

GOVERNMENT OF MANIPUR  
SECRETARIAT: SCIENCE & TECHNOLOGY DEPARTMENT

NOTIFICATION

Imphal the 9<sup>th</sup> December, 2014

No. 9/9/2014-S&T(MANIREDA)- In pursuance of decision of the State Cabinet taken on 1<sup>st</sup> December, 2014, the Governor of Manipur is pleased to adopt “MANIPUR GRID INTERACTIVE ROOFTOP SOLAR PHOTO VOLTAIC (SPV) POWER POLICY, 2014” for promoting grid quality solar power generation, which shall come into force from the date of publication in the Manipur Gazette as below:

**1.0 OBJECTIVE:**

1.1 Energy is the key driver of growth in any Economy. The biggest challenge in the world today is to meet the rising demand of energy on a sustainable basis especially in view of limitations on natural resources (fossil fuels) to generate energy. The challenge is more pronounced in our country with limitation of resources and ever-increasing demand in view of our high population. The availability has always been behind demand and it is very likely that the present trend will continue for at least a few more years. In order to supplement the scarcity on a sustainable basis, it is necessary to move towards renewable sources of energy in the State. This policy aims to lay a framework for harnessing the ubiquitous Solar energy in the State by utilising the empty rooftops of the buildings in the State. This policy is also a mandate and in synergy with to provisions of The Electricity Act, 2003.

1.2 There is a large potential available for generating solar power using unutilized space on rooftops and wastelands around buildings. Small quantities of power generated by each individual household, industrial building, commercial buildings or any other type of building can be used to partly fulfil the requirement of the building occupants and surplus, if any, can be fed into the Grid<sup>1</sup>.

**1.3 SOME ADVANTAGES:**

- a. **Solar power** is pollution free. No greenhouse gas is emitted after installation.
- b. Reduced dependence on foreign oil and fossil fuels.
- c. Renewable clean power that is available every day of the year, even cloudy days produce some power.
- d. Reasonable Return on investment.
- e. Virtually no maintenance as solar panels last over 25- 30 years.
- f. Excess power can be sold back to the power company through intertied grid.

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<sup>1</sup> Power Distribution Grid of the Power Distribution Utility of the State

- g. Ability to live without power from Grid if all power generated provides enough for the home/ building.
- h. Safer than traditional electric current.
- i. Solar energy fed to the grid under Rooftop SPV scheme can be accounted for RPO (Renewable Purchase Obligation).
- j. Saving in transmission & distribution losses for the utility.
- k. No requirement of additional land.
- l. Local Employment generation

1.4 Manipur has a good potential of Solar Energy. About 280-300 sunny days are available in the State which provide an excellent potential for installation of Rooftop and other Small Solar Power Plants in the State. The sunshine period per day on an average comes to about 8-10 hours, of which effective solar energy would be for about 4.5 - 6 hours per day.

1.5 The price of power generated from solar plants installed today is at par with or lower than the commercial tariff for consumers. The cost of solar power is on the decline while the cost of fossil fuel based electricity is increasing day by day. It is important to popularize the use of solar energy so that people gain confidence and start using solar options more and more, wherever feasible.

1.6 The Ministry of New and Renewable Energy (MNRE), Govt. of India has been implementing a programme on “Off-grid and Decentralized Solar Applications” from the first phase of the Jawaharlal Nehru National Solar Mission (JNNSM). The programme has been amended time to time and with the recent amendment a provision on this ongoing scheme has been made to connect the small SPV Plants with grid to export excess power. MNRE may provide one time subsidy upto (30-70)% of the benchmark cost of the project as follows (current rate):

Sl. No.	Type of Consumer	Applicable CFA
1.	Central and State Government Ministries and their organisations (excluding PSU/Corporate buildings)/Govt. Educational Institutions/ Hospitals/ Community Centres/Anganwadis/ Panchayat Ghars /State/Central Govt. Buildings/ Municipal Corporation Buildings/Police Stations/Police Posts/Vocational Training Centres/Govt. Hostels etc.	70% of the MNRE Benchmark cost*.
2.	Individuals	30% of the MNRE Benchmark cost.

\*The MNRE revise capital subsidy for rooftop solar power plants from time to time, details are available in; [www.mnre.gov.in](http://www.mnre.gov.in)

## 2 THE SCHEME:

- 2.1 General:** Keeping the above in view, grid interactive rooftop solar plants will be supported under this scheme. The generated power from such SPV system/project will be utilized fully for powering captive loads during the day time and excess power will be fed into the Grid as long as Grid is available. In case solar power generation is not sufficient due to cloud cover etc., the captive loads will be served by drawing power from the Grid. The connectivity of such projects will be either at 33 KV/11 KV three phase lines or of 440/220 volt three/single phase line depending on the system installed. Ideally, grid interactive systems do not require battery back-up as Grid acts as the back-up for feeding excess solar power and vice-versa. However, to enhance the performance reliability of the overall system, a minimum battery back-up of one hour of load capacity is recommended. In Grid interactive systems, it has, however to be ensured that in case the Grid fails, the solar power has to be fully utilized and feeding to the grid (if any in excess) be stopped immediately so as to safe-guard any grid person/technician from getting shock (electrocuted) while working on the grid for maintenance etc.
- 2.2 Tariff system:** The feed in tariff for the power generated from the Solar Power Plant will be decided by JERC in such a manner that it provides safeguard to all stakeholders including DISCOMs. The availability of electricity Grid near the solar installation is an essential component which needs to be provided by the concerned agencies i.e. MSPDCL<sup>2</sup> or MSPCL<sup>3</sup>, as the case maybe.
- 2.3 Metering System:** Net metering facility will be implemented for the consumers of MSPDCL who intend to encourage solar green energy and set up solar PV plants at available places on roof-tops. Individual households, industries, offices, commercial establishments, institutions, residential complexes etc. will be eligible for project capacity of minimum 1 KW upto a maximum of 500 KW with/ without battery back-up support. Consumers will generate solar power for self consumption and can feed excess power into the grid through a bi-directional export/import meter. Alternatively, two meters can also be installed to measure the export and import of power separately. All the equipment to be installed like solar PV panels, inverters, synchronizer, MPPT, batteries, transformers, cables, junction boxes etc shall be as per specified Indian/IEC standards. **MSPDCL shall install/seal tested bi-directional (export & import) or separate export and import energy meters for all Solar PV projects. However, the same could be purchased by the Plant owner or provided by the MSPDCL at pre-notified rates. The meters should be as per CEA and BIS specifications only.**
- 2.4 Capacity:** The electricity generated by the rooftop solar system of an eligible consumer shall not be more than 80% of the electricity consumption by the eligible consumer at the end of the settlement period.  
Provided that such injection of the above mentioned eligible consumer shall be settled only as per net metering arrangement at the end of each year.

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<sup>2</sup> Manipur State Power Distribution Company Limited

<sup>3</sup> Manipur State Power Company Limited

Provided further that in the event the electricity generated exceeds 80% of the electricity consumed at the end of the settlement period, no payment shall be made by the distribution licensee and shall not be carried forward to next year and the same shall be treated as unwanted/inadvertent injunction. Provided also that at the beginning of each year, cumulative carried over injected electricity will be reset to zero.

**2.5 Eligibility and Targets under the scheme:** The policy aims to utilize the existing roof space of buildings for the roof-top SPV systems to replace DG gensets installed for minimum load requirement for operation during load shedding. It also aims to harness the available potential for generating solar power using unutilized space, alongwith promotion of green and clean power to reduce the dependence on conventional source of energy.

All the individuals, residential/commercial/Institutional/Govt./Semi-Govt. building owners, Industrial units are eligible to set up Rooftop Solar Power Plant within the prescribed capacity limit. Eligible project capacity limit under the scheme will be from 1 KW upto 500 KW. The total capacity of 5 MW is targeted to be covered during 12<sup>th</sup> Plan period for which a formal proposal was already been submitted to the MNRE, GoI. Actual target will be subject to allocated target by the Ministry.

**2.6 OPTIONS FOR INSTALLATION OF SOLAR POWER PROJECTS:-** For the success and smooth operation of rooftop solar power plants, various situations and conditions needs to be provided for to make it a workable business model. There can be many possible business models, some of which can be considered are as follows:

(a) Solar installations owned by consumer:

- i) Solar Rooftop facility owned, operated and maintained by the consumer(s).
- ii) Solar Rooftop facility owned by consumer but operated and maintained by the 3<sup>rd</sup> party.

(b) Solar installations owned, operated and maintained by 3rd Party:

The 3<sup>rd</sup> party implements the solar rooftop facility and provides services to the consumers. The surplus electricity may be injected to the electricity grid. The combinations could be:

*i) Arrangement as a captive generating plant for the roof owners:*

The 3<sup>rd</sup> party implements the facility at the roof or within the premise of the consumers; the consumer may or may not invest as equity in the facility as mutually agreed between them. The 3<sup>rd</sup> party may also make arrangement of undertaking operation and of maintenance of the facility. The power is then sold to the roof owner.

*ii) Solar Lease Model, Sale to Grid :*

The 3<sup>rd</sup> party implementing the solar facility shall enter into a lease agreement with the consumer for medium to long term basis on rent. The facility is entirely owned by the 3<sup>rd</sup> party and consumer is not required to make any investment in facility. The power generated is fed into the Grid and the roof top owner gets a rent.

(c) Solar Installations at roofs of Government and its allied buildings /structures.

In order to ensure quality of the equipment's installed and its smooth performance, MANIREDA will be the implementing agency for rooftop solar systems in Government Departments and its allied institutions.

**2.7 SITE REQUIREMENT:**

- i. The project site/rooftops at office buildings, commercial buildings, residential complexes etc. can be selected on the basis of total energy requirement of the premise and the area available for installation of roof top Solar PV system.
- ii. Solar PV system on the roof top of selected buildings can be installed for meeting the requirement of the building as much as possible.
- iii. Though rooftop systems shall be generally connected on LT supply, large solar PV system may have to be connected to 11kV system. Following criteria may be made by Hon'ble JERC for selection of voltage level in the distribution system for ready reference of the solar suppliers:  

<b>Load upto 8 KW</b>	<b>:</b>	<b>low voltage single phase supply</b>
<b>Load &gt;8 kW and upto 75 kW</b>	<b>:</b>	<b>low voltage three phase supply</b>
<b>Load &gt;75 kW and upto 500 KW</b>	<b>:</b>	<b>at 33kV/11 Kv</b>
- iv. Export Import meters shall be installed with the facility of net metering. Two way meters can also be used as they are cheaper and give better idea about power exported. The meter may also be finalized in consultation with the DISCOM.

**2.8 Restrictions on level of overall or local grid penetration.**

- i. Net-metering based rooftop solar systems are small capacity systems and can be expected to proliferate fast when the policy and procedures are conducive. The impact and level of proliferation of net-metering based rooftop would have an impact on the local grid which has to address technical, safety and grid security issues arising out of possible reverse flow of electricity in the local grids. The distribution licensee shall provide net metering arrangement to all eligible consumers as long as the cumulative capacity to be allowed for a particular distribution transformer shall not exceed 30% of the rated capacity of the distribution transformer.
- ii. The distribution utility to which the consumer is connected can be given the benefit of deemed RPO for self-consumption of electricity by consumers who are not defined as obligated entities under the RPO framework as long as such consumers does not opt for REC framework for self-consumption as eligible entity. This will encourage utilities to facilitate implementation of small capacity net-metering based rooftop solar projects.
- iii. The quantum of electricity consumed by an eligible consumer, who is not defined as an obligated entity from the rooftop solar system under net-metering arrangement shall qualify as deemed Renewable Purchase Obligation (RPO) for the distribution licensee.

## **2.9 OPERATION AND MAINTENANCE:**

- (i) The solar plant shall comply with the relevant standards specified by MNRE/BIS and CEA. The responsibility of operation and maintenance of the SPV generator including all accessories and apparatus lies with the consumer. The design and installation of the rooftop SPV should be equipped with appropriately rated protective devices to sense any abnormality in the system and carry out automatic isolation of the SPV from the grid. The inverters used should meet the necessary quality requirements and should be certified for their quality by appropriate authority; the protection logics should be tested before commissioning of the plant.
- (ii) The automatic isolation or islanding protection of SPV should be ensured for, no grid supply and low or over voltage conditions and within the required response time. Adequate rated fuses and fast acting circuit breakers on input and output side of the inverters and disconnect/isolating switches to isolate DC and AC system for maintenance shall be provided. The consumer should provide for all internal safety and protective mechanism for earthing, surge, DC ground fault, transient etc.
- (iii) To prevent back feeding and possible accidents when maintenance works are carried out by DISCOM personnel, Double pole/Triple pole with neutral isolating disconnect switches with specifications as per CEA guidelines, which can be locked by DISCOM personnel should be provided. This is in addition to automatic sensing and isolating on grid supply failure etc, and in addition to internal disconnect switches. In the event of DISCOM HT/LT supply failure, the consumer has to ensure that there will be no any solar power being fed to the LT/HT grid of MSPDCL. The consumer is solely responsible for any accident to human beings/animals whatsoever (fatal/non-fatal/departmental/non departmental) that may occur due to back feeding from the SPV plant when the grid supply is off. MSPDCL reserves the right to disconnect the installation at any time in the event of damage to its grid, meter etc. or to prevent accident or damage.
- (iv) The consumer shall abide by all the codes and regulations issued by the Commission to the extent applicable and in force from time to time. The consumer shall comply with JERC/MSPDCL/CEA requirements with respect to safe, secure and reliable function of the SPV plant and the grid. The power injected into the grid shall be of the required quality in respect of wave shape, frequency, absence of DC components etc.
- (v) The consumer shall restrict the harmonic generation within the limit specified in the agreement or specified by the Central Electricity Authority (CEA) as and when such regulation is issued.

## **2.10 APPLICABILITY OF RENEWABLE ENERGY CERTIFICATE and RPO:**

Net-metering injection is not eligible for REC. The quantum of electricity consumed by an eligible consumer, who is not defined as an obligated entity from the rooftop solar system under net-metering arrangement shall qualify as deemed Renewable Purchase Obligation (RPO) for the distribution licensee.

### **2.11 PENALTY & COMPENSATION:**

In case of failure of net metering system, the provisions of penalty or compensation shall be as per the provisions of the standard of performance regulations for distribution licensee.

### **2.12 POWER TO INTERPRET, RELAX AND AMEND:**

The Science & Technology Department, Govt. of Manipur, shall be final authority to interpret any of the provisions and may by general or specific order, relax any of the provisions of this Policy and from time to time add, vary, alter, suspend, modify, amend or repeal any provisions of this Policy.

### **2.13 POWER PURCHASE AGREEMENT:-**

- i. A Power Purchase Agreement (PPA) should be signed between the owner of buildings, 3<sup>rd</sup> party, MANIREDA and MSPDCL as applicable.
- ii. An agreement between MSPDCL and the owner of building/premise/SPV plant needs to be signed for the net metering and billing on the monthly/bi-monthly basis as applicable. Suitable payment security mechanism to be provided by the MSPDCL.
- iii. MSPDCL will separately issue the tariff notification for solar energy under various options as provided for in the policy with due approval of the JERC or otherwise, as necessary.

**2.14 APPLICABLE SUBSIDY:** Rate and amount of applicable subsidy would be according to approved rate, sanctioned amount and also on the basis of allocated target by the MNRE, GoI.

### **2.15 IMPLEMENTING AGENCY:**

The Manipur Renewable Energy Development Agency (MANIREDA) shall be the implementing Agency of the Rooftop Solar Scheme.

### **2.15 HOW TO APPLY & REGISTER:-**

- i) Application form will be made available on MANIREDA website ([www.manireda.com](http://www.manireda.com)).
- ii) Photocopies of the application form may be used. When the targets available (as sanctioned by GOI) get exhausted, application process will be closed and the matter intimated on MANIREDA's website. Applicants are advised to verify this status on MANIREDA's website, before sending the application.
- iii) Applicant has to apply to MANIREDA in the prescribed format along with an application fee @ Rs. 500/- per KW in the form of DD drawn in favor of Director/ MANIREDA, Imphal. The maximum application fee will be Rs. 50,000/- per project.
- iv) The application form must be accompanied by the required application fee, a self-attested copy of a photo identity card, copy of recent electricity bill, and a

self-addressed Rs.25/- stamped envelope. In the case of Government/Govt. Undertaking/Autonomous body buildings, photo ID card are exempted upon making an official request by the Head of office concerned is required.

- v) Complete filled in application form along with registration fee and documents has to be sent to The Director/ MANIREDA, Imphal by post/courier.
- vi) Applications without application fee, required details and documents will be summarily rejected.
- vii) Selection of beneficiaries will be strictly on first- come first- served basis (subject to the condition that application is complete in all respects including technical parameters). District wise target allocation may be introduced if found necessary.
- viii) A registration number will be allotted by MANIREDA in the acknowledgement letter to the applicant.
- ix) The registration is not transferable to another beneficiary or site/building.
- x) The site will be inspected by MANIREDA and MSPDCL officials for assessing technical feasibility and if found technically feasible, plant will be allotted to the applicant through an Allotment Letter.
- xi) Plants constructed without getting the Allotment Letter from MANIREDA or without following the instructions/ specifications contained in the Allotment Letter from MANIREDA will not be considered for subsidy release.
- xii) Rate and amount of subsidy for installation of rooftop solar power plants will vary from time to time and would be subject to approval and sanction of applicable subsidy by the MNRE, GoI.

By order & in the name of Governor,

**Rajesh Agrawal,**  
**Commissioner (Science & Technology),**  
**Government of Manipur.**

Copy to:

1. The Secretary to Governor, Raj Bhavan, Imphal.
2. The Secretary to Chief Minister, Manipur.
3. The PPS to Deputy Chief Minister, Manipur.
4. The PPS to Chief Secretary, Govt. Manipur.
5. The Commissioner(Power), Govt. of Manipur.
6. The Managing Director, MSPCL/MSPDCL
7. The Director, MANIREDA.
8. The Director Printing & Stationery, Manipur with 2(two) spare copies for publication in the Manipur Extra-ordinary Gazette. He is requested to send 15 copies of the said Rules to this Department. Necessary bill(s) may be sent to Under Secretary (GAD), Govt. of Manipur.
9. The Under Secretary (GAD), Govt. of Manipur.
10. Website Manager, Department of Information Technology, 4<sup>th</sup> Floor, West Block, New Secretariat.
11. Guard File.