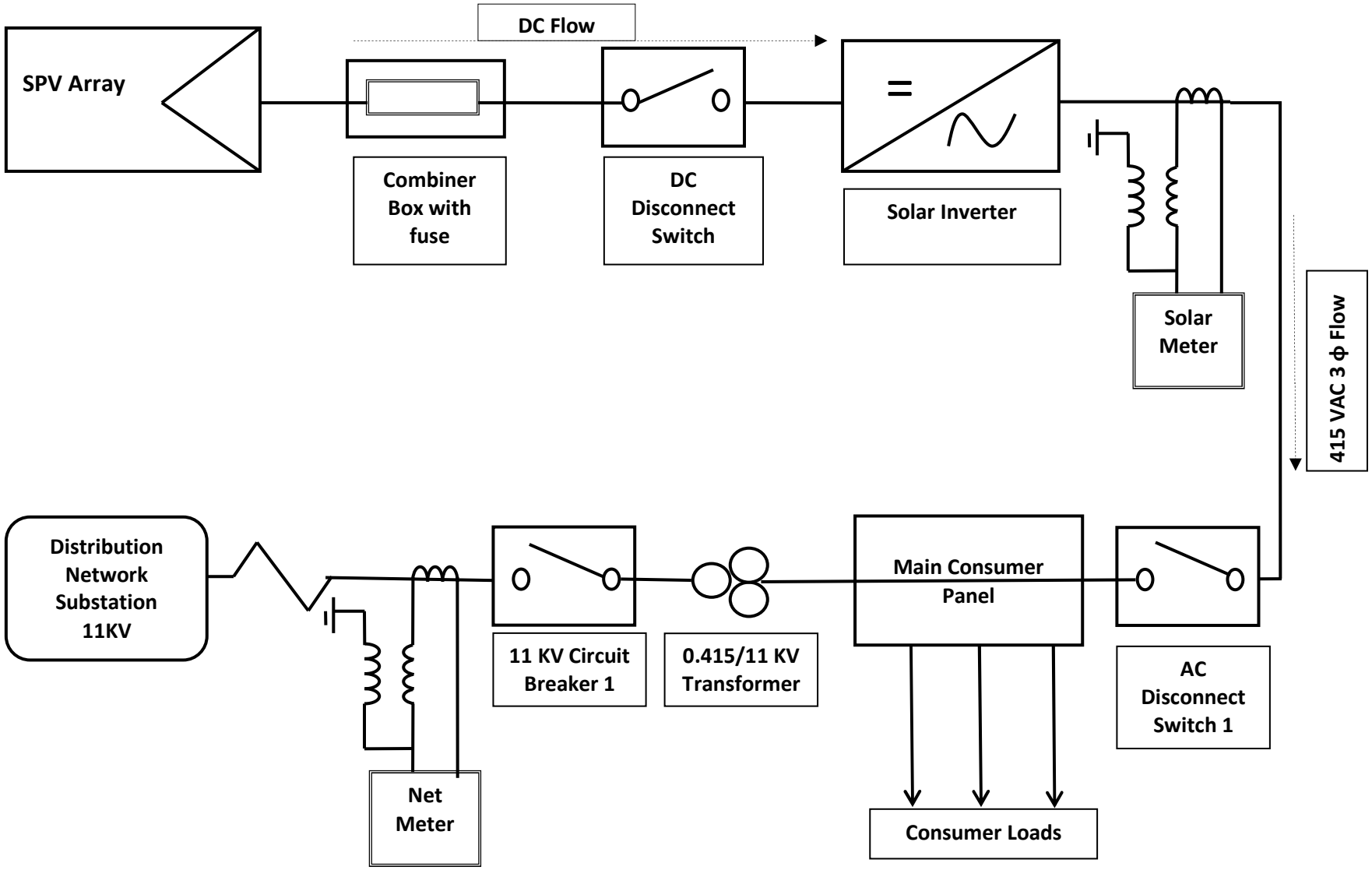
| | | | |
|---|---|---|---|
| | | CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013 | not inject DC power more than 0.5% of full rated output at the interconnection point or 1% of rated inverter output current into distribution system under any operating conditions. |
| 11. | **Power Factor** | | When the output of the inverter is greater than 50%, the power output from the inverter shall have a lagging power factor of greater than 0.9. |
| 12. | **Islanding and Disconnection** | | The Renewable Energy system must island/ disconnect itself within IEC standard<br>Stipulated time in the event of fault, voltage or frequency variations. |
| 13. | **Overload and Overheat** | | The inverter should have the facility to automatically switch off in case of overload or overheating and should restart when normal conditions are restored. |
| 14. | **Paralleling Device** | | Paralleling device of Renewable Energy system shall be capable of withstanding 220% of the normal voltage at the interconnection point. |
| 15. | **Earthing** | | Earthing shall be done in accordance IS 3043-1986, provided that Earthing conductors shall have a minimum size of 6 $mm^2$ copper wire or 10 $mm^2$ aluminum wire or 3 mm X 70 mm hot dip galvanized steel flat. |

# Annex - IV

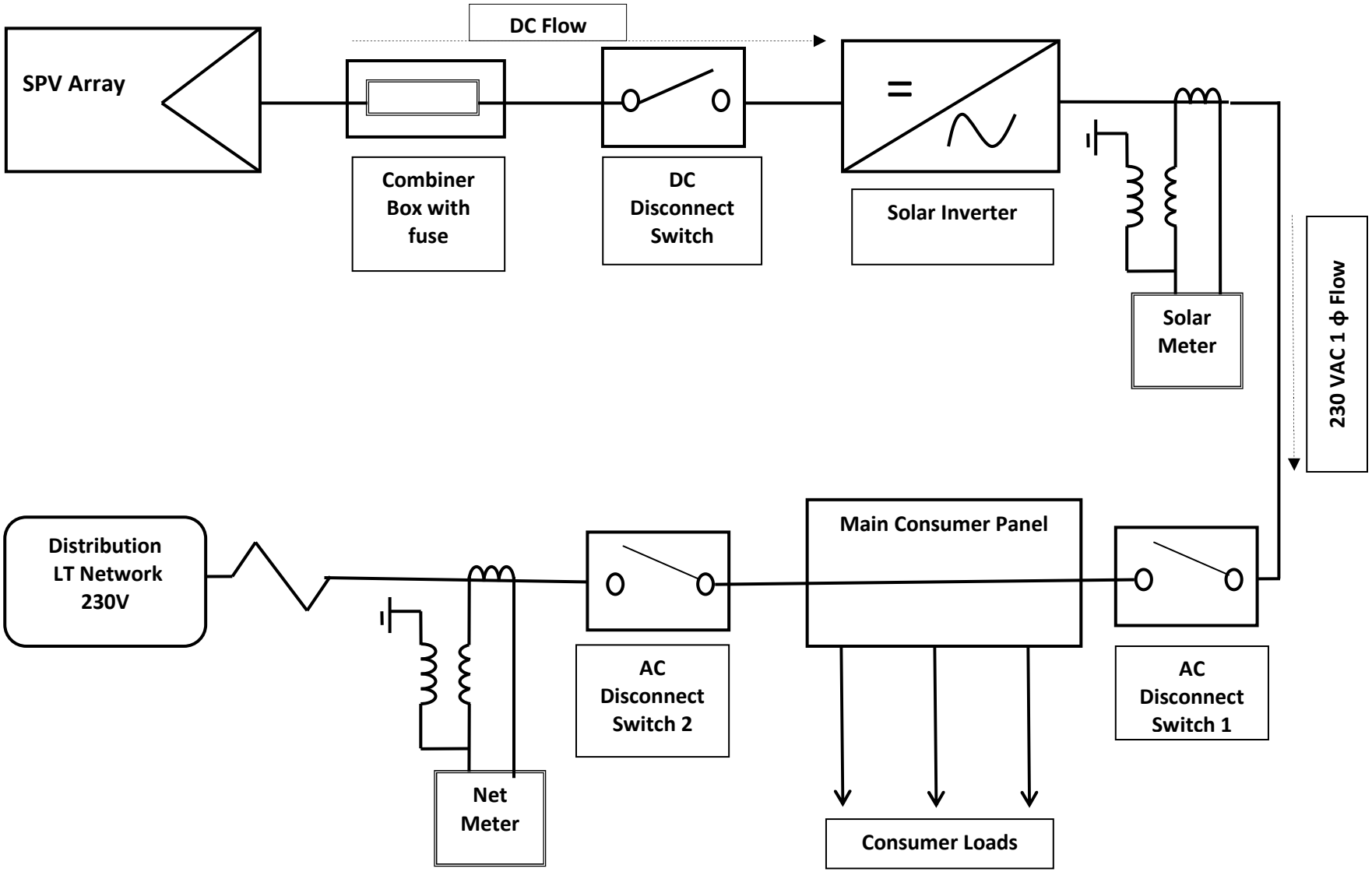
**SLD FOR GRID TIED ROOFTOP SPV SYSTEM (WITHOUT STORAGE) OF CAPACITY 3 KW TO 112 KW – 415 V THREE PHASE LT CONNECTION**



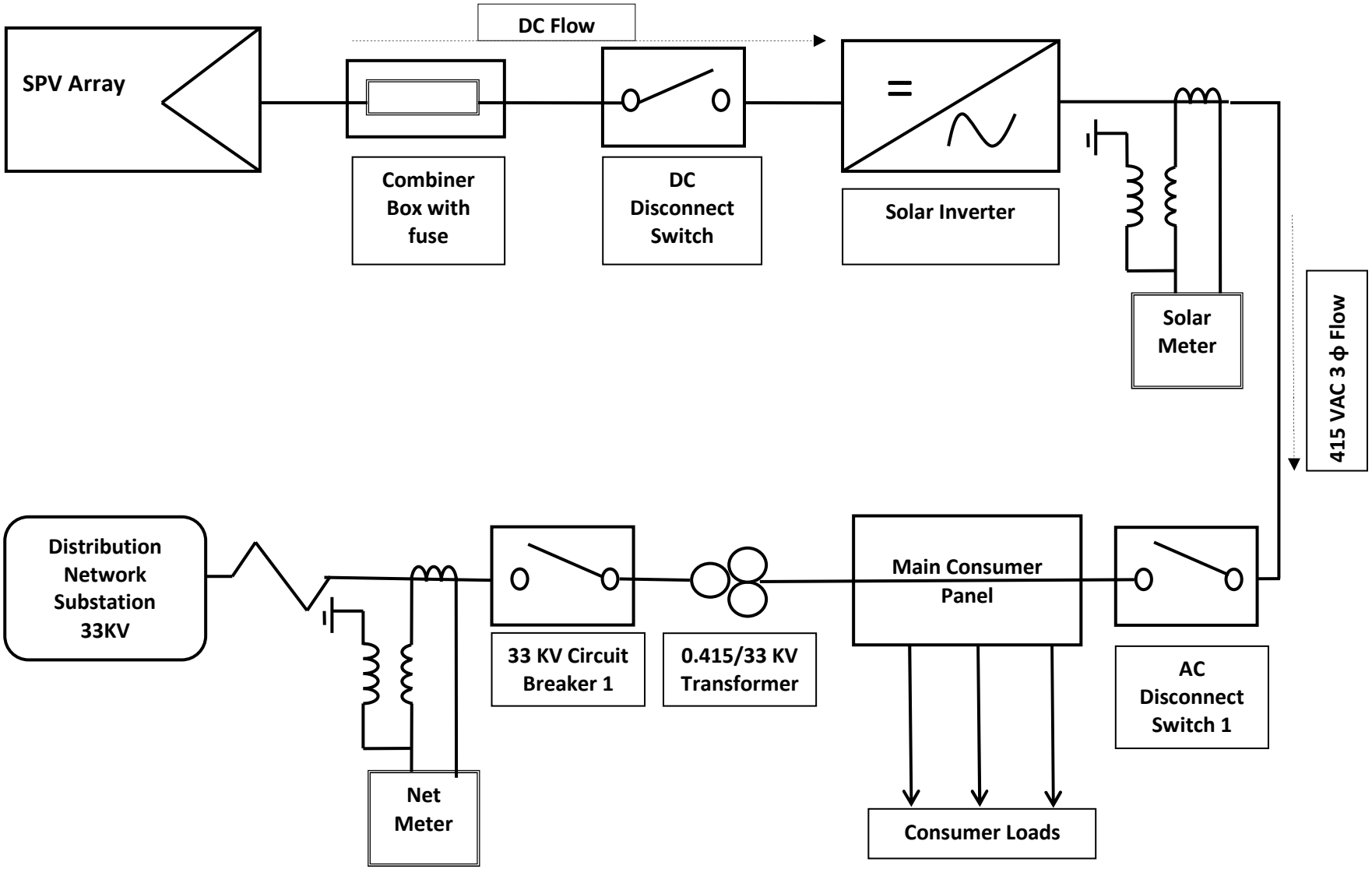
**SLD FOR GRID TIED ROOFTOP SPV SYSTEM (WITHOUT STORAGE) OF CAPACITY 112 KW TO 300 KVA – 11 KV THREE PHASE HT CONNECTION**



**SLD FOR GRID TIED ROOFTOP SPV SYSTEM (WITHOUT STORAGE) OF CAPACITY < 3 KW – 230V SINGLE PHASE LT CONNECTION**



**SLD FOR GRID TIED ROOFTOP SPV SYSTEM (WITHOUT STORAGE) OF CAPACITY 300 KVA TO 10000 KVA – 33 KV THREE PHASE HT CONNECTION**



**Annex - V**

**Application for Net Metering and Grid Connectivity of Grid Connected Rooftop & Small Solar Photovoltaic System**

To:
The Executive Engineer / The Superintendant Engineer
_____ (Distribution Licensee Name)
(Name / Address of office)

Date:

I / we herewith apply for a renewable energy net-metering connection at the existing service connection and for renewable energy plant of which details are given below.

| **Applicant Details** | |
|---|---|
| Name of applicant | |
| Address of applicant | |
| Service Connection Number | |
| Telephone/Mobile number(s) | |
| Email ID | |
| **Existing Connection Details** | |
| Connection Type | Single Phase / Three Phase |
| Sanction Load (KW/HP/KVA) and Contract Demand (KVA) | • _____KW<br>• _____ HP<br>• _____KVA |
| Category | Domestic / Non-Domestic / Industrial / Non-Industrial / Others (please specify) |
| **Proposed System Details** | |
| Type of proposed Renewable Energy system | Solar PV / Any Other (please specify) |

| | |
|---|---|
| Proposed Renewable Energy plant capacity at AC (Kilo Watts) | |
| Proposed Connectivity Voltage | Single Phase LT / Three Phase LT / HT |
| Approximate suitable area (Sq. Mt) available for installation of proposed Renewable Energy plant | |
| **Documents enclosed with this application** | |
| Copy of latest electricity bill | Yes / No |
| Mode of payment (Non-refundable registration fees) | Online/ Cash/ DD etc. |

**Certificate:** The above stated information is true to the best of my knowledge.

Place:

Date:

Signature:

Applicant's Name:

(Or on his behalf RESCO/MPUVN/or its representative)

**Instructions:**

1. The filled-in application along with the necessary documents shall be submitted to jurisdictional O&M Sub-division office, _____ Discom.

2. **On-line application:** Application can also be made online on the website www._____.com.

3. The registration fees of Rs 1000 shall be payable in Cash / DD / Online

4. The applicant is advised to select a system installer, who is empanelled under MP Net – Metered Renewable Energy Applications, 2016 to install the particular type of Renewable Energy System.

5. After installation of Renewable Energy system, office of Discom would inspect the Renewable Energy system up to 10 kW. For capacities above 10 kW, Electrical Inspectorate, Government of Madhya Pradesh would be the inspecting and certifying authority. They shall certify whether the installation meets necessary safety standards.

6. On-grid inverters: Only MNRE / MPUVN approved manufacturers of grid-tied inverters shall be used. Reports of the tests conducted for IEC/IS standards and specifications of the selected model shall be submitted.

7. Bi-directional meter as per CEA guidelines shall be purchased from Discom / MPUVN approved vendors. The vendors list of bi-directional meters can be downloaded from Discom/MPUVN website.

**General Terms and Conditions:**

1. The premise must have easy access for inspection, metering and other necessary checks.

2. The applicant should be the owner of the property or an authorized person of the owner organisation. If the property is in the name of the Company, Trust, Co-operatives / partnership firms, then authorization shall be assigned to a person for correspondence, paperwork, execution of various agreements, etc. Such person must be authorized by the management of the organization. In case of partnership firms, the authorized signatory must be one of the partners, to whom written consent has been given by the other partners.

3. The suggestive format for authorization certificate can be downloaded from the website or from Consumer Information manual. This authorization certificate must be submitted to the Discom office at the time of submitting the interconnection agreement signed by the authorised person.

4. Registered application is not transferable.

5. Discom shall not be held responsible for any legal disputes between the applicant and Renewable Energy system installer arising out of the contract.

6. The proposed capacity of the Renewable Energy system shall be in-line with the provisions of the Madhya Pradesh Electricity Supply Code, 2013, for permitting consumer connections.

**Annex - VI**

## Net-metering Application Acknowledgement

Received an application for net-metering connection for

| | |
|---|---|
| Name of applicant | |
| Service Connection Number | |
| Type of proposed renewable energy system | Solar PV / Other (please specify) |
| Proposed Plant AC Capacity (KW) | |
| Application registration number | |
| Date of Registration | |
| Application Fees details - receipt number and date | |

Signature of Authorized person :

Office Stamp :

Date :

**Annex - VII**

**Consumer Approval Letter**

**with respect to**

**the Application for Net Metering and Grid Connectivity of Grid Connected renewable energy System**

Date:

To:

(Consumer applicant's name) M/S / Mr. / Ms. _____

_____

Ref: Your application No. _____ dated _____

Our registration number _____ dated _____

With reference to your above mentioned application, approval is herewith accorded for installing renewable energy system of_____ kW in your premises as per the following terms and conditions:

1. You are advised to select an empanelled system installer of your choice to install the renewable energy system. The installer should have prior experience in design, supply and installation of renewable energy system. A list of empanelled installers of grid-connected PV systems by MNRE (Ministry of New and Renewable Energy, Government of India) / Madhya Pradesh Urja Vikas Nigam Limited (MPUVN) is a good reference point for identifying an installer.

2. You must select an inverter only from MNRE or MPUVN approved and empanelled manufacturers list. The vendors list of inverter manufacturers can be downloaded from MNRE / MPUVN website. You must submit the copy of Test Certificates for having complied with relevant IEC standards of the selected model along with work completion report.

3. All components of renewable energy system must comply with applicable IS/IEC standards. Please find attached a list of standards to be complied with attached with this approval letter.

4. In case of any changes required at your premises due to this proposed installation, these shall be performed by you at your own cost.

5. The grid connectivity of the system shall be in accordance with the MPERC 'Net Metering Regulations 2015' dated 14.10.2015 and any amendments thereof from time to time and shall confirm to requirements of Government of Madhya Pradesh's Policy for Net - Metered Renewable Energy Applications,2016.

6. Net meter shall be purchased from DISCOM / MPUVN approved vendors (as per standards of MPERC/CEA and subsequent amendments thereof) and shall be fixed at the meter point, after getting successfully tested from Discom's or their authorized laboratory at the cost of Eligible Consumer.

7. The Applicant shall provide check meters when the renewable energy system capacity is higher than 250 kWp.

9. All the safety measures and standards of the installed system must comply with requirements as stated in MPERC/CEA Regulations and all standards referred to in those regulations.

10. Please submit the following documents after installation of Renewable energy system:

- Work Completion report in provided format
- Test Certificate of Net meter from Discom laboratory
- Inspection Report by Electrical Inspector, Government of Madhya Pradesh (as notified by the State Govt.), wherever applicable, i.e renewable energy systems having capacity above 10kW.
- Copy of signed Net Metering Interconnection Agreement on Rs. 500/- non-judicial stamp paper with Discom

This approval is valid for 180 days from the date of this letter and the renewable energy system is to be commissioned within this period, progress of system

installation shall be monitored by MPUVN authorized officer / Agency and, if adequate progress is not observed MPUVN may recommend cancellation of the approval to DISCOM.

You should download the guidelines, the procedures and all technical specifications, standards and other requirements of the solar rooftop system from _____ (link to website of documents download)

Signature of Officer

Name and Designation

Date

Stamp

Enclosure : Annex I , Annex II , Annex III & Annex IV.

**Annex - VIII**

## Net Metering Inter Connection Agreement

1. This Agreement is made and entered into at (location) ____ on this (date) _____ day of (month) _____ year ____ between the 'Eligible Consumer', by the name of _____ having premises at (address) as first party AND Distribution Licensee Madhya Pradesh Poorv/ Paschim/Madhya Vidyut Vitran Company (hereinafter called as Discom) and represented by (designation of office) and having its registered office at (address) as second party of the agreement.

And whereas, the Discom agrees to provide grid connectivity to the Eligible Consumer for injection of the electricity generated from his renewable energy plant of capacity ___ kilowatts into the power system of Discom, as per conditions of this agreement, and MPERC (Net Metering) Regulations, 2015 issued by Madhya Pradesh Electricity Regulatory Commission, and MP Net Metered Renewable Energy Applications Policy, 2016. Both the parties hereby agree to as follows:

### 2. Technical and Interconnection Requirements

2.1 The Eligible Consumer agrees that his renewable energy generation plant and net metering system will conform to the standards and requirements specified in MPERC (Net Metering) Regulations, 2015 and MP Net-Metered Renewable Energy Applications Policy, 2016, al also the following Regulations and codes, as amended from time to time:-

1. CEA's (Technical Standards for connectivity of the Distributed Generating Resources) Regulations, 2013
2. Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006
3. Central Electricity Authority (Measures relating to safety and electric supply) Regulations, 2010
4. MPERC Supply Code Regulations, 2007

2.2 Eligible Consumer agrees that he has installed or will install, prior to connection of Renewable Energy system to Discom's distribution system, an isolation device (both automatic and inbuilt within inverter and external manual relays) and agrees for the Discom to have access to the renewable energy

system, if required for repair & maintenance of the distribution system.

2.3 Eligible Consumer agrees that in case of a power outage on Discom's system, Renewable Energy system will disconnect/isolate automatically and his plant will not inject power into Licensee's distribution system.

2.4 All the equipment connected to distribution system shall be compliant with relevant International (IEEE/IEC) or Indian standards (BIS) and installations of electrical equipment must comply with Central Electricity Authority (Measures of Safety and Electricity Supply) Regulations, 2010.

2.5 Eligible Consumer agrees that licensee will specify the interface/interconnection point and metering point.

2.6 Eligible Consumer and licensee agree to comply with the relevant CEA regulations and MPERC (Metering) Regulations, 2007 in respect of operation and maintenance of the plant, drawing and diagrams, site responsibility schedule, harmonics, synchronization, voltage, frequency, flicker, etc.

2.7 Due to Discom's obligation to maintain a safe and reliable distribution system, Eligible Consumer agrees that, if it is determined by the Discom that Eligible Consumer's Renewable Energy system either causes damage to and/or produces adverse effects affecting other consumers or Discom's assets, Eligible Consumer will have to disconnect Renewable Energy system immediately from the distribution system upon direction from the Discom and correct the problem at his own expense prior to a reconnection.

2.8 The consumer shall be solely responsible for any accident to human being/animals whatsoever (fatal/non-fatal/departmental/non-departmental) that may occur due to back feeding from the SPG plant when the grid supply is off. The distribution licensee reserves the right to disconnect the consumer's installation at any time in the event of such exigencies to prevent accident or damage to man and material.

## 3. Clearances and Approvals

3.1 The Eligible Consumer shall obtain all the statutory & necessary approvals and clearances before connecting the Renewable Energy system to the distribution system.

## 4. Access and Disconnection

4.1 Discom shall have access to metering equipment and disconnecting means of the renewable energy system, both automatic and manual, at all times.

4.2 In emergency or outage situation, where there is no access to the disconnecting means, both automatic and manual, such as a switch or breaker, Discom may disconnect service to the premises of the Eligible Consumer.

## 5. Liabilities

5.1 Eligible Consumer and Discom shall indemnify each other for damages or adverse effects from either party's negligence or intentional misconduct in the connection and operation of Renewable Energy system or Discom's distribution system.

5.2 Discom and Eligible Consumer shall not be liable to each other for any loss of profits or revenues, business interruption losses, loss of contract or loss of goodwill, or for indirect, consequential, incidental or special damages, including, but not limited to, punitive or exemplary damages, whether any of the said liability, loss or damages arise in contract, or otherwise.

5.3 Discom shall not be liable for delivery or realization by Eligible Consumer for any fiscal or other incentive provided by the Central/State Government beyond the scope specified by the Commission in its relevant Order

5.4 The Discom may consider the quantum of electricity generation produced in the renewable energy system under net metering arrangement towards RPO. (Applicable only in case of Eligible Consumer who is not defined as an Obligated Entity).

5.5 The proceeds from CDM benefits shall be retained by the Discom.

**6. Commercial Settlement**

6.1 All the commercial settlement under this agreement shall follow the Net Metering Regulations, 2015 issued by MPERC.

6.2 If there is surplus power generated after fulfilling captive consumption requirement at the end of the settlement period, the surplus power shall be compensated as per MPERC Net Metering Regulations, 2015 and amendments thereof. The unadjusted net credited units of electricity, at the end of each 'Settlement period', shall be purchased by the Distribution Licensee at its Average Pooled Cost of Power Purchase, as approved by the Commission for that year. The Distribution Licensee shall provide credit equivalent to the amount payable in the immediately succeeding Billing Cycle, and, if any credit still remains, then in the following Billing Cycle(s).

**7. Connection Costs**

7.1 The Eligible Consumer shall bear all costs related to setting up of renewable energy system including metering and interconnection costs. The Eligible Consumer agrees to pay the actual cost of modifications and upgrades to the service line required to connect Renewable Energy system to the grid in case it is required.

**8. Termination**

8.1 The Eligible Consumer can terminate agreement at any time by providing Discom with 90 days prior notice.

8.2 Discom has the right to terminate Agreement on 30 days prior written notice, if Eligible Consumer commits breach of any of the terms of this Agreement or MPERC (Net Metering) Regulations, 2015 issued by the Madhya Pradesh Electricity Regulatory Commission or MP Net-Metered Renewable Energy Applications Policy, 2016 and does not remedy the breach within 30 days of receiving written notice from Discom of the breach.

8.3 Eligible Consumer shall upon termination of this Agreement, disconnect the Renewable Energy system from Discom's distribution system in a timely manner and to Discom's satisfaction.

In witness, whereof, Mr. /Ms._____ ----------
for and on behalf of _____(Eligible Consumer) and Mr./Ms. _____ -
for and on behalf of _____ (Discom) sign this agreement in two originals.

| | |
|---|---|
| Eligible Consumer | Madhya Pradesh Poorv/Paschim/ Madhya Vidyut Vitran Company |
| Name | Name |
| Address | Designation |
| Signature<br>Witness 1 | Signature<br>Witness 2 |

**Annex - IX**

# Madhya Pradesh Urja Vikas Nigam Limited, Bhopal

(Wholly owned Government of Madhya Pradesh Undertaking)
www.mprenewable.nic.in

**Form I for Project Proposals for**
**Grid Connected Rooftop and Small SPV Power Plants**
**(For the project above 5 kWp & upto 50 kWp)**

Photo of the beneficiary with signature

**PART- I : Project Details**

**[A] General Details**

| Sl. No. | Description | Remark |
|---|---|---|
| 1. | **Net Metering Registration Number** | |
| 2. | **Capacity of the plant (kWp)** | |
| 3. | **Category of the Applicant/Project Proponent**<br>Government Organization/ PSU/ State Nodal Agency/ SECI/ Channel Partner/ RESCO/ System Integrator/ Finance Integrator/ Manufacture/Supplier of Solar equipment's/ Developer/ NGO/Financial Institutions/Financial Integrator/Individual/ Any other (please specify) | |
| 4. | **Details of the Applicant/ Representative/ Project Proponent**<br>Name<br>Designation<br>Mailing Address<br>Telephone, Fax & Email (Web site, if any) | |
| 5. | **Executive Summary of the Proposal**<br>(Please attach a separate sheet) | |
| 6. | **Objective for implementing the Plant**<br>(a) Sale of electricity to the distribution licensee at feed-in tariff or competitively discovered rate<br>(b) Sale of electricity to the distribution licensee at Average Pooled Price Cost (APPC) and participation in REC Mechanism<br>(c) Sale of electricity to third party<br>(d) Self-consumption total or partial generation<br>(e) Diesel saving<br>(f) Combination of above (please mention)<br>(g) Any other, please specify | Not Applicable<br>Not Applicable<br>Not Applicable |
| 7. | **Any Other detail relevant for consideration of support under the scheme by the evaluation committee** | |

**[B] Details of the plant site/location**

| Sl. No. | Description | Remark |
|---|---|---|
| 1. | **Is the plant located at the address mentioned in [A] 4 above; if No, Address of the location of the plant(s)**<br>Name<br>H. No.<br>Street/Locality/Road<br>District<br>State<br>Pin code | |
| 2. | **Is the beneficiary same as [B] 1. If No, Details of Project Beneficiary/ Organization**<br>Head of the organization<br>Name of the contact person<br>full address, phone, mobile and e-mail | |
| 3. | **Details of Proposed Power Plant**<br>(a) Proposed capacity of the SPV Power Plant (kWp)<br>(b) Plant proposed at single site/multiple sites<br>(c) Interconnection with the electricity network at single point or multiple point<br>(d) Availability of shadow free south facing rooftop/ land area for the power plant with photograph<br>(e) Total loads to be energized by SPV Power Plant (kW)<br>(f) Calculations and justification for the proposed capacity (Please elaborate)<br>(g) Expected annual energy generation<br>(h) Space for housing the plant control systems and battery bank (if any) | Single Site<br>Single Point |
| 4. | **Details of electrical load where the plant is to be installed**<br>i. Total connected electrical load in kW (as per electricity bill)<br>ii. Applicable consumer category (domestic/commercial/individual/others, please specify)<br>iii. Total electrical load to be met by the SPV power plant (kW) | |
| 5. | **Technology Description & System Design /Specification** | |

| Sl. No. | Description | Remark |
|---|---|---|
| | i. Sketch/Line diagram of the complete SPV System with details (please attach drawing)<br>ii. Capacity/ Power of each PV Module (kWp)<br>iii. Number of modules and total array capacity (nos. & kWp)<br>iv. Solar cell technology and Module efficiency proposed to be used (mono-crystalline/ poly-crystalline/ thin film/ any other)<br>v. Details of Tracking of PV Array, if proposed (single axis/ double axis tracking etc.)<br>vi. PCU/inverter capacity with detailed specifications (kVA) (Details of quality of output power, standards)<br>vii. Type of inverter (central/ string/ multi string/any other), inverter efficiency<br>viii. Number of PCU/inverters proposed to be used<br>ix. DC Bus voltage<br>x. Capacity of battery bank (Current, Voltage and AH), if used, any<br>xi. Type of battery proposed (lead acid tubular/ lithium ion/ NaS/ any other)<br>xii. Details of protections to be deployed on PV array and AC output side<br>xiii. Details of Metering, Indication, Data logging operation<br>xiv. Schematic diagram of the system including protecting interlocking devices, monitoring and data logging points to be provided.<br>xv. Details of training of manpower to be provided for successful operation of the plant. (Compliance to BIS/IEC Standards is mandatory).<br>xvi. Details of Mounting system:<br>- Roof mounted system<br>- Ground mounted system | |
| 6. | **Details of Building to install the Electronics Control Panel and Battery Bank (if any)**<br>i. Whether any existing building is to | |

| Sl. No. | Description | Remark |
|---|---|---|
| | be used as control room, if so, details to be provided.<br>ii. If a new building is to be constructed, area, estimated cost and layout, etc. to be provided and time frame to construct the building. | |

**Notes:**

- It is mandatory to provide technical performance specifications of each component of the power plant proposed to be installed under the project as applicable and for which the performance will be warranted.
- All technical parameters and warranty requirements must meet or exceed the requirements mentioned in the guidelines issued by the Ministry.

**[C] Operation and Maintenance Arrangements**

| Sl. No. | Description | Remark |
|---|---|---|
| | – Details of Operation and Maintenance Arrangements<br>– Arrangements for Generation Data Collection through remote monitoring *(applicable for SPV Power Plants having more than 5 kWp capacity)*<br>– Is dedicated staff being trained for O&M of the plant?<br>– No. of personnel to be trained in O&M | |

**[D] Project Duration and Implementation Schedule**

Completion schedule with milestones *(Please attach PERT CHART preferably)*

**[E] Monitoring Mechanism**

Details of Data Monitoring on Daily, Monthly and Annual energy generation
*(Data logging and compilation and sharing with MNRE)*

**Please provide details in the following format**

| | |
|---|---|
| Own Mechanism (up to 5 kWp) | |
| Third Party | |
| Remote Monitoring (for SPV power plants of 10kWp and above) | |

**[F] Costing of Project**

| Sl. No. | Systems | Unit Cost (Rs. in lakh) | Quantity | Total Cost (Rs. in Lakh) |
|---|---|---|---|---|
| **1.** | Cost of Systems Hardware<br>– SPV modules<br>– Inverters | | | |

| | | | | |
|---|---|---|---|---|
| | – Installation structure<br>– Electrical Wires<br>– Battery Bank (if any)<br>– Meter<br>– Any other | | | |
| **2.** | Cost of transportation and insurance | | | |
| **3.** | Cost of civil works and electrical works | | | |
| **4.** | Cost of installation and commissioning | | | |
| **5.** | Cost of Annual Maintenance for 5 years | | | |
| **6.** | Cost of Battery replacement | | | |
| **7.** | Any other related costs | | | |
| | **Total Cost** | | | |

## [G] Means of Finance

**(Rs. in lakh)**

| | | |
|---|---|---|
| 1. | Envisaged Central Financial Assistance from MNRE | Rs. |
| 2. | Contribution of Beneficiaries | Rs. |
| 3. | Contribution of Project Proponent | Rs. |
| 4. | Other Source (s) of Funding | Rs. |
| 5. | Envisaged Soft Loan assistance, if any | Rs. |
| | Details of Revenue to be collected with payback period | |

## [H] ANY OTHER INFORMATION

**PART – II . Details of Grid Connectivity of the Project**

(The developer shall submit "Single line diagram elaborating Interconnection of the Solar Photovoltaic Plant to the Grid")

| Sl. No. | Description | Remarks |
|---|---|---|
| **A.** | **Grid Connectivity Level**<br>• Low Voltage single phase supply (Up to 10 kW SPV system)<br>• Three phases low voltage supply (Up to 100 kW SPV system)<br>• Connected at 11kV level. (100 kW to 1.5 MW SPV systems)<br>• Connected at 11kV/33 kV/66kV level (1.5 MW to 5.0 MW SPV systems)<br>• Any Other level | |
| **1.** | Distance of interfacing point of the SPV Plant with the Grid | |
| **2.** | Type of Grid available | |
| **3.** | Letter of Consent for Synchronization of SPV Plant with the Network of Distribution Licensee/NOC (enclose letter) | |
| **4.** | Applicable Fee & Charges made for the Grant of Connectivity if any | |
| **B.** | **Details of Distribution Licensee providing Grid Interconnection**<br>Name and complete address of Distribution Licensee<br>Details of Contact Person<br>E-mail<br>Phone Number<br>Mobile<br>Fax | |
| **C.** | **Metering Arrangement for the Project**<br>*(Along with the application for the consideration of Central Financial Assistance, the developer shall submit "Single line diagram elaborating type and location of Meter(s))*<br>I. Export Import meters/Net Meter<br>II. Two way meters<br>III. Three Meter system | |

| | | |
|---|---|---|
| | IV. Any other (Pl specify)<br>V. Price of meter<br>VI. Whether meter is approved by Distribution Licensee:<br>VII. Class of Energy Meter | |
| **D.** | **Power Purchase Agreement**<br>*(A copy of agreement made with distribution licensee and/or third party shall be enclosed)* | Agreement with distribution licensee is attached/enclosed. |
| **E.** | **Business Model Proposed for the project**<br>i. Solar installations owned by consumer<br>– *Solar Rooftop facility owned, operated and maintained by the consumer(s).*<br>– *Solar Rooftop facility owned by consumer but operated and maintained by the 3rd party*<br>ii. Solar installations owned, operated and maintained by 3rd Party<br>– *Arrangement as a captive generating plant for the roof owners*<br>– *Solar Lease Model, Sale to Grid*<br>iii. Solar Installations Owned by the Utility<br>– *Solar installations owned operated and maintained by the DISCOM*<br>– *Distribution licensee provides appropriate viability gap funds*<br>iv. Any Other Model (Pl specify) | |
| **F.** | **Commercial Arrangement**<br>• Sale to Distribution Licensee<br>– Sale at Feed-in-Tariff determined by SERC<br>– Sale at rate discovered under competitive bidding and adopted by SERC<br>– Sale at Average power purchase cost determined by SERC and participation in REC Mechanism<br>• Self or Captive Consumption<br>– Participation in Net Metering Mechanism<br>– Sale of Surplus Power to Grid or 3rd party<br>• Sale to 3rd Party<br>– Rate committed for sale of electricity<br>– Sale of Power on Short Term (Negotiation of rate at Regular Intervals) or<br>– Sale of Power on Long Term Basis<br>– Participation in REC Mechanism | Participation in Net Metering Mechanism |

| | | |
|---|---|---|
| | • Any Other system, please specify | |
| **G.** | **Undertakings from Involved Parties**<br>I. Undertaking from the consumer/ beneficiary regarding the acceptability and cost sharing of the project<br>II. Undertaking from the third party/project developer regarding Quality assurance, installation, operation and maintenance of the system | |
| **H.** | **Any other relevant information**<br>I. Incentives availed from any other Agency (National/International)<br>II. Likely Capacity Utilization Factor<br>III. Any other. | |

# Agreement / Consent/ Certificate from User/ Beneficiary

**(To be furnished by User/ beneficiary in Appropriate Stamp Paper)**

1. This is to certify that I …….... S/o Shri …….. Resident of ……..... herewith agree to install the Grid Connected Rooftop Project / Small Power Plant of …… kWp capacity as per details submitted in the Form B / DPR of the proposal.

2. I confirm that the CFA received will be utilized for this project only and not for any other purpose. I herewith also confirm that the balance cost in addition to the CFA will be met by me from my own/ other resources.

3. I agree that the roof space will be made available in the proposed project site and is owned by me/ leased to me by the owner.

4. This is also confirmed that I will extend full cooperation including access to the project site premise to the implementing/ executing agency during installation and O&M, of the plant.

**Signature…..……..……..……**
**Name & Designation, Organization, Address of the User/ Beneficiary**
(with Seal if available)

Place:
Date:

**Annex X**

# Madhya Pradesh Urja Vikas Nigam Limited, Bhopal

(Wholly owned Government of Madhya Pradesh Undertaking)
www.mprenewable.nic.in

Photo of the beneficiary

## Format for Detailed Project Report for Grid Connected Rooftop and Small SPV Power Plants (Capacity above 50kwp to 500kwp)

1. **Introduction**
2. **All Information as per Annexure IX**
3. **Rooftop Solar Power Generation System description**
4. **System Description and Specifications of the Components**
   - (a) Solar PV module
   - (b) Grid Tie inverter
   - (c) Module mounting structure
   - (d) Array Junction Box
   - (e) AC Distribution Board
   - (f) Cable (All type)
   - (g) Earthing Kit (maintenance free)
   - (h) Installation Kit
   - (i) Meters
   - (j) Online monitoring system
   - (k) Any other component
5. **Bill of material/ system (no. /quantities)**
   **(For above components)**
6. **Calculation for unit cost of power generation**
7. **Cost benefit analysis, pay back period**
8. **Expected output**
9. **Respective drawings for layout, connection, components etc.**
10. **Connectivity details with grid and metering arrangement (with sketch diagram)**
11. **Agreement with distribution licensee/ DISCOMs**
12. **Any other information**

**Annex - XI**

# Work Completion Report

(To be submitted by the applicant)

**To,**

The Executive Engineer
…….. O & M-City
……..
**Madhya Pradesh Madhya/Paschim/Poorv Vidyut Vitran Company**

**Sir/Madam,**

**Sub:** Submission of work completion report (to be submitted by the applicant) for system documentation requirements.

**Ref:** Our Application Registration No.: _____ dtd: _____

With reference to the above, I hereby confirm to you that we have completed the work of installation of the renewable energy system and submit the following basic information for your perusal and request you to arrange to inspect and commission the system at the earliest:

## A. Details of the Solar PV module

| | | |
|---|---|---|
| 1. | Model No. | |
| 2. | Name and address of manufacturer | |
| 3. | Capacity of each Module (Wp) | |
| 4. | No. of Modules | |
| 5. | Total Capacity (kWp) | |
| 6. | Date of Installation | |

## B. Details of the Inverter

| | | |
|---|---|---|
| 1. | Name and address of the inverter manufacturer | |
| 2. | Brand Name of the inverter | |
| 3. | Model No. | |
| 4. | AC capacity of individual inverter (kW) | |
| 5. | No. of inverters installed | |
| 6. | Total AC capacity of inverter (kW) | |
| 7. | Serial Nos. | |
| 8. | Date of Installation | |

## C. Details of the Cables: DC

| | | |
|---|---|---|
| 1. | Make / Name of manufacturer | |
| 2. | Size & Type | |

**D. Details of the AC wiring**

| | | |
|---|---|---|
| 1. | Make / Name of manufacturer | |
| 2. | Size & Type | |

**E. Details of the DC distribution box**

| | | |
|---|---|---|
| 1. | Make / Name of manufacturer | |
| 2. | Sl. No. | |
| 3. | DC Surge Protection Device | |
| 4. | MCB /Isolator quantity & capacity | |
| 5. | Size & Type | |

**F. Details of the AC distribution box**

| | | |
|---|---|---|
| 1. | Make / Name of manufacturer | |
| 2. | Sl. No. | |
| 3. | AC Surge Protection Device | |
| 4. | MCB /MCCB quantity &capacity | |
| 5. | Size & Type | |

**G. Details of Battery Bank (if applicable)**

| | | |
|---|---|---|
| 1. | Make / Name of manufacturer | |
| 2. | Type of battery | |
| 3. | Sr. Nos. | |
| 4. | Capacity of each Cell (V / AH) | |
| 5. | Number of Cells in series | |
| 6. | Number of Cells in parallel | |
| 7. | Total capacity in AH | |
| 8. | Total battery bank voltage | |

**H. Details of the Earthing**

| | | |
|---|---|---|
| 1 | Earth resistance (shallbe less than 2 ohms) | |
| 2 | Size of the Earth wire / flat* | |
| 3 | Two separate Earthing points<br>Modules & DC Surge arrester<br>Inverter, AC Surge protection device & Lightening Arrester | <br>Yes / No<br>Yes / No |
| 4 | Size & Type | |

**I. Details of the Net meter details (please enclose the test report of the bi-directional meter tested at the laboratory of the Discom)**

| | | |
|---|---|---|
| 1. | Make | |
| 2. | Serial No. | |

| | | |
|---|---|---|
| 3. | Capacity | |
| 4. | Type / Model | |
| 5. | Single ph./Three ph. | |
| 6. | CT Ratio | |
| 7. | Date of Test by MT, Discom | |

**J. Details of the Caution signage**

**K. Provision of manual and automatic switches : Yes / No**

**L. G.P.S. Co-ordinates of the Renewable Energy System Installation**

(i) Latitude: (ii) Longitude:

**M. Whether Operation and Maintenance Manual provided to the consumer**: Yes/ No

Certified that the above said renewable energy system was installed and the equipment used comply with the Technical and Safety standards as specified by the Discom under net metering program.

Signature of the Applicant

Name and Address with Seal
Name: _____
_____
Date: _____

Name and Signature of the System Installer

Name of the firm and address:
_____
Date: _____

**Enclosures:**

1. Test report of net meter tested at the laboratory of the Discom.
2. Copy of the IEC/IS Test certificates of PV modules, Inverter etc.
3. Data sheets/Drawing for the array mounting System.
4. Actual Single line wiring diagram (SLD) of the SPV System.
5. Copy of Maintenance & Operation information manual provided by the System Installer
6. Copy of Interconnection Agreement on non-judicial stamp paper of Rs.500/-with Discom