

Annexure - A

Off-Grid and Decentralized Solar Application Scheme: Operational Guidelines for Grid Connected Rooftop and Small Solar Power Plants Programme

I. Background:

The Government had launched Jawaharlal Nehru National Solar Mission during 2010-11, which is a major initiative of the Government of India and State Governments to promote ecologically sustainable growth while addressing India's energy security challenge. It will also constitute a major contribution by India to the global effort to meet the challenges of climate change.

The immediate aim of the Mission is to focus on setting up an enabling environment for solar technology penetration in the country both at a centralized and decentralized level. The first phase (up to 31st March 2013) focused on promoting off-grid systems including hybrid systems to meet / supplement power, heating and cooling energy requirements. Based on the experience gained during the 1st phase of the Mission, the programme is being expanded with a focus on energy access and replacement of fossil fuels with renewable energy. These systems still require interventions to bring down costs but the key challenge is to provide an enabling framework and support for entrepreneurs to develop markets. The scheme is completely demand driven.

Solar energy including thermal and PV is second largest renewable energy source after wind energy. Around 60 million households worldwide use solar hot water collectors. Total Worldwide installed capacity is 235 GWth (335 million sqm.). India was ranked 4th in the world in terms of new capacity addition during the year 2011. Installed capacity for India stands at 7.281million sq m² equivalent to 5082 MWth till 30th October 2013. Worldwide these achievements were possible with interventions in the form of capital subsidy/incentive in Electricity bill/ mandatory provision through heat laws.

In India Fossil fuels are being used for process heating, drying, distillation/ desalination, water heating, space heating, refrigeration and power/electricity generation. Nearly 25 million households are using electric geysers, consuming ~7500 GW-hr of electricity (assuming minimum annual consumption of ~600 kWh/ year/ geyser) and 15 million tons/year of petroleum fuels are used in industries in thermal form at temperatures below 300°C. It is assumed that 30% of



energy consumed in industry is used for heating water, which shows that there is a huge potential.

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 building or any other type of building can be used to partly fulfill the requirement of the building occupants and surplus, if any, can be fed into the grid. The roof-top SPV systems on building's roof space can be installed to replace DG gensets for operation during load shedding.

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 trend while the cost of fossil fuel based electricity is increasing day by day.

The cost of generating solar power at present is a little higher than the tariff charged from consumers by Distribution Licensees/DISCOMS in most cases (other than commercial). With the capital subsidy (upto 30%) or so, it may be possible to generate power between Rs.5.0 -6.50 per unit for the next 20 years, which is cheaper than the diesel gen-set based electricity and this could also be cheaper than the cost at which most Distribution Licensees/DISCOMS would make power available to the same consumer. It is therefore important to popularize the use of solar energy so that people gain confidence and then its use can increase on its own.

II. Scheme

Grid Connected Rooftop and Small Solar Power Plants Programme

1.0 Grid connected Rooftop Solar Power Plant

1.1 In grid connected rooftop or small SPV system, the DC power generated from SPV panel is converted to AC power using power conditioning unit and is fed to the grid either of 33 kV/11 kV three phase lines or of 440/220 Volt three/single phase line depending on the capacity of the system installed at institution/commercial establishment or residential complex and the regulatory framework specified for respective States. They generate power during the day time which is utilized fully by powering captive loads and feed excess power to the grid as long as grid is available. In case, where solar power is not sufficient due to cloud cover etc., the captive loads are served by drawing power from the grid. The grid-interactive rooftop system can work on net metering basis wherein the beneficiary pays to the utility on net meter reading basis only. Alternatively two meters can also be installed to major the export and import of power separately. The mechanism based on gross metering at mutually agreed tariff can also be adopted. Many such power plants can be installed at the roofs of residential and



commercial complex, housing societies, community centers, government organizations, private institutions etc.

1.2 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 systems, 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 or stopped immediately feeding to the grid (if any in excess) so as to safe-guard any grid person/technician from getting shock (electrocuted) while working on the grid for maintenance etc. This feature is termed as 'Islanding Protection'.

1.3 The grid connected rooftop solar photovoltaic power generation plants, generates electricity at the consumption center and hence contributes to reducing the network losses of the distribution licensee. The electricity generation shall also contribute to meeting the demand and supply gap and shall also enable the obligated entities for complying with their solar purchase obligation targets as specified by appropriate Electricity Regulatory Commissions'. India has a huge potential for deployment of grid connected rooftop solar photovoltaic power generation plants and the MNRE envisages harnessing this potential.

2.0 Objective of the Programme

- To promote the grid connected SPV rooftop and small SPV power generating plants among the residential, community, institutional, industrial and commercial establishments.
- To mitigate the dependence on fossil fuel based electricity generation and encourage environment friendly Solar electricity generation.
- To create enabling environment for investment in solar energy sector by private sector, state government and the individuals.
- To create enabling environment for supply of solar power from rooftop and small plants to the grid.
- To encourage innovation in addressing market needs and promoting sustainable business models and ensure employment opportunities.
- To provide support to channel partners and potential beneficiaries, within the framework of boundary conditions and in a flexible demand driven mode.
- To create a paradigm shift needed for commoditization of grid connected SPV rooftop applications.
- To support consultancy services, seminars, symposia, capacity building, awareness campaigns, human resource development, etc.
- To encourage replacement of diesel, wherever possible.

3.0 Scope of the Programme:

3.1 The programme would be applicable in all parts of India and would, to begin with, be co-terminus with the Jawaharlal Nehru National Solar Mission and will, Inter alia, focus on promoting grid connected solar rooftops and small power plants to

meet/ supplement electricity/power requirements. The Project Appraisal Committee could also examine other feasible hybrid technologies for inclusion in the Programme.

3.2 The grid connected rooftop solar photovoltaic power generation plants up to a maximum capacity of 500 kWp per project/system to generate electricity/power would be eligible under the Programme. The minimum capacity of 1.0 kW would be eligible under this programme. The programme may be implemented in Urban and Rural Areas as well. The programme encourages installation of rooftop solar photovoltaic power generation plant for self-consumption as well as supply/sale of electricity to the grid.

3.3 The programme will also cover some R&D work related to suitable meters, grid connectivity, online monitoring, software development, establishment of testing facilities, state specific studies on potential assessment, system package development, policy development, engagement of consultants, seminars/workshops, capacity building & trainings, awareness campaigns preparation of literature/guidelines, innovative projects, IT enabled monitoring mechanisms, evaluation and other studies etc.

4.0 Implementation Arrangements:

4.1 The programme would be implemented through multiple agencies for rapid up-scaling in an inclusive mode. These agencies would be State Nodal Agencies/Depts. Implementing the renewable energy programmes, Solar Energy Corporation of India and other Govt. organizations i.e. PSUs/Institutions/State Departments/Local Governments/Municipal Corporations/NHB/IREDA/DMRC, Metro Rail Corporations of other States etc. The Distribution Licensees/DISCOMs will also be eligible for direct implementation of the programme. Channel partners may also be considered for some cases.

4.2 The implementation will be carried out in both programme/project modes. The projects upto 50 kWp can be implemented in programme mode while projects above 50 kWp will be done on project mode. Following categories of implementing agencies will be utilised:-

(i) State Nodal Agencies(SNAs)

State Nodal Agencies/Depts. for implementing various renewable energy programmes have been established under the control of respective State Governments. The projects up to 50 kWp can be implemented in programme mode. Beyond 50 kWp the implementation will be in project mode. The yearly target will be allocated to the States/SNAs depending upon their interest, demand and the capability in the beginning of the Financial Year (FY) or even in February for the preceding year. About 10% of eligible CFA can be released in advance at the time of target allocation. The SNAs will keep/maintain all applications and records with them and will submit the requisite brief about the beneficiaries/projects duly



certified by them. These records will be made available for the audit purpose or to the inspecting team/MNRE officials etc.

(ii) Solar Energy Corporation of India (SECI)

The Solar Energy Corporation of India is a section 8 company established under the JNNSM as a company not for profit under the administrative control of MNRE. The SECI will submit the plan for implementation, as and when necessary and depending upon the feasibility and availability of funds the MNRE after taking into account the feasibility shall consider the plan or may suitably modify the plan before approval. SECI shall set up the allotted capacity/projects following the competitive bidding route.

(iii) Channel Partners

These channel partners would help the individuals and small groups of clients to access the provisions/benefits available under the programme. The Channel Partners enable significant reduction in the administrative/transaction cost and help in timely implementation of the projects. The Channel Partners which would be used for implementation could include the following:-

- a) Renewable Energy Service Providing Companies (RESCOs)
- b) System Integrators
- c) Manufactures of any component of the Solar Plants
- d) Project developers
- e) Vendors/ suppliers of solar equipment
- f) Reputed and relevant NGOs of National level

All Channel Partners will need to submit the proposals in the prescribed format. The online mechanism will be developed /preferred. They will follow all terms and conditions, of scheme and technical specifications as specified by MNRE time to time and will ensure the quality work.

Channel Partners will be empanelled by MNRE based on certificate from a rating agency in the country for technical and financial strength. The rating agencies would check the net worth/ turnover of the participating entity, its technical capability of supplying, installing and providing after sales service, track record and tie-ups with the equipment suppliers. Reputed Govt. technical Institutions could be exempted from the accreditation by rating agency on submission of their application with MNRE based on criteria defined for this purpose.

A transparent methodology for accrediting these entities by MNRE will be put in place. The empanelment would be done initially for 2 years which may be extended further on merit. Those channel partners who are already empanelled by MNRE under 'Off-grid and Decentralized Solar Applications' Scheme would also be considered based on their performance for the grid connected rooftop plants also. The channel partners already selected may also be notified under the programme.

Detailed Guidelines for accrediting/empanelling channel partners will be separately put in place by MNRE, or by SNAs, if the later is so directed by MNRE to empanel Channel Partners.

(iv) Financial Institutions/Financial Integrators

The financial Institutions and financial Integrators i.e., NABARD, National Housing Banks, other Banks, IREDA, SECI etc. will also be eligible for implementing the programme. They may source funds from MNRE, their own resources or any other sources i.e., carbon credits, National Clean Energy Fund, funds from States, beneficiary contribution, CSR sources etc..

(v) Other Govt. Departments/Agencies

The other Govt. Departments/Agencies i.e., Railways, Defence/Para Military Forces, Local Government Bodies including Municipal Corporations/Municipalities, PSUs, Institutions, Development Authorities, DMRC, State Departments interested in directly implementing the programme will also be encouraged. They may directly implement their own projects for meeting their large scale demands or other projects.

5.0 Project Cost, Benchmark Cost and Central Financial Assistance

5.1 The project cost of a grid connected rooftop PV system will include the hardware i.e., PV modules, inverters, meters, support structures, charge controllers, cables and minimum battery required to ensure smooth operation. It will also include cost of transportation, installation, connectivity, civil works and operation and maintenance for five years along with warranty of the system.

5.2 The benchmark cost may be fixed by MNRE on yearly/half yearly basis. The Central Financial Assistance (CFA) would be 30 % / 70% of the benchmark cost or the actual project cost as applicable, whichever is lower. The level of CFA may be revised by MNRE from time to time.

6.0 Funding Pattern.

6.1 Funding under the scheme would be in Project mode for systems larger than 50 kWp or equivalent, i.e. there must be a project report which would, inter alia, include client details, technical & financial details, O&M and monitoring arrangements. For lower capacity systems, i.e., below 50 kWp this would be operated in programme mode. Project proposals shall be submitted to the MNRE in the prescribed formats for small capacity systems. For the proposals upto 5 kWp the exact address of the beneficiary, project details with project cost etc. will be submitted by the implementing agencies in the list mode duly certified by them that their individual applications, beneficiary's identification, photo and the system photographs have been kept and maintained in their office for any audit and inspection purpose. For the projects from 5 kWp to 50 kWp the proposals shall be submitted in the prescribed format. For the projects above 50 kWp the proposal

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along with detail project report will be submitted. The total project cost shall be funded through CFA, and the users/beneficiary contribution. The beneficiary could also obtain loan from the Bank at commercial interest for meeting a cost of the power plant. Techno-economic specifications for a minimum cut-off level for the requirement of the project mode would be specified by MNRE.

6.2 MNRE would provide financial support in accordance with the benchmark cost and subsidy levels fixed by MNRE every year or on half yearly basis. The present CFA would be 30% of the benchmark cost of the grid connected rooftop and small solar power plants. However, it can be revised by MNRE time to time. The benchmark cost of a PV system will include the hardware cost up to the site including PV modules, inverters, minimum storage battery, cost of meters, local connectivity cost, cost of civil works, foundations, installation, operation and maintenance for a period of five years, comprehensive maintenance for a period of 5 years, warranty for the complete systems, etc.

6.3 In Special Category states viz. North Eastern States, Sikkim, Jammu & Kashmir, Himachal Pradesh and Uttarakhand, Lakshadweep, A&N Islands etc. the CFA upto 70% may be provided. This subsidy pattern can be accessed ONLY by Central and State Government Ministries, Departments and their organizations, State Nodal Agencies, SECI and Local bodies. This will be applicable for the projects at Central and State Government Ministries and their organizations (excluding PSU/Corporate buildings); Government Educational Institutions, Hospitals, community centers, Anganwadis, Panchayat Ghars, State/Central Government Buildings, Municipal Corporation Buildings, Police Stations, Police Posts, vocational training centers, Government hostels etc. depending on requirement.

6.4 Upto 3.0 % of CFA would be admissible as service charges to State Nodal Agencies, SECI/NHB/IREDA/DMRC or other govt. agencies etc. This would be provided by MNRE, in addition to the CFA. The amount of CFA to be given to the State Nodal Agencies/ SECI etc. as service charges would be determined as follows:-

- (a) Efforts made in preparing innovative cases by deploying staff in the field preparing DPRs etc. and having dedicated units at Head Office for such purpose.
- (b) Providing technical assistance / help in implementation of the schemes.
- (c) Having an IT based real time monitoring mechanism in place to reflect not only the progress during implementation but also performance after installation.
- (d) MNRE may retain appropriate amount out of this 3% and provide to SECI or some other organization to give technical support to such Nodal Agencies which may be weak or not having enough technical staff. Experts or qualified professionals may also be placed with SNAs.
- (e) Detailed guidelines on this will be issued in a month's time from the date of approval.

6.5 Some R&D work related to suitable meters, grid connectivity, online monitoring, software development, establishment of testing facilities etc. will also be supported under this programme on merit. The state specific studies on media publicity/ potential assessment, system package development, policy development engagement of consultants etc. will be supported under the programme. Upto 1% of the total budget would be earmarked for this purpose.

6.6 CFA for organizing seminars/workshops, trainings, awareness campaigns preparation of literature/guidelines, innovative projects or other miscellaneous work etc. can be provided depending on merit. A total fund of upto 2% would be earmarked and about 100 such activities are proposed during the 12th Plan across the country.

6.7 In order to manage the all activities in MNRE, a project management cell, engagement of consultancy organization may be done. A total fund of upto 0.50 % may be utilized for the Project Management Cell/engagement of consultancy organization etc.

6.8 The CFA from MNRE would not preclude the channel partners from availing other fiscal and financial benefits being provided by State, Central Governments and any other agency so long as the same is clearly disclosed in the project report. They could also try to access a combination of capital subsidy and allow cost interest for the end consumer, provided they can tie up with lending institutions. These lending institutions could then enter into an agreement for refinance/ interest subvention with IREDA/other suitable institutions.

6.9 The present benchmark price for photovoltaic systems without battery back-up support is considered as Rs.100/-per Wp for the systems upto 100 kWp and Rs. 90/- per kWp for the systems 100-500 kWp. This may be revised from time to time.

6.10 MNRE may work out a mechanism of disbursing subsidy through SECI/IREDA/any suitable government institution in a phased manner.

7.0 Business models for grid connected rooftop and small solar power plants

For the successful smooth operation of rooftop and small solar power plants, various situations and conditions based models may be worked out to make it a workable business model. The business models must be in accordance with the prevailing legal framework. 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 3rd party.

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

If the 3rd party implements the solar 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 3rd 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 3rd 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 3rd 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 3rd 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 Owned by the Utility**

i) **Solar installations owned operated and maintained by the DISCOM**

The DISCOM may own, operate and maintain the solar facility and also may opt to sub contract the operation and maintenance activity. The DISCOM may recover the cost in the form of suitable tariff. The electricity generation may also be utilized by DISCOM for fulfilling the solar renewable purchase obligation.

ii) **Distribution licensee provides appropriate viability gap funds**

The DISCOM may appoint a 3rd party to implement the solar facilities on its behalf and provide appropriate funds or viability gap funds for implementing such facility. It may also enter into an agreement with the 3rd party undertaking the operation and maintenance of the solar facilities.

There can be many such business models which may be developed/adopted depending upon the market conditions, user's interest, and initiatives by the ESCOs.



8.0 Requirements for grid connected rooftop and small solar plants

The following points may be considered:

i) **Connectivity Regulations**

Central Electricity Authority (CEA) has notified "**CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013**". This standard provides necessary guidance to Distribution Licensee/DISCOMs and also the transparency in the process and encourages consumers for installing such grid connected rooftop solar plants.

ii) **Tariff determination**

The projects can be installed on Net Metering or Feed-in-Tariff (FIT) basis. This will be decided by Regulators/DISCOMs/Distributed Licensee in consultation with the implementing agencies. In case of the feed-in-tariff, the provisions should be in such a manner that it provide a safeguard to all stakeholders including DISCOMs. The tariff may be such that it is attractive for the roof owner and does not put too much burden on the DISCOMs. Therefore, regulators need to come up with feed in tariff for roof tops with and without MNRE subsidy.

iii) **Availability of Electricity Grid**

The availability of electricity grid near the solar installation is an essential component which needs to be provided by the concerned agencies.

iv) **Signing of MOU/Agreements**

If required, an MoU will need to be entered into among the beneficiaries / DISCOMs / Distribution Licensees and the other involved parties.

9.0 Classification of Projects based on Grid Connectivity:

The Projects under these guidelines fall within two broad categories i.e.(a) the projects connected to HT voltage at distribution network (i.e. below 33 kV) (b) the projects connected to LT voltage i.e. 400/415/440 volts (3-phase) as the case may be or 230 volts (1-phase). Accordingly, the projects may be under the following two categories.

10.1. Category 1: Projects connected at HT level (below 33kV) of distribution network

The Projects with proposed installed capacity of minimum 50 kW and upto 500 kW and connected at below 33kV shall fall within this category. The projects will have to follow appropriate technical connectivity standards in this regard.

10.2. Category 2: Projects connected at LT level (400 Volts-3 phase or 230 Volts-1 phase)

The Projects with proposed installed capacity of less than 100kW and connected to the grid at LT level (400/ 415/ 440 volts for 3-phase or 230V for 1-phase) shall fall within this category.

11.0 Modus Operandi and submission of Proposals

11.1 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.

11.2 Solar PV system on the roof top of selected buildings can be installed for meeting the requirement of the building as much as possible in agreement with the local DISCOMs/Distribution Licensee.

11.3 Though rooftop systems shall be generally connected on LV supply, large solar PV system may be connected to 11kV system. Following criteria is suggested for selection of voltage level in the distribution system for ready reference of the solar suppliers however, the connectivity level may be decided depending upon the site conditions and policies:

- Up to 10 kW solar PV systems the connectivity may be at Low Voltage single phase supply point.
- Between 10-100 kW solar PV systems, the connectivity may be at three phases low voltage supply
- Above 100 kWp upto 500 kWp capacity, system connection can be made at 11 kV/33 kV level.

11.4 Export Import meters/two way/bi-directional meters need to 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 Distribution Licensee/DISCOM. The CEA regulations on metering arrangements may also be followed.

11.5 The billing of buildings by DISCOM can be done on the basis of net energy drawn from the grid during the month on the tariff prescribed by the Regulatory Commission for commercial consumers or as finalized with the DISCOM.

11.6 A Power Purchase Agreement (PPA) needs to be signed between the owner of buildings, 3rd party and the DISCOMs as applicable. If the State has already



announced a policy on the grid connected roof top and small solar plants, the relevant notification may be mentioned along with the proposals.

11.7 An agreement between DISCOM 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 may need to be provided by the DISCOM/ Distribution Licensee/ State Nodal Agency/ Utility etc..

11.8 The proposal can be submitted in the format as prescribed by MNRE with details of grid connectivity & metering arrangements, agreement signed with DISCOM etc. to this Ministry as per the Programme. For the small category residential users up to 5.0 kWp the bulk proposals can be submitted by SNAs along with the list of beneficiaries duly certified by them (ref para 6.1) in the format as prescribed by MNRE.

The above options/procedure is a suggestive in nature and it needs to be left on the wisdom of the implementing agency, user, DISCOMs/Distribution Licensee and states to suitably modify depending upon the prevailing conditions. There is also need to formulate a separate policy on grid connected rooftop and small solar plants by States. The policy may adopt net-metering or gross metering/feed-in Tariff or any other mechanism as deemed appropriate.

12.0 Release of Funds:

12.1 For setting up of the projects the release of funds for various Implementing Agencies would be as follows:

Sl. No.	Implementing Agency	Pattern for Release of Funds
1.	State Nodal Agencies and State Nodal Departments	Upto 30% of the eligible CFA and services charges at the time of sanction of the proposal in the project/programme mode. However, 10% advance may be given at the time of allocation of targets on programme mode. Balance 70% after successful commissioning of the projects after sample verification on submission of requisite claims.
2.	Solar Energy Corporation of India (SECI)	Upto 30 % after submission of detailed proposal on the costs firmed up on tender basis. However, 10% advance may be given on allocation of targets/sanction of the preliminary proposal on programme mode.

		Balance 70% on completion/ commissioning, performance report for about one month and due verification/third party inspection thereof on submission of requisite claims.
3.	Channel Partners	On reimbursement basis on completion/ commissioning, performance report for about one month and due verification/third party inspection thereof on submission of requisite claims. 50% of the eligible CFA may be released at the stage of claims submitted after completion/commissioning and balance 50% after verification/3rd party inspection.
4.	Financial Institutions/ Financial Instigators	Upto 30% of the eligible CFA and services charges at the time of sanction of the proposal in the project/programme mode. Balance 70% after successful commissioning of the projects after sample verification on submission of requisite claims.
5	Other Government Agencies for the Govt. Projects	Upto 30% of the eligible CFA and services charges at the time of sanction of the proposal in the project/ programme mode. Balance 70 % after successful commissioning of the projects after sample verification on submission of requisite claims.

12.2 The subsidy will be disbursed directly by MNRE to the channel partners unless decided – otherwise i.e. through SNAs. MNRE may specify an accounting system, monitoring mechanism and transparent computer based web enabled data bank with beneficiaries and system details. MNRE may also use SECI / SNAs for subsidy disbursement to channel partners. For Implementing Agencies like State Nodal Agencies/PSUs (involved in manufacturing of PV modules), the release of funds could on milestone basis on the progress of the project. The advance on milestone basis to SNAs/Depts./Govt. Depts. is applicable only to Govt. Supported projects.



12.3 The balance of CFA would be released as second and final tranche of the sanctioned CFA after receipt of Utilisation Certificate, of not less than 50% of the first tranche released. While releasing the second tranche, MNRE would take into consideration, revision in initial annual estimate (if any) for appropriate funding. An audited statement of accounts will be submitted by the proponents for the release of the second/final tranche.

13.0 Approval Mechanism

13.1 At the beginning of each year MNRE will estimate broadly the capacity available under the scheme in that year. Not more than 50% of the capacity shall be available for execution through the channel partner route. At the beginning of each Quarter, MNRE shall earmark/release an indicative target for that period. All the Channel Partners shall submit, within a 15 day period to be prescribed by MNRE, proposals/ targets in the prescribed formats along with a commitment for meeting the balance cost of the project other than the CFA to MNRE. Targets will be approved and communicated and the channel partners can start implementation at their own risk and investment. They will be responsible for following the scheme guidelines and MNRE specifications. Project will be sanctioned within 45 days of receiving of the project report from the project proponent. The proposals of the Channel Partners will be sanctioned on the appraisal and recommendations of the Project Appraisal Committee (PAC) constituted by MNRE.

In case capacity applied for by the Channel Partners exceeds the available capacity in that period, MNRE will devise a transparent mechanism to decide on the allocation of capacity to the various Channel Partners. However, in no case shall the total capacity allocated through Channel Partners exceed 50% of the total capacity allocation in any particular quarter.

13.2 Proposals of State Nodal Agencies, SECI and other Govt. Agencies, NHB, PSUs and IREDA will not require PAC approval and will be directly processed/ sanctioned by the division.

13.3 The entire process of receiving proposals, processing them and giving approvals would be preferably IT enabled. The mechanism for online monitoring of each project will be developed and efforts will focus towards real time monitoring. The PAC would also frame rules and prescribe formats etc., for project approval, with in the overall framework of this scheme, so as to make the process transparent.

13.4 The in-principle approval of the targets/ proposals may be granted by the Ministry in-advance to the States Departments/SNAs/Channel Partners and other implementing agencies to enable them for planning their strategies identify the beneficiaries, formulate the specific proposals etc..

13.5 MNRE reserves the right to decentralise the whole process of administering the Channel Partners to SNAs.



14.0 Project Management Consultant (PMC)

The government may engage a reputed agency as a Project Management Consultant (PMC) to handle all the processes such as assistance for formulation, appraisal and screening of proposals preceding the formal approval which would be a function of MNRE. It would also assist the Ministry in formulating the detailed implementation guidelines/formats, if any. A Project Management Cell is also proposed to be created in MNRE. The PMC will also device a suitable Monitoring System.

15.0 Monitoring and Evaluation:

15.1 Monitoring and evaluation studies of the Scheme and its implementation will be carried out during the period of implementation of the Scheme as is given below:

- i. At the primary level of monitoring, channel partners would be responsible for monitoring parameters such as end-use verification and KYC compliance and also compilation of statistical information.
- ii. National monitors, Consultants, Institutions, Reputed Civil Society Groups, eminent persons, Corporate Houses (as an activity under Corporate Social Responsibility) with relevant experience, SNAs, other govt. organizations and MNRE officials would be involved, for ground verification/performance evaluation on random sample basis.
- iii. The electricity generation data should be available at the beneficiary level. However, for projects above 5 kW, the system providers would also make available generation data to MNRE at intervals specified.
- iv. For the projects 50 kWp and above 100% field inspection would be required and the claim will contain the inspection report.

However, primarily responsibility of monitoring and reporting will be with the implementing agencies.

15.2 Information and Communication Technology must be used for ensuring fool proof monitoring. Since the scheme envisages IT enabled monitoring and verification protocols, the cost of monitoring may be included in the total project cost which should be used by various channels partners/agencies/organisations for compliance.

15.3 It is envisaged that certified energy auditors, scheme monitors and others would be empanelled for certifying the outputs of the system correspond to the parameters laid down in the programme.

16.0 Technical Requirements

16.1 The scheme requires the project proponents to adhere to the national/international standards specified by the Ministry from time to time.

16.2 Only indigenously manufactured PV modules should be used in Solar PV systems power plants. However, other imported components can be used, subject to adequate disclosure and compliance to specified quality norms and standards.

16.3 Grid interactive SPV power plants and/ systems, inverters, meters, cables, mounting structures and other balance of systems etc. should have the minimal technical requirements and Quality Standards as specified by MNRE from time to time.

17.0 Supporting Innovation

In very special and rare cases, the Ministry could consider higher CFA for undertaking pilot and demonstration projects either for demonstrating new and innovative applications or for demonstrating new technologies. Ministry may also consider sanctioning to SECI or other government institutions demonstrative projects with higher CFA with a provision for recovery of the CFA on savings in fuel usage. Detailed guidelines for such schemes would be separately drawn up, if required.

18.0 Natural Calamities and Disasters

18.1 Ministry could consider providing 100% funding in case of natural calamity for installation of grid connected rooftop and small solar plants on humanitarian ground.

19.0 Interpretation of the Guidelines

In case of any ambiguity in interpretation of any of the provisions of these guidelines, the decision of the Ministry shall be final.

20.0 Review

20.1 The scheme would be reviewed by an Internal Review Committee at 6 month/yearly interval and modifications therein as and when recommended would be incorporated by the Ministry in the programme time to time. In addition, a platform for experts to discuss best practices, debate over issues to overcome bottlenecks and provide effective policy suggestions for ensuring wide spread grid connected solar solutions deployment would also be established at the national level.

20.2 MNRE may frame specific guidelines for various products and various categories based on this scheme to bring in more clarity and easy applicability. In these guidelines MNRE may exclude certain provisions if they are not required for that product category or if it is felt that lesser support is required.

III. Fixing of CFA and Benchmark cost

All CFA values will be based on bench mark cost and would be fixed in absolute value i.e. In Rs/Watt. There could also be other parameters like efficiency of system. For fixing CFA and bench mark cost, MNRE will set up a

committee which will take inputs from rates received in various tenders by SECI and other agencies including Nodal agencies, component market rates, global rate trends etc. The CFA may be fixed annually or biannually. In case of channel partners a correction factor will apply on the bench mark price to determine the CFA.

Following procedure will be used to determine the benchmark cost under Solar Off Grid Scheme for the Grid Connected Rooftop and Small Solar Power Plants:-

1. Benchmark cost will be determined separately for the Grid Connected Rooftop Photovoltaic (PV) plants including the cost of components as mentioned in para 5 above.
2. Separate committee would be constituted in MNRE for the grid connected categories.
3. The benchmark cost would be fixed based on the following two main criteria:
 - a) Price determined through tenders done by SECI, State Nodal Agencies and other Government Departments/ organizations in 12 months preceding the date when the committee starts working for determining the benchmark cost for next year.
 - b) Component wise cost breakup to arrive at an estimated price of each of the products for which benchmark cost is determined. The committee will collect data about all the tenders floated with MNRE subsidy. These would then be clubbed into different categories depending on the product, technology etc. Thereafter the committee may develop criteria for arriving at a rate out the price or by calculating median. The benchmark so determined through tendered price will then be compared with values arrived at through costing by clubbing the price of various components. In case of wide difference, the committee may go into the reasons and if need be, apply correction factor.
4. The committee may take into account all relevant factors and also co-opt experts if necessary to adopt a benchmark price as close to the actual price as possible. The committee may also relook the benchmark cost after 6 months in case it is felt that there is a major change in the market.
5. It is hoped that price of the system will come closer and closer to benchmark cost as time progresses and after few years the price coming through tenders would not be very different from benchmark cost. Benchmark cost will also get rationalized as technologies improve.



IV. Tatkal Scheme

There would be provision for reserving quantities of various solar systems at lower subsidy levels along with the facility of disbursal on priority basis in a definite time period. This would, however, be done within the upper subsidy cap as laid down in the scheme for the particular component. A committee will be set up to decide the scheme separately.

V. Hybrid systems

There would be a provision to promote hybrids like Wind-solar etc. within the defined CFA and subsidy limits for that particular component in this scheme.

VI. Specification and standards

Ministry will set the technical specification and quality standards from time to time and rationalize them as may be required. Technical specification and standard for each part of the scheme is specified in Annexure-1 as currently applicable.

VII. Monitoring and System life

Online monitoring will be compulsory for all systems more than 10 kWp capacity for PV and equivalent of 10 kW capacity for thermal systems. Real time monitoring may be specified by MNRE for large systems and online monitoring would be eventually extended to 1 kWp systems as well.

Life of systems and products will be specified from time to time and efforts will be made to ensure that no systems or products are discarded before full life usage.

VIII. Guidelines for Channel Partners

The Channel Partners are an important implementing agency. It is essential to ensure that guidelines for selection, rating and appraisal of channel partners are transparent and simple. It shall also be ensured that there are no restrictions on the number of channel partners and all otherwise eligible agencies are empanelled subject to their rating and appraisal. In case of overcapacity of applications, the projects shall be allocated among channel partners in a transparent manner. MNRE shall issue detailed guidelines within 30 days from the date of approval for channel partners covering all these aspects.



IX. Redundancy and Interpretation

In case of a particular application being eligible for CFA under more than one of the sub-schemes outlined above, the same shall be considered for sanction under that sub-scheme which involves lesser minimum CFA.

In case of any ambiguity regarding interpretation of the guidelines, the decision of MNRE shall be final.



Annexure- 1

[A] BOUNDARY CONDITIONS FOR SUPPORT TO GRID Connected SOLAR PV APPLICATIONS

S.NO.	Category of beneficiaries	Size
1	All Categories including Individuals, Industrial/Commercial/ Non Commercial entities	1 kWp to 500 kWp

[B] Minimal Technical Requirements /Standards for SPV Systems / Plants to be deployed under the Programmes of Ministry of New and Renewable Energy

1. PV MODULES:

- 1.1 The PV modules must conform to the latest edition of any of the following IEC /equivalent BIS Standards for PV module design qualification and type approval: Crystalline Silicon Terrestrial PV Modules IEC 61215 / IS14286, Thin Film Terrestrial PV Modules IEC 61646 / Equivalent IS (Under Dev.), Concentrator PV Modules & Assemblies IEC 62108.
- 1.2 In addition, the modules must conform to IEC61730 Part 1-requirements for construction & Part 2 – requirements for testing, for safety qualification or Equivalent IS (Under Dev.)
- 1.3 PV modules to be used in a highly corrosive atmosphere (coastal areas, etc.) must qualify Salt Mist Corrosion Testing as per IEC 61701 / IS 61701.

1.4 IDENTIFICATION AND TRACEABILITY

Each PV module must use a RF Identification tag (RFID), which must contain the following information:

- (i) Name of the manufacturer of PV Module
- (ii) Name of the Manufacturer of Solar cells
- (iii) Month and year of the manufacture (separately for solar cells and module)
- (iv) Country of origin (separately for solar cells and module)
- (v) I-V curve for the module
- (vi) Peak Wattage, I_m , V_m and FF for the module

- (vii) Unique Serial No and Model No of the module
- (viii) Date and year of obtaining IEC PV module qualification certificate
- (ix) Name of the test lab issuing IEC certificate
- (x) Other relevant information on traceability of solar cells and module as per ISO 9000 series.

Until March 2013, the RFID can be inside or outside the module laminate, but must be able to withstand harsh environmental conditions.

1.5 VALIDITY :

The validity of the existing Certificates/Reports in the old format/procedure shall be valid till March 2013 only. Manufactures are advised to get their samples tested as per the new format/procedure before 31st March 2013, whose validity shall be for five years.

1.6 AUTHORIZED TESTING LABORATORIES/ CENTERS

PV modules must qualify (enclose test reports/ certificate from IEC/NABL accredited laboratory) as per relevant IEC standard. Additionally the performance of PV modules at STC conditions must be tested and approved by one of the IEC / NABL Accredited Testing Laboratories including Solar Energy Centre of MNRE. For small capacity PV modules upto 50 Wp capacity STC performance as above will be sufficient. However, qualification certificate from IEC/NABL accredited laboratory as per relevant standard for any of the higher wattage regular module should be accompanied with the STC report/ certificate.

1.6.1 Details of Test Labs shall be given separately.

(Any other Test Lab that has set – up for testing and wants to get included may contact Director, MNRE)

1.6.2 While applying for Testing, the Manufacturer has to give the following details:

- A copy of registration of the company particularly for the relevant product/ component/ PV system to be tested
- An adequate proof from the manufacturer, actually showing that they are manufacturing product by way production, testing and other facilities
- Certification as per JNNSM standards for other bought out items used in the system

Without above proof test centers are advised not to accept the samples.

1.7 WARRANTY

PV modules used in solar power plants /systems must be warranted for their out put peak watt capacity, which should not be less than 90% at the end of 12years and 80% at the end of 25 years.

2. BALANCE OF SYSTEM (BOS) ITEMS/ COMPONENTS:

2.1 The BOS items /components of the SPV power plants /systems deployed under the Mission must conform to the latest edition of IEC/ e quivalent BIS Standards / MNRE specifications / as specified below:

BOS Item / System	Applicable BIS /Equivalent IEC Standard Or MNRE Specifications	
	Standard Description	Standard Number
Power Conditioners/ Inverters**including MPPT and Protections (more than 100 Wp and up to 20 KWp Capacity only) :	Efficiency Measurements Environmental Testing	IEC 61683 / IS 61683 IEC 60068-2 (1, 2, 14, 30) / Equivalent BIS Std.
Charge Controller/MPPT units	Environmental Testing	IEC 60068-2 (1,2,14,30) /Equivalent BIS Std.
Storage Batteries	General Requirements & Methods of Testing Tubular Lead Acid / VRLA / GEL Capacity Test Charge/Discharge Efficiency Self-Discharge	As per relevant BIS Std.

<u>Cables</u>	General Test and Measuring Method PVC insulated cables for working voltage up to and including 1100 V and UV resistant for outdoor installation	IEC 60227 / IS 694 IEC 60502 / IS 1554 (Pt. I & II)
<u>Switches/Circuit Breakers /Connectors</u>	General Requirements Connectors –safety A.C./D.C.	IEC 60947 part I,II, III / IS 60947 Part I,II,III EN 50521
<u>Junction Boxes /Enclosures for Inverters/Charge Controllers/Luminaries</u>	General Requirements	IP 54(for outdoor)/ IP 21(for indoor) as per IEC 529
<u>Meters</u>	As per CEA Guidelines issued from time to time	
<u>Grid Connectivity</u>	As prevalent in the State	

**In case if the Charge controller is in-built in the inverter, no separate IEC 62093 test is required and must additionally conform to the relevant national/international Electrical Safety Standards wherever applicable

2.2 AUTHORIZED TESTING LABORATORIES/ CENTERS

Test certificates / reports for the BoS items/components can be from any of the NABL/ IEC Accredited Testing Laboratories or MNRE approved test centers. The list of MNRE approved test centers will be reviewed and updated from time to time.

2.3 WARRANTY

The mechanical structures, electrical works including power conditioners/inverters/charge controllers/maximum power point tracker units/distribution boards/digital meters/switch gear/storage batteries, etc. and over all workmanship of the SPV power plants/ systems must be warranted against any manufacturing/ design/ installation defects for a minimum period of 5 years.



No. 03/88/2015-16/GCRT
Government of India
Ministry of New and Renewable Energy
(Solar Energy Group)

Block No. 14, CGO Complex,
Lodhi Road, New Delhi,
Dated: 04/03/2016

To
The Pay and Accounts Officer
Ministry of New and Renewable Energy
Government of India, New Delhi

Subject: Grid Connected Rooftop and Small Solar Power Plants Programme – Scaling-up of budget from Rs. 600 crore during the 12th Five Year Plan to Rs.5000 crore for implementation over a period of five years upto 2019-20 under National Solar Mission (NSM) - Amendment regarding.

Sir,

In continuation to the Administrative Approval for 'Grid Connected Rooftop and Small Solar Power Plants Programme' under 'Off-Grid and Decentralized Solar Applications' scheme issued vide no. 30/11/2012-13/NSM dated 26th May, 2014 and the guidelines for the same issued vide even no. dated 26th June, 2014, I am directed to convey the approval of the President of India for scaling-up of the budget outlay of 'Grid Connected Rooftop and Small Solar Power Plants Programme' from Rs.600 crore during the 12th Five Year Plan to Rs.5000 crore for implementation over a period of five years i.e. 2015-16, 2016-17, 2017-18, 2018-19 and 2019-20 under National Solar Mission. Out of this Rs.5000 crore, the outlay of Rs.1750 crore will be allocated for implementation during the 12th Five Year Plan and balance outlay of Rs.3250 crore will be allocated for implementation during the remaining period i.e. 2017-18 to 2019-20.

2. The pattern of Central Financial Assistance (CFA) of the grid connected solar rooftop systems will be retained as per existing on-going scheme under implementation as issued vide no 30/11/2012-13/NSM dated 26th June, 2014, with following modifications:

- i. The existing pattern of capital subsidy at the rate upto 30% of benchmark cost for the general category States (upto 70% of benchmark cost for special category States i.e., North Eastern States including Sikkim, Uttarakhand, Himachal Pradesh, Jammu & Kashmir and Lakshadweep, Andaman & Nicobar Islands) is being modified to the extent that there will be no subsidy for commercial and industrial establishments in the private sector.
- ii. The Government Institutions including Public Sector Undertakings (PSUs) shall not be eligible for subsidy; instead they will be given achievement-linked incentives/awards for which a separate notification will be issued.
- iii. All remaining sectors including residential, institutional (hospitals, educational institutions etc.), social sectors etc. will be eligible for subsidy as above (irrespective of the type of electricity connection).
- iv. The details of sector-wise eligibility of Central Financial Assistance is given in **Annexure.**



3. The other terms and condition of the existing "Grid Connected Rooftop and Small Solar Power Plants Programme" under implementation vide no. 30/11/2012-13/NSM dated 26th May, 2014 and the guidelines vide even no. dated 26th June, 2014 will remain same.

4. To ensure smooth and timely implementation of the scheme, MNRE will be authorized to make amendments in the terms and conditions of the scheme including subsidy pattern, within the broad parameters outlined, with the approval of Minister, NRE without increasing the total financial requirement.

5. The financial outlay is being revised from Rs.600 crore to Rs.5000 crore for implementation over a period of 5 years from 2015-16 to 2019-20. The year-wise estimated financial outlay and corresponding targets would be as follows:

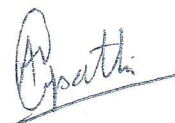
(Rs. in Crore)

Sl. No.	Items	2015-16	2016-17	2017-18	2018-19	2019-20	Total
1.	Physical Targets (in MWp) to be sanctioned/awarded*	1000	1500	1500	200	---	4200
2	Capital Subsidy including incentives/awards*	210	1445	1435	940	695	4725
3	Capacity building, Surya Mitra's training, awareness generation, seminars/workshops literature/guidelines, consultancy/Project Management Cell, R&D, innovative projects, monitoring, software/IT tools development, testing facilities etc. as per provisions in the programme.	25	35	35	30	10	135
4	Service charges to the State Nodal Agencies, DISCOMs, Solar Energy Corporation of India, IREDA, REC, NHB, Banks or any other Govt. organizations (upto 3% of total budget/CFA).	15	20	30	30	45	140
Total		250	1500	1500	1000	750	5000

*Estimates based on present average benchmark cost as Rs.7.5 crore per MWp. This will change from time to time. The above year-wise allocations may be changed within the overall provisions of the scheme as per demand and feasibility.

6. The expenditure involved will be debited to following budget heads for current financial year 2015-16:

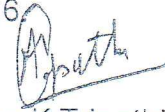
Budget Heads
Demand No. 69-Ministry of New and Renewable Energy
Major Head: 2810-New & Renewable Energy
Minor Head: 101-Grid Interactive & Distributed Renewable Power
01-Grid Interactive Renewable Power
04-Solar Power
01.04.31-Grants-in-Aid General during the year 2015-16 (Plan).
01.04.33-Subsidy
01.04.20-Other Administrative Expenses



7. This is an amendment to the Administrative Approvals issued earlier for implementation of the "Grid Connected Rooftop and Small Solar Power Plants Programme" under "Off-Grid & Decentralized Solar Applications" scheme of National Solar Mission vide order no. 30/11/2012-13/NSM dated 26th May, 2014 and the guidelines for the same issued vide even no. dated 26th June, 2014.

8. The implementation of above amendments in the programme will come into effect from the date of issue of this amendment.

9. This sanction issues in exercise of powers delegated to this Ministry and with the concurrence of IFD dated 15.02.2016 vide their Dy. No. 2027 dated 11.02.2016.



[Dr. Arun K Tripathi]
Adviser/Scientist 'G'
Telefax: 011-24363035
Email: aktripathi@nic.in

Copy for information and appropriate action to:-

1. All Central Ministries and Departments;
2. Department of Public Enterprises (DPE), Block 14, CGO Complex, New Delhi
3. Principal Director of Audit, Scientific Audit-II, DGACR Building, I.P. Estate, Delhi
4. Principal Secretaries/Secretaries (Energy Departments) all States /UTs
5. All State/UT Nodal Agencies (by name)
6. All Municipal Commissioners
7. CMD, IREDA, 1st floor, East Court, Indian Habitat Centre, Lodhi Road, New Delhi
8. Director General, Bureau of Indian Standards, Manak Bhawan, 9, Bahadur Shah Zafar Marg, New Delhi
9. D.G., National Institute of Solar Energy, Gwal Pahari, Gurgaon, Haryana
10. MD, Solar Energy Corporation of India, D-3, A Wing, 1st Floor, Religare Building, District Centre, Saket, New Delhi-110017
11. National Housing Bank and all Nationalized/Private Banks.
12. Director, National Institute of Wind Energy/Director, National Institute of Bio Energy

Copy to:

1. PS to Hon'ble Minister of State for Power, Coal and New and Renewable Energy, Shram Shakti Bhawan, New Delhi.
2. PSO to Secretary, MNRE
3. PS to JS&FA, MNRE
4. JS(VJ)/JS(TK)
5. All Advisers & Group Heads
6. All Under Secretaries in MNRE
7. Director (NIC) to upload this on the Ministry's website
8. CA, MNRE/Cash Section
9. Hindi section for Hindi version
10. Sanction folder




[Dr. Arun K Tripathi]
Adviser/Scientist 'G'

Annexure

Sector-wise eligibility of Central Financial Assistance (CFA) and Achievement-linked Incentives/Awards

Sl. No.	Category	Coverage of buildings	Central Financial Assistance/Achievement linked Incentives & awards
(i)	Residential	All types of residential buildings	CFA upto 30% of benchmark cost for General Category States/UTs and upto 70% of benchmark cost for Special Category States i.e., North Eastern States including Sikkim, Uttarakhand, Himachal Pradesh, Jammu & Kashmir and Lakshadweep, Andaman & Nicobar Islands.
(ii)	Institutional	Schools, health institutions including medical colleges & hospitals, universities, educational institutions etc. <i>[applicable to not-for-profit registered organizations only, except those covered under Sl. No. (iv), (v) & (vi)].</i>	CFA upto 30% of benchmark cost for General Category States/UTs and upto 70% of benchmark cost for Special Category States i.e., North Eastern States including Sikkim, Uttarakhand, Himachal Pradesh, Jammu & Kashmir and Lakshadweep, Andaman & Nicobar Islands.
(iii)	Social sector	Community centres, welfare homes, old age homes, orphanages, common service centres, common workshops for artisans or craftsman, facilities for use of community, Trusts/NGOs/Voluntary organizations/Training institutions, any other establishments for common public use etc. <i>[applicable to not-for-profit registered organizations only, except those covered under Sl. No. (iv), (v) & (vi)].</i>	CFA upto 30% of benchmark cost for General Category States/UTs and upto 70% of benchmark cost for Special Category States i.e., North Eastern States including Sikkim, Uttarakhand, Himachal Pradesh, Jammu & Kashmir and Lakshadweep, Andaman & Nicobar Islands.
(iv)	Government Buildings	Buildings of Both Central, & State Government, local government covering all Government offices.	No CFA. Achievement linked Incentives/awards will be provided.
(v)	Government Institutions	Government Institutions, Public Sector Undertakings, all buildings owned by Government directly or by any Government owned societies, companies, corporations, Institutions or organizations, Government educational/health institutions.	No CFA. Achievement linked Incentives/awards will be provided.
(vi)	Private, commercial and industrial sector	All types of buildings.	No CFA.

No CFA is applicable for any type of Government buildings, Government institutions/Government organizations including PSUs. Only achievement linked Incentives/awards will be eligible for which a separate notification will be issued.


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